SITE PLAN CP 408 BLOCK 1
COOPER CREEK CEDAR LTD.

A. TENURE IDENTIFICATION

LICENCE NO.:	CP:	BLOCK:	TIMBER MARK:	UTM:	LICENSEE NAME:
FL A30171	**408**	**1**	**FE5408**	**497040E , 5575870N**	**Cooper Creek Cedar (CCC)**
AREA UNDER TENURE (ha):	MAPSHEET/OPENING #:		ELEVATION:	LOCATION:	
22.5	**082K035**		**820 – 860m**	**Greyhorse**	

B. AREA SUMMARY

AREA OF NO PLANNED REFORESTATION (ha) (NPR)									
PERMANENT ACCESS	ROCK	WATER	SWAMP	OTHER NP	NC>4ha	WILDLIFE TREE RETENTION AREA (HA):	IMMATURE	Cultural Heritage Reserve	TOTAL NPR AREA
0.8	-	-	-	-	-	**4.9**	-	**0.1**	**5.8**

NET AREA TO BE REFORESTED (ha)		
SU	SU AREA DESCRIPTION	NET AREA TO BE REFORESTED:
A	**ICH mw2 110^{6} 101^{4}** Aspect is generally Northwest to Southwest facing. Slope position is lower, with short discontinuous slopes. Slopes range from 0 – 40%. Surface and subsoil soil texture is Silty Loam (SiL). Soils are moderately well drained. Coarse fragment content is low (20 - 25%) in surface soils and subsoils. Coarse fragments were noted as small, elongated, and easy to flake apart. Moisture regime is predominantly mesic to subhygric, and nutrient regime is medium. Humus form is a thin mor (3.0 cm thickness on average). Rooting depth is 30 cm. Average stand density (all species) is 848 stems//ha. Most stems fall within the 20 – 45cm DBH classes, with <5% of stems in the 50 – 80cm DBH classes. Approximate species densities are Hw 562 stems/ha, Cw 204 stems/ha, Sx 29 stems/ha, Fd 27 stems/ha, and At 26 stems/ha. The understory contains low to moderate densities of Hw Cw poles, saplings and regen that are suppressed and in poor condition; though some saplings and regen growing in openings are in good condition. There are also 126 stems/ha of dead SxPw(Cw), mainly in the 20 – 30 cm DBH classes. **SU A has Non-Sensitive soils.** SU A will be logged via **ground based harvest** methods and a clearcut silviculture system.	**11.5**
B	**ICH mw2 104^{9} 101^{1}** Aspect is variable, ranging from West / South / East facing. Slope position is lower to middle, with short discontinuous slopes. Slopes range from 10 – 30%. Surface soil texture is Loam (L) to Silty Loam (SiL), and subsoil texture is Silty Loam (SiL). Soils are moderately well drained. Coarse fragment content is low (20 – 25%) in surface soils, and moderate (40%) in subsoils. Moisture regime is predominantly submesic, and nutrient regime is poor to medium. Humus form is a thin mor (4.5 cm thickness on average). Rooting depth is 40 cm. Average stand density (all species) is similar to SU A. **SU B has Non-Sensitive soils** SU B will be logged via **ground based harvest** methods and a clearcut silviculture system.	**5.2**
	TOTAL NET AREA TO BE REFORESTED:	**16.7**
	TOTAL AREA UNDER THE PLAN:	**22.5**

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	25.0	3.5
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 soil compaction and soil displacement risk. Use designated harvesting trails during summer months, or a supporting snow pack in the winter. • Spot piling along roadsides, landings, and within the NAR may be necessary to remedy high levels of coarse woody debris.

RESULTS AND STRATEGIES

Biodiversity Objectives	
Result or Strategy Description	**3.5.3 - Old and Mature Forest**
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	'KBHLP Objective 2 – Old & Mature Forests' 'KBHLP Objective 5 – Connectivity' Field data collection found this block to be ICH mw2, and the block lies within Connectivity Corridor. For the ICH mw2, there is a Mature + Old forest requirement in this landscape unit (K17), and the Old forest target is met with OGMA area. Analysis completed by Timberland (Sept 6, 2018) shows that post-harvest there will be a surplus of Mature + Old within the Landscape Unit ICH mw2 as a whole, and also within connectivity corridor.
Result or Strategy Description	**3.5.3 - Green-up**
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	'KBHLP Objective 4 – Green-up' – The proposed cutblock is consistent with FPPR Section 65(2).
Result or Strategy Description	**3.5.1 - Objectives set by Government for Biodiversity – Landscape Level**
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	Biodiversity Emphasis. 'KBHLP Objective 4 – Green-up' The proposed cutblock and adjacent cutblocks comply with Sections 64 and 65 of the FPPR.
Cultural Heritage Resources	
Result or Strategy Description	**3.7 - Objectives set by Government for Cultural Heritage Resources**
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	A referral letter dated July 11, 2018, for CP 408 development was sent to the appropriate individual(s) and/or group(s). Cooper Creek Cedar Ltd did not receive any comments from First Nations identifying any concerns with the proposed development that had the potential of impacting cultural heritage values. See Section E.5 'ARCHAEOLOGICAL IMPACT ASSESSMENT' for 0.1 ha Cultural heritage reserve information.
Recreation Resources	
Result or Strategy Description	**4.3 - Recreation**
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	The proposed cutblock is not located within a designated Recreational Area or Trail with legal objectives; therefore, managing for Recreation Resources is not applicable.
Riparian Management	
Result or Strategy Description	**3.4.1 - Objectives set by Government for Riparian Areas**
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	1) Deception Creek **(S3 class)** flows through WTRA-2. 2) See Section E.1 for Riparian Management Strategies. 3) See Section F for management strategies related to Temporary Access Structures and Soil Disturbance that should be used during and post-harvest in order to prevent/reduce soil disturbance and sediment delivery.
Soil Objectives	
Result or Strategy Description	**3.1 - Objectives set by Government for Soils [FPPR Section 5 and 12.1(1)]**
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	(FPPR Section 35 & 36) 1) **SU A** and **SU B** do not contain Sensitive soils, and soil disturbance will not exceed **10%**. Specific measures for mitigating soil disturbance levels are addressed under Section F of this Site Plan. 2) Areas of the block where temporary access structures are required will be rehabilitated. 3) Specific rehabilitation measures are addressed under Section F of this Site Plan. 4) PAS will not exceed the recommended limit of **7.0%** and is estimated at **3.5%**. 5) Areas within the block assigned to roadside work areas will not exceed **25%**.
Visual Objectives	
Result or Strategy Description	**3.6 – Visual Quality**
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	A Visual Impact Assessment for **CP 408** was completed by Timberland Consultants Ltd in September, 2018. Portions of two cutblocks (**blocks 5** and **7**) fall within polygons with a VQO of Modification, and the remaining cutblocks fall within area that is Not Visually Sensitive. Analysis showed that **blocks 5** and **7** were only partially visible to non-visible from Highway 31 viewpoints; therefore the proposed development of **CP 408** meets the established VQO of Modification.
Water Management Objectives	
Result or Strategy Description	**3.4.4 - Consumptive Use Streams**
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	'KBHLP Objective 6' – Does not apply – the majority of **block 1** (central and southern sides) is located within the Meadow Creek 1 domestic Watershed. Deception Creek flows to the East towards and through the cutblock, then turns to the north due to historic redirection. Deception Creek, and Mat Creek to the South, are lower order streams than Meadow Creek; therefore, the KBHLP streamside management zone does not apply. Meadow Creek has six domestic use PODs, the closest of which is >7.0km from **block 1.** Referral letters were sent to Meadow Creek water users on August 22, 2018 and no comments or concerns were received. The distance between the block and PODs will help avoid or minimize disturbance to water quality.

Wildlife Objectives	
Result or Strategy Description	**3.3.1 - Objectives set by Government for Wildlife - Species at Risk – Section 7 of the FPPR**
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	The block is not within a Wildlife Habitat Area. There were no sightings of Species at Risk during field development of this cutblock.
Result or Strategy Description	**3.5.2 - Objectives set by Government for Wildlife and Biodiversity – Stand Level**
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	(FPPR Section 66 & 67) There are two Wildlife Tree Retention Areas planned for this block, totalling **4.9 ha**. Overall wildlife tree retention percentage is approximately **21.8%**. The WTRA % meets the minimum % requirements stated in the FSP.
Result or Strategy Description	**3.3.2 – Ungulate Winter Range**
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	**Block 1** is outside designated Ungulate Winter Range.

ADDITIONAL COMMENTS

Consistency Statement

This block is consistent with the **2018 – 2023 Forest Stewardship Plan – Cooper Creek Cedar Ltd. Forest Licence A30171**, approved January 26, 2018.

This Site Plan is prepared for **CP 408 block 1**, 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 1 is not within an Enhanced Resource Development Zone. The requirement to create a Result/Strategy for this objective does not apply.

Fire Maintained Ecosystems

FSP Section **3.5.3**

'KBHLP Objective 8 – Fire maintained Ecosystems'. There are no NDT 4 ecosystems in the FDUs under this FSP, therefore the fire-maintained ecosystem objective is not applicable.

Fisheries Sensitive Watersheds

FSP Section **3.4.2**

At the time the FSP was developed there were no designated "Fisheries Sensitive Watersheds" in FDUs in the FSP, therefore the requirement to create a Result/Strategy for this objective does not apply.

Invasive Plants

FSP Section **4.1** – Invasive Plants

The IAPP website was checked on October 2, 2018. The following invasive species were reported in nearby areas to **CP 408**; Common tansy, Canada Thistle, Chicory, Hawkweed species, Oxeye Daisy, Orange Hawkweed, Spotted Knapweed, St. John's wort, Yellow Hawkweed, and Burdock species.

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

- Cleaning equipment before moving from a work site with existing infestations to a new work site.
- Minimizing soil disturbance during primary forest activities (PFA).
- Reseed exposed mineral soil, resulting from a PFA in the first available fall or spring within 12 months following the soil disturbance. Plan planting of cutblocks as soon after harvesting as possible.
- During PFAs minimize soil disturbance by:
  - harvest on a snowpack, when feasible
  - random skid to designated skid trails to minimize skidder traffic on the ground
  - utilize benches for skid trails to minimize side cuts
  - utilize brush to construct skid trails to reduce contact with the ground
  - use overhead cable harvesting systems on steep ground
- Where grass seeding is undertaken, CCC will use certified grass seed (Canada common #1 or better grade) from reputable suppliers to ensure premium quality free of invasive plant seed, or a seed mix recommended by a MFLRNO range specialist.
- See FSP for additional strategies and practices regarding invasive plants.

Natural Range Barriers

FSP Section **4.2**

Not applicable. There are no range tenures located in the FDUs covered by this FSP.

Timber

FSP Section **3.2** - Timber

As per Sec 12(8) of the FPPR, results or strategies are not required for an objective set by government for timber.

Wildlife - Caribou

FSP Section **3.3** and **3.5.3**

'KBHLP Objective 3 – Caribou' was cancelled and replaced by *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	Standards ID #	Other Performance Standards
A	11.5	1057477	See Section H - Stocking Requirements
B	5.2	1057474	See Section H – Stocking Requirements

C. MANAGEMENT OBJECTIVES & STRATEGIES

C.1 MANAGEMENT OBJECTIVES

- Objectives for **CP 408 Block 1** include meeting visual quality objectives, protecting streams, and retaining stand structure and forage values for wildlife.
- Harvest this mature stand of **Hw Cw (Fd Sx At)** for saw logs, chips and value-added products and manage for healthy, free growing stands of planted and natural **Cw Fd Lw Hw (Pw)** in **SU A**, and **Fd Lw Pw (Hw Pl Py Cw)** in **SU B,** for similar end products.
- **Wildlife Tree Retention Areas (WTRA's):** Two patches are planned for retention, totaling **4.9 ha** in size.
- **Kootenay Boundary Land Use Plan – Implementation Strategy (June 1997):** This block is located within **Resource Management Zone K-S08** (Lardeau, Cooper and Meadow Creeks – Special Resource Management Zone) and within the designated **Landscape Unit K17** (Goat Range) – High BEO Assignment.

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

C.2a WILDLIFE

Stand Level attributes/ concerns identified:

Ungulate Winter Range: **Block 1** is outside designated Ungulate Winter Range.

Slope values are low to moderate in SU A and B. Lower to middle elevation ICH mw2 site conditions. Aspect is Northwest to Southwest to South facing, with small area of East facing slopes at North end of block. Slopes are short and discontinuous. Lower to middle slope landscape location. Vegetation cover varies from very low to low over most of the unit. SU A has isolated areas of seepage with aspen (live and dead), and birch snags throughout most of the area. North end of block (SU B) has continuous aspen throughout that is expected to sucker once harvested, and sections of rocky terrain. Existing coarse woody debris levels are low overall (≤ 10% ground cover) with ≤ 30cm diameter. Small areas of old blowdown are present.

SU A and **B:** Stand type is **Hw7Cw2Fd1(SxAt)**. Few Fd Cw vets are present.

Average stand density (all species) is 848 stems//ha. Most stems fall within the 20 – 45cm DBH classes, with <5% of stems in the 50 – 80cm DBH classes. Approximate species densities are Hw 562 stems/ha, Cw 204 stems/ha, Sx 29 stems/ha, Fd 27 stems/ha, and At 26 stems/ha. The understory contains low to moderate densities of Hw Cw poles, saplings and regen that are suppressed and in poor condition; though some saplings and regen growing in openings are in good condition. There are also 126 stems/ha of dead SxPw(Cw), mainly in the 20 – 30 cm DBH classes.

Forest cover adjacent to the block includes a significant amount of immature stands in cutblocks harvested between 1969 and 2005, similar to more open structured mature stands, and natural openings.

Actions prescribed:

Total Area specified for the retention of wildlife trees: **4.9 ha** (21.8% of gross area)

Wildlife Tree Retention Areas (WTRA's):

WTRA-1 (1.1 ha) Cw5Hw5(Act). WTRA is located on the Southern side of the block. Density is 200 – 400 sph; Height range is 27 – 35m; DBH range is 40 – 85cm; Age class is 5 - 6. Crown closure is 20%. Cw and Hw vets are present along with few Cw snags. Cavities and sloughing bark were noted on larger Cw Hw. The patch has an open stand structure with old stumps, an NCD channel, gentle slopes, and moisture receiving areas. Vegetation cover includes devil's club, skunk cabbage, lady's fern, maple, and alder. Wildlife sign includes browse on shrubs, bear bark peeling on Cw, and woodpecker activity.

WTRA-2 (3.8 ha) Cw5Hw4Fd1(ActEp). WTRA is located in the central area of the block, and contains a mixture of similar stands to the harvest area, open stands, and immature stands (logged '76). Density is 100 – 600 sph; Height range is 10 – 35m; DBH range is 20 – 50cm; Age class is 3 – 6. Crown closure is 15%. Cw and Hw vets are present along with few Cw Hw Fd snags. Wildlife sign inside the patch included beaver, moose tracks and scat, browsing on shrubs, and nests. Moisture receiving and wetland areas are present inside the WTRA, along with Deception Creek (S3) and dispersed seasonal ponding water; wetland buffered at 20 – 30m from harvest area.

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

Snags

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

C.2c FISHERIES

There is one **S3 class** stream (Deception Creek) that flows through WTRA-2. This stream flows in an Eastern direction through the block then turns and drains to the North. The **20m RRZ** will be reserved within the WTRA, and ≥ **85%** of the basal area will be retained within the **20m RMZ** inside WTRA-2 and in areas outside the block.

See Section E.1 for Riparian Management Strategies.

C.2d WATERSHEDS

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

C.2e RECREATION

See RESULTS AND STRATEGIES (4.3 – Recreation).

C.2f BIOLOGICAL DIVERSITY

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

C.2g VISUAL RESOURCE MANAGEMENT

See RESULTS AND STRATEGIES (3.6 – Visual Quality).

C.2h CULTURAL HERITAGE

See RESULTS AND STRATEGIES (3.7 - Objectives set by Government for Cultural Heritage Resources).

See section E.5 for Archaeological information and 0.1 ha cultural heritage reserve.

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:

Block 1 is surrounded on most sides by immature stands where previous harvesting has occurred, natural openings, and open stands; Windthrow hazard will be **Very Low** for these areas. The remaining sides have adjacent mature stands where Windthrow hazard is **Moderate**. Mature stands adjacent to SU A and B are similar to more open, and have already been partially exposed to winds from previous harvesting, and road and natural openings.

The block is medium in size, with a long narrow irregular shape, and a lower slope landscape location.

Soils in **SU A** are moderately well drained. Rooting depth is 30cm with low soil coarse fragment content.

Soils in **SU B** are moderately well drained. Rooting depth is 40cm with low to moderate soil coarse fragment content.

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	mw	2	$110^{6}\,101^{4}$	-
B	1	ICH	mw	2	$104^{9}\,101^{1}$	-

E. MANAGEMENT STRATEGIES

E.1 RIPARIAN MANAGEMENT STRATEGIES

RIPARIAN RESERVE ZONE (RRZ)

RIPARIAN/ LAKE ID	RIPARIAN/ LAKE CLASS	HARVESTING Y/N	SU XREF	DESCRIPTION OF THE PURPOSE AND EXTENT OF REMOVAL OR MODIFICATION OF TREES AND ANY RELATED FOREST PRACTICES IN RIPARIAN RESERVE ZONE(S)
Deception Creek	S3	N	WTRA-2	**20m RRZ:** No harvesting will take place in the 20m RRZ of Deception Creek. Harvest boundary was located ≥20m from Deception Creek.

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).
Deception Creek	Y	A, B, WTRA-2	**20m RMZ: ≥ 85%** of the basal area will be retained within the **20m RMZ** inside WTRA-2 and in areas outside the block. Portions of the 20m RMZ that fall within the block will be harvested as per SU A and B. (See additional management strategies below)

NON-CLASSIFIED (NC) RIPARIAN AREAS

RIPARIAN/ LAKE ID	SU XREF	MANAGEMENT STRATEGIES
NCD-1-1	A WTRA-1	One NCD channel is present in the south side of SU A, and inside WTRA-1. NCD channel has been marked in the field with red ribbon. Only a short section (~50m) of the NCD is within SU A. Channel had low flow and 0.1 - 0.3m width. (See management strategies below)

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

1) **Deception Creek (S3)** – stream had moderate flow, average channel width of 3.2m, and average gradient ≤10%. Stream is located in the central area of the block, inside WTRA-2.
2) Observe a **5m Machine Free Zone (MFZ)** on the **NCD** channel, except at designated crossings. Reserve non-merchantable understory stems **<17.5cm DBH** and **shrubs** within the **5m MFZ**, where practicable.
3) **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.
4) 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.
5) All **machine trails** and **crossings** should be fully rehabilitated upon the completion of harvesting. Excess material that could cause redirection of natural drainage patterns should not be left at crossing locations.
6) **All surface drainage patterns** should be maintained and any that are disrupted as a result of harvesting operations should be restored immediately.
7) **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.
8) **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	**8**	H	• Armillaria is absent or present at very low levels in this 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 (and/or managing for) a species mixture that includes species tolerant and /or moderately susceptible to Armillaria (e.g.: Cw, Hw, Lw, Pw in SU A; Lw, Pw, Pl, Hw, Py, Cw in SU B). Fd (highly susceptible) may be included in the planting mixture 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, and high soil hazards.
		Host factors	**3**	L	
		Inoculum potential	**0**	L	
		Disease factors	**0-5**	L	
			11-16	L	

Other Forest Health Factors

SU	Code	%	Comments	Current risk to inventory
A, B	IWS	0	If Sx is planted in the post-harvest stand, monitor for white pine (spruce) weevil during silviculture surveys.	nil
A, B	DML	0	Lw is absent from the stand, or present in very low amounts. No Lw fell within the cruise plots. No incidence of DML noted.	nil
A, B	IBS	≤3	Absent to Very Low incidence of Spruce beetle. Sx forms 3% to 4% of the current stand density and volume (all stems in 30cm DBH class). No incidence of Spruce beetle noted.	Very Low
A, B	IBD	≤3	Absent to Very Low incidence of Douglas-fir beetle. Fd forms approximately 3% of the current stand density and 8% of the current stand volume. (DBH range 30 – 75cm).	Very Low
A, B	DSB	0	Pw is present in very minor amounts in the current stand. A small amount of Pw may be planted in SU A and SU B. Plant only rust resistant stock. Expect high incidence of white pine blister rust on any naturally regenerated Pw.	nil

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 **September 2018**.

Future risks include seedling drought mortality and stress on warmer aspects, especially in summer months. In SU A, risk of cold wet depressions in early spring.

SU A and **B:** Average species composition of the pre-harvest stand (stand density) is approximately **Hw 67% Cw 24% Fd 3% Sx 3% At 3%**.

The age of mature trees in the stand, based on ages taken during cruising, is **81 – 145 years** (average 105 years).

E.3 VEGETATION MANAGEMENT STRATEGIES

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

Current Brush Hazard:

SU A & B: Very Low to **Low** levels of brush inside harvest boundaries.

Future Brush Hazard:

SU A: Future hazard is **High** to **Very High** due to mesic to subhygric moisture conditions, and presence of deciduous stems in the area. Bracken fern, thimbleberry and deciduous noted as major components of adjacent stands. Deciduous snags (some live At) noted throughout.

SU B: Future hazard is **Moderate** to **High** due to submesic moisture conditions, warm aspect, and presence of deciduous stems in the area. Mature, live aspen noted to have minor suckers expected to release once harvested.

Potential competitor species include alder, maple, birch, cottonwood, aspen, thimbleberry, and bracken fern.

Species Complex:

SU A: Current vegetation includes western yew, black huckleberry, baldhip rose, Utah honeysuckle, devils club, thimbleberry, bunchberry, one-leaved foamflower, oak fern, and queen's cup.

SU B: Current vegetation includes baldhip rose, western yew, falsebox, Douglas maple, black huckleberry, beaked hazelnut, bracken fern, thimbleberry, prince's pine, and twinflower.

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

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

Note: Where possible, avoid brushing **Vaccinium spp** in order to maintain huckleberry picking values, and to maintain forage on site for grizzly and black bears.

E.4 COARSE WOODY DEBRIS (CWD) MANAGEMENT STRATEGIES

CWD levels are **Low** (<10% ground cover) in most areas, with lesser areas of **Moderate** (15 - 20% ground cover) usually associated with old blowdown. CWD is predominantly composed of ≤ 30cm diameter stems of SxPwHwCwFd. Stems are in various stages of decay, ranging from no bark to full bark cover.

CWD levels are expected to be Low to Moderate post-harvest. Post-harvest CWD will consist of unmerchantable existing levels and snags, along with residue and breakage. A reduction of CWD levels is anticipated through clean harvesting practices and/or site preparation for planting, if required.

(FPPR Section 68): **Retain a minimum of 4 logs per hectare**, each being at least **2 metres** in length and at least **7.5cm** in diameter at one end.

See the SITE PREP section (K.1) for CWD management strategies.

E.5 ARCHAEOLOGICAL IMPACT ASSESSMENT

Archaeological Overview Mapping of the **CP 408** area shows that a portion of **block 1** falls within a polygon that has a potential rating. The overlap occurs along the western edge of the cutblock, and through the center of WTRA-2.

An Archaeological Impact Assessment was required. An assessment was completed on August 31, 2018 by Fraser Bonner of Ursus Heritage Consulting Ltd. and a representative from the Adams Lake Indian Band. A small area of archaeological potential was identified within block 1 (approximately 30m x 30m) directly adjacent to the Northwest side of WTRA-2, extending to the outer cutblock boundary near stations 7 and 8. This area has been ribbonned in the field and excluded from harvest, and is noted on the HP and SP maps as a 0.1 ha 'Cultural Heritage Reserve'. This area is reserved from harvest but is not a WTRA.

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+	None to 60cm
B	High	Moderate	High	60+	60+	None 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): **3.5%**

Roadside harvesting or temporary landings will be used.

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

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

MASD for Roadside Work Areas: 25%

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

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

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

Very few areas of **steep slopes >35%** were identified in parts of SU A and B, and are noted on the **Harvest Plan map**.

F.3 REHABILITATION TIME FOR TEMPORARY ACCESS STRUCTURES

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

F.4 MANAGEMENT STRATEGIES FOR TEMPORARY ACCESS STRUCTURES

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

Temporary Landings:
SU A: 4 landings @ 0.2 ha = 0.8 ha

- **SU A & B: Roadside harvest with landings. Favourable skidding with minor adverse skidding, predominant gentle slopes.**
- **If broadcast burn treatment is anticipated, disperse non-merchantable woody debris and slash on site during harvest to enhance fuel levels.**
- **See Section E.1 for 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 or redistributing woody debris that is concentrating subsurface moisture
- Return displaced surface soils, retrievable side-cast and berm materials on the excavated portion of the area
- Re-contour the slope
- Re-establish natural surface drainage
- IF soil erosion may cause sediment to enter a stream or wetland, place some woody debris over exposed mineral soils, and revegetate exposed mineral soils.

G. SILVICULTURAL SYSTEMS

SILVICULTURAL SYSTEMS

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

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

H.1 ADMINISTRATION INFO and ASSESSMENT DATES

SU Regime #	SU A – 1057477 SU B – 1057474	FREE GROWING ASSESSMENT PERIOD (years)	
Name:	SU A - ICH mw2 110 SU B – ICH mw2 104		
SU	REGENERATION DATE (YEARS)	EARLY	LATE
A	4	9	20
B	7	12	20

H.2 STOCKING REQUIREMENTS FOR SILVICULTURAL SYSTEMS OTHER THAN SINGLE TREE SELECTION

SU	PREFERRED SPECIES		ACCEPTABLE SPECIES		POST SPACING DENSITY (stems/ha)		MAX CONIFEROUS (stems/ha)
	SPECIES	MINIMUM HEIGHT (m)	SPECIES	MINIMUM HEIGHT (m)	MAX	MIN	
A	Cw Hw[201] Fd[1,14,32,58] Lw[1,14,32] Pw[31] Sx[10,13,201]	Lw Pw – 2.0 Fd – 1.4 Cw Hw Sx – 1.0	-	-	1800	700	10,000
B	Cw[10,201] Fd[58] Lw Pw[31]	Lw Pw – 2.0 Fd – 1.4 Cw – 1.0	Pl Hw Py[9,14,203] Sx[10,13]	Pl – 2.0 Hw Py Sx – 1.0	1800	700	10,000

SU	WELL SPACED TREES/ha				MINIMUM PRUNING HEIGHT	RESIDUAL STAND STRUCTURE (other than single tree selection)		HEIGHT RELATIVE TO COMPETITION (% Tree over brush)
	TARGET pa	MIN pa	MIN p	MIN inter-tree DISTANCE	(*delete if not applicable*)	BA (m^2/ha)	DENSITY (SPH)	
A	1200	700	600	2.0 *	-	-	-	150%
B	1200	700	600	2.0 *	-	-	-	150%

Footnotes	
1	Suitable on elevated microsites
9	Suitable on warm aspects.
10	Suitable on cool aspects.
13	Suitable at upper elevations.
14	Suitable at lower elevations.
31	Must use of blister rust resistant stock. See BC Journal of Ecosystems and Management 10(1):97-100 for supplementary information.
32	Limited by growing-season frosts
58	**South Area** – Fd limited to a max 50% of preferred and acceptable well-spaced stems due to root rot. See Root Rot Handbook (2017, in press).
201	Maximum 50% of preferred and acceptable well-spaced trees.
203	Recommended on sites for climate change adaptation.
*	MITD: For site series that do not already have reduced MSS, a reduced mitd of 1.7m may be used to facilitate planting superior microsites, when sites have: mechanical site preparation (mounding & disk trenching), been previously fill planted, or conditions where obstacle planting for snow creep is necessary. Reduced MITD applies to PLANTED TREES ONLY.

This block is located at lower elevations of the ICH mw2 biogeoclimatic unit.

SU A and B have variable aspects, and are generally northwest or southwest facing (refer to map). Small area of eastern aspect on the east side of SU B.

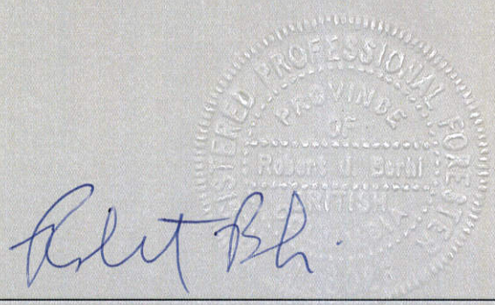
SU A has variable terrain consisting of wetter depressions, flats, and raised slopes.

Py is potentially an acceptable species for planting in parts of SU B based on aspect and elevation.

Cw is potentially an acceptable species for planting on the east side of SU B, based on aspect.

See Section K for planting stock recommendations.

I. ADMINISTRATION

SITE PLAN PREPARED BY (RPF SIGNATURE AND SEAL):	
Robert Borhi RPF Name (Printed) Date: 10/12/2018 RPF #: 3026	 RPF Signature and Seal
SITE PLAN ATTACHMENTS:	**MAJOR LICENSEE SIGNING AUTHORITY:**
☑ 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	High				
Soil Displacement	Moderate (10)	Moderate (8)				
Surface Erosion	High (27)	High (27)				
Forest Floor Displacement	High (17)	Moderate (14)				
Mass Wasting	Moderate (38)	Low (17)				
Harvest System	Ground based	Ground based				
TOTAL AREA	17.3	5.2			22.5	
Wildlife Tree Patches / NP Nat						% WTP/IMM
WTRA	4.9	-			4.9	21.8
Cultural heritage reserve	0.1	-			0.1	0.4
Permanent Access Structures						% Disturbance
Proposed roads	0.5	0			0.5	2.2
Existing roads	0.3	0			0.3	1.3
Landings	0	0			0	0
Total disturbance permanent access structures	0.8	0			0.8	3.5
NET AREA TO BE REFORESTED	11.5	5.2			16.7	
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, landings)	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:

Existing road (permanent access):
SU A: Section 1: 512m x 5m = **0.26 ha**
SU A: Section 6: 54m x 5m = **0.03 ha**

Proposed roads (permanent access):
SU A: Spur 1-1: 280m x 10m = **0.28 ha**
SU A: Spur 1-2: 255m x 10m = **0.26 ha**

Proposed Landings (temporary):
SU A: 4 landings @ 0.2 ha = 0.8 ha

See **Section F** for Soil Conservation and Management of Temporary Access Structures.

K.1 SITE PREP

SU	PREFERRED	ALTERNATE
A, B	- 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.	- No site prep, plant as is. - * Mechanical site preparation (e.g.: mounding, scarification) where necessary and feasible, combined with brush/slash piling, utilizing an excavator. - ** Broadcast burn or Spot burn if needed within the NAR to reduce excessive slash cover. Low to Moderate intensity burn, impact rank 2 to 3.

* **SU A:** Mechanical site preparation (such as mounding) could be considered within wetter depressions and flats (110 site series).

** Broadcast burn or Spot burn is a good option to reduce slash levels prior to planting, and improve soil warming on cooler aspects.

Site Limiting Factors include:

Moderately well drained soils, low to moderate soil coarse fragment content. Mesic to Subhygric (SU A) with dispersed wetter depressions and isolated seepage; Submesic (SU B).

Low existing CWD levels, with few areas of Moderate cover. Very few areas of **≥35%** slopes. Lower elevation ICH mw2 location.

Low to moderate slash hazard expected from snags, breakage, non-merch and fine slash. If burn treatment is anticipated, retain woody debris and slash on site during harvest.

No streams within harvest boundary. For **machine use**, avoid or minimize crossings on **watercourse 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.

K.2 PLANTING / SEEDLING REQUIREMENTS

	STOCK				SEASON
SU	SPECIES	AGE	TYPE	CNTR	
A	Cw Fd Lw (Pw)	1+0	PSB	410 / 412A / 415	May / June
B	Fd Lw Pw (Pl Py Cw)	1+0	PSB	410 / 412A	May / June

A, B

1) Manage for a mixed species stand of preferred and acceptable species to the extent possible.
2) Refer to stocking standards (Section H.2) for footnote comments on elevation, aspect, and other limitations.
3) Target Cw to moister areas and depressions. In SU B, target Cw to cool aspects.
4) Recommend **Fd** to account for **≤ 50%** of planting stock due to root disease potential (as per stocking standards).
5) Expect low to moderate levels of **Hw Cw (Fd Sx)** natural regeneration.
6) 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.
7) In wet areas, target trees to elevated microsites.
8) Monitor for signs of **ungulate browsing** during silviculture surveys.

K.3 BRUSHING

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

Current Brush Hazard:

SU A & B: Very Low to **Low** levels of brush inside harvest boundaries.

SU A: Current vegetation includes western yew, black huckleberry, baldhip rose, Utah honeysuckle, devils club, thimbleberry, bunchberry, one-leaved foamflower, oak fern, and queen's cup.

SU B: Current vegetation includes baldhip rose, western yew, falsebox, Douglas maple, black huckleberry, beaked hazelnut, bracken fern, thimbleberry, prince's pine, and twinflower.

Future Brush Hazard:

SU A: Future hazard is **High** to **Very High** due to mesic to subhygric moisture conditions, and presence of deciduous stems in the area. Bracken fern, thimbleberry and deciduous noted as major components of adjacent stands. Deciduous snags (some live At) noted throughout.

SU B: Future hazard is **Moderate** to **High** due to submesic moisture conditions, warm aspect, and presence of deciduous stems in the area. Potential for dry shrub brush complex. Mature, live aspen noted to have minor suckers expected to release once harvested.

Competitor species: Potential competitor species include alder, maple, birch, cottonwood, aspen, thimbleberry, and bracken fern.

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.