

# SITE PLAN CP 410 BLOCK 11 COOPER CREEK CEDAR LTD.

## A. TENURE IDENTIFICATION

LICENCE NO.: <b>FL A30171</b>	CP: <b>410</b>	BLOCK: <b>11</b>	TIMBER MARK: <b>FE5410</b>	UTM: <b>502700 E, 5499100 N</b>	LICENSEE NAME: <b>Cooper Creek Cedar Ltd.</b>
AREA UNDER TENURE (ha): <b>12.5</b>	MAPSHEET/OPENING #: <b>082F066</b>	ELEVATION: <b>795-925m</b>	LOCATION: <b>Balfour Face</b>		

## 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
1.0	-	-	-	-	-	1.6	-	-	2.5
NET AREA TO BE REFORESTED (ha)									
SU	SU AREA DESCRIPTION								NET AREA TO BE REFORESTED:
A	<p><b>ICHdw1 104<sub>9</sub>101<sub>1</sub></b>                      The aspect of SU A is southeast facing, slopes range from 5 to 50% with an average of 25%. Surface soil texture is Sandy Loam (SL), and subsoil texture is Loamy Sand (LS). Soils are moderately to well drained. Coarse fragment content is Low to moderate (30-40%) in surficial soils, and high in subsoils (70-80%). Moisture regime is submesic to mesic and nutrient regime is medium to poor. Humus form is a moder (6.0cm thickness) and rooting depth is 35cm. Soils in SU A exhibit <b>non-sensitive</b> characteristics.</p> <p>The block includes two Wildlife Tree Retention Areas comprised of timber representative of the rest of the SU, open patches of non-valuable (immature or dead useless) timber, rich wildlife features, and will act as a visual aide to help achieve a partial retention Visual Quality Objective.</p> <p>SU A will be harvested with <b>Conventional Ground Based</b> methods and a clearcut with reserves silviculture system.</p>								9.9
TOTAL NET AREA TO BE REFORESTED:									9.9
TOTAL AREA UNDER THE PLAN:									12.5

## 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%	8.0%

SU	CRITICAL SITE CONDITIONS THAT AFFECT THE TIMING OF OPERATIONS AND HOW THEY AFFECT THEM
A	<ul style="list-style-type: none"> <li>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.</li> <li>Spot piling along roadsides, landings and within the NAR may be necessary to remedy high levels of coarse woody debris.</li> </ul>

## RESULTS AND STRATEGIES

<b>Biodiversity Objectives</b>		<b>Landscape Unit K10</b>
Result or Strategy Description	<b>3.5.3 - Old and Mature Forest</b>	
Applies:	YES	
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<p>'KBHLP Objective 2 – Old &amp; Mature Forests'</p> <p>Field data collection found this block to be ICH dw1, and the block lies within Connectivity Corridor. CP410 falls within Landscape Unit K10: West Arm</p> <p>For the ICH dw1, there is a Mature + Old forest requirement in this landscape unit.</p> <p>Analysis completed by Timberland (August 29, 2018) 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.</p>	
Result or Strategy Description	<b>3.5.3 - Green-up</b>	
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	<b>3.5.1 - Objectives set by Government for Wildlife and Biodiversity – Landscape Level</b>	
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.	
<b>Cultural Heritage Resources</b>		
Result or Strategy Description	<b>3.7 - Objectives set by Government for Cultural Heritage Resources</b>	
Applies:	YES	
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	A referral letter dated February 14, 2018, 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.	
<b>Recreation Resources</b>		
Result or Strategy Description	<b>4.3 - Recreation Sites</b>	
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 in not applicable.	
<b>Riparian Management</b>		
Result or Strategy Description	<b>3.4.1 Objectives set by Government for Fish, Water, Wildlife &amp; Biodiversity in Riparian Areas</b>	
Applies:	NO	
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<b>NCD 11-3</b> is a minor intermittent channel within the harvest area. <b>NCD 11-1</b> and <b>NCD 11-2</b> are outside the block or within WTRA. Management of streams in block 11 meets the requirements set out in section 3.4.1 of the FSP.	
<b>Soil Objectives</b>		
Result or Strategy Description	<b>3.1 - Objectives set by Government for Soils [FPPR Section 5 and 12.1(1)]</b>	
Applies:	YES	
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<ol style="list-style-type: none"> <li>1) <b>SU A</b> does not contain sensitive soils and soil disturbance will not exceed <b>10%</b>. Specific measures for mitigating soil disturbance levels are addressed in Section F of this Site Plan.</li> <li>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.</li> <li>3) PAS slightly exceeds the recommended limit of <b>7.0%</b> and is estimated at <b>8.0%</b>.</li> <li>4) Areas within the block assigned to roadside work areas will not exceed <b>25%</b>.</li> </ol> <p><b>Rationale for exceeding PAS proportion:</b> Block 11 is long and narrow, resulting in a high proportion of road to reach the end of the block. Block 11 was originally planned to have an area of cable harvest up to the road which required the road to extend to the end of the block. The road location is necessary for potential future harvest of this cable area.</p>	
<b>Visual Objectives</b>		
Result or Strategy Description	<b>3.6 – Visual Quality</b>	

Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<p><b>CP 410</b> falls partially within a polygon with a PR objective.</p> <p>A Visual Impact Assessment was completed by Timberland Consultants in March 2018, 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.</p> <p>The proposed development of <b>CP410</b> meets the established VQO of PR from the selected viewpoints.</p>
<b>Water Management Objectives</b>	
Result or Strategy Description	<b>3.4.4 - Consumptive Use Streams</b>
Applies:	Yes
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<p>'KBHLP Objective 6' –</p> <p><b>Queens Creek (S6 Class)</b> has 3 PODs, the closest of which is &gt;200m downstream. PODs were looked up on the iMAP database and two were found to be active and for domestic use, one for irrigation. Referral letters dated April 5, 2018 were sent to POD licensees with a 30 day response period. Several comments were received from water users. Management for these concerns includes reserving Queens Creek and its entire RMA outside of the block, as well as a mature timbered buffer of &gt;200m from the stream. This will help avoid or minimize disturbance to water quality to downstream water users.</p> <p>The geotechnical assessment rated the likelihood of landslide initiation as a result of timber harvesting in Block 11 as Low, and there were no specific recommendations for this block.</p>
<b>Wildlife Objectives</b>	
Result or Strategy Description	<b>3.3.1 - Objectives set by Government for Wildlife - Species at Risk – Section 7 of the FPPR</b>
Applies:	NO
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<p>The block is not within a Wildlife Habitat Area.</p> <p>There were no sightings of Species at Risk during field development of this cutblock.</p>
Result or Strategy Description	<b>3.5.2 - Objectives set by Government for Wildlife and Biodiversity – Stand Level</b>
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<p>Two Wildlife Tree Retention Areas are planned for this block, totalling <b>1.6ha</b>. Overall wildlife tree retention percentage for block 11 is approximately <b>12.8%</b>. Total WTRA for CP410 is <b>22.9ha</b> which constitutes approximately <b>24.1%</b> of the gross area of the permit.</p> <p>The WTRA area meets the minimum percent requirements stated in the FSP for each block (3.5%) and for the whole cutting permit (7%).</p>
Result or Strategy Description	<b>3.3.2 - Ungulates</b>
Applies:	YES
How the Result or Strategy Applies to the Site (or Rationale if it does not apply)	<p>The proposed development CP410 is located within UWR Management Unit 178 and overlaps five distinct polygons with specific requirements in the ICHdw.</p> <p>Analysis completed by Timberland (August 29, 2018) shows that post-harvest, Ungulate Winter Range Management Unit 178 meets the minimum retention and maximum disturbance requirements for snow interception cover and forage areas.</p>

## ADDITIONAL COMMENTS

<b>Consistency Statement</b>
This block is consistent with the approved <b>2017 to 2022 Forest Stewardship Plan for Cooper Creek Cedar Ltd – Forest Licence A30171</b> . This Site Plan is prepared for <b>FL A30171 CP 410 Block 11</b> , in accordance with FRPA Section 10(1), (2) & (3).
<b>Community Watersheds</b>
FSP Section <b>3.4.3</b> Not applicable - The proposed block is not located within a Community Watershed.
<b>Enhanced Resource Development Zones</b>
FSP Section <b>3.2.1</b> 'KBHLP Objective 7 – Enhanced Resource Development Zones – Timber' <b>Block 11</b> is not within an Enhanced Resource Development Zone.
<b>Fire Maintained Ecosystems</b>
FSP Section <b>3.5.3</b> 'KBHLP Objective 8 – Fire maintained Ecosystems'. There are no NDT 4 ecosystems in the FDUs under this FSP, therefore the requirement to create a Result/Strategy for this objective does not apply.

<p><b>Fisheries Sensitive Watersheds</b></p> <p>FSP Section 3.4.2</p> <p>At the time the FSP was developed there were no designated “Fisheries Sensitive Watersheds” in FDU under this FSP, therefore the requirement to create a Result/Strategy for this objective does not apply.</p>
<p><b>Invasive Plants</b></p> <p>FSP Section 4.1 – Invasive Plants</p> <p>The IAPP website was checked on May 31, 2018. The following invasive species were reported in nearby areas to <b>CP 410</b>, mainly at low elevations within the first km of Balfour Face FSR in the general area of the Balfour Transfer Station: Canada thistle, Chicory, Common tansy, Himilayan blackberry, Hoary alyssum, Japanese knotweed, and Spotted knapweed.</p> <p>Measures to prevent the introduction or spread of invasive plants noted in the FSP include:</p> <ul style="list-style-type: none"> <li>• Cleaning equipment before moving from a worksite with existing infestations to a new work site.</li> <li>• Minimizing soil disturbance during primary forest activities (PFA).</li> <li>• 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.</li> <li>• During PFAs minimize soil disturbance by: <ul style="list-style-type: none"> <li>• Harvest on a snowpack, when feasible</li> <li>• Random skid to designated skid trails to minimize skidder traffic on the ground</li> <li>• Utilize benches for skid trails to minimize side cuts</li> <li>• Utilize brush to construct skid trails to reduce contact with the ground</li> <li>• Use overhead cable harvesting systems on steep ground</li> </ul> </li> <li>• 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.</li> <li>• See FSP for additional strategies and practices regarding invasive plants.</li> </ul>
<p><b>Natural Range Barriers</b></p> <p>FSP Section – 4.2</p> <p>Not applicable. There are no range tenures located in the FDU covered by this FSP.</p>
<p><b>Timber</b></p> <p>FSP Section 3.2 - Timber</p> <p>As per Sec 12(8) of the FPPR, results or strategies are not required for an objective set by government for timber.</p>
<p><b>Wildlife - Caribou</b></p> <p>FSP Section – 3.3 and 3.5.3</p> <p>‘KBHLP Objective 3 – Caribou’ was cancelled and replaced by <i>GAR Order #U-14-012 – Mountain Caribou – Southwest Kootenay Planning Unit</i>. This block does not fall within a Caribou Management Zone.</p>
<p><b>Wildlife – Grizzly Bear Habitat - Connectivity</b></p> <p>FSP Section 3.3 and 3.5.3</p> <p>‘KBHLP Objective 5 – Grizzly Bear Habitat &amp; Connectivity Corridors’. Not applicable to the FDU which includes this block.</p> <p><b>Block 11</b> falls within Connectivity Corridor area. Applicable targets for Old and Mature forest will be met following harvest.</p>

## STOCKING REQUIREMENTS

SU	NAR (ha)	Standards ID #	Other Performance Standards
A	9.9	1057452	See Section H - Stocking Requirements

## C. MANAGEMENT OBJECTIVES & STRATEGIES

<p><b>C.1 MANAGEMENT OBJECTIVES</b></p> <ul style="list-style-type: none"> <li>• Objectives for <b>CP 410 Block 11</b> include meeting visual quality objectives, protecting nearby streams, maintaining water quality, managing for a changing climate, contributing to fire mitigation strategies, and maintaining rich biodiversity and wildlife values: All of these objectives are carefully considered, and in some cases there are trade-offs in strategies (e.g. Leave trees for visuals vs. forest health issues), but a balance between all management objectives is the goal.</li> <li>• Harvest this mature stand of <b>Fd (EpLwPwCwHwPy)</b> for sawlogs, chips and value-added products and manage for a healthy, free growing stand of planted and natural <b>FdLwPyPw(BgPICw)</b> for similar end products.</li> <li>• <b>Wildlife Tree Retention Area (WTRA)</b>: Two reserves are planned for retention, totalling <b>1.6ha</b> in size (12.8% of the block). The reserves shelter mature stand values, wildlife values and portions of stand structure that are similar to the harvest area.</li> <li>• <b>Kootenay Boundary Land Use Plan – Implementation Strategy (June 1997)</b>: This block is located within the designated <b>Landscape Unit K10 (West Arm) – Intermediate BEO</b> Assignment.</li> <li>•</li> </ul>
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**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:**

The proposed development CP410 is located within UWR Management Unit 178 and overlaps five distinct polygons with specific requirements in the ICHdw.

Analysis completed by Timberland (August 29, 2018) shows that post-harvest, Ungulate Winter Range Management Unit 178 meets the minimum retention and maximum disturbance requirements for snow interception cover and forage areas.

**Migratory Bird Habitat Assessment:** Block 11 is partially within Migratory Bird Risk Rating 4 and 5 polygons (VRI Age Class 5,6,7/Mixed Conifer) – ICH Mixed Conifer (FdLwEpPwCw). The management matrix therefore requires the implementation of at minimum two Best Management Practice (BMP) with a Degree of Protection rank of at least moderate. BMP's LO2 and PL2 have been implemented on site to reduce the likelihood of incidental take and to conform with CCC's adopted management strategy. LO2 refers to higher levels of retention prescribed surrounding riparian features: this is implemented in the full retention of the RMA surrounding Queens Creek. PL2 refers to the implementation of a patch/edge retention system around biodiversity anchors encompassed in WTRA 1 and 2.

Slope values are low to moderate in the block, with few smaller areas of short, steeper slopes. Middle to upper elevation ICH dw1 site conditions. Aspect is mainly southeast facing, with short broken slopes. Middle slope location. Vegetation cover is moderate over most of the unit. A minor NCD runs is located within the harvest area. All road access will be new construction. Old stumps were seen within the block Existing coarse woody debris levels are low (10-25cm diameter) in most areas.

SU A (entire block): Stand type is: Fd<sub>10</sub>(EpLwPwCwHwPy). Fd Ep Cw Pw Hw snags with loose bark are scattered throughout the stand. Average stand density (all species) is 427 stems/ha. Most stems fall within the 30-60cm DBH classes, with 3.9% of stems in the 65-70cm DBH classes. Approximate species densities are Fd 215 stems/ha, Ep 130 stems/ha, Lw 28 stems/ha, Cw 19 stems/ha, Hw 18 stems/ha, and Pw 15 stems/ha. Stand age ranges from 70-111 with an average of 96 years old. The understory contains low densities of Bg Hw Cw 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 with natural openings outside the South and East boundaries, and previous harvesting to the North-west.

**Actions prescribed:**

Total Area specified for the retention of wildlife trees: **1.6 ha** (12.8% of gross area)

**Wildlife Tree Retention Patch (WTRA):**

**WTRA-1 (0.5 ha) Fd6Lw2Py1Ep1:** This WTRA is located in a semi-open patch of timber and contains a Fd leading stand. Density is 500-600 sph; Height range is 15 - 35m; DBH range is 15 – 60cm; Age class is 5 - 7. Slope values range from low to moderate, and crown closure is 15%. Values within the area include large diameter stems, and snags. Ungulate scat and wildlife trails were seen within the WTRA as well as an elk shed. Vegetation cover includes maple and alder patches up to 5m tall.

**WTRA-2 (1.1 ha) Fd7Ep2At1(PI):** This WTRA is located on a steep semi-open slope at the north end of the block and contains a Fd leading stand. Density is 400-500 sph; Height range is 15-35m; DBH range is 15-70; Age class is 6. Slope values range from moderate to steep, and crown closure is 15%. Values within the area include large diameter stems, and snags. Ungulate scat and wildlife trails were seen within the WTRA. Vegetation cover includes maple and alder patches up to 5m tall.

The WTRAs have been established in part, as a best management practice for the reduction of migratory bird incidental take (**BMP PL2**), to maintain ecological integrity within riparian areas, to ensure compliance with Visual Quality Objectives, 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 Southeast, towards the community of Balfour.

**C.2d WATERSHEDS**

**Queens Creek (S6 Class)** has 3 PODs, the closest of which is >200m downstream. PODs were looked up on the iMAP database and two were found to be active and for domestic use, one for irrigation. Referral letters dated April 5, 2018 were sent to POD licensees with a 30 day response period. Several comments were received from water users. Management for these concerns includes reserving Queens Creek and its entire RMA outside of the block, as well as a mature timbered buffer of >200m from the stream. This will help avoid or minimize disturbance to water quality to downstream water users.

The geotechnical assessment rated the likelihood of landslide initiation as a result of timber harvesting in Block 11 as Low, and there were no specific recommendations for this block.

<b>C.2e RECREATION</b>
Not applicable. The proposed cutblock is not located within a designated Recreational Area or Trail with legal objectives.
<b>C.2f BIOLOGICAL DIVERSITY</b>
<u>Landscape Unit - K10 (West Arm)</u> : Intermediate BEO Assignment.
<b>C.2g VISUAL RESOURCE MANAGEMENT</b>
<p><b>CP 410</b> falls partially within a polygon with a PR objective.</p> <p>A Visual Impact Assessment was completed by Timberland Consultants in March 2018, 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.</p> <p>The proposed development of <b>CP410</b> meets the established VQO of PR from the selected viewpoints.</p>
<b>C.2h CULTURAL HERITAGE</b>
<p>A referral letter dated February 14, 2018, was sent to the appropriate individual(s) and/or group(s).</p> <p>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.</p> <p>No cultural heritage values were noted in this area. See section E.5 for Archaeological information.</p>
<b>C.2i RANGE</b>
Not applicable. There are no range tenures located in the FDU's covered by this FSP.
<b>C.2j OTHER RESOURCES</b>
<p><b>Trapping / Guiding:</b></p> <p>Trappers or guiding license holders in the area will be identified and notified through the Forest Stewardship Planning process.</p> <p><b>Windthrow:</b></p> <p>Windthrow hazard is <b>Low</b> for adjacent immature stands that were harvested in the past (10 – 15m tall)</p> <p>Windthrow hazard is <b>Low to Moderate</b> for adjacent mature stands. Mature stands surrounding the harvest area are similar to the block with moderately well to well drained soils, or are lower density stands with natural brush openings. Stands to the east drop away steeply downslope from the harvest boundaries, and upslope stands to the west climb at steeper slopes than the block. These adjacent mature stands have already been partially exposed to winds from natural openings or previous harvest openings.</p> <p>Soils are fine and well drained with 35 cm rooting depth.</p>
<b>CONDITIONS NOT APPLICABLE TO THIS SITE PLAN</b>
THE FOLLOWING CONDITIONS WERE CONSIDERED, AND FOUND NOT TO BE APPLICABLE TO THIS SITE PLAN: None identified.

## D. ECOLOGICAL INFORMATION AND SITE CHARACTERISTICS

D.1 STANDARDS UNITS AND CRITICAL SITE CONDITIONS						
SU	TREATMENT UNIT	ZONE	BIOGEOCLIMATIC			SITE TYPE
			SUBZONE	VARIANT & PHASE	SITE SERIES	
A	1	ICH	dw	1	104 <sub>9</sub> 101 <sub>1</sub>	-

## 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).	

N/A		
<b>NON-CLASSIFIED (NC) RIPARIAN AREAS</b>		
RIPARIAN/ LAKE ID	SU XREF	MANAGEMENT STRATEGIES
NCD 11-3	A	none

<b>E.2 FOREST HEALTH MANAGEMENT STRATEGIES</b>					
SU	Code	Nelson Region DRA Risk Factors	Points	Relative Risk	Comments
A	DRA	Site factors	8	H	<ul style="list-style-type: none"> <li>• Armillaria is absent or present at low levels within the stand. Occurrence is likely opportunistic and compounded by other pathogens (DRN, DDE) weakening this stand.</li> <li>• The Nomographic Zones in Section 3.0 of the "<u>Armillaria Root Disease Management Guidelines for the Nelson Forest Region</u>" (June 1998) indicate that Alternative or Intensive deferred treatments for root disease management are appropriate for this site, should Armillaria become a problem.</li> <li>• Alternative treatments will include planting a species mixture that includes species tolerant and /or moderately susceptible to Armillaria (e.g.: Lw, Cw, Pw, Py). 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.</li> <li>• 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).</li> <li>• Stumping or pushover harvesting treatments are not suitable due to low sign of Armillaria, steep slopes in SU C, and high soil hazards.</li> </ul>
		Host factors	6	M	
Inoculum potential	0	L			
Disease factors	12	M			
			26	M	
<b>Other Forest Health Factors</b>					
SU	Code	%	Comments		Current risk to inventory
A	IBD	1	<p>Grey, red and green attack on Fd stems was observed in SU A especially in northern end of the block. This corroborates with MoF AOS completed in 2017. Due to the presence of frass, beetles and pupae/larva the infestation is presumed to be ongoing at endemic levels. Due to the risk rating of the stand and the high consequence should an epidemic occur a treatment plan has been designed to manage the infestation.</p> <p>A Star Probe Walkthrough survey was completed on July 24, 2018 by Nazca Consulting Ltd. And a high incidence of beetle was found. The potential for spread and the priority level were both determined to be high.</p> <p>Funnel traps and subsequent trap trees in the area should be utilized if required based on the results of the completed survey and post-harvest spillover probes conducted by a Qualified Professional.</p> <p>No leave trees prescribed for this block due to IBD concerns.</p> <p>Trap trees may be considered for beetle management if timing of road building and block harvesting permits. This is to be determined by a qualified professional.</p>		High
A	DSB	0	<p>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.</p>		nil
<b>Expected future risks and actions</b>					
<p>Forest health information was collected during SP field data collection in <b>November 2017</b>.</p> <p>Stand health risks in the future include low elevation, warm aspect, and possible moisture deficits during the growing season.</p> <p><b>SU A:</b> Timber type of the pre-harvest stand is Fd<sub>10</sub>(EpLwPwCwHwPy).</p>					
<p><b>Recommendations from the Fir Beetle Survey by Nazca Consulting Ltd. On July 24, 2018:</b> Harvesting of Block 11 in the fall of 2018 in conjunction with trap trees in the spring of 2019 would be the best management practices for the control and reduction of current Fir beetle populations in the immediate area. It is also recommended to review annually overview and perform detailed helicopter surveys of the adjacent areas to develop further management plans to help control and reduce the impacts of the growing trends of Douglas fir beetle populations in the West Arm.</p>					

### E.3 VEGETATION MANAGEMENT STRATEGIES

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

**Current Brush Hazard: SU A:** Moderate levels throughout the majority of the block with high levels of brush in small patches of open canopy scattered throughout the block and in openings outside of block.

**Future Brush Hazard:** Moderate due to mesic-submesic moisture regime, low elevation, and warm southeast aspect with dry brush complex growing in open areas. Potential competitor species exist outside the block and at block boundaries, and include maple, alder, saskatoon, rose, and thimbleberry.

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

**Risks and Considerations:** Woody brushing or stand tending treatments must be carefully assessed due to pathogen ability to colonize wounds on stocked trees that may be damaged by brushing treatments..

**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 (<5% ground cover). CWD is predominantly composed of 10-25cm diameter stems. Fd Ep Cw Pw Hw are the dominant CWD species. The stand has a dead standing and down component. Fire scars were noted on older snags and CWD.

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 410** area shows that **block 11** falls partially within a polygon that has a potential rating.

On July 16-17th, 2018, TMECS completed an archaeological field inspection under BC Heritage Inspection Permit 2018-0192 for CP410-12. No archaeological materials or sites were observed, recorded or are otherwise suspected within the proposed boundaries of the cut blocks in CP410.



## F. SOIL CONSERVATION

F.1 SITE DISTURBANCE						
SU	HAZARD RATINGS			SOIL CHARACTERISTICS		
	SOIL COMPACTION	SOIL DISPLACEMENT	SURFACE SOIL EROSION	DEPTH TO UNFAVOURABLE SUBSOIL (cm)		TYPE OF UNFAVOURABLE SUBSOIL
				MIN(cm)	MAX(cm)	
A	Moderate	High	Moderate	22	30	Sands, Fragmental (>70% CF)

### F.2 SOIL DISTURBANCE LIMITS

**SU A:** ARE THERE SENSITIVE SOILS?  YES  NO

MAX. PROPORTION OF TOTAL AREA UNDER THE PRESCRIPTION ALLOWED FOR PERMANENT ACCESS STRUCTURES (PAS): **7%**. PAS for this block is estimated at **8.0%** which exceeds the maximum proportion allowable.

**Rationale:** Block 11 is long and narrow, resulting in a high proportion of road to reach the end of the block. Block 11 was originally planned to have an area of cable harvest up to the road which required the road to extend to the end of the block. The road location is necessary for potential future harvest of this cable area.

**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.

**Terrain Stability Assessment, Balfour Face, CP 410, Blocks 10, 11, 12, and 13 (report dated July 30, 2018)**

Block 11, and the associated Spur 6 road, were reviewed by Christopher Perdue, P.Geol., Eng.L. of Perdue Geotechnical Services on July 6 & 9, 2018. The likelihood of landslide initiation as a result of the proposed timber harvesting is rated as **Low**.

No specific recommendations were identified with regard to this block. General Timber Harvesting Recommendations are included in the TSA report and are noted on the Harvest Plan map.

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	<b>10%</b>	<b>5%</b>

**MASD for Roadside Work Areas: 25%**

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 are noted on the **Harvest Plan Map**. In SU A 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	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**

**Proposed Roads** (permanent):

SU A: Spur 6 = 974m x 10m = **0.97ha**

**Total PAS** = 0.97ha

- **SU A: Roadside harvest with landings. Favourable skidding with a very small amount of adverse skidding at the south end.**
- **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 woody debris that is conducting subsurface moisture
- Place fill material that was sidecast on the excavated portion of the trail
- Re-contour the slope
- Re-establish natural surface drainage
- Place some woody debris over exposed mineral soil

**G. SILVICULTURAL SYSTEMS**

SILVICULTURAL SYSTEMS	
SU	SYSTEM / VARIANT / PHASE
A	Clear-cut with reserves silviculture system.
SU	STAND STRUCTURE AND SITE CONDITION - COMMENTS
A	<p>Post-harvest stand structure will be even-aged with one age class. Planted trees and natural regeneration will include <b>Fd Lw Py Pw (Bq Pl Cw Hw)</b>.</p> <p><b><u>2 Wildlife Tree Group Reserve Areas (WTRA):</u></b> totalling 1.6 ha</p> <p><b><u>Leave Trees</u></b> No leave trees are prescribed for the block due to levels of IBD observed in the stand. A clear cut with no reserve trees provides a good fire-break, provided there are no residual surface fuels left behind.</p> <p><b><u>Snags</u></b> No snags or stubbed trees are prescribed to be left behind in the block, as they are a hazard from a fire management perspective.</p>

## H. STOCKING REQUIREMENTS

LICENCE #	CP	BLOCK	OPENING NUMBER	LOCATION
A30171	410	11	82F066	Balfour Face


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	9.9	ICH	dw	1	104 <sub>9</sub> 101 <sub>1</sub>	770	910	840	Middle	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)				
1057452		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	1057452	7		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	
Fd <sup>58</sup> Lw Py <sup>9,203</sup> Pw <sup>31</sup>	Fd-1.4, Lw Pw- 2.0 Py- 1.0	Bg PI Cw <sup>10,204</sup>	PI - 2.0, Bg Cw- 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 (%)				150	
<p><b>Other Required Stocking Information/Footnotes :</b></p> <p>9 – suitable on warm aspects</p> <p>10 – suitable on cool aspects</p> <p>31 - must use of blister rust resistant stock. See BC Journal of Ecosystems and Management 10(1): 97-100 for supplementary information.</p> <p>58 – South Area – Fd limited to a max 50% of preferred and acceptable well-spaced stems in the IDFnw and all subzones of the ICH due to root rot. See Root Rot Handbook (2017, in press).</p> <p>203 – Recommended on sites for climate change adaptation.</p> <p>204 – Not recommended due to climate change concerns.</p> <p>* - 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</p>									

H3 SITE PREPARATION	
Area (ha)	TECHNIQUE (S) / LIMITING FACTORS
A 9.9	<p>Options for SU A include:</p> <ul style="list-style-type: none"> <li>Mechanical bunching (pile and burn) where feasible to minimize CWD as a method of wildfire mitigation.</li> <li>Up to 10% of piles may be left unburned in order to contribute to wildlife habitat and coarse woody debris values.</li> <li>Manage CWD and slash with a goal of future wildfire mitigation; minimize surface fuels post-harvest. Clearcutting and site prep that removes almost all of the aboveground biomass 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.</li> </ul>

H4 PLANTING								
SU	Area (ha)	Regen. Method	Species	Age	Stock Type	Season	Stems/Ha	Total Stems
A	9.9	Plant	FdiLwPyPw (BgPICw)	1+0	PSB 412A	Spring	1400-1600	14850
<p>LIMITING FACTORS / COMMENTS:</p> <ul style="list-style-type: none"> <li>Fd limited to a maximum of 50% of preferred and acceptable well-spaced stems.</li> <li>Plant on the high or low side of obstacles to minimize snow creep and snow press.</li> <li>Bg is an acceptable species, and significant amounts of natural Bg Hw regen exist within certain areas the block. Expect quantities of natural regeneration.</li> <li>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.</li> </ul> <p>CP410 is currently very heavy to Fd. 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.</p> <ul style="list-style-type: none"> <li>Microsite selection for Lw, Pl, and Py should be concentrated to dry sites with Cw concentrated to wet sites.</li> <li>Limiting factors include a warm aspect and shallow soils. Moisture deficits are expected to persist through the summer.</li> <li>Plant as soon as possible following harvesting or site prep operations. <b>Note:</b> 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.</li> <li>Anticipated Timing/Constraints: Treatment needs will be assessed through periodic walkthroughs and silviculture surveys.</li> <li>Monitor for signs of ungulate browse during silviculture surveys</li> </ul>								
H5 BRUSHING / STAND TENDING								
Area (ha)	TECHNIQUE (S) / LIMITING FACTORS							
9.9	<p><u>Brush hazard:</u> Current hazard is Moderate due to submesic moisture regime and dry brush complex in adjacent openings. Future brush hazard is high due to dry aspect and shallow rocky soil with dry brush complex. Competitor species post-harvest include thimbleberry and woody shrubs such as alder, maple and willow.</p> <p><u>Brushing Methods:</u> Manual treatments are preferred. However, existing pathogens spread by colonizing wounds on stocked trees and care must be taken to limit damage to crop trees. Woody brushing may be necessary prior to Free Growing and likely is an option in pathogen management, as long as crop trees are not injured.</p> <p><u>Anticipated Timing/Constraints:</u> Treatment needs will be assessed through periodic walkthroughs and silviculture surveys. Treatment timing will be prescribed at the time of brush assessment.</p>							

**I. ADMINISTRATION**

<b>SITE PLAN PREPARED BY (RPF SIGNATURE AND SEAL):</b>	
<p>Russell Fountain</p> <hr/> <p>RPF Name (Printed)</p>  <p>Date: <u>September 28, 2018</u>      RPF #: <u>4970</u></p>	 <hr/> <p>RPF Signature and Seal</p>
<b>SITE PLAN ATTACHMENTS:</b>	<b>MAJOR LICENSEE SIGNING AUTHORITY:</b>
<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> SP MAP(S)</li> <li><input checked="" type="checkbox"/> ARCHAEOLOGICAL IMPACT ASSESSMENT</li> <li><input checked="" type="checkbox"/> TERRAIN STABILITY FIELD ASSESSMENT</li> <li><input checked="" type="checkbox"/> VISUAL IMPACT ASSESSMENT</li> <li><input type="checkbox"/> RIPARIAN ASSESSMENT</li> <li><input type="checkbox"/> FOREST HEALTH / PEST INCIDENCE ASSESSMENT</li> <li><input type="checkbox"/> SOIL CONSERVATION TABLE</li> <li><input checked="" type="checkbox"/> OTHER: <u>REFORESTATION PRESCRIPTION</u></li> <li><input checked="" type="checkbox"/> OTHER: <u>ARMILLARIA RISK ASSESSMENT MATRIX</u></li> </ul>	<hr/> <p>Licence Holder Signing Authority Signature</p> <hr/> <p>Licence Holder Signing Authority Name (Printed)</p>  <p>Date: _____</p>

	Standards Units					TOTAL HA	%
	A						
<b>HAZARD RATINGS:</b>							
Compaction	Moderate						
Soil Displacement	High (15)						
Surface Erosion	Moderate (20)						
Forest Floor Displacement	Moderate (10)						
Mass Wasting	Low (17)						
Harvest System	Conventional						
<b>TOTAL AREA</b>	12.5					12.5	
<b>Wildlife Tree Patches / NP Nat</b>							% WTP/IMM
WTRA	1.6					1.6	12.8
IMM	-					-	-
<b>Permanent Access Structures</b>							% Disturbance
Proposed roads	1.0					1.0	8.0
Existing roads	-						
Landings	-						
<b>Total disturbance permanent access structures</b>	<b>1.0</b>					<b>1.0</b>	<b>8.0</b>
<b>NET AREA TO BE REFORESTED</b>	<b>9.9</b>					<b>9.9</b>	
Sensitive Soils (Y/N)	No						
<b>Temporary Access Structures:</b> Road, landing, excavated or bladed trails that will be rehabilitated (% of NAR).	5% (excavated/bladed trails)						
<b>Max. Allowable dispersed Soil Disturbance</b> (% of NAR by Standards Unit) as a result of harvesting, mechanical site preparation, or hazard abatement activities.	10%						
<b>Comments: Landings and spurs within the NAR are temporary and will be fully rehabilitated.</b>							
<b>Rehabilitation/Deactivation measures:</b>							
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.							
<b>Perm Road:</b> 974m x 10m = 0.97ha							
<b>Temp Road:</b> N/A							
<b>Temp Landings:</b> 2 temporary landings utilizing new access structures. Total of two 0.2 ha landings within SU A NAR.							
See <b>Section F.4</b> for discussion of rehabilitation of excavated/bladed trails.							