SITE PLAN CP 413 BLOCK 2
COOPER CREEK CEDAR LTD.

A. TENURE IDENTIFICATION

LICENCE NO.:	CP:	BLOCK:	TIMBER MARK:	UTM:	LICENSEE NAME:
FL A30171	**413**	**2**	**FE5413**	**505300 E, 5501900 N**	**Cooper Creek Cedar Ltd.**
AREA UNDER TENURE (ha):	MAPSHEET/OPENING #:		ELEVATION:	LOCATION:	
26.4	**82F066-**		**625-710m**	**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
2.3	**-**	**-**	**-**	**-**	**-**	**4.3**	**-**	**3.0**	**9.6**

NET AREA TO BE REFORESTED (ha)		
SU	SU AREA DESCRIPTION The block is located in the Coffee South Face Domestic Watershed north of the community of Queens Bay	NET AREA TO BE REFORESTED:
A	**ICH dw1 101_8 104_2** . Aspect is variable but mainly east facing, slopes range from 13 to 42% with an average of 27%. Terrain is gentle slopes facing a non-classified drainage. Surface soil texture is Silty Loam (SiL), and subsoil texture is Silty Loam to Sandy Loam (SiL-SL). Soils are moderately well drained. Coarse fragment content is Low (20%) in surface soils and low to moderate (30-40%) in subsoils. Moisture regime is mesic and nutrient regime is poor to medium. Humus form is a thin mor (2.5-3.0cm thickness) and rooting depth is 35cm. Soils are **non-sensitive**. Average stand density (all species) is 600 stems/ha. Most stems fall within the 20-55cm DBH classes, with 3.1% of stems in the 60-85cm DBH classes. Approximate species composition by density is Cw 55%, Hw 21%, Fdi 18%, Ep 4%, Bg 3% and Lw At Py <1%. Stand age ranges from 49-154 with an average of 102 years old. The understory contains low densities of Hw and Cw regen, saplings and poles that are mainly in poor (suppressed) condition but growing well in openings. **Conventional Ground Based** harvest methods and a Clearcut with reserves silviculture system. **Retain 20-25 stems/ha** as per section G (Silvicultural Systems).	**9.3**
B	**ICH dw1 104_8 101_2** Aspect is variable, slopes range from 4 to 46% with an average of 25%. Terrain is a gentle ridge and surrounding slopes. Surface soil and subsoil texture is Sandy Loam (SL). Soils are well drained. Coarse fragment content is moderate (30-60%). Moisture regime is submesic and nutrient regime is poor to medium. Humus form is a thin mor (4cm thickness) and rooting depth is 28cm. Soils are **non-sensitive**. Average stand density (all species) is 598 stems/ha, Approximate species composition by density is Fdi 53%, Cw 28%, Ep 13%, and Lw 6%. Most stems fall in the 20-55cm DBH classes. **Conventional Ground Based** harvest methods and a Retention silviculture system. **Retain 65 stems/ha**, where available, as per section G (Silvicultural Systems).	**7.5**
	TOTAL NET AREA TO BE REFORESTED:	**16.8**
	TOTAL AREA UNDER THE PLAN:	**26.4**

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	• 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 Consultants Ltd 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). Cooper Creek Cedar Ltd has completed the First Nations referral and 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) **Pons Creek (NCD/S6)** runs through the block and drains into Madden Creek. 2) **Madden Creek (S6)** runs outside the southern harvest boundary. 3) See Section E.1 for Riparian Management Strategies. 4) 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** do not contain 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 within the block boundaries. 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 65 stems/ha of mature retention throughout SU B and 20-25 stems/ha of mature retention in SU A 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)	'KBHLP Objective 6' – **CP413 Block 2** is located within the Coffee South Face Domestic Watershed. Referral letters dated November 9, 2019 were sent to POD licensees with a 30 day response period. **Madden Creek (S6)** has 2 active PODs downstream of development. The majority of the RMA of Madden Creek was located outside the harvest boundary **Pons Creek (S6)** flows into Madden Creek after turning into an NCD south of the block. Mature timber reserves were placed on the stream portion of Pons Creek and Machine-Free zones placed on most of the NCD portions.
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)	One internal Wildlife Tree Retention Area is planned for this block, totalling **4.3 ha**. Overall wildlife tree retention percentage for block 2 is approximately **16.3%.** Total WTRA for CP413 is **7.0 ha** which constitutes approximately 11.9**%** 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:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	**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.

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 413 Block 2**, 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 2 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 January 31, 2019. The following invasive species were reported in nearby areas to **CP 413 (Queens Bay)**: Canada thistle, Chicory, Common tansy, Oxeye daisy, Himilayan blackberry, Japanese knotweed, Scotch broom, Spotted knapweed, Yellow hawkweed, Orange hawkweed, St. John's wort, Bladder campion, and Burdock species.

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 2 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	9.3	1062310	See Section H - Stocking Requirements
B	7.5	1062309	See Section H - Stocking Requirements

C. MANAGEMENT OBJECTIVES & STRATEGIES

C.1 MANAGEMENT OBJECTIVES

- Objectives for **CP 413 Block 2** 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.
- Harvest this mature stand of **FdCwHw(BgLwEp)** 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(BgPlPyHw)** for similar end products.
- **Wildlife Tree Retention Area (WTRA):** Two WTRAs are planned totalling **4.3 ha** in size (16.3% 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 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 3.2.2 - Ungulates

Migratory Bird Habitat Assessment: Block 2 is within Migratory Bird Risk Rating 4 polygon (Age Class 6(5) & Height class 4(3) – ICH: MixCon - Cw Fdi Hw(Bg Lw Ep))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, where 70 stems/ha will be retained. 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 Pons and 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 the block. Lower elevation ICH dw1 site conditions. Aspect is variable but mainly east facing, with short, broken slopes. Lower slope location. Vegetation cover is low over most of the block. Most road access is existing structures. Existing coarse woody debris levels are low, 10-15% (15-30cm diameter) in most areas.

Average stand density (all species) is 525 stems/ha. Most stems fall within the 20-55cm DBH classes, with 3.1% of stems in the 60-85cm DBH classes. Approximate species densities are Cw 239 stems/ha, Fd 139 stems/ha, Hw 90 stems/ha, Ep 31 stems/ha, Bg 16 stems/ha, and Lw 9 stems/ha. Stand age ranges from 49-154 with an average of 102 years old. The understory contains low densities of Hw and Cw regen, saplings and poles that are mainly in poor (suppressed) condition but growing well in openings.

SU A: stand type by density is: Cw5 Fdi2 Hw2 (Bg Lw Ep At Py).
SU B: stand type by density is: Fdi6 Cw3 Ep1 (Bg Lw Hw).

Forest cover adjacent to the block includes similar mature stands outside north, east and west boundaries, logged private land outside the south boundary and powerline right-of-way outside the northwest and southwest boundary.

Actions prescribed:

Total Area specified for the retention of wildlife trees: **4.3 ha** (16.3% of gross area)

Wildlife Tree Retention Patch (WTRA):

WTRA-1 (4.3 ha) Hw4Cw4Fdi2(Lw): This WTRA is located surrounding a section of low lying riparian area around an S6 stream (Pons Creek) with saturated soils and rich biodiversity. 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 80%. Values within the area include large diameter wildlife trees, forage and cover. Vegetation cover includes devils club, and ferns.

WTRA's will provide stand structure values for wildlife, perching and cover values, riparian values and visual values. WTRA's have 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 to mitigate risk to domestic water sources.

WTRA Replacement

CP 413 Block 1 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.

C.2d WATERSHEDS

CP413 Block 2 is located within the Coffee South Face Domestic Watershed.

See RESULTS and STRATEGIES 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 RESULTS and STRATEGIES 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. Most of the adjacent mature stands have already been exposed to windthrow hazard by private land clearing and powerline and highway right-of-way clearing.

Soils are medium to coarse and moderately well to well drained with 28-35 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	ICH	dw	1	101_8104_2	-
B	1	ICH	dw	1	104_8101_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 OR DENSITY FOR RMZ (S) AND LMZ (S).
Madden Creek (S6)	Y	SU A	**30m RMZ**: ≥90% of the basal area will be retained within WTRA-1 and outside the harvest area. (See additional management strategies below)
Pons Creek (S6)	Y	SU A + WTRA-1	**30m RMZ** : ≥90% of the basal area will be retained within WTRA-1 and outside the harvest area. (See additional management strategies below)

NON-CLASSIFIED (NC) RIPARIAN AREAS

RIPARIAN/ LAKE ID	SU XREF	MANAGEMENT STRATEGIES
Pons Creek (NCD)	A, WTRA-1	Pons Creek begins as an NCD, becomes an S6 within WTRA-1 and turns back into an NCD before entering Madden Creek to the south of Block 2 (See additional management strategies below)

Section E.1 continued

Riparian Assessment was completed in **November 2018**.

1) **Madden and Pons Creeks** stream sections are classed S6's but being managed as **S4 class** for community planning purposes**.**
2) **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.
3) 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.
4) 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.
5) **All surface drainage patterns** should be maintained and any that are disrupted as a result of harvesting operations should be restored immediately.
6) **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.
7) **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	DRA	Site factors Host factors Inoculum potential Disease factors **25**	**8** **4** **0** **13** **25**	H L L M **M**	• Armillaria present at low to moderate levels within the stand. • 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.: 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).

Other Forest Health Factors

SU	Code	%	Comments	Current risk to inventory
A,B	IBD	5	Approximately 5% of stems show signs of IBD, of which nearly all are grey attack, with very little red or green attack noted. Several down Fd stems showed signs of IBD. 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. 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. 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. 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.	Mod
A,B	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
A,B	DML	50	Lw forms approximately 1% of the current stand density and 2% 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 $Fdi_{47}\ Cw_{32}\ Hw_{11}\ Bg_{6}\ Ep_{2}\ Lw_{2}$

E.3 VEGETATION MANAGEMENT STRATEGIES

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

Current Brush Hazard: Low levels of brush inside harvest area.

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. Live birch and snags are scattered throughout the stand.

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

CWD levels are low to moderate (5 to 15% ground cover). CWD is predominantly composed of 10-30cm diameter stems. Lw Fd Ep Pw Hw 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 centre 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 a small section of **block 2** falls within a polygon (12-4) that has a potential rating. On January 21st, 2019, Ursus Heritage Consulting Ltd completed an archaeological field inspection for CP 413-2. No archaeological materials or sites were observed, recorded or are otherwise suspected within the proposed boundaries of the cut block and it was decided that at no further archaeological work is warranted for CP 413 Block 2.

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	60	60	No restricting layer to 60cm
B	Moderate	Moderate	Moderate	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

MAX. PROPORTION OF TOTAL AREA UNDER THE PRESCRIPTION ALLOWED FOR PERMANENT ACCESS STRUCTURES (PAS): 8.7**%**

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	**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 SU A and B 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	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: **3** landings @ 0.2 ha = **0.6 ha**
SU B: **1** landings @ 0.2 ha = **0.2 ha**

Total PAS = **2.3 ha**

- **SU A, B: Favorable and adverse 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	Clearcut with Reserves / Even-aged fire management silviculture system.
B	Retention silviculture system.

STAND STRUCTURE AND SITE CONDITION - COMMENTS

Post-harvest stand structure will be even-aged with one age class.

Planted trees and natural regeneration will include **Fd Lw Cw Pw (Pl Bg Py Hw)**.

2 Wildlife Tree Group Reserve Areas (WTRA): totalling 4.3 ha

Leave Trees

- **SU A:** Retain 20-25 stems/ha. Target larger diameter Fd, Lw and Py in the ≥30cm dbh class. Retain stems in small clumps or single trees. Do not substitute other species. Expect there are going to be areas with no preferred species – these will remain open.
- **SU B:** 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).

Even-Aged Fire Management Stocking Standards (SU A)

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.

Wildfire Mitigation / Shaded Fuel Break (SU B)

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.

Snags

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.

H. STOCKING REQUIREMENTS

LICENCE #	CP	BLOCK	OPENING NUMBER	LOCATION
A30171	413	2	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	9.3	ICH	dw	1	101_8104_2	640	710	675	Lower	SiL
B	7.5	ICH	dw	1	104_8101_2	635	658	660	Lower	SL

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 **12m²/ha** basal area of preferred and acceptable leave trees is retained **1-3 years post harvest.** . Acceptable leave trees must be dominant or co-dominant layer trees >17.5 cm dbh, and: • > 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.			
Standards ID				
1062309	**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,B 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.

H4 PLANTING

SU	Area (ha)	Regen. Method	Species	Age	Stock Type	Season	Stems/Ha	Total Stems
A	9.3	Plant	FdLwCwPw (PyHw)	1+0	PSB 412A	Spring	~~1400-1600~~ 400-600 - CH	3,720 – 5,580

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.
- Plant on the high or low side of obstacles to minimize snow creep and snow press.
- 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 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

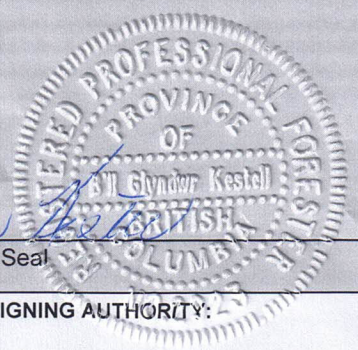
RPF SIGNATURE AND SEAL:

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					
	A	**B**			**TOTAL HA**	**%**
HAZARD RATINGS:						
Compaction	High	Moderate				
Soil Displacement	Moderate (8-10)	Moderate (8)				
Surface Erosion	High (25-26)	Moderate (20)				
Forest Floor Displacement	Moderate - High (13-17)	High (17)				
Mass Wasting	Moderate (33)	Low (14)				
Harvest System	Ground Based	Ground Based				
TOTAL AREA	18.8	7.6			26.4	
Wildlife Tree Patches / NP Nat						% WTP/IMM
WTRA	4.3	-			4.3	16.3
Reserve	3.0	-			3.0	11.4
Permanent Access Structures						% Disturbance
Proposed roads	0.6	0.1			0.7	2.6
Existing roads	1.6				1.6	6.1
Landings	-					
Total disturbance permanent access structures	**2.2**	**0.1**			**2.3**	**8.7**
NET AREA TO BE REFORESTED	**9.3**	**7.5**			**16.8**	
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.

Permanent Road: Spur 2 (Proposed) = 335m x 20m = 0.6 ha (SU A)
27m x 20m = 0.1 ha (SU B)
Queens Bay Rd. (Existing) = 450m x 20m & 492 x 15 = 1.6 ha

Total PAS: 2.3 ha

Proposed Landings (temporary):
SU A: **3** landings @ 0.2 ha = **0.6 ha**
SU B: **1** landings @ 0.2 ha = **0.2 ha**

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