# SITE PLAN CP 409 BLOCK 16
# COOPER CREEK CEDAR LTD.

## A. TENURE IDENTIFICATION

| LICENCE NO.: | CP: | BLOCK: | TIMBER MARK: | UTM: | LICENSEE NAME: |
|---|---|---|---|---|---|
| **FL A30171** | **409** | **16** | **FE5409** | **495900 E, 5574200 N** | **Cooper Creek Cedar Ltd.** |
| AREA UNDER TENURE (ha): | MAPSHEET/OPENING #: | | ELEVATION: | LOCATION: | |
| **18.4** | **82K035** | | **925-1125m** | **Deception Creek** | |

## B. AREA SUMMARY

| AREA OF NO PLANNED REFORESTATION (ha) (NPR) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PERMANENT ACCESS | ROCK | WATER | SWAMP | OTHER NP | NC>4ha | WILDLIFE TREE RETENTION AREA (HA): | IMMATURE | OTHER | TOTAL NPR AREA |
| **0.8** | **-** | **-** | **-** | **-** | **-** | **4.3** | **-** | **-** | **5.1** |

| NET AREA TO BE REFORESTED (ha) | | |
|---|---|---|
| SU | SU AREA DESCRIPTION<br><br>The block is located in the Meadow Creek Watershed. | NET AREA TO BE REFORESTED: |
| A | **ICH wk1 $05_8 01_2$**<br><br>Aspect is mainly east-northeast facing, slopes range from 22 to 60% with an average of 40%. The elevation of SU A is 925-1070m. Surface and subsoil texture is Silty-Loam (SiL). Soils are moderately well drained. Coarse fragment content is low-moderate (10-40%). Moisture regime is mesic and nutrient regime is medium-rich. Humus form is a mor (5.0cm thickness) and rooting depth is 30cm.<br>Soils are **sensitive**.<br><br>Average stand density (all species) is 560 stems/ha. Most stems fall within the 20-60cm DBH classes, with <6% of stems in the 65-125cm DBH classes. Approximate species densities are Cw 395 stems/ha, Hw 150 stems/ha, and Sx 15 stems/ha. Stand age ranges from 50-225 with an average of 138 years old. The understory contains low - moderate densities of Hw and Cw regen, saplings and poles that are mainly in poor (suppressed) condition unless in small canopy openings.<br><br>**Conventional Ground Based** harvest methods and a clearcut silviculture system. | **11.0** |
| B | **ICHwk1 01**<br>Aspect is mainly east-northeast facing with slopes ranging from 10 to 25% with an average of 15%. The elevation of SU B is from 925-975m. Surface soil texture is Silt to Silty Loam (Si-SiL) and subsoil texture is Silty-Loam (SiL). Soils are moderately well drained. Coarse fragment content is low (15-25%). Moisture regime is mesic and nutrient regime is medium. Humus form is a mor (13.0cm thickness) and rooting depth is 28cm.<br>Soils are **non-sensitive**.<br><br>Average stand density (all species) is similar to SU A.<br><br>**Conventional Ground Based** harvest methods and a clearcut silviculture system | **2.3** |
| | TOTAL NET AREA TO BE REFORESTED: | **13.3** |
| | TOTAL AREA UNDER THE PLAN: | **18.4** |

## 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 | 5.0 | 5.0 | 25% | 4.3 |
| B | 10.0 | 5.0 | | |

| SU | CRITICAL SITE CONDITIONS THAT AFFECT THE TIMING OF OPERATIONS AND HOW THEY AFFECT THEM |
|---|---|
| A | • 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.<br>• 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'<br>For the purposes of biodiversity analysis older (1994) BEC mapping is used and this block falls in ICHmw2, and within Connectivity Corridor.<br>Landscape Unit K17.<br>For the ICHmw2, there is a Mature + Old forest requirement in this landscape unit.<br>Analysis completed by Timberland (April, 2019) shows that post-harvest there will be a surplus of Mature + Old within the Landscape Unit ICHmw2 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'.<br>The proposed cutblock complies 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 August 15, 2018, was sent to the appropriate individual(s) and/or group(s).<br>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.<br>No cultural heritage values were noted in this area. |
| **Recreation Resources** | |
| Result or Strategy Description | **4.3 - Recreation Sites** |
| Applies: | NO |
| How the Result or Strategy Applies to the Site (or Rationale if it does not apply) | The proposed cutblock is not located within a designated Recreational Area or Trail with legal objectives; therefore, managing for Recreation Resources is not applicable. |
| **Riparian Management** | |
| Result or Strategy Description | **3.4.1 Objectives set by Government for Fish, Water, Wildlife & Biodiversity in Riparian Areas** |
| Applies: | NO |
| How the Result or Strategy Applies to the Site (or Rationale if it does not apply) | 1) There are two NCD channels located in the north, central part of the harvest area.<br>2) See Section E.1 for Riparian Management Strategies.<br>3) See Section F for management strategies related to Temporary Access Structures and Soil Disturbance that should be used during and post-harvest in order to prevent/reduce soil disturbance and sediment delivery. |
| **Soil Objectives** | |
| Result or Strategy Description | **3.1 - Objectives set by Government for Soils [FPPR Section 5 and 12.1(1)]** |
| Applies: | YES |
| How the Result or Strategy Applies to the Site (or Rationale if it does not apply) | 1) **SU A** contains sensitive soils and soil disturbance will not exceed **5%. SU B** contains non-sensitive soils and soil disturbance will not exceed **10%.** Specific measures for mitigating soil disturbance levels are addressed in Section F of this Site Plan.<br>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.<br>3) PAS will not exceed the recommended limit of **7.0%** and is estimated at **4.3%**.<br>4) Areas within the block assigned to roadside work areas will not exceed **25%**. |
| **Visual Objectives** | |
| Result or Strategy Description | **3.6 – Visual Quality** |
| Applies: | YES |
| How the Result or Strategy Applies to the Site (or Rationale if it does not apply) | A Visual Impact Assessment was completed for CP 409, 412 and 414 by Timberland Consultants in May 2019. Portions of two cutblocks (CP412-15 and 409-4) fall within polygons with a VQO of Modification and the remaining cutblocks fall within area that is not visually sensitive.<br>The proposed development of this CP meets the established VQO of M from the selected viewpoints. |
| **Water Management Objectives** | |
| Result or Strategy Description | **3.4.4 - Consumptive Use Streams** |
| Applies: | NO |
| How the Result or Strategy Applies to the Site (or Rationale if it does not apply) | 'KBHLP Objective 6' – **Block 16** is located within the Meadow Creek watershed. Matt Creek is located >700m to the east of the block. Matt Creek is a lower order stream that flows into Meadow Creek; therefore the KBHLP streamside management zone does not apply.<br>Meadow Creek has six domestic use POD's, the closest of which is >5.5km from **Block 16.** Referral letters were sent **April 1, 2019** and comments were received. The distance between the block and POD's will help avoid of 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.<br>There were no sightings of Species at Risk during field development of this cutblock. |
| Result or Strategy Description | **3.5.2 - Objectives set by Government for Wildlife and Biodiversity – Stand Level** |
| Applies: | YES |
| How the Result or Strategy Applies to the Site (or Rationale if it does not apply) | Two Wildlife Tree Retention Areas are planned for this block, totalling **4.3 ha**. Overall wildlife tree retention percentage for block 16 is approximately **23.4%.** Total WTRA for CP409 is **9.0ha** which constitutes approximately **11.0%** of the gross area of the permit.<br>The WTRA area meets the minimum percent requirements stated in the FSP for each block (3.5%) and for the whole cutting permit (7%). |
| Result or Strategy Description | **3.3.2 - Ungulates** |
| Applies: | NO |
| How the Result or Strategy Applies to the Site (or Rationale if it does not apply) | Block 16 is outside designated Ungulate Winter Range |

## ADDITIONAL COMMENTS

**Consistency Statement**

This block is consistent with the approved **2018 to 2023 Forest Stewardship Plan for Cooper Creek Cedar Ltd – Forest Licence A30171**.
This Site Plan is prepared for **FL A30171 CP 409 Block 16**, 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 16** 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, 7, 2019. The following invasive species were reported in nearby areas to **CP 409 Deception**: Canada thistle, Chicory, Common tansy, Orange hawkweed, Yellow hawkweed, Hawkweed species, Oxeye daisy, St. John's wort, and Spotted knapweed.

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-4-012 – Mountain Caribou – Southwest Kootenay Planning Unit.* This block does not fall within a Caribou Management Zone.

This block falls within the Southern Mountain Caribou Matrix Range and Beneficial Management Practices (BMPs) for operating in woodland caribou habitat have been applied. BMPs include:

- 'Habitat connectivity - Design blocks to minimize fragmentation'. Blocks have been grouped into clusters leaving retention patches anchored to creeks and NCDs.
- 'Utilize existing access roads'. New road construction has been reduced by using existing roads.
- Caribou Sign and Sightings - Staff and contractors are to report any sightings or sign to supervisor.
- Silviculture treatments will not result in the conversion of forest cover to pure spruce stands. The intent is to have silviculture practices result in a species composition that existed prior to forest harvest. A mixed species composition, similar to the preharvest stand, will be planted.

**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 16** 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** | 11.0 | 1057900 | See Section H - Stocking Requirements |
| **B** | 2.3 | 1057894 | |

## C. MANAGEMENT OBJECTIVES & STRATEGIES

### C.1 MANAGEMENT OBJECTIVES

- Objectives for **CP 409 Block 16** protecting nearby streams, maintaining water quality, and maintaining rich biodiversity and wildlife values: All of these objectives are carefully considered, and a balance between all management objectives is the goal.
- Harvest this mature stand of **CwHw (Sx)** for sawlogs, chips and value-added products and manage for a healthy, free growing stand of planted and natural **CwHwSx(FdLwPw)** for similar end products.
- **Wildlife Tree Retention Area (WTRA):** Two group reserves are planned for retention, totalling **4.3 ha** in size (23.4% of the block). The reserves shelter mature stand values, wildlife values, and portions of stand structure that are similar to the harvest area.
- **Kootenay Boundary Land Use Plan – Implementation Strategy (June 1997):** This block is located within the designated **Landscape Unit K17 (Goat Range)** – High BEO 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 16 is outside designated ungulate winter range

**Migratory Bird Habitat Assessment:** Block 16 is within Migratory Bird Risk Rating 5 polygon (Age Class derived from cruise data 7, 8 & Height class 4 – ICH: CH - (Cw (HwSx)). The management matrix therefore requires:

1) The entire Site must be scheduled for harvest outside Restricted Period 1 (April 23 – August 1) , OR
2) Two or more BMP's with DoP rank 2 (moderate) or DoP rank 3 (high) must be selected from the list of BMPs and applied to the Site.

BMP's PL2 and LO4 have been implemented on site to reduce the likelihood of incidental take and to conform to CCC's adopted management strategy. PL2 refers to the implementation of a patch/edge retention system around biodiversity anchors encompassed in WTRA-1 and 2. LO4 refers to the retention of individual trees or snags suitable for cavity nesting. Snags <5m tall that will be retained in SU A and B where operationally feasible. Snags with evidence of wildlife use are preferred.
BMP PL3 and SO4 have been implemented as well. PL3 refers to the appropriate training of forest planners, layout personnel, and forest workers. SO4 refers to operation specific recommended practices when chance encounters of active nests occur.

**Stand/Site Attributes:**

Slope values are low to moderate in most of the block. Middle to lower elevation ICH wk1 site conditions. Aspect is mainly northeast facing, with short and long broken, discontinuous slopes. Middle slope location. Vegetation cover is low to moderate over most of the unit. Existing coarse woody debris levels are low (<5-15%) (15-100cm diameter) in most areas.

**SU A:** stand type by density is: $Cw_7Hw_3$ (Sx) with 400-600 stems/ha.

**SU B:** stand type by density is: $Hw_7Cw_3$ with 300-500 stems/ha.

Average stand density (all species) is 560 stems/ha. Most stems fall within the 20-60cm DBH classes, with <6% of stems in the 65-125cm DBH classes. Approximate species densities are Cw 395 stems/ha, Hw 150 stems/ha, and Sx 15 stems/ha. Stand age ranges from 50-225 with an average of 138 years old. The understory contains low - moderate densities of Hw and Cw regen, saplings and poles that are mainly in poor (suppressed) condition unless in small canopy openings.

Forest cover adjacent to the block includes historic clearcut harvesting to the northeast and southwest, and historic selective harvesting to the northwest and southeast.

**Actions prescribed**:

Total Area specified for the retention of wildlife trees: **4.3 ha** (23.4% of gross area)

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

**WTRA-1 (0.3ha) Hw6Cw4:** This WTRA is located in the east (lower) part of the block. It contains areas of historic selective logging. Density is 300 sph; Height range is 15 - 30m; DBH range is 30 – 50cm; Age class is 5 - 7. Slope values are moderate to steep, and crown closure is 40%. Values within the area include moderate vegetation cover including devil's club, maple, alder, yew and bracken fern, moderate, well decayed CWD cover, and Hw, Cw vet wildlife trees.

**WTRA-2 (4.0ha) Hw5 Cw5:** This WTRA is located in the west end of the block and contains similar stand structure to the adjacent harvest area. The area shelters a stand of older trees with high wildlife values. Density is 500sph; Height range is 27-32m tall; Age class is 9; and crown closure is 50%.

**WTRA's** will provide stand structure values for wildlife, perching, forage and cover values. Coarse woody debris values will also be created over time from dead and fallen stems. WTRAs have been established in part, as a best management practice for the reduction of migratory bird incidental take **(BMP PL2, LO2)**

**Snags**

Retain safe snags **<5m tall** 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 down slope to the East, towards Matt Creek.

#### C.2d WATERSHEDS

See RESULTS and STRATEGIES (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 - 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

**C.2i RANGE**

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

**C.2j OTHER RESOURCES**

**Trapping / Guiding:**

Trappers or guiding license holders in the area will be identified and notified through the Forest Stewardship Planning process.

**Windthrow:**

Windthrow hazard is **Moderate** for adjacent mature stands and **Low** for adjacent immature stands. These stands have already been partially exposed to winds from past harvesting, roads and natural openings.

Soils are fine and moderately well drained with 28-30 cm rooting depths.

**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 | wk | 1 | $05_{8}01_{2}$ | - |
| B | 1 | ICH | wk | 1 | 01 | - |

## 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 | - | - | - |

**NON-CLASSIFIED (NC) RIPARIAN AREAS**

| RIPARIAN/ LAKE ID | SU XREF | MANAGEMENT STRATEGIES |
|---|---|---|
| NCD-16-1, 2 | A | (See management strategies below) |

1) **Fall and skid timber away from riparian features** (streams, NCD's, wetland) where practicable. Any debris entering a riparian feature as a result of harvesting will be removed upon completion of harvesting activities unless it does not obstruct water flow or its removal would cause further damage to the riparian feature. **Minimize crossings** on **watercourse channels** to the extent possible.
2) Where **watercourses** are crossed more than once, it is recommended to place a temporary skid bridge (e.g.: logs placed in draw) in order to prevent a potential diversion of flow.
3) All **machine trails** and **crossings** 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.
4) **All surface drainage patterns** should be maintained and any that are disrupted as a result of harvesting operations should be restored immediately.
5) **A post-harvest inspection** should be completed to assess the amount of logging debris/excess soil within the wetted perimeter of all subtle drainage features. All natural drainage patterns should be maintained and left free of excess debris (slash or soil) that could result in a redirection of seasonal surface runoff/drainage diversion.
6) **Basal area retention** levels for the in-block RMZ's (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 low levels within the stand.<br>• 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.<br>• Alternative treatments will include planting a species mixture that includes species tolerant and /or moderately susceptible to Armillaria (e.g.: Lw, Cw, 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.<br>• 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). |
| | | Host factors | **3-5** | L-M | |
| | | Inoculum potential | **0** | L | |
| | | Disease factors | **0-5** | L | |
| | | | **11-18** | **L-M** | |

**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 | 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 and 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 **October 2018**.

Stand health risks in the future include a heavy snowpack on a cool aspect causing snowpress.

Timber type of the pre-harvest stand by volume is $Cw_{62}$ $Hw_{33}Sx_5$

## E.3 VEGETATION MANAGEMENT STRATEGIES

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

**Current Brush Hazard:** Low-moderate levels of brush inside most of the block with patches of moderate levels of brush in disturbed openings and old logging roads.

**Future Brush Hazard:** Moderate to High. Mesic moisture regime, cool east-northeast aspect and established brush in disturbed areas. Potential competitor species exist outside the block and at block boundaries, and include alder, lady fern, devil's club, and maple.

**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

Existing coarse woody debris levels are low (<5-15%) (15-100cm diameter) in most areas. Some areas contain older, well decayed debris from previous selective logging. The stand has a dead standing and down component.

(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 409** area shows that **block 16** does not fall within a polygon that has a potential rating. An Archaeological Impact Assessment is not required.

## F. SOIL CONSERVATION

### F.1 SITE DISTURBANCE

| | HAZARD RATINGS | | | SOIL CHARACTERISTICS | | |
|---|---|---|---|---|---|---|
| SU | SOIL COMPACTION | SOIL DISPLACEMENT | SURFACE SOIL EROSION | DEPTH TO UNFAVOURABLE SUBSOIL (cm) | | TYPE OF UNFAVOURABLE SUBSOIL |
| | | | | MIN(cm) | MAX(cm) | |
| A | High | High | Very High | 60 | 60 | None found to 60cm |
| B | High | Moderate | High | 60 | 60 | None found 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): **4.3%.**

**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 | **5%** | **5%** |
| B | **10%** | **5%** |

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

Maximum soil disturbance limits 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 (ground based harvest methods) and are noted on the **Harvest Plan Map.** In SU A and B conventional 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: **1** landing @ 0.2 ha = **0.2 ha**
SU B: **1** landing @ 0.2 ha = **0.2 ha**

- **SU A: Roadside harvest with landings. Favorable and adverse skidding**
- **SU B: Roadside harvest with landings. Adverse skidding up to spur 17-2.**
- **See Section E.1 for stream management strategies.**

**The following will apply for any excavated/bladed trails that are required:**

- Maximum trail width is 4m.
- Actual dimensions of bladed trails may vary depending on topography.
- The amount of bladed trail constructed will be kept to a minimum.

Short sections that become bladed trails where a non-bladed trail crosses a hump or ridge will be exempt from rehabilitation requirements provided that the soil disturbance limits in this SP are not exceeded.

**Rehabilitation for bladed or excavated trails:**
Any bladed or excavated trails will be rehabilitated as follows:

- De-compact the trail, including removing woody debris that is conducting subsurface moisture
- Place fill material that was sidecast on the excavated portion of the trail
- Re-contour the slope
- Re-establish natural surface drainage
- Place some woody debris over exposed mineral soil

## G. SILVICULTURAL SYSTEMS

| SILVICULTURAL SYSTEMS | |
|---|---|
| SU | SYSTEM / VARIANT / PHASE |
| A, B | 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.<br>Planted trees and natural regeneration will include **Fd Cw Lw Sx Hw (Bl Pw)**.<br>**1 Wildlife Tree Group Reserve Area (WTRA):** totalling 4.3ha<br>**Leave Trees:**<br>No mature leave trees are prescribed for this block.<br>**Snags**<br>Retain safe snags <5m tall 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)

| LICENCE # | CP | BLOCK | OPENING NUMBER | LOCATION |
|---|---|---|---|---|
| A30171 | 409 | 16 | 82K035 | Deception Creek |

**H1 ECOLOGICAL INFORMATION**

| SU | Net Area (ha) | Zone | Subzone | Variant/ Phase | Site Series (complex - %) | Elevation | | | Slope position | Soil Texture (0-30cm) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Min | Max | Avg | | |
| A | 11.0 | ICH | wk | 1 | $05_{8}01_{2}$ | 925 | 1070 | 1000 | Mid-slope | SiL |
| B | 2.3 | ICH | wk | 1 | 01 | 925 | 975 | 950 | Mid-slope | SiL |

RATIONALE FOR STOCKING STANDARD FSP ID SELECTION

| STANDARDS UNIT FSP ID # | CHANGE FROM STANDARD PRACTICE | COMMENT: (For example: Forest health (DRA) or Rocky site) |
|---|---|---|
| 1057900 | N/A | 05 leading – Site series complex. |
| 1057894 | 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 | 1057900 | 4 | | 9** | | | 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 |
| $Cw^{32}$ $Hw^{201}$ $Sx^{201}$ | Cw Hw Sx- 1.0 | $Pw^{1,31}Bl^{500}$ | Pw- 2.0, Bl- 1.0 | **Well Spaced Trees (sph)** | | | | |
| | | | | **Target** | **Minimum p**ref&acc | | **Minimum** preferred | **Min Horizontal Inter-tree distance (m)** |
| | | | | 1200 | 700 | | 600 | 2.0* |
| | | | | | | | Height Relative to Competition (%) | |
| | | | | | | | 150 | |

| B | 1057894 | 4 | | 9** | | | 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 |
| Cw $Hw^{201}$ $Fd^{9,14,58,203}$ $Pw^{31}$ | Fd- 1.4, Pw- 2.0, Cw Hw- 1.0 | $Lw^{9,14,16,32}$ $Sx^{10,13,204}$ | Lw- 2.0, Sx- 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 | |

* - 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.

**Other Required Stocking Information/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

16 – suitable in the southern portion of biogeoclimatic unit

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 in the IDFmw and all subzones of the ICH 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.

204 – Not recommended due to climate change concerns.

500- DSE: Advance Bl regen: <1.5 m tall at time of harvest, >75% live crown, >10cm leader, no scars, forks, crooks, or sweeps, and Apical dominance >1 as measured by comparing ratio of leader height to length of most recent branch.

## H3 SITE PREPARATION

**TECHNIQUE (S) / LIMITING FACTORS**

Options for SU A, B include:

- Pile, or pile and burn, slash accumulations on roadsides and landings, or within the NAR. Up to 10% of piles may be left unburned in order to contribute to wildlife habitat and coarse woody debris values.
- 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.

(Broadcast burn or Spot burn is a good option to reduce slash levels prior to planting, and improve soil warming on this cool aspect.)

## H4 PLANTING

| SU | Area (ha) | Regen. Method | Species | Age | Stock Type | Season | Stems/Ha | Total Stems |
|---|---|---|---|---|---|---|---|---|
| A | 11.0 | Plant | CwSx (Pw) | 1+0 | PSB 412A/410 | Spring | 1400-1600 | 15,400-17,600 |
| B | 2.3 | Plant | CwFdPw (SxLw) | 1+0 | PSB 412A/410 | Spring | 1400-1600 | 3,220-3,680 |

LIMITING FACTORS / COMMENTS:

.

- Plant on the high or low side of obstacles to minimize snow creep and snow press.
- Hw is a preferred species in SU A and B and limited to a maximum of 50% of the WS density, and natural regen exist. Expect quantities of natural regeneration post harvest.
- 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 Fdi, will promote a stand that is more likely to tolerate a warming climate.
- Microsite selection for Lw, and Fdi concentrated to dry sites and Cw and Sx populating draws and cold air exposures.
- Limiting factors include a cool aspect and heavy snowfall. Moisture surpluses are expected in the spring.
- 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**

Brush hazard: Current hazard is moderate. Future brush hazard is moderate to high due to cool aspect and evidence of wet alder brush complex in openings. Competitor species post-harvest include thimbleberry, lady fern, fireweed and woody shrubs such as alder, maple and willow.

Brushing Methods: 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.

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.

## I. ADMINISTRATION

**RPF SIGNATURE AND SEAL:**

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: _____RPF #:

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** | **%** |
| | | | | | | |
| Compaction | High | High | | | | |
| Soil Displacement | High (16) | Moderate (7) | | | | |
| Surface Erosion | Very High (34) | High (29) | | | | |
| Forest Floor Displacement | High (17) | Low (6) | | | | |
| Mass Wasting | High (42) | Moderate (28) | | | | |
| **Harvest System** | Ground Based | Ground Based | | | | |
| **TOTAL AREA** | 15.6 | 2.8 | | | 18.4 | |
| **Wildlife Tree Patches / NP Nat** | | | | | | % WTP |
| WTRA | 4.0 | 0.3 | | | 4.3 | 23.4 |
| **Permanent Access Structures** | | | | | | % Disturbance |
| Proposed roads | 0.1 | 0.2 | | | 0.3 | 1.6 |
| Existing roads | 0.5 | - | - | | 0.5 | 2.7 |
| Landings | - | - | - | | - | - |
| **Total disturbance permanent access structures** | **0.6** | **0.2** | | | **0.8** | **4.3** |
| **NET AREA TO BE REFORESTED** | **11.0** | **2.3** | | | **13.3** | |
| Sensitive Soils (Y/N) | Yes | 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. | 5% | 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.

**Proposed Roads** (permanent):

SU A: Spur 17-1 = 54m x 10m = **0.05ha**

Spur 17-2 = 67m x 10m = **0.07ha**

SU B: Spur 17-2 = 211m x 10m = **0.21ha**

**Existing Roads** (permanent):

SU A: No name 1 = 174m x 10m = **0.17ha**

No name 2 = 296m x 10m = **0.30ha**

Total PAS = **0.8ha**

**Proposed Landings: 1** landing utilizing existing access structures, **1** landing utilizing new access structures.

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