WEST FRASER MILLS LTD
PACIFIC INLAND RESOURCES DIVISION

Box 3130 Tatlow Road
Smithers, B.C.
V0J 2N0
Phone: (250) - 847-2656
Fax: (250) -847-5520

BULKLEY TIMBER SUPPLY AREA

FOREST STEWARDSHIP PLAN

FOR

Forest Licence A-16830 (expired: A-16829, A-57077, A-81629), Lake Babine Nation Licence A-88862, A95975, N2M and Forest Licence A-78037 (Myron Smaha)

Final Original Version 1.2
Date Authored: March 15, 2018
Date Submitted: March 20th, 2018
Approval Date: April 13, 2018
Expiry Date: April 12, 2023

FSP Tracker #: 214 Amendment #20 FSP 5yr Extension
Date Submitted: September 20, 2023
Approval Date: April 13, 2023
Expiry Date: April 12, 2028
Minor Amendment to strike phrase "*Without unduly reducing the supply of timber…*" to be consistent with FPPR.
Minor Amendment to update Agricultural and Wildlife zones on FSP maps.
Minor Amendment to update Appendix I and Appendix J.

This Page Intentionally Left Blank

Table of Contents

Signatures of Persons Required to Prepare Plan

Preparing Forester	RPF Signature and Seal
"I certify that the work described herein fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work"	 Ben Barker, RPF Planning Forester
Authorized Licensee Signature	Matt Sear, RPF Woodlands Manager Pacific Inland Resources A Division of West Fraser Mills Ltd. SEPT 15 / 2023

1.0 INTERPRETATION

1.1 Definitions

In this FSP, unless this FSP specifies, or the context requires, otherwise:

(a) "**Access Control Point**": Is a physical feature or combination of features, such as road deactivation, placed or developed on a road to restrict **Motorized Access.**

(b) **"CHR"** means a cultural heritage resource that is the focus of a traditional use by an aboriginal people, has evidence of past use, is of continuing importance to that people and is not regulated under the *Heritage Conservation Act*.

(c) "Closed Road" or "Inaccessible Road" means a road where **Motorized Access** is restricted through the use of a one or combination of, **access control points**, gates, or road deactivation activities. *(note that gated roads that have no other restriction on **motorized access** are not considered "closed")*

(d) **"Effective Date"** means the date the **Term** commences, as specified in Paragraph 3.1.

(e) **"FSP Holder"** means a holder of a licence specified in Division 2.1

(f) **"Legislated Planning Date"** means:

(i) subject to subclause (ii), the date 4 months before the Submission Date; or

(ii) if an enactment or an established objective requires that a date different than the date referred to in subclause (i) be applied under this FSP, then that different date;

(g) **"Main Haul Road"** means a forestry road used to access an entire landscape unit or operating area and, for greater certainty, but without limiting the foregoing, means, as of the **Submission Date**, the following roads in the Bulkley Timber Supply Area: 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, and 9000 roads.

(h) **"Map"**, when followed by a number, means the map of that number in Appendix H to this FSP.

(i) **"Mapped Habitat"** means the area of wildlife habitat for a species, as shown on Map 2 of this FSP.

(j) "Mature Stand" and **"Over Mature Stand"** is defined as > 120 yr in the MHmm2 and ESSFmc/mk/wv; as > 100 yr in the ICHmc1/mc2 and SBSdk/mc2; and as > 80 yr in the CWHws2

(k) "Motorized Access" means access that permits the passage of highway insurable 2-wheel drive or 4-wheel drive motor vehicles not intended for off-road usage.

(l) "Open Road means" means a road without restriction on **motorized access** *(note that gated roads that have no other restriction on **motorized access** are considered "open")*

(m) Open Road Density means the linear distance of open roads per square kilometer.

(n) "Patch" means stand of trees that is larger than 1 hectare in size, even aged and differing in age from adjacent stands by more than 20 years.

(o) "Permanent Road" means a road intended to facilitate long term harvesting, hauling and silviculture activities, typically planned to be maintained for longer than 5 years.

(p) "Classified Riparian Feature" means a stream, wetland or lake with a riparian class determined

under Division 3 *(Riparian areas)* of Part 4 (*Practice requirements) of the* **FPPR**.

(q) **"Qualified Professional"** means a person who by education, experience and professional credentials is considered knowledgeable and able to provide expert advice on a given subject in a given situation.

(r) **"Rotation"** means the time needed from regeneration of crop trees until those trees are harvestable timber and, for greater certainty, but without limiting the foregoing, means for the SBS 80-100 years and for the ESSF/ICH/CWH/MH 100-120 years.

(s) **"Submission Date"** means the date this FSP is submitted for approval.

(t) **"Temporary Road"** means a road intended to facilitate short term harvesting, hauling and silviculture activities, typically planned to be an **Inaccessible Road** within two years of construction.

(u) **"Term**" means the period during which this FSP is in effect, as determined from Paragraph 3.1 and 3.2.

(v) **"Wildlife Tree Retention Area"** means an area occupied by wildlife trees that is (a) located in a cutblock, (b) in an area that is contiguous to a cutblock, or (c) in an area close to the cutblock that the wildlife trees could directly impact on, or be directly impacted by, a forest practice carried out in the cutblock.

1.2 Definitions from Legislation

In this FSP, unless this FSP specifies, or the context requires, otherwise, words and phrases defined in FRPA or the *Forest Act* have the same meaning as those definitions as they were on the Legislative Planning Date.

1.3 Abbreviations

(a) **"Act"** means the *Forest and Range Practices Act* SBC 2002, c.69

(b) **"BEC" means** biogeoclimatic ecological classification

(c) **"DBH"** means diameter at breast height;

(d) **"DDM"** means Designated Decision Maker

(e) **"*Forest Act*"** means the *Forest Act* RSBC 1996, c.157

(f) **"FPC"** means the *Forest Practices Code of British Columbia Act* RSBC 1996, c.159 and regulations thereunder

(g) **"FLNRO"** means the Ministry of Forests, Land and Natural Resource Operations

(h) **"FRPA"** means the *Forest and Range Practices Act* and regulations thereunder

(i) **"FPPR"** means the *Forest Planning and Practices Regulation* B.C. Reg. 14/2004

(j) **"FSP"** means forest stewardship plan

(k) **"FDU"** means a forest development unit specified in Division 4.1

(l) **"OGMA"** means Old Growth Management Area(s)

(m) **"MITD"** means Minimum Inter-Tree Distance

(n) **"NAR" means** the Net Area to be Reforested

(o) **"NDT"** means Natural Disturbance Type

(p) **"VQO"** means Visual Quality Objective

(q) **"WTRA"** means Wildlife Tree Retention Area

1.4 Organization

This FSP is divided into parts, paragraphs, subparagraphs, clauses and subclauses, illustrated as follows:

1. Part;
   1.1 Paragraph;
      (a) Subparagraph;
         (i) Clause;
            (A) Subclause;
               (I) Section,

1.5 Changes to Legislation

If legislation referred to in this FSP is renamed or a provision of legislation referred to in this FSP is renumbered, the reference in this FSP is to be construed as a reference to the provision as renamed or renumbered, as the case may be.

1.6 Expressions Inclusive

In this FSP, the singular includes the plural and the plural includes the singular, unless the context indicates otherwise.

1.7 Objectives Cancelled

If an established objective for which a result or strategy is included under this FSP is cancelled, the result or strategy under this FSP pertaining to that objective is no longer applicable, effective on the date of cancellation of the objective.

1.8 Protection Provided by FRPA

Except as expressly provided for under Paragraph 2.2 and 2.3, despite any other provision in this FSP, an area within an **FDU** is not subject to a result or strategy under Part 5, a measure under Part 6 or a stocking standard under Part 7 if:

(a) the area is subject to a cutting permit or road permit that, under section 19(1) of the **Act**, is not affected by approval of the FSP;

(b) in respect of a result or strategy, section 2(2) of the Government Actions Regulation provides that the objective to which it pertains does not apply to the area;

(c) in respect of a result or strategy, the objective to which that result or strategy pertains specifies that the objective does not apply to the area; or

(d) FRPA otherwise provides that the area is not subject to such component of this FSP.

1.9 No Prohibition on Activities Otherwise Permitted or Required

Despite any other provision in this FSP, nothing in this FSP prevents, affects or limits the FSP Holder from carrying out an activity permitted by section 4(1.1) of the FPPR.

1.10 Appendices Part of FSP

The Appendices to this FSP are a part of this FSP and any reference in this FSP to this FSP includes a reference to the Appendices.

2.0 APPLICATION OF THIS FSP

2.1 Licences

In respect to West Fraser Mills Ltd. Pacific Inland Resources Division this FSP applies to Forest Licence A16830, Forest Licence A57077, Forest Licence A16829 and Forest Licence A81629.

In respect to Lake Babine Nation all parts of this FSP apply to Forest Licence A88862, A95975, and First Nation Woodland Tenure N2M with the exception of Part 7 Stocking Requirements.

In respect of Myron Smaha's tenure all parts of this FSP apply to Forest Licence A78037.

2.2 Application of the FSP to Permits Issued during Term of Previous FSP

For the purposes of Section 21(2) of the FRPA, with the exception of Stocking Standards, this FSP does not apply to a cutting permit or road permit issued under a previous FSP.

2.3 Application of this FSP to Areas Otherwise Subject to the Forest Practices Code

For the purposes of Sections 197 (4) and (7) of the FRPA, with the exception of Stocking Standards, this FSP does not apply to each cutting permit or road permit currently issued to the FSP Holder. Whether or not timber harvesting or road construction pertaining to that permit has begun as of the commencement of the Term.

2.4 Application of this FSP's Stocking Standards to Pre-Existing Cutblocks held by West Fraser Mills ltd

For the purposes of sections 197(5) and (7) of the **Act**, the stocking standards described in Part 7 of this FSP apply to the standard units of each cutblock to which those sections apply that:

(a) are within an **FDU** and;

(b) are subject to a licence referred to in Division 2.1; and

(c) either:

  (i) immediately before the **Effective Date** are subject to:

    (A) a site plan under section 21.1 of the *Forest Practices Code of British Columbia Act*; and

    (B) an existing obligation to establish a free growing stand; or

  (ii) on or after the **Effective Date** become subject to an obligation to establish a free growing stand.

In respect to Lake Babine Nation licence A88862, A95975, and First Nation Woodland Tenure N2M the stocking standards that apply are those that applied to the licence the day prior to this FSP being approved. For reference a copy of these stocking requirements is attached as Appendix G.

3.0 TERM OF THIS FSP

3.1 Commencement of Term

The **Term** of this FSP commences on the date this plan is approved by the DDM.

3.2 Length of Term

The length of the **Term** of this FSP is 5 years, or as specified by the DDM unless:

(a) the FSP Holder elects to replace it with another approved forest stewardship plan; or

(b) it is extended pursuant to FRPA.

4.0 IDENTIFYING FOREST DEVELOPMENT UNITS

4.1 Boundaries of FDU's

Woodlots, private land, parks, Indian Reserves, and all other non-Crown ownerships that fall within a FDU boundary are not part of the FDU and are excluded from the requirements of this FSP.

The following FDU's are included within this FSP:

- PIR-Bulkley FDU
- Lake Babine Nation(LBN)- Bulkley FDU

The FSP maps within Appendix H show the boundaries of the FDU's.

4.2 Areas Considered Approved

For the purposes of section 14(3)(j) of the **FPPR**, the cutting permits and road permits held by the FSP Holder under a licence referred to in Paragraph 2.1 and within the FDUs are listed in Appendix D and shown on Map 1 of Appendix I.

4.3 Designations in Effect Four Months Prior to Submission of the FSP

Table 1: The designations in effect at the time of the submission of this FSP are

Designation	Legal Order Reference Number	Effective Date	FDU's of Overlap
Fisheries Sensitive Watersheds	F-6-001: Cumming Creek F-6-002: Gramaphone Creek F-6-003: Jonas Creek F-6-004: Toboggan Creek F-6-005: Five Mile Creek	December 28, 2005	PIR-Bulkley
Canyon Creek Community Watershed	CWS Code 460.003	June 15, 1995	PIR-Bulkley
Bulkley Land and Resource Management Plan- Higher Level Plan Order Appendix 2, 3, and 4	Section3(1) and3(2) of the *Forest Practices Code, and* remains in effect as per section 181 of the *Forest and Range Practices Act.*	December 19, 2000	PIR-Bulkley
Visual Quality Objectives Bulkley LRMP- Higher Level Plan Order	Remains in effect as per section 181 of the *Forest and Range Practices Act.*	December 19, 2000	PIR-Bulkley LBN-Bulkley
Bulkley LRMP Objectives set by Government	Section 93.4 (1) of the *Land Act*	November 6, 2006	PIR-Bulkley LBN-Bulkley
Telkwa Caribou WHA	Order-Wildlife Habitat Area-#6-333	November 30, 2015	PIR-Bulkley
Bulkley Mountain Goat UWR	Order-Ungulate Winter Range #U-6-007	July 17, 2019	PIR-Bulkley

Maps 2 and 3 Appendix H identify all the other things, required to be identified in sections 14(3)(a) – (i) of the **FPPR**.

5.0 RESULTS OR STRATEGIES

5.1 Objectives set by Government for Biodiversity

5.1.1 Ecosystem Representation: Core Ecosystems

Background Information	
Summary of Objective	*a. Maintain biodiversity by representing a cross section of naturally-occurring ecosystems in identified core ecosystem on map 2.* *b. Maintain biodiversity by maintaining some areas with forest interior conditions in identified core ecosystems on map 2* *c. Maintain biodiversity by retaining representative examples of rare and endangered plant communities in core ecosystems on map 2 by* *i. not expanding range use in core ecosystems; and* *ii. not harvesting timber in core ecosystems unless it is necessary for:* a. *protecting the integrity and function of the ecosystem;* b. *mineral and energy exploration and development;* c. *providing access to timber outside the core ecosystem that would otherwise be isolated, or* d. *forest health control where there is a risk to operable timber outside of the core ecosystem*
Source of Objective	*Bulkley LRMP (HLP – 2006) Objectives* (Objective 1.2) established under *section 93.4 (1)* of the *Land Act*
Date Objective in Effect	November 6, 2006

Result or Strategy

5.1.1.1 **Definitions**

(a) "**Rare and endangered plant communities":** means indigenous plant species or plant communities, that have been red listed by the British Columbia Ministry of Environment Conservation Data Centre, that are extirpated, endangered or threatened in British Columbia.

(b) In Subparagraph 5.1.1.2, **"Core Ecosystem"** means a core ecosystem shown on Map 5 in the **Bulkley LRMP (HLP - 2006)** as of the **Legislated Planning Date**.

5.1.1.2 **Limitation on Roads and Harvesting in Core Ecosystems**

If harvesting a cutblock or constructing a road to which this FSP applies and within a Core Ecosystem, the FSP Holder will:

(a) not construct a:

(i) permanent access structure; or

(ii) a **permanent road**,

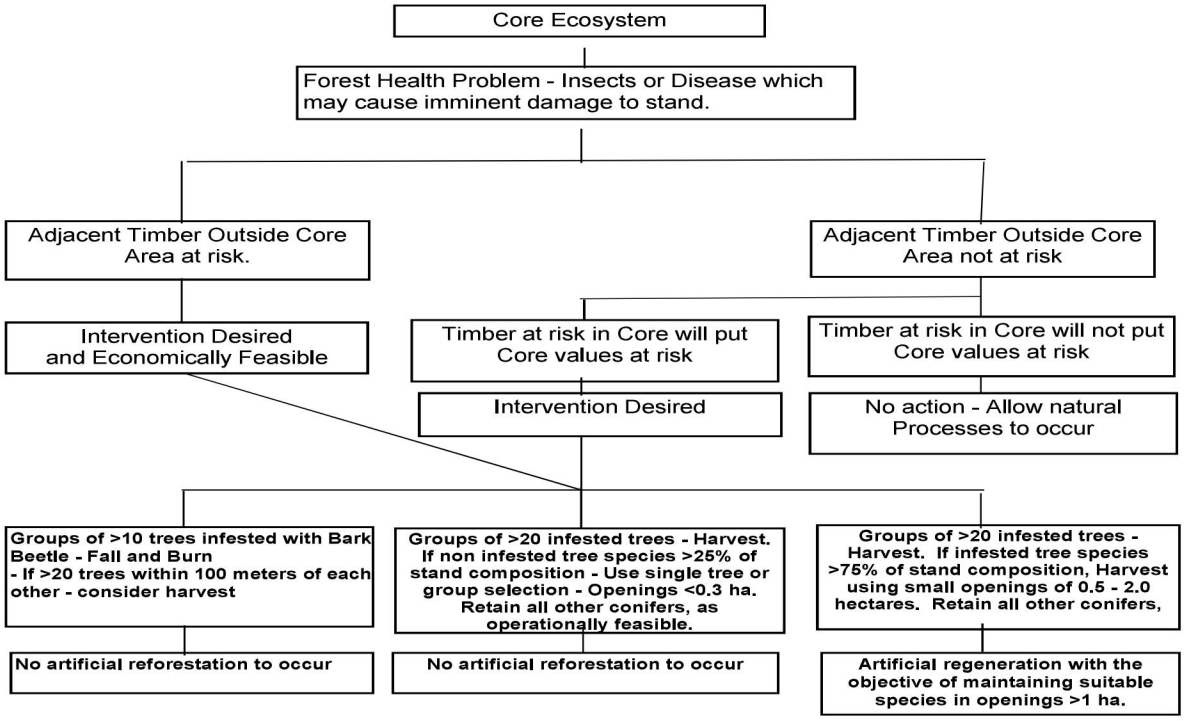
in that Core Ecosystem unless:

(iii) in the case of either a permanent access structure or a **permanent road**, there is no other practicable option for conducting the harvesting described in clause (b) in which case roads will be permanently deactivated following harvesting; or

(iv) in the case of a **permanent road**, it is the only practicable option for accessing operable timber outside the Core Ecosystem; and

(b) undertake that harvesting in accordance with Figure 1:

Figure 1. Decision Matrix for Harvesting in Core Ecosystems



Silviculture - Commitment to stocking. Plant only to maintain ecological integrity of the stand.
Site Plans required only for opening >1.0 ha.
Where harvesting within Core Ecosystems results in openings > 1 ha, the Reforestation Target Stocking Standard (TSS) will be equal to the Minimum Stocking Standards (MSS), as defined by Appendix A for the corresponding BEC site series of the site.

(c) Ensure timber harvesting and road building do not occur within **Rare and endangered plant communities** located in Core Ecosystems .

(d) This subsection applies where timber in a Core Ecosystem is in danger of being damaged, significantly reduced in value, lost or destroyed, and/or poses a hazard to public safety and the original Core Ecosystem values are at risk. In these circumstances the FSP holder may develop harvest plans, subject to District Manager approval, that facilitate harvesting of the affected timber. In all cases the Bulkley TSA LRMP balance must be maintained through the introduction of an offsetting constrained area deemed acceptable by the District Manager.

5.1.2 Connectivity: Landscape Corridors

Background Information	
Summary of Objective	*a. Maintain, within a managed forest setting, habitat connectivity across the landscape by maintaining landscape corridors dominated by mature tree cover and containing most of the structure and function associated with old forest, identified in Map 2.* *b. Maintain, within a managed forest setting, movement and dispersal of organisms in landscape corridors identified in Map 2.*
Source of Objective	***Bulkley LRMP (HLP – 2006)** Objectives (Objective 1.3)*
Date Objective in Effect	November 6, 2006

Result or Strategy

5.1.2.1 **Definitions**

In Subparagraph 5.1.2.2:

(a) **"Functional Old Forest"** means coniferous species leading forest older than 80 years or a deciduous species leading forest older than 60 years; and

(b) **"Landscape Corridor"** means a landscape corridor shown on Map 5 in the **Bulkley LRMP (HLP - 2006)** as of the **Legislated Planning Date**.

(c) **"Infested"** means an area of timber where on average greater than 30% of the gross volume has been affected by spruce or pine bark beetles.

(d) **"burned"** means the area is within Provincial wildfire boundary R32009.

5.1.2.2 **Limits on Activities in Landscape Corridors**

If harvesting a cutblock or constructing a road to which this FSP applies within a Landscape Corridor, and the harvest originates from layout completed after January 1, 2018 the FSP Holder will:

(a) not cause, as a result, and as of the conclusion, of that harvesting, the area of Functional Old Forest on Crown forested land associated with a cutblock within a Landscape Corridor to be less than 70% of such area;

(b) ensure the area of Functional Old Forest associated with a cutblock in a Landscape Corridor is contained within the landscape corridor being harvested and is not associated with any previous timber harvesting activities.

(c) limit the size of each clear-cut opening within the cutblock, so that it does not exceed the greater of:

(i) 3.0 hectares; or

(ii) if the Landscape Corridor is Infested by insects or burned;

(A) the area necessary to harvest the Infested or burned timber and,

(B) if the clear-cut opening of a block is greater than 3.0 hectares maintain a minimum 100m wide Functional Old Forest corridor associated with the clear-cut opening within the Landscape Corridor.

(d) within harvested areas greater than 1 ha retain to the extent practicable, a minimum of 60 stems per hectare of which 50% are greater than or equal to 15 cm at DBH.

(e) not build a permanent access structure unless no other practicable alternative exists for accessing or extracting timber; and

(f) not construct a road outside a cutblock but within the Landscape Corridor unless no other practicable option exists for accessing or extracting timber outside the Landscape Corridor.

5.1.2.3 **Application to Layout Completed Prior to January 1, 2018**

If harvesting a cutblock or constructing a road to which this FSP applies within a Landscape Corridor, and the harvest originates from layout completed prior to January 1, 2018 and the area is identified in Appendix J, the FSP in effect at the time of layout applies.

5.1.3 Seral Stage

Background Information	
Summary of Objective	*Maintain biodiversity by maintaining a natural seral-stage distribution specified in the objective*
Source of Objective	***Bulkley LRMP (HLP – 2006)*** *Objectives* (Objective 1.1)
Date Objective in Effect	November 6, 2006

Result or Strategy

5.1.3.1 **Definitions**

In Subparagraphs 5.1.3.2 and 5.1.3.3:

(a) **"Infested"** means an area of timber where on average greater than 30% of the gross volume has been affected by spruce or pine bark beetles.

(b) **"Seral Stage Target"** means the seral-stage targets by landscape unit and **BEC** subzone set out in Table 1 of Objective 1.1 in the **Bulkley LRMP (HLP - 2006)** as of the **Legislated Planning Date**; and

(c) **"Old"**, **"Mature"** and **"Young"** have the meaning given them in Objective 1.1 in the **Bulkley LRMP (HLP - 2006)** as of the **Legislated Planning Date**.

5.1.3.2 **Limits on Activities to Maintain Natural Seral Stage Distribution**

Where the layout of a cutting permit was completed after January 1, 2018. The FSP Holder will not apply for a cutting permit that causes the amount of:

(a) Old, or Mature and Old timber to fall below; or

(b) Young timber to exceed,

the applicable **Seral Stage Target**.

5.1.3.3 **Limits on Activities Where Targets Already Not Met**

If, as of cutting permit application referred to in Subparagraph 5.1.3.2, the amount of:

(a) Old or Mature and Old timber is less than; or

(b) Young timber is greater than,

the applicable Seral Stage Target, the cutting permit will be limited to an amount that is:

(a) consistent with a rate of harvesting that enables the Seral Stage Targets for Old and Mature to be achieved over a **Rotation,** and

where the amount of Old is below the applicable Old Seral Stage Target not apply for cutting permits containing Old seral forest, unless;

(a) Harvesting is required to develop an access structure and no other practicable alternative exists for accessing or extracting timber, or

5.1.3.4 **Application to Layout Completed Prior to January 1, 2018**
If harvesting a cutblock or constructing a road to which this FSP applies and the harvest originates from layout completed prior to January 1, 2018 and the area is identified in Appendix J, the FSP Seral Stage results and strategies in effect at the time of layout apply.

5.1.4 Objective Set by Government for Wildlife and Biodiversity –Landscape Level

Background Information	
Summary of Objective	*The objective set by government for wildlife and biodiversity at the landscape level is, to the extent practicable, to design areas on which timber harvesting is to be carried out that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape.*
Source of Objective	*FPPR s.9*
Date Objective in Effect	*January 31, 2004*

Result or Strategy

5.1.4.1 **Limitations on Harvesting to Provide Patch Size Distribution**

The FSP Holder will limit the size of cutblocks it harvests and to which this FSP applies such that the **Patch** size distribution created by that harvesting, by landscape unit, and natural disturbance types, will trend over time towards the applicable ranges specified in Table 2.

Table 2: Patch Size Distribution by Natural Disturbance Type (NDT)

Natural Disturbance Type	Patch Size Distribution		
	<40 hectares	40-80 hectares	> 80 hectares
NDT 1 and 2 [a]	30-40%	30-40%	20-40%
	<40 hectares	40-250 hectares	> 250-1000 hectares
NDT 3 [b]	10-20%	10-20%	60-80%

[a] includes ESSFmk/wv, MHmm2, CWHws2, ESSFmc and ICHmc1/mc2

[b] includes SBSdk/mc2

5.1.5 Tree Species Diversity

Background Information	
Summary of Objective	*Maintain a diversity of coniferous and deciduous species representing the natural species composition for each biogeoclimatic subzone.*
Source of Objective	***Bulkley LRMP (HLP - 2006)*** *Objectives* (Objective 1.4)
Date Objective in Effect	November 6, 2006

Result or Strategy

5.1.5.1 Activities Pertaining to Tree Species Diversity

(a) If harvesting a cutblock to which this FSP applies, where the volume of deciduous species in the cutblock is greater than 10% of the net merchantable volume, the FSP holder will retain at the conclusion of that harvesting, deciduous species in wildlife tree retention areas or riparian reserve zones that relate to the cutblock.

(b) Reforest cutblocks as per the Stocking Standards in part 7 of this FSP, which have been designed to maintain a diversity of coniferous species representing the natural species composition for each biogeoclimatic subzone and variant.

5.1.6 Stand Structure

Background Information	
Summary of Objective	*Maintain a diversity of attributes of old forest, such as coarse woody debris and standing dead and live trees, in managed stands in the percentages identified in Table 2 in the objective.*
Source of Objective	***Bulkley LRMP (HLP - 2006)*** *Objectives* (Objective 1.5)
Date Objective in Effect	November 6, 2006

5.1.6.1 **Definitions**

In Subparagraphs 5.1.6.2 and 5.1.6.3:

"**cutblock**" means the area to be harvested within the harvesting authority boundary;

Table 3: Percentage of cutblock to be retained in wildlife tree retention areas by BEC Subzone and landscape unit for harvesting that occurs under this FSP.

LU	CWHws2	ESSFmc	ESSFmk	ESSFwv	ICHmc1	ICHmc2	MHmm2	SBSdk	SBSmc2
Babine		3							7
Blunt		3							7
Bulkley Valley		5			3	5		5	7
Chapman		5							11
Copper	5	1		3			1		5
Corya				1	3	5			
Deep Ck.		1						1	3
Harold Price		3		1	1	1			7
Nilkitkwa		1							5
Reiseter		1			7	5		3	5
Telkwa	3	3	1	1				3	7
Torkelson		3							7
Trout Ck.				1	7	3		1	1

Result or Strategy

5.1.6.2 **Wildlife Tree Retention**

(a) Where the FSP holder completes harvesting on one or more cutting permits within a landscape unit ensure that, at the end of that 12 month period, beginning on April 1 of any calendar year, the total area covered by wildlife tree retention areas that relate to the combined cutblocks harvested by the FSP holder, will be a minimum percentage of the total harvested area, in each landscape unit and BEC subzone combination identified in Table 3.

(b) If harvesting a cutblock to which this FSP applies that is 15 hectares or greater in size, the FSP Holder:

(i) will, subject to clause (c), retain at the completion of that harvesting, a wildlife tree retention area that relates to the cutblock of not less than 50% of the amount specified in Table 3;

(ii) may relate a wildlife tree retention area required under clause (a) to more than one cutblock if all the cutblocks that relate to the wildlife tree retention area collectively meet the applicable requirements of clause (a).

(c) The FSP Holder will ensure that the WTRAs applicable under this Clause or the trees within such WTRAs include one or more of the following attributes:

(i) Diversity of wildlife tree retention strategies (e.g., a range of patch sizes combined with dispersed trees);
(ii) Diversity of habitat types;
(iii) Internal decay (heart rot or natural/excavated cavities present);
(iv) Crevices present (loose bark or cracks suitable for bats);
(v) Large brooms present;

(vi) Active or recent wildlife use;
(vii) Tree structure suitable for wildlife use (e.g., large nest, hunting perch, bear den);
(viii) Large trees for the site (height and diameter) and veterans;
(ix) Representative of the size, age and species of the pre-harvest stand.

5.1.6.3 **Restriction on Harvesting Wildlife Tree Retention Areas**
The FSP Holder will not harvest a wildlife tree retention area referred to in clause (a) unless:

(a) the trees on the net area to be reforested of the cutblock to which the wildlife tree retention area relates have developed attributes that are consistent with a mature seral condition; or

(b) the FSP Holder specifies one or more wildlife tree retention areas that provide an area, number of trees or habitat that is equivalent to the portion of the wildlife tree retention area that is harvested.

5.2 Objectives set by Government for Wildlife

Background Information		
Summary of Objective	**Source of Objective**	**Date Objective in Effect**
For mountain goat: *Maintain General Wildlife Measures identified in Order-UWR #U-6-007;* *(a) See Appendix M "Order – Ungulate Winter Range, #U-6-007, Bulkley Mountain Goats – Skeena-Stikine Natural Resource District"*	***GAR Order-Ungulate Winter Range #U-6-007***	July 17, 2019
For grizzly bear: *(a) Provide high-value habitat buffered for security and bedding for grizzly bears in the locations identified in Map 2.* *(b) Provide diverse understory within high-value, mixed forest habitat identified in Map 2.* *(c) Limit road development and the number and duration of entries within moderate-value grizzly bear habitat identified in Map 2.* *(d) Avoid human-bear conflicts in high-value grizzly bear habitat identified in Map 2.* *(e) Provide opportunities for movement with minimal disturbance from humans between important landscape features in the Boucher Creek Wetlands management unit, the Nichyeskwa South management unit and the Nichyeskwa North management unit identified in Map 2.*	***Bulkley LRMP (HLP - 2006)*** *Objective 2.5*	November 6, 2006
For moose: *(a) Provide woody browse in moose winter habitat identified in Map 2* *(b) Provide visual screening, security, thermal and snow-interception cover in moose winter habitat identified in Map 2.*	***Bulkley LRMP (HLP - 2006)*** *Objective 2.2*	November 6, 2006
For deer: *(a) Provide woody browse during winter in deer habitat identified in Map 2* *(b) Provide visual screening, security, thermal and snow-interception cover in deer habitat identified in Map 2.* *(c) Provide mature cover adjacent to steep, south facing slopes within deer habitat identified in Map 2.*	***Bulkley LRMP (HLP - 2006)*** *Objective 2.6*	November 6, 2006

Background Information		
Summary of Objective	**Source of Objective**	**Date Objective in Effect**
For woodland caribou: *Maintain General Wildlife Measures identified in Order – WHA # 6-333:* *(a) see Appendix L "Order – Wildlife Habitat Area #6-333, Norther Caribou Telkwa Herd, Skeena Stikine and Nadina Natural Resource Districts"* *(b) subject to (also Appendix L) the "Memorandum by Karen Diemart, Head Landbase Stewardship Resource Management division, Skeena Region"*	***GAR Order- Wildlife Habitat Area # 6-333*** ***Memorandum Telkwa Caribou Wildlife Habitat Area***	November 30, 2015 June 19, 2015
For wildlife : *Provide for wildlife habitat and populations by implementing and timing road location, development and maintenance activities in a manner that minimizes the effects on these values.*	***Bulkley LRMP (HLP - 2006)*** *Objective 2.1*	November 6, 2006

Result or Strategy

5.2.1 **Definitions**

In Paragraph 5.2.2:

(a) "**Low or No Use**" in respect of grizzly bears use means the time period between October 31 and May 1 of any given year, or another time period determined by a Qualified Person.

(b) **"Mapped Habitat"** means the area of wildlife habitat for a species, as shown on Map 2 of this FSP;

(c) **"High Value"**, **"Moderate"** or **"Mixed Forest"** means the Mapped Habitat for grizzly bear shown to be in that category on Map 2 of this FSP;

(d) "**Directly adjacent**" means the portion of any riparian feature with a riparian management class that due to its location is within its riparian management zone distance from a block harvested under this FSP.

(e) "**Qualified Person**" means a person who, by education and experience, is knowledgeable in identifying wildlife use and habitat features.

(f) "**Visual screening**" means the retention to the extent practicable of deciduous species, non-merchantable conifers, non-commercial stems, and brush species present when harvesting commenced, that are located:

(i) within the first 30m adjacent to a Main Haul Road measured from the outside edge of the road ditch line considering site lines and road safety or

(ii) within 30m of a classified wetland edge.

(g) **"Old"**, **"Mature"** and **"Young"** have the meaning given them in Objective 1.1 in the **Bulkley LRMP (HLP - 2006)** as of the **Legislated Planning Date**.

5.2.2 **Activities Related to Wildlife Species**

If harvesting a cutblock or constructing a road to which this FSP applies, the FSP Holder will:

(a) in respect of Wildlife Habitat Order UWR #U-6-007, Bulkley Mountain Goats: (http://www.env.gov.bc.ca/wld/documents/uwr/u-6-007_ord.pdf)

  (i) follow General Wildlife Measures as per Order UWR #U-6-007 (see Appendix M)

(b) in respect of Mapped Habitat for grizzly bear:

  (i) Only construct roads or harvest timber within High Value mapped habitat during periods of low or no use by grizzly bears;

  (ii) within 2 years of the conclusion of, road construction and harvesting conducted under this FSP ensure:

    (A) the **open road density** is less than 0.6 km/km^2 in a High Value Mapped Habitat polygon in which the road construction and harvesting occurred;

    (B) the **open road density** is less than 0.6 km/km^2 in a Mixed Forest Mapped Habitat polygon in which the road construction and harvesting occurred;

    (C) The **open road density** is less than 0.6 km/km^2 in the Boucher Creek Wetlands, Nichyeskwa South and Nichyeskwa North management units in which the road construction and harvesting occurred;

  (iii) not construct a **Permanent Road** associated with timber harvesting under this FSP through or immediately adjacent to such Mapped Habitat that is High Value, except where there is no other practicable option to prevent the isolation of timber, in which case the FSP Holder will, where permitted to do so at law, restrict **Motorized Access** on that road;

  (iv) where **Permanent road(s)** associated with timber harvesting under this FSP access Mapped Habitat that is High Value, Moderate, or Mixed Forest an **access control point** will be established within two years following construction where permitted by law to restrict **Motorized Access**;

(v) where permitted to do so at law, deactivate all roads, equivalent to a **closed road** standard, not required for future timber development within a cutblock in such Mapped Habitat that is High Value, Moderate, or Mixed Forest within two years of completing timber harvesting activities;

(vi) where permitted to do so at law, manage **access control points** to provide opportunities for grizzly bear movement with limited disturbance from humans;

(vii) maintain visual screening of classified wetlands **directly adjacent** to timber harvesting or road construction in areas of Mapped Habitat that is High Value, Mixed Forest, Moderate, provided that such screening need not be removed for safety reasons or to fulfill any other requirement under this FSP or at law; and

(viii) maintain visual screening within a cutblock located immediately adjacent to **Main Haul Roads**, provided that such screening is available and need not be removed for safety reasons or to fulfill any other requirement under this FSP or at law;

(ix) All cutblocks located within such Mapped Habitat that is High Value, Moderate, Mixed Forest or located within the Boucher Creek Wetlands, Nichyeskwa South and Nichyeskwa North management units are to be reviewed by a qualified person prior to cutting permit application to determine areas of high grizzly bear use which are to be excluded from harvest.

(c) in respect of Mapped Habitat for moose:

(i) retain at the conclusion of such harvesting within such Mapped Habitat:

(D) where the volume of deciduous species is greater than 5% of the net merchantable stand volume of the cutblock immediately prior to commencing harvesting, wildlife tree retention areas or riparian reserve zones containing a deciduous component; and

(E) visual screening within a cutblock located immediately adjacent to **Main Haul Roads**, provided that such screening is available and need not be removed for safety reasons or to fulfill any other requirement under this FSP or at law;

(ii) where permitted to do so at law, deactivate all roads within a cutblock in such Mapped Habitat not required for future timber development by a date as soon as practicable after the FSP Holder completes for that cutblock all activities required to achieve the stocking standards that apply under this FSP to the regeneration date; and

(iii) not use in a cutblock within such Mapped Habitat pesticides to treat brush;

(d) in respect of Mapped Habitat for deer:

(i) retain at the conclusion of such harvesting within such Mapped Habitat:

(A) where the volume of deciduous species is greater than 5% of the net merchantable stand volume of the cutblock; immediately prior to commencing harvesting, wildlife tree retention areas or riparian reserve zones containing a deciduous component; and

(B) where harvesting occurs adjacent to steep south facing slopes, wildlife tree retention areas adjacent to or on the steep south facing slopes; and

(C) visual screening within a cutblock located immediately adjacent to Main Haul Roads, provided that such screening is available and need not be removed for safety reasons or to fulfill any other requirement under this FSP or at law;

(ii) where permitted to do so at law, deactivate all roads within a cutblock in such Mapped Habitat not required for future timber development by a date as soon as practicable after the FSP Holder completes for that cutblock all activities required to achieve the stocking standards that apply under this FSP to the regeneration date; and

(iii) not use in a cutblock within such Mapped Habitat pesticides to treat brush;

(e) in respect of Wildlife Habitat Order #6-333 Northern Caribou Telkwa Herd (http://www.env.gov.bc.ca/wld/documents/wha/RATA_6-333_ord.pdf):

(i) follow General Wildlife Measures as per Order WHA #6-333 (see Appendix L).

5.3 Objectives set by Government for Fish Habitat and Water Quality

5.3.1 Objectives set by Government for Water, Fish, Wildlife and Biodiversity within Riparian Areas

Background Information	
Summary of Objective	*The objective set by government for water, fish, wildlife and biodiversity within riparian areas is to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas*
Source of Objective	*FPPR s.8*
Date Objective in Effect	*January 31, 2004*

Result or Strategy

5.3.1.1 **Definition**

In Paragraph 5.3.1.3:

(a) **"Directly adjacent"** means the portion of any riparian feature with a riparian management class that due to its location is within its riparian management zone distance from a block harvested under this FSP.

(b) **"RMZ"** means riparian management zone; and

(c) **"Stub"** means a live or dead tree that has had its top removed, leaving a high stump greater than 3m in height.

(d) **"Sensitive S6 Stream"** means the first 500 meter portion of an S6 stream measured from its confluence with a fish bearing stream, and
(I) has a channel width of greater than 1.0 meter, and
(II) has the same stream order as the most downstream reach of the tributary.

(e) **"Retain"** or **"Retention"** relates to standing live or dead trees. Blowdown of retained trees following harvest of the RMZ are considered retention. A tree felled for safety or windthrow management and left on-site is considered retention.

(f) **"Countable-stems-per-hectare"** means stems retained post-harvest and includes: live and dead, merchantable and non-merchantable trees and stubs and downed stems, ≥10cm DBH. Retention (green or dead) can be stubbed for worker safety and to minimize blowdown.

(g) **"Merchantable DBH"** means the diameter specified as merchantable in the accepted cruise compilation applicable to the block.

5.3.1.2 **Activities in Riparian Areas**

The FSP Holder adopts as a result or strategy under this FSP, applicable to the **FDU**, sections 47, 48, 49, 50, 51, 52 (2) and 53 of the FPPR.

5.3.1.3 **Retention in RMZs**

For the purposes of section 12(3) and 12.3 (6) of the FPPR, the FSP Holder, when felling trees in a cutblock to which this FSP applies within an RMZ of a riparian feature, will, at the conclusion of that activity:

(a) Retain the amounts referenced in Table 4 for each portion of RMZ within or **directly adjacent** the cutblock harvested under this FSP,

Table 4: Retention of trees within RMZ of Wetlands and Lakes and Features with a Riparian Reserve Zone.

Riparian Class	Merchantable Preharvest Stems per Hectare or Un-harvested Area to be retained within Riparian Management Zone (%)
S1A or S1B, S2, S3	≥20%
W1 or W5	≥10%
L1-B	≥10%
L3	≥10%
The merchantable preharvest stems per hectare or area % retained unharvested shall count both live and dead merchantable and non-merchantable trees and stubs. Retained green or dead trees can be stubbed for worker safety.	

(b) For W3 wetlands, the FSP Holder will retain within a 10 meter zone:
  (i) Not less than 25% of the area or not less than 25% of the pre-harvest stems/ha greater than merchantable DBH as stubs or full stems, and
  (ii) As practicable, brush species, advanced regeneration, non-merchantable conifers, and non-commercial stems.

(c) Retain greater than 150 countable-stems-per-hectare within a 20 meter zone (consists of 10 m either side) of a S4, S5 or sensitive S6 streams that is within or directly adjacent to a cutblock harvested by the FSP Holder. If pre-harvest structure is insufficient, ≥50% of the 20 meter zone area equivalent will be retained as WTRA or Leave along the stream.

(d) The FSP Holder will, as of the conclusion of harvesting a cutblock, retain to the extent practicable, the brush and non-merchantable conifer and non-commercial stems within the 10 meters that begins at both sides of the edge of the stream channel bank of each S4, S5 and sensitive S6 stream within or directly adjacent to a cutblock.

(f) The FSP Holder's harvest shall reserve greater than 150 countable-stems-per-hectare within a 20 meter zone (consists of 10 m either side) of an S6 stream that is not sensitive and that is within or directly adjacent to a cutblock harvested by the FSP Holder. If pre-harvest structure is insufficient, ≥15% of the 20 meter zone area equivalent will be retained as WTRA or Leave along the stream.

(f) The FSP Holder will, as of the conclusion of harvesting a cutblock, retain to the extent practicable, the brush and non-merchantable conifer and non-commercial stems within the 5 meters that begins at both sides of the edge of the stream channel bank of each S6 stream that is not sensitive and W3, L1-A, and L3 within or directly adjacent to a cutblock.

5.3.2 Objectives Set by Government for Fish Habitat in Fisheries Sensitive Watersheds

<table>
<tr><th colspan="2">Background Information</th></tr>
<tr><td>Summary of Objective</td><td>
To provide, within the normal forest Rotation, special management of the amount, timing and distribution of primary forest activities, in order to:
(a) conserve the natural hydrological conditions, natural stream bed dynamics and integrity of stream channels in the Fisheries Sensitive Watershed,
(b) conserve the quality, quantity and timing of water flows required by fish in the Fisheries Sensitive Watershed, and
(c) prevent the cumulative hydrological effects of primary forest activities in the Fisheries Sensitive Watershed from resulting in a material adverse impact on the fish habitat of the watershed.

For the purposes of this FSP, the objective applies to the following fisheries sensitive watersheds:
<table>
<tr><th>Watershed Common Name</th><th>Watershed Gazetted Name</th><th>Forest District</th><th>GIS FSW Identifier</th><th>Watershed Code</th></tr>
<tr><td>Cumming Creek</td><td>Cumming Creek</td><td>Skeena Stikine</td><td>F-6-001</td><td>460422700283</td></tr>
<tr><td>Gramaphone Creek</td><td>Gramaphone Creek</td><td>Skeena Stikine</td><td>F-6-002</td><td>4602238</td></tr>
<tr><td>Jonas Creek</td><td>Jonas Creek</td><td>Skeena Stikine</td><td>F-6-003</td><td>460422700414</td></tr>
<tr><td>Toboggan Creek</td><td>Toboggan Creek</td><td>Skeena Stikine</td><td>F-6-004</td><td>4602429</td></tr>
<tr><td>West Babine</td><td>Five Mile Creek</td><td>Skeena Stikine</td><td>F-6-005</td><td>4804523</td></tr>
</table>
</td></tr>
<tr><td>Source of Objective</td><td>Order BCReg 62/2005 dated December 28, 2005 under schedule 2 of the Forest Planning and Practices Regulation.</td></tr>
<tr><td>Date Objective in Effect</td><td>December 28, 2005</td></tr>
</table>

Result or Strategy

5.3.2.1 **Definition**

In Subparagraph 5.3.2.2, **"FSW"** means the Cumming Creek, Gramaphone Creek, Jonas Creek, Toboggan Creek or West Babine Fisheries Sensitive Watershed, as it was on the **Legislated Planning Date** unless, after that date, any such fisheries sensitive watershed is reduced in area, in which case from the date of reduction, it means that part of that fisheries sensitive watershed remaining after the reduction.

5.3.2.2 **Activities within Fisheries Sensitive Watersheds**

If harvesting a cutblock or constructing a road to which this FSP applies:

(a) in a FSW listed in Table 5, the FSP Holder will not cause as of the conclusion, and by virtue, of that harvesting or construction a target specified in Table 5 to be exceeded, or

(b) if timber is in danger of being damaged, significantly reduced in value, lost or destroyed, and/or poses a hazard to public safety. In these circumstances the FSP holder may develop harvest plans, subject to District Manager approval, that facilitate harvesting of the affected timber specified in Table 5.

Table 5: Fisheries Sensitive Watershed Targets

FSW Gazetted Name	Targets			
	Equivalent Clearcut Area (% of total FSW area)	Peak Flow Index associated with the FSW	Open Road Density (km/km^2 in the FSW)	Stream Crossing Density ($\#/km^2$ in the FSW)
Cumming Creek	30	35	1.4	0.5
Gramophone Creek	25	35	1.6	0.6
Five Mile Creek	35	45	1.3	0.6
Toboggan Creek	25	32	1.4	Not Available

(c) in a FSW not listed in Table 5, the FSP Holder will:

(i) before harvesting a cutblock NAR exceeding 1 hectare in size, or constructing a road, determine, through a watershed assessment, the targets listed in Table 5, applicable to that FSW; and

(ii) not cause, as of the conclusion, and by virtue, of that harvesting or road construction, such a target to be exceeded.

5.3.3 Objectives Set by Government for Water in Community Watersheds

Background Information	
Summary of Objective	*Where water is being diverted for human consumption through a licensed waterworks in specified community watersheds, prevent, within specified limits of impact on timber supply, the cumulative hydrological effects of primary forest activities within the watershed from resulting in:* *(a) a material adverse impact on the quantity of water or the timing of the flow of the water from the waterworks, or* *(b) the water from the waterworks having a material adverse impact on human health that cannot be addressed by water treatment required under* *(i) an enactment, or* *(ii) the licence pertaining to the waterworks.*
Source of Objective	*FPPR s.8.2*
Date Objective in Effect	*February 25, 2005*

Result or Strategy

5.3.3.1 **Definition**

In Subparagraph 5.3.3.2, **"CW"** means the Canyon Creek Community Watershed, as it was shown on Map 2 in the Bulkley TSA Amalgamated Resource Management Zone as of the **Legislated Planning Date** unless, after that date, that community watershed is reduced in area, in which case from the date of reduction, it means that part of that community watershed remaining after the reduction.

5.3.3.2 **Activities within a Community Watershed**

For that portion of the **FDU** within the CW, the FSP Holder adopts as a result or strategy sections 59, 60, 61, 62 of the FPPR, as they pertain to cumulative hydrological effects on water quality affecting human health in the CW.

5.3.4 Objectives for Fish Habitat

Background Information	
Summary of Objective	*Provide for lakes containing high-value fish habitat by maintaining lakes in a full spectrum of settings including semi-primitive and primitive.*
Source of Objective	***Bulkley LRMP (HLP- 2006)*** *Objectives* (Objective 3.0)
Date Objective in Effect	November 6, 2006

Result or Strategy

5.3.4.1 **Definition**

In Subparagraph 5.3.4.2, **"Wilderness Lake"** means a lake that, as of the **Legislated Planning Date**, has been designated by the District Manager to be a wilderness lake

unless, after that date, that designation is removed from such lake, in which case from the date of removal, that lake will no longer be included within this definition.

5.3.4.2 **Activities Related to Wilderness Lakes**

The FSP Holder will:

(a) not construct a **Permanent Road** to which this FSP applies within 1 kilometer of a Wilderness Lake; and

(b) subject to any restrictions in law that limit or prevent it from doing so, as soon as practicable after it has completed use of a road that, was built after the commencement of the **Term**, the FSP Holder constructed within 1 kilometer of a Wilderness Lake, modify the road so that it will not provide **Motorized Access** to that Wilderness Lake.

5.4 Enhanced Timber Development Areas

Background Information	
Summary of Objective	*Enhance available timber supply and improve timber quality in Enhanced Timber Development areas identified in Map 2.*
Source of Objective	***Bulkley LRMP (HLP-2006)*** *Objectives* (Objective 4.1)
Date Objective in Effect	November 6, 2006

Result or Strategy

5.4.1 **Activities Related to Mapped Enhanced Timber Development Areas**

The FSP Holder will give priority to exercising the timber harvesting rights under the licences listed in Division 2.1 in **Mature Stands** and **Over Mature Stands** except where:

(a) other resource values reduce this priority;

(b) such harvesting will be inconsistent with the obligations of the FSP Holder under this FSP, FRPA, those licences, the *Forest Act* or any other legislation governing such harvesting;

(c) other areas become a higher priority for harvest because of pest or disease outbreaks, fire suppression or salvage or safety issues;

(d) prioritizing these areas for harvest impairs the ability of the FSP Holder to exercise those timber harvesting rights in a manner consistent with section 6 of the FPPR;

(e) third party harvesting, resource development or use or other action impairs the ability of the FSP Holder to harvest according to this priority;

(f) the FSP Holder is unable to obtain authority to harvest according to this priority; or

(g) the FSP Holder is directed by government to harvest in a manner inconsistent with this priority.

5.5 Objectives for Outdoor Recreation

5.5.1 Recreation Opportunities

Background Information	
Summary of Objective	*Maintain or enhance a diverse range of recreational values and opportunities*
Source of Objective	***Bulkley LRMP Objectives set by Government: Objective 5.1***
Date Objective in Effect	November 6, 2006

Result or Strategy

5.5.1.1 **Activities Related to Recreation Features**

If harvesting a cutblock or constructing a road to which this FSP applies, the FSP Holder will:

(a) not harvest timber within a recreation site established under FRPA or the FPC by the **Legislated Planning Date** and still in effect at the time of the harvesting or construction, unless authorized or directed to do so by the District Manager;

(b) if the harvesting or construction:

(i) is adjacent to or on a recreation trail established under FRPA or the FPC by the **Legislated Planning Date** and still in effect at the time of the harvesting or construction; and

(ii) results in debris on the trail preventing access to the trail by hikers, as soon as practicable after conclusion of the harvesting or construction either:

(A) remove the debris; or

(B) if the District Manager agrees with the FSP Holder, establish new access to the trail in accordance with that agreement.

5.5.2 Recreation Access

Background Information	
Summary of Objective	*Maintain reasonable access to a diverse range of recreational values and opportunities.*
Source of Objective	***Bulkley LRMP Objectives set by Government: Objective 5.2***
Date Objective in Effect	November 6, 2006

Result or Strategy

5.5.2.1 **Activities Related to Recreation Access**

If as of the Date of Submission, the FSP Holder is maintaining a road or portion thereof to which this FSP applies over which **Motorized Access** to a recreation trail or recreational site established under FRPA or the FPC by the **Legislated Planning Date** and still in effect, then if and when the FSP Holder deactivates the road, the FSP Holder will:

(a) if site conditions permit **Motorized Access** to be retained as of the conclusion of the

deactivation, retain that access at that time; or

(b) if site conditions do not permit **Motorized Access** to be retained as of the conclusion of the deactivation, notify the District Manager before deactivating the road and, if the District Manager and the FSP Holder agree, not deactivate the road.

5.6 Visual Quality

Background Information	
Summary of Objective	Manage viewpoints and associated scenic areas as mapped (see Appendix H) and made available at the Landscape Level. (scenic areas, viewpoints and visual quality objectives have been identified in Landscape Unit Plans and in the Valley Sustainable Resource Management Plan).
Source of Objective	***Visual quality objectives established under the Bulkley LRMP- Higher Level Plan Order signed December 19, 2000 apply to scenic areas in Bulkley TSA as grandfathered through FRPA section 181 .***
Date Objective in Effect	December 19, 2000

Result or Strategy

5.6.1 Definition

In Subparagraph 5.3.2,

"Alteration" means a change or something different as a result of the FSP Holder conducting timber harvesting;

"Category of Alteration" means the applicable visual quality objective; and

"Public Viewpoint" means a viewpoint as determined as part of the Bulkley TSA Landscape Unit Plans and located on Map 3: Scenic Areas and Viewpoints.

5.6.2 Activities in Scenic Areas

(a) If the FSP Holder harvests timber in a cutblock to which this FSP applies and that is located in scenic areas identified on Map 3 the cutblock will, at the conclusion of harvesting, be consistent with the characteristics of alteration indicated in Table 6 for the applicable Category of Alteration or any category above it in Table 6

Table 6: Characteristics of Alteration by Alteration Category

Category of Alteration (as identified through the process provided in Objective 10 of the **Bulkley LRMP (HLP – 2000)** as of the **Legislated Planning Date**)	**Characteristics of Alteration Caused by a Cutblock**
Preservation	Forest management activities are to have no visible activity from the designated viewpoints.
Retention	Forest management activities may be discernible but not clearly visible to the average viewer from the designated viewpoint. Disturbances should appear to be from natural causes.
Partial Retention	Forest management activities may be noticeable but must blend well with the natural appearance of the landscape from the designated viewpoint
Modification	Forest management activities must have natural appearing characteristics and blend with existing landforms

(b) The characteristics for a cutblock in subparagraph (a) are assessed:

(i) from the Public Viewpoint applicable to the cutblock as indicated by the mapped VQO polygon codes (appendix H); and

(ii) evaluated to the perspective landform(s).

5.7 Agriculture/Wildlife Zone

Background Information	
Summary of Objective	*Enhance agricultural capacity and protect high value wildlife habitat by developing forest resources in a manner that minimizes conflicts between agriculture and wildlife.*
Source of Objective	*Objective 14 in Appendix 2 to the* ***Bulkley LRMP (HLP – 2000)***
Date Objective in Effect	December 19, 2000

Result or Strategy

5.7.1 Definition

In Paragraph 5.7.2, **"Mapped Agriculture / Wildlife Zone"** means the agriculture / wildlife zone shown on Map [2].

5.7.2 **Activities in the Mapped Agriculture / Wildlife Zone**

If harvesting a cutblock or constructing a road to which this FSP applies in the Mapped Agriculture/Wildlife Zone, the FSP Holder will apply the result or strategy listed in Table 7 for the relevant species of concern identified from Map 2:

Table7 Result or Strategy Applicable for Indicated Species in Agriculture / Wildlife Zone

Species of Concern Identified on Map 2	Result or Strategy that will be Applied
Grizzly Bear	**Paragraph 5.2.2 (b)**
Goat	**Paragraph 5.2.2 (a)**
Moose	**Paragraph 5.2.2 (c)**
Deer	**Paragraph 5.2.2 (d)**
Woodland Caribou	**Paragraph 5.2.2 (e)**

5.8 Objectives set by Government for Cultural Heritage Resources

Background Information	
Summary of Objective	*To conserve, or, if necessary, protect cultural heritage resources that are* *(a) the focus of a traditional use by an aboriginal people that is of continuing importance to that people, and* *(b) not regulated under the Heritage Conservation Act.*
Source of Objective	*FPPR s.10*
Date Objective in Effect	*January 31, 2004*

Result or Strategy

5.8.1 Definition

In Subparagraph 5.8.2

"CHR" means a ***cultural heritage resource*** that is the focus of a traditional use by an aboriginal people, has evidence of past use, is of continuing importance to that people and is not regulated under the *Heritage Conservation Act*;

"Cultural Heritage Resource Evaluation": means a documented process conducted by a **qualified person** and consisting of the following steps:

a. Record the location and nature of any cultural heritage resource;

b. Evaluate the direct impact of the planned development on the cultural heritage resource;

c. If necessary, prepare recommendations in order to conserve, mitigate, or if necessary protect, the **CHR** considering the factors in FPPR Schedule1(4), to address the objectives of FPPRs.10

"qualified person" means a person who, by education and experience, is knowledgeable in identifying CHRs.

5.8.2 Conserving or Protecting Cultural Heritage Resources

The FSP Holder will in all FDU's:

(a) Provide information on proposed harvesting and road building activities to affected aboriginal groups as per consultation processes defined by government and document **CHR** brought to the attention of the FSP Holder through this process; and

(b) Before applying for a cutting permit or a road permit the FSP Holder will carry out a **Cultural Heritage Resource Evaluation** within all blocks and roads; and

(c) Where CHR features are found provide copies of completed CHR Evaluations to affected aboriginal groups prior to applying for a cutting permit or road permit; and

(d) Conduct all harvesting, road construction and mechanical site preparation activities consistent with recommendations given in the **CHR** evaluation referred to in subparagraph (b) that are practicable.

(e) If the **FSP Holder** encounters a previously unidentified **CHR** during **harvesting**, road construction or mechanical site preparation activities:

(i) modify the activity to the extent necessary to protect the unidentified **CHR** until a **CHR Evaluation** is completed;

(ii) ensure subsequent harvesting, road construction, or mechanical site preparation activities that are carried out in the CHR area are consistent with recommendations given in the **CHR** Evaluation; and

(iii) communicate the results of the **CHR Evaluation** to the affected aboriginal group(s) and to appropriate government staff within 30 days.

5.9 Objectives set by Government for Soils

Background Information	
Summary of Objective	*,The objective set by government for soils is to conserve the productivity and the hydrologic function of soils*
Source of Objective	*FPPR s.5*
Date Objective in Effect	*January 31, 2004*

Result or Strategy

5.9.1 Conservation of Soils Values

The FSP Holder adopts as a result or strategy applicable in the **FDU** sections 35 and 36 of the FPPR.

5.10 Resource Management Zones

Background Information		
Summary of Objective	**Source of Objective**	**Date Objective in Effect**
For Babine River Resource Management Zone (Sub-unit 2-2): *Maintain the following river-based resource values adjacent to Babine River Provincial Park:* *• wilderness recreation opportunities,* *• water clarity and hydrologic stability for fish habitat in the tributaries of the Babine River,* *• visual quality within view of the Babine River, and* *• travel and denning habitat for grizzly bears* *by:* *• developing timber in a manner which minimizes the effects on these values,* *• not constructing new, permanent, unrestricted road access north of the Babine River bridge,* *• avoiding road construction to the Babine River corridor boundary, and* *• logging by selection harvesting or small clearcuts only.*	Objective 22 in Appendix 3 to the **Bulkley LRMP (HLP- 2000)**	December 19, 2000
For Jack Mould Lake (Sub-unit 9-2): *Maintain:* *• connectivity of mature forest between Kitseguecla and Jack Mould lakes,* *• recreational opportunities, and* *• visual quality within view of Jack Mould Lake and Kitseguecla Lake* *by:* *• developing timber in a manner which minimizes the effects on these values, and* *• maintaining walk-in only status to Jack Mould Lake.*	Objective 25 in Appendix 3 to **the Bulkley LRMP (HLP- 2000)**	December 19, 2000
For Mooseskin Johnny Lake Management Zone (Sub-unit 11-3): *Maintain:* *• existing commercial backcountry tourism opportunities,* *• caribou and goat habitat,* *• shallow lakes and wetlands,* *• visual quality within view of Mooseskin Johnny Lake, and* *• forest connectivity between the Howson Range SMZ1 and Hankin Plateau SMZ1*	Objective 30 in Appendix 3 to the **Bulkley LRMP (HLP- 2000)**	December 19, 2000

by: *• developing timber in a manner which minimizes the effects on these values, and* *• restricting **Motorized Access** on roads.*		
For Telkwa River Resource Management Zone (Sub-unit 11-5): *Maintain:* *• water quality and hydrologic stability for fish habitat,* *• structural diversity of the riparian area,* *• wetlands, and* *• a corridor for deer and grizzly bear* *by developing timber in a manner which minimizes the effects on these values.*	Objective 31 in Appendix 3 to the **Bulkley LRMP (HLP- 2000)**	December 19, 2000

Result or Strategy

5.10.1 Definitions

In Paragraphs 5.10.1 and 5.10.2:

(a) **"Babine River Management Zone"** means the Babine River Resource Management Zone (Sub-unit 2-2) as specified in the **Bulkley LRMP (HLP - 2000**);

(b) **"Jack Mould Lake Management Zone"** means the Jack Lake Resource Management Zone (Sub-unit 9-2) as specified in the **Bulkley LRMP (HLP- 2000);**

(c) **"Mooseskin Johnny Lake Management Zone"** means the Mooseskin Johnny Resource Management Zone (Sub-unit 2-2) as specified in the **Bulkley LRMP (HLP- 2000)**;

(d) **"Telkwa River Management Zone"** means the Telkwa River Resource Management Zone (Sub-unit 11-5) as specified in the **Bulkley LRMP (HLP- 2000**),

(e) **"Management Zone"** means the Babine River, Jack Mould Lake, Mooseskin Johnny Lake, Reiseter Creek ,Telkwa River, Upper Corya Creek and Glacier Gulch Management Zones; and to the extent any such Resource Management Zone is shown on Map 2.

5.10.2 Activities within Management Zones

If harvesting a cutblock or constructing a road to which this FSP applies, the FSP Holder will:

(a) in the Management Zones specified in Table 7 achieve the results or carry out the strategies specified for the Management Zones in that Table;

Table 7 : Results and Strategies applicable to Management Zones

Management Zone	Applicable Result or Strategy (Paragraph of this FSP)
Babine River Management Zone	5.2.2 (b), 5.3.1, 5.5.1, and 5.6.1
Mooseskin Johnny Lake Management Zone	5.2.2 (e), 5.3.1, 5.5.1, and 5.6.1.
Telkwa River Management Zone	5.2.2 (e), and 5.3.1
Jack Mould Lake Management Zone	5.1.1, 5.1.2, 5.5.1, and 5.6.1
Upper Corya Creek Management Zone	5.6.1

(b) in the Babine River Management Zone:

(i) north of the Babine River bridge, not construct a road with unrestricted access for the public, provided that restricting such access is consistent with the permit under which the road is constructed;

(ii) not construct a permanent road within 300 meters of the Babine River Park; and

(iii) if harvesting using a clearcut system limit the size of each opening so that it does not exceed the greater of:

(a) 15.0 hectares; or

(b) if the area is impacted by a timber damaging agent, achieve the maximum cutblock size and retention requirements contained in Table 8:

Table 8: Results and strategies applicable to cutblocks harvested in the Babine Management Zone with openings greater than 15 hectares.

Maximum Cutblock Size	Minimum Average stems per hectare to be retained following harvesting activities	Required characteristics of retained stems
40 Ha	Retain not less than 150 trees or stubs per hectare. Where the maximum number of stubs is 25% of the stems retained on site.	Retained trees and stubs must be greater than 2.5m tall and 15cm dbh.
80 ha	Retain not less than 300 trees or stubs per hectare. Where the maximum number of stubs is 25% of the stems retained on site.	Retained trees and stubs must be greater than 2.5m tall and 15cm dbh.
Unlimited	Retain not less than 500 trees or stubs per hectare. Where the maximum number of stubs is 25% of the stems retained on site.	Retained trees and stubs must be greater than 2.5m tall and 15cm dbh.

(c) in the Jack Mould Lake Management Zone, not construct a **Permanent Road** within 1 kilometer of Jack Mould Lake;

6.0 MEASURES

6.1 Measures for Preventing the Introduction or Spread of Invasive Plants

6.1.1 Definition

"Disturbed Area" means contiguous areas of exposed mineral soil greater than 0.1 ha that are associated with access structures or harvesting activities excluding the running surface of **permanent roads** or pullouts.

"Growing season" means the time period between the last freeze in the spring and the first frost in the fall.

"**Invasive Plants**" means those plants listed in the *Invasive Plant Regulation.*

"Revegetated" means the establishment of non-invasive plants over more than 50% of the disturbed area (including the natural in-fill of domestic plants) that could be reasonably expected to support vegetation.

"Seed" means seed that meets or exceeds Canada Common No. 1 forage mixture or Canada No. 1 Cover Mixture as defined by the *Canada Seeds Act* and Regulations and verified noxious weed free and invasive weed free with a certificate of seed analysis.

6.1.2 Measures

In relation to section 17 of the FPPR, the FSP Holder will:

(i) Seed disturbed areas no later than the end of the growing season following completion of harvesting or road construction activities.

(ii) If treated disturbed areas are not revegetated within two growing seasons, the area will have a single subsequent treatment.

6.2 Measures to Mitigate the Loss of Natural Range Barriers

6.2.1 Definition

"Natural Range Barrier" means a river, rock face, dense timber or any other naturally occurring feature that stops or significantly impedes livestock movement and is located within an area subject to a **Range Tenure.**

"Range Tenure" means an agreement under the *Range Act* that provides grazing rights.

"known natural range barrier" means a range barrier that has been communicated to the FSP holder by a range tenure holder and/or the Ministry of Forests and Range.

"qualified person" means a person who, by education and experience, is knowledgeable in identifying range barriers.

6.2.2 Measures

In relation to section 18 of the FPPR, the FSP Holder will:

(a) Annually, and at least 30 days before harvesting a cutblock or constructing a road to which this FSP applies and that is located within an area subject to a Range Tenure, inform the holder of that Range Tenure of the harvesting or construction and;

(b) Annually, request range tenure information including known natural range barriers and range infrastructure from Range Tenure holders and FLNRO Range Tenure Officer

(c) Where the Range Tenure holder or other qualified person indicates the harvesting or construction referred to in clause (a) will remove or render ineffective a known natural range barrier that a holder of a Range Tenure relies upon for the purposes of that Range Tenure:

(i) make reasonable efforts to come to an agreement with that **Range Tenure** holder on mitigation measures, and

(ii) implement:

(A) mitigation measures in accordance with the agreement referred to in clause (i); or

(B) if the FSP Holder and Range Tenure holder cannot agree on mitigation measures as soon as practicable after the harvesting or construction, the FSP Holder will implement alternative mitigation measures. Examples of mitigation measures include but are not limited to, cattle guard, wing fencing, and fence line establishment.

7.0 STOCKING REQUIREMENTS

7.1 Definitions

In Part 7.0:

(a) **"Analysis Units"** (AUs) For the purpose of these FSP Landscape Reforestation Standards the AU's are the same as those found in the Bulkley TSR data package dated December 2012. These AUs stratify the TSA Timber Harvesting Land Base (THLB) into 35-ecosystem-based Analysis Units (AUs) based on site-series groupings of (Dry, Fresh, Moist, Wet) moisture ranking for each of the (9) **BEC** – Sub-zone variants within the Bulkley TSA. The relative productivity classes of each AU form the basis for the Landscape Reforestation Stocking Standards;

(b) **"NSR"** means not containing a regenerated stand meeting the stocking standards in Divisions 7.3 and 7.4 and Appendices A (Even-Aged Stocking Standards) or B (Un-Even-Aged Stocking Standards) of this FSP;

(c) **"Regeneration Delay Period" (RDP)** means the maximum time period, measured in years, to establish and declare the regeneration standard has been met, as measured from the harvest commencement date of the NAR, to the regeneration declaration date.
Refer to Appendix A for the "**Regeneration Delay Period" (RDP)** for each Analysis Unit (AU)*;*

(d) **"M Value for Stocking and Free Growing Surveys**" means the maximum number of healthy, well-spaced trees that may be tallied in a single plot as calculated by dividing the target stocking standard for the standards unit by the plot multiplier, which, if not a whole number, is rounded to the nearest higher whole number.
Refer to Appendix A for the **"M-Values "** for each Analysis Unit (AU);

(e) **"Minimum Inter-Tree Distance"** (MITD) means the minimum inter-tree distance that must exist between crop trees. For analysis units to which this document applies the MITD is 2.0 m, except in the following conditions:

(i) MITD is 1.5 m where

- Mechanical Site Prep (MSP) has been applied
- Cable or Aerial yarding systems have been applied
- Fill-planting has occurred

(ii) MITD is 1.0 m where

- Cluster planting is prescribed by an RPF to enhance wildlife management areas such as; identified moose winter habitat, identified deer habitat, and identified high-value and moderate value grizzly bear habitat as outlined on FSP maps.

(f) **"Suitable Species"**: means species as defined for each **BEC** sub-zone variant within the Bulkley by a team of ecologists, (including the regional pathologist and the regional entomologist) to set Landscape Species Composition Targets (LSCTs). These species are set for each Analysis Unit (AU), based on existing standards for each AU grouping of Site Series. Refer to Appendix A for **"Suitable Species"** for each Analysis Unit (AU).

(g) **"Free Growing Crop Trees (FCTs)"** are defined as coniferous trees identified in a silviculture survey conducted under the direction of this FSP that meet the following conditions:

(i) are considered a suitable species, as defined in this document,
(ii) are determined to be well spaced as defined by the MITD,
(iii) are considered a healthy tree as defined by the forest health and damage criteria of the Silviculture Survey Procedures Manual, (SSPM) dated April 1, 2016,
(iv) meet the vegetation competition criteria as defined by Appendix13 of the SSPM, and
(v) trees of the following species Pl, Fdi and Lw have a minimum height of 1.6 m and all other suitable species have a minimum height of 0.8 m.

(h) **"Other Crop Trees (OCTs)"** are defined as coniferous trees identified in a silviculture survey conducted under the direction of this FSP that meet the following conditions:

(i) are considered a suitable species as defined in this document,
(ii) are considered a healthy tree as defined by the forest health and damage criteria of the Silviculture Survey Procedures Manual, (SSPM) dated April 1, 2016,
(iii) trees of the following species Pl, Fdi and Lw have a minimum height of 1.0 m and all other suitable species have a minimum height of 0.5 m, and
(iv) are NOT required to meet the well-spaced criteria or the vegetation competition criteria which are defined in appendix 13 of the SSPM.

(i) **"Non-Crop Trees (NCTs)"** are defined as all coniferous trees that do not meet the definition of "**Free Growing Crop Trees"** or **"Other Crop Trees", as well as Aspen, Birch, and Cottonwood.**

7.2 Election

For the purposes of section 16(1) of the FPPR, section 45 of that regulation will apply to each area to which this FSP applies where the FSP Holder is required to establish a free growing stand.

7.3 General Standards

For the purposes of section 16(3) of the FPPR, for each area to which this FSP applies where the Agreement Holder is required to establish a free growing stand:

a. The applicable regeneration date and applicable stocking standards referred to in section 45(1) of the FPPR, and
b. The applicable free growing date and applicable stocking standards referred to in section 45(2) of the FPPR.

7.4 Special Circumstances

The special circumstances referred to in Division 7.3 are:

(a) where harvesting within Core Ecosystems results in openings > 1 ha, the Reforestation Target Stocking Standard (TSS) will be equal to the Minimum Stocking Standards (MSS), as defined by Appendix A for the corresponding Analysis Unit (AU),

(b) deleterious competition at the time of Free Growing will be assessed using *Appendix 13 of the Silviculture Survey Procedures Manual, dated April 1, 2015. Appendix 13* will apply to all Analysis Units in the Bulkley Timber Supply Area; and the definition of upland cottonwood in *Appendix 13* will be taken to mean any cottonwood not growing on a floodplain or fluvial deposit;

(c) aspen, cottonwood and birch, are not considered deleterious competition:
- (i) within the riparian management area of a stream, wetland or lake; or
- (ii) where there is an incidence of greater than 20% of spruce crop trees by number affected by Pissodes strobi (White Pine Weevil);

(d) brush species within 10 meters of a **Classified Riparian Feature** are not considered deleterious competition;

(e) exotic species planted in research trials, not exceeding the lesser of 2 hectares or 10% of the **NAR** of a cutblock, will be considered preferred trees;

(f) Partial Cutting Un-Even Aged Stocking Standards*, Appendix B*, may be applied to standard units, where partial cutting silviculture systems have been implemented, and where the retained stems greater than 12.5 centimeters diameter at breast height (DBH) have a combined basal area greater than 5 metres^2/hectare

(g) Division 7.3 does not apply to an area:
- (i) where the timber harvested was in danger of being significantly reduced in value, lost or destroyed; and
- (ii) the harvested area, when taken together with an adjoining harvested area, will not result in an opening with a contiguous **NSR** greater than or equal to 1 hectare.

7.5 No Intermediate Cutting or Special Forest Products

The Agreement Holder does not propose to carry out timber harvesting on an area that is restricted to:

(a) commercial thinning, removal of individual trees, or a similar type of intermediate cutting, or

(b) harvesting of special forest products, and as such, section 16(4) and 44(4) of the FPPR have no application to this FSP.

7.6 Landscape Reforestation Standards

These Landscape Reforestation Standards (LRS) establish two (2) standards for each **Analysis Unit** and for each declaration period of Regeneration and Free Growing.

These standards are

- Minimum Density Standard (MDS) assessed at the Standard Unit (SU) level
- Minimum Volume Standard (MVS) assessed at the **Analysis Unit** (AU) level

a) Regeneration Standards,

i) Regeneration Minimum Density Standard

(1) Regeneration Minimum Density Standards (MDS) for each Standard Unit must be met, and

(2) Regeneration MDS are defined by Appendix A and,

(3) Regeneration will be assessed at the Time of Planting (ToP), within the Regeneration Delay Period (RDP), as defined by Appendix A and,

(4) Minimum Stratum Size area for Regeneration is 1.0 ha

And

ii) Regeneration Minimum Volume Standard

(1) Regeneration Minimum Volume Standards (MVS) for each **Analysis Unit** must be met and,

(2) Regeneration (MVS) are defined by Appendix A

b) Free Growing Standards:

i) Free growing Minimum *Density* Standard

(1) Free growing Minimum *Density* Standard (MDS) for each Standard Unit must be met, and

(2) The FG (MDS) are defined by Appendix A, and

(3) Free Growing (FG) will be assessed 12 growing seasons after planting and,

(4) Minimum Stratum Size area for Free growing is 2.0 ha and,

(5) The FG (MDS), will be assessed using FG m-capped densities.

ii) Free growing Minimum *Volume* Standard

(1) FG Minimum Volume Standard (MVS), for each Analysis Unit must be met and,

(2) FG (MVS) are defined by Appendix A and,

(3) FG (MVS), will be assessed using Densities and Species composition of the Free-Growing Crop Trees (FCTs) from (FGm+) un-capped and Other Crop Trees (OCTs)

Forecasting future timber yields relating to these PIR-FSP Landscape Reforestation Standards will be done using TASS II, and by the process defined by the Forest Analysis and Inventory Branch (FAIB) modelers.

TASS (Tree and Stand Simulator) is a biologically oriented, spatially explicit (distance dependent), individual tree model, and TASS II was used to generate (All) forecasted timber yields relating to these PIR-FSP Landscape Reforestation Standards.

Refer to Appendix "F" of FSP 216 Amendment #11: Forecasting Managed Stand Yields with TASS-II

7.7 Enhanced Reforestation Standards

As provided for by:

a) the (in-progress) *Integrated Silviculture Strategy – Bulkley Timber Supply Area (March 31, 2020) Section 4.6 Impediments to Long Term Value Creation, and*

b) the *Interior Appraisal Manual (July 1, 2017 onward) Section 4.5.1 Enhance Silviculture*;

enhanced stocking standards are attached as Appendix A amendment #19.

8.0 APPENDICES

This Page Intentionally Left Blank

Appendix A: Even Aged Stocking Standards

This Page Intentionally Left Blank

Appendix A - 'PIR Landscape Reforestation Standards (LRS) as Even-Aged Stocking Standards

PIR -FSP- LRS - Updated for AU 8-typo on Site Index for Sx - Feb 8, 2018

Analysis Unit (AU) Base Ecosystem - Data						Species	RDP	TSS	M	MDSs		Volume NMV80 Yields					
MOFR Stocking Regime ID	TSR Analysis Unit (AU) #	TSR Analysis Unit (AU) Name	TSR Analysis Unit (AU) Site Series Grouping	SU Names	(MAI) Productivity Class	Suitable Species	(RDP) Regeneration Delay Period (maximum years)	TSS at Regen	M- Value	(Regen-MDS) -Minimum Density Stanard SPH Based on Current MSS	(FG -MDS) Minimum Density Stanard SPH	"S" Supply Yield NMV80 Based on Average of Input Values	"P" Possible Yield NMV80 Based on Provincial Target Stocking Standards (TSS)	"T" Threshold Yield NMV80 (m3/ ha)	"Ao" Actual. Yield NMV80 (from FG Survey) Average Outputs	(A -T)_ must be > "0"	"Ai" Actual. Yield NMV80 (from FG Survey) Average Inputs
1055533	1	CWHws2 Dry	02	Kinnikinick	5	Pli Cw Hw Hm	6	600	3	400	200	58	58	49			
1055534	2	CWHws2 Fresh	01,03,05	Bramble Feathermoss Queens Cup	2	Sxs Pli Ba Bl Cw Hw Hm	6	1000	5	500	420	386	365	329			
1055535	3	CWHws2 Moist	04,06,07,08	Oak Fern	1	Sxs Ba Bl Cw Hw Hm	3	1000	5	500	500	554	537	483			
1055536	4	CWHws2 Very Moist	09, 11	Cottonwood-Willow Skunk Cabbage	5	Sxs Ba Bl Cw Hw	3	800	4	400	200	120	116	99			
1055537	5	CWH ws2 Wet	10	Sphagnum	6	Pli Cw Hw Hm	3	400	2	200	150	41	41	31			
1055538	6	ESSFmc Dry	02, 03	Juniper-Cladonia Huckleberry-Crowberry	4	Sx Pli Bl Pa	7	1000	5	500	300	143	139	118			
1055539	7	ESSFmc Fresh	01, 04, 05	Huckleberry-Leafy Liverwort Huckleberry-Heron's-Bill Huckleberry-Thimbleberry	4	Sx Pli Bl	7	1200	6	700	300	228	224	202			
1055540	8	ESSFmc Moist	06, 07	Oak Fern-Heron's-Bill Devil's Club-Lady Fern	2	Sx Pli Bl	4	1200	6	700	300	315	317	286			
1055541	9	ESSFmc Wet	08, 09, 10	Valerian-Sickle Moss Horsetail-Glow Moss Horsetail-Leafy Moss	5	Sx Bl	4	1000	5	500	200	141	142	126			
1055542	10	ESSFmk Dry	02	Cladonia	6	Sx Pli Bl Pa Hm	7	1000	5	500	150	43	43	36			
1055543	11	ESSFmk Fresh	01, 03	Twistedstalk Cladonia	5	Sx Pli Bl Ba Pa Hm	7	1200	6	700	200	123	121	109			
1055544	12	ESSFmk Moist	04, 05	Oak Fern Devil's Club-Lady Fern	5	Sx Pli Bl Ba Hm	4	1200	6	700	200	152	150	135			
1055545	13	ESSFmk Wet	06, 07	Horsetail-Leafy Moss Lady Fern-Horsetail	6	Sx Bl Ba Hm	4	1000	5	500	150	46	45	41			
1055546	14	ESSFwv Dry	02, 03	Cladonia Feathermoss	6	Sx Pli Bl Hm Pa	7	1200	6	600	150	39	45	39			
1055547	15	ESSFwv Fresh	01, 04	Azalea Heron's-Bill	4	Sx Pli Bl Hm	7	1200	6	700	300	186	189	170			
1055548	16	ESSFwv Moist	05, 06	Oak Fern-Heron's-Bill Devil's Club-Lady Fern	5	Sx Pli Bl Hw Hm	4	1200	6	700	200	155	155	140			
1055549	17	ESSFwv Wet	07, 08, 09	Valerian-Sickle Moss Horsetail-Glow Moss Lady Fern-Horsetail	6	Sx Bl Hw Hm	4	1000	5	500	150	41	46	41			
1055550	18	ICHmc1 Dry	02	Kinnikinick-Cladonia	2	Pli Bl Fdi Lw Hw	7	1000	5	500	420	270	258	217			
1055551	19	ICHmc1 Fresh	01, 03, 04, 05	Step Moss Oak Fern Devil's Club Dogwood (Floodplain)	4	Sx Bl Ba Pli Fdi Lw Hw	4	1200	6	700	500	446	442	398			
1055552	20	ICHmc1 Wet	06	Azalea-Skunk Cabbage	2	Sx Bl Ba Hw	4	1000	5	500	420	373	380	338			
1055553	21	ICHmc2 Dry	02	Kinnikinick-Cladonia	4	Pli Bl Ba Fdi Lw Hw	7	1000	5	500	300	138	138	113			
1055554	22	ICHmc2 Fresh	01, 03, 04, 05, 06, 51, 52, 53, 54	Step Moss Oak Fern Devil's Club-Oak Fern Devil's Club-Lady fern Dogwood (Floodplain) Feathermoss Thimbleberry-Hazelnut Dogwood Devil's Club	1	Sx Pli Bl Ba Fdi Lw Cw Hw	4	1200	6	700	500	425	422	390			
1055555	23	ICHmc2 Moist	07	Horsetail-Skunk Cabbage	2	Sx Bl Ba Cw	4	1000	5	500	420	396	391	352			
1055556	24	MHmm2 Dry	02	Mountain-Heather	6	Ba Yc Hm	4	800	4	500	150	21	32	27			
1055557	25	MHmm2 Fresh	01, 03, 05	Oak Fern Twistedstalk	5	Ba Yc Hm	7	1000	5	500	200	111	122	104			
1055558	26	MHmm2 Moist	04, 06, 07	Deer-Cabbage Hellebore	6	Ba Yc Hm	7	1000	5	500	150	50	50	42			
1055559	27	MHmm2 Wet	08, 09	Sphagnum Skunk Cabbage	6	Yc Hw Hm	4	800	4	500	150	34	36	30			
1055560	28	SBSdk Dry	02, 03	Juniper-Ricegrass Feathermoss-Cladonia	3	Sx Pli Fdi Lw Sb	7	1200	6	600	360	211	205	180			
1055561	29	SBSdk Fresh	01, 04, 05, 06	Soopolallie-Feathermoss Spirea-Feathermoss	3	Sx Pli Fdi Lw	7	1200	6	700	360	300	317	285			
1055562	30	SBSdk Moist	07, 08	Dogwood-Prickly Rose (Floodplain)	1	Sx Pli Fdi Lw	4	1200	6	600	500	382	385	347			
1055563	31	SBSdk Wet	09, 10	Creeping-Snowberry-Sphagnum (Forested Bog) Soft-Leaved Sedge-Sphagnum (Forested Swamp)	5	Sx Pli Sb	4	400	2	200	200	141	147	119			
1055564	32	SBSmc2 Dry	02	Huckleberry-Cladonia	4	Sx Pli Bl Fdi Lw	7	1000	5	500	300	185	174	146			
1055565	33	SBSmc2 Fresh	01, 03, 05, 06, 09	Huckleberry Feathermoss Twinberry-Coltsfoot Oak Fern Devil's Club	2	Sx Pli Bl Fdi Lw	7	1200	6	700	420	332	331	298			
1055566	34	SBSmc2 Moist	07, 10	Scrub Birch Horsetail	2	Sx Pli Bl Fdi Lw Sb	4	1000	5	500	420	362	362	322			
1055567	35	SBSmc2 Wet	12	Scrub Birch-Sedge (Forested Swamp)	6	Sx Pli Bl Sb	4	400	2	200	150	102	103	84			

Appendix A - 'PIR Landscape Reforestation Standards (LRS) as Even-Aged Stocking Standards

PIR -FSP- LRS - Updated for AU 8-typo on Site Index for Sx - Feb 8, 2018

Suitable Species	Suitable Species for each Analysis Unit (AU) are prescribed as shown above

Notes regarding the application of *"Suitable Species"*

Each Species is Color-Coded based on the following:

Black	**Sx, Pli, Bl, Ba, Sxs**	**These species will be planted as part of the PIR program**
Red	**Fdi, Lw, Pa**	**These species will be planted as part of the PIR program (Fdi & Lw as Species Migration) and Pa as Species at Risk**
Green	**Cw, Ym**	**These species will NOT Likely, but may be planted, where appropriate as part of the PIR program**
Blue	**Hw , Hm, Sb**	**These species will NOT be planted as part of the PIR program**

As all Species are considered as "*Ecologically Suitable Species*" for each Analysis Unit (AU) as these site series grouping , they will contribute to the stocking where they meet all required critria in these standards

Conifer Species

"Sx" means hybrid spruce or interior spruce; Sx is limited to the AUs as defined above.

"Ss" means Sitka spruce; will not be planted, but "Naturals" will be considered as a "Suitable Species": where it meets the Forest Health and Damage Criteria

"Pli" means Interior lodgepole pine; (Pli) will not be considered as a "Suitable Species" at Elevations > 1200m due to risk of snow damage

"Pli" means Interior lodgepole pine; (Pli) will not be planted at > 10 % Species Composition within the ICH Zones due to risk of Dothistroma

"Bl" means subalpine fir; Bl will not be considered as a "Suitable Species" at Elevations < 900m due to risk of moose browse

"Ba" means amabilis fir; Ba is limited to the AUs as defined above.

"Lw" means Western Larch; Planting of Lw will be limited to appropriate sites of (SBSdk AU 28- 29-30) & (SBSmc2 AU 32- 33 -34) & (ICHmc1 AU 18-19) (ICHmc2 AU 21-22)

"Fdi" means Interior Douglas-fir; Planting of Fdi will be limited to appropriate sites of(SBSdk AU 28- 29-30) & (SBSmc2 AU 32- 33 -34) & (ICHmc1 AU 18-19) (ICHmc2 AU 21-22)

"Pa" means whitebark pine; will be limited to appropriate sites of the ESSFF and are limited to < 5 % of the Prescribed Planting Density

"Cw" means western red cedar; Cw May or May Not be planted , but "Naturals" will be considered as a "Suitable Species": where it meets the Forest Health and Damage Criteria

"Yc" means Yellow cedar; Yc May or May Not be planted but "Naturals" will be considered as a "Suitable Species": where it meets the Forest Health and Damage Criteria

"Hm" means mountain hemlock; will not be planted, but "Naturals " will be considered as a "Suitable Species": where it meets the Forest Health and Damage Criteria

"Hw" means western hemlock; will not be planted, but "Naturals" will be considered as a "Suitable Species": where it meets the Forest Health and Damage Criteria

General Standards

Minimum Height for Free Growing (FG) for Pl, Lw and Fdi is 1.6m and for all other species is 0.8m

Minimum Height for Other Crop tres for Pl, Lw and Fdi is 1.0 m and for all other species is 0.5 m

Crop Tree Height over deleterious competition Brush Height Ratio is: (125% on ESSF and MH BEC Zones) and (150% on All Other BEC Zones)

Minimum Stratum Size to Assess Minimum Density Standard at Regeneration Stage is 1.0 ha

Minimum Stratum Size to Assess Minimum Density Standard at Freegrowing Stage is 2.0 ha

Minimum Inter-Tree Distance (MITD) is 2.0 m, except as described in section 7.4 (Special Circumstances) of the FSP document

Minimum Inter-Tree Distance (MITD) is 1.5 m, Where • Mechanical Site Prep (MSP) has been applied• Cable or Aerial yarding systems have been applied• Fill-planting has occurred

Minimum Inter-Tree Distance (MITD) is 1.0 m, Where • *Cluster Planting* has been implemented, as prescribed by an RPF to enhance wildlife habitat

Special Circumstances referred to in Division 7.3 are:

(a) where harvesting within Core Ecosystems results in openings > 1 ha, the Reforestation Target Stocking Standard (TSS) will be equal to the Minimum Stocking Standards (MSS), as defined by Appendix A for the corresponding Analysis Unit (AU),

(b) deleterious competition at the time of Free Growing will be assessed using *Appendix 13 of the Silviculture Survey Procedures Manual, dated April 1, 2015*
Appendix 13 will apply to all Analysis Units in the Bulkley Timber Supply Area; and
the definition of upland cottonwood in Appendix 13 will be taken to mean any cottonwood not growing on a floodplain or fluvial deposit;

(c) aspen, birch and cottonwood are not considered deleterious competition:

(i) within the riparian management area of a stream, wetland or lake; or

(ii) where there is an incidence of greater than 20% of spruce crop trees by number affected by Pissodes strobi (White Pine Weevil);

(d) brush species within 10 meters of a **Classified Riparian Feature** are not considered deleterious competition;

(e) exotic species planted in research trials, not exceeding the lesser of 2 hectares or 10% of the **NAR** of a cutblock, will be considered preferred trees;

Freegrowing Crop Trees (FCTs)- Other Crop Trees (OCTs) and and Non-Crop Trees (NCTs) are defined as:

(a) **"Free Growing Crop Trees (FCTs)"** are defined as coniferous trees identified in a silviculture survey conducted under the direction of this FSP that meet the following conditions:

(i) are considered a suitable species, as defined in this document,

(ii) are determined to be well spaced as defined by the MITD,

(iii) are considered a healthy tree as defined by the forest health and damage criteria of the Silviculture Survey Procedures Manual, (SSPM) dated April 1, 2016,

(iv) meet the vegetation competition criteria as defined by Appendix13 of the SSPM, and

(v) trees of the following species Pl, Fdi and Lw have a minimum height of 1.6 m and all other suitable species have a minimum height of 0.8 m.

(b) **"Other Crop Trees (OCTs)"** are defined as coniferous trees identified in a silviculture survey conducted under the direction of this FSP that meet the following conditions:

(i) are considered a suitable species as defined in this document ,

(ii) are considered a healthy tree as defined by the forest health and damage criteria of the Silviculture Survey Procedures Manual, (SSPM) dated April 1, 2016,

(iii) trees of the following species Pl, Fdi and Lw have a minimum height of 1.0 m and all other suitable species have a minimum height of 0.5 m, and

(iv) are NOT required to meet the well-spaced criteria or the vegetation competition criteria which are defined in Appendix 13 of the SSPM.

(c) **"Non-Crop Trees (NCTs)"** are defined as all coniferous trees that do not meet the definition of "**Free Growing Crop Trees**" or "**Other Crop Trees**"; as well as Aspen, Birch and Cottonwood

Appendix A - PIR Landscape Reforestation Standards (LRS) as Even-Aged Stocking Standards

Amendment 19; enhanced stocking densities Oct 1, 2020

MOFR Stocking Regime ID	Enhanced Regime ID Sx1600	Enhanced Regime ID PI1800/2000	TSR Analysis Unit (AU) #	TSR Analysis Unit (AU) Name	TSR Analysis Unit (AU) Site Series Grouping	SU Names	(MAI) Productivity Class	Suitable Species	(RDP) Regeneration Delay Period (maximum years)	TSS at Regen[1]	M- Value	(Regen-MDS) -Minimum Density Stanard SPH Based on Current MSS	(FG -MDS) Minimum Density Stanard SPH	"S" Supply Yield NMV80 Based on Average of Input Values	"P" Possible Yield NMV80 Based on Provincial Target Stocking Standards (TSS)	"T" Threshold Yield NMV80 (m3/ ha)
1055533	n/a	n/a	1	CWHws2 Dry	02	Kinnikinick	5	Pli Cw Hw Hm	6	600	3	400	200	58	58	**49**
1055534	n/a	n/a	2	CWHws2 Fresh	01,03,05	Bramble Feathermoss Queens Cup	2	Sxs Pli Ba Bl Cw Hw Hm	6	1000	5	500	420	386	365	**329**
1055535	n/a	n/a	3	CWHws2 Moist	04,06,07,08	Oak Fern	1	Sxs Ba Bl Cw Hw Hm	3	1000	5	500	500	554	537	**483**
1055536	n/a	n/a	4	CWHws2 Very Moist	09, 11	Cottonwood-Willow Skunk Cabbage	5	Sxs Ba Bl Cw Hw	3	800	4	400	200	120	116	**99**
1055537	n/a	n/a	5	CWH ws2 Wet	10	Sphagnum	6	Pli Cw Hw Hm	3	400	2	200	150	41	41	**31**
1055538	n/a	n/a	6	ESSFmc Dry	02, 03	Juniper-Cladonia Huckleberry-Crowberry	4	Sx Pli Bl Pa	7	1000	5	500	300	143	139	**118**
1055539	n/a	n/a	7	ESSFmc Fresh	01, 04, 05	Huckleberry-Leafy Liverwort Huckleberry-Heron's-Bill Huckleberry-Thimbleberry	4	Sx Pli Bl	7	1200	6	700	300	228	224	**202**
	1067412		7	ESSFmc Fresh	01, 04, 05	Huckleberry-Leafy Liverwort Huckleberry-Heron's-Bill Huckleberry-Thimbleberry	4	Sx Pli Bl	7	1600'	6	700	300	228	224	**202**
		1067413	7	ESSFmc Fresh	01, 04, 05	Huckleberry-Leafy Liverwort Huckleberry-Heron's-Bill Huckleberry-Thimbleberry	4	Sx Pli Bl	7	1800'	6	700	300	228	224	**202**
1055540	n/a	n/a	8	ESSFmc Moist	06, 07	Oak Fern-Heron's-Bill Devil's Club-Lady Fern	2	Sx Pli Bl	4	1200	6	700	300	315	317	**286**
	1067414		8	ESSFmc Moist	06, 07	Oak Fern-Heron's-Bill Devil's Club-Lady Fern	2	Sx Pli Bl	4	1600'	6	700	300	315	317	**286**
		1067415	8	ESSFmc Moist	06, 07	Oak Fern-Heron's-Bill Devil's Club-Lady Fern	2	Sx Pli Bl	4	1800'	6	700	300	315	317	**286**
1055541	n/a	n/a	9	ESSFmc Wet	08, 09, 10	Valerian-Sickle Moss Horsetail-Glow Moss Horsetail-Leafy Moss	5	Sx Bl	4	1000	5	500	200	141	142	**126**
	1067416		9	ESSFmc Wet	08, 09, 10	Valerian-Sickle Moss Horsetail-Glow Moss Horsetail-Leafy Moss	5	Sx Bl	4	1600'	5	500	200	141	142	**126**
		1067417	9	ESSFmc Wet	08, 09, 10	Valerian-Sickle Moss Horsetail-Glow Moss Horsetail-Leafy Moss	5	Sx Bl	4	1800'	5	500	200	141	142	**126**
1055542	n/a	n/a	10	ESSFmk Dry	02	Cladonia	6	Sx Pli Bl Pa Hm	7	1000	5	500	150	43	43	**36**
1055543	n/a	n/a	11	ESSFmk Fresh	01, 03	Twistedstalk Cladonia	5	Sx Pli Bl Ba Pa Hm	7	1200	6	700	200	123	121	**109**
1055544	n/a	n/a	12	ESSFmk Moist	04, 05	Oak Fern Devil's Club-Lady Fern	5	Sx Pli Bl Ba Hm	4	1200	6	700	200	152	150	**135**
1055545	n/a	n/a	13	ESSFmk Wet	06, 07	Horsetail-Leafy Moss Lady Fern-Horsetail	6	Sx Bl Ba Hm	4	1000	5	500	150	46	45	**41**
1055546	n/a	n/a	14	ESSFwv Dry	02, 03	Cladonia Feathermoss	6	Sx Pli Bl Hm Pa	7	1200	6	600	150	39	45	**39**
1055547	n/a	n/a	15	ESSFwv Fresh	01, 04	Azalea Heron's-Bill	4	Sx Pli Bl Hm	7	1200	6	700	300	186	189	**170**
1055548	n/a	n/a	16	ESSFwv Moist	05, 06	Oak Fern-Heron's-Bill Devil's Club-Lady Fern	5	Sx Pli Bl Hw Hm	4	1200	6	700	200	155	155	**140**
1055549	n/a	n/a	17	ESSFwv Wet	07, 08, 09	Valerian-Sickle Moss Horsetail-Glow Moss Lady Fern-Horsetail	6	Sx Bl Hw Hm	4	1000	5	500	150	41	46	**41**
1055550	n/a	n/a	18	ICHmc1 Dry	02	Kinnikinick-Cladonia	2	Pli Bl Fdi Lw Hw	7	1000	5	500	420	270	258	**217**
1055551	n/a	n/a	19	ICHmc1 Fresh	01, 03, 04, 05	Step Moss Oak Fern Devil's Club Dogwood (Floodplain)	4	Sx Bl Ba Pli Fdi Lw Hw	4	1200	6	700	500	446	442	**398**
1055552	n/a	n/a	20	ICHmc1 Wet	06	Azalea-Skunk Cabbage	2	Sx Bl Ba Hw	4	1000	5	500	420	373	380	**338**
1055553	n/a	n/a	21	ICHmc2 Dry	02	Kinnikinick-Cladonia	4	Pli Bl Ba Fdi Lw Hw	7	1000	5	500	300	138	138	**113**
1055554	n/a	n/a	22	ICHmc2 Fresh	01, 03, 04, 05, 06, 51, 52, 53, 54	Step Moss Oak Fern Devil's Club Feathermoss Thimbleberry-Hazelnut Dogwood Devil's Club	1	Sx Pli Bl Ba Fdi Lw Cw Hw	4	1200	6	700	500	425	422	**390**
1055555	n/a	n/a	23	ICHmc2 Moist	07	Horsetail-Skunk Cabbage	2	Sx Bl Ba Cw	4	1000	5	500	420	396	391	**352**
1055556	n/a	n/a	24	MHmm2 Dry	02	Mountain-Heather	6	Ba Yc Hm	4	800	4	500	150	21	32	**27**
1055557	n/a	n/a	25	MHmm2 Fresh	01, 03, 05	Blueberry Oak Fern	5	Ba Yc Hm	7	1000	5	500	200	111	122	**104**
1055558	n/a	n/a	26	MHmm2 Moist	04, 06, 07	Bramble Deer-Cabbage	6	Ba Yc Hm	7	1000	5	500	150	50	50	**42**
1055559	n/a	n/a	27	MHmm2 Wet	08, 09	Sphagnum Skunk Cabbage	6	Yc Hw Hm	4	800	4	500	150	34	36	**30**
1055560	n/a	n/a	28	SBSdk Dry	02, 03	Juniper-Ricegrass Feathermoss-Cladonia	3	Sx Pli Fdi Lw Sb	7	1200	6	600	360	211	205	**180**

1055561	n/a	n/a	29	SBSdk Fresh	01, 04, 05, 06	Spirea-Purple Peavine Soopolallie-Feathermoss Spirea-Feathermoss Twinberry-Coltsfoot	3	Sx Pli Fdi Lw	7	1200	6	700	360	300	317	**285**
	1067418		29	SBSdk Fresh	01, 04, 05, 06	Spirea-Purple Peavine Soopolallie-Feathermoss Spirea-Feathermoss Twinberry-Coltsfoot	3	Sx Pli Fdi Lw	7	1600'	6	700	360	300	317	**285**
		1067419	29	SBSdk Fresh	01, 04, 05, 06	Spirea-Purple Peavine Soopolallie-Feathermoss Spirea-Feathermoss Twinberry-Coltsfoot	3	Sx Pli Fdi Lw	7	1800'	6	700	360	300	317	**285**
		1067420	29	SBSdk Fresh	01, 04, 05, 06	Spirea-Purple Peavine Soopolallie-Feathermoss Spirea-Feathermoss Twinberry-Coltsfoot	3	Sx Pli Fdi Lw	7	2000'	6	700	360	300	317	**285**
1055562	n/a	n/a	30	SBSdk Moist	07, 08	Horsetail Dogwood-Prickly Rose (Floodplain)	1	Sx Pli Fdi Lw	4	1200	6	600	500	382	385	**347**
	1067421		30	SBSdk Moist	07, 08	Horsetail Dogwood-Prickly Rose (Floodplain)	1	Sx Pli Fdi Lw	4	1600'	6	600	500	382	385	**347**
		1067422	30	SBSdk Moist	07, 08	Horsetail Dogwood-Prickly Rose (Floodplain)	1	Sx Pli Fdi Lw	4	1800'	6	600	500	382	385	**347**
1055563	n/a	n/a	31	SBSdk Wet	09, 10	Creeping-Snowberry- Sphagnum Soft-Leaved Sedge- Sphagnum	5	Sx Pli Sb	4	400	2	200	200	141	147	**119**
1055564	n/a	n/a	32	SBSmc2 Dry	02	Huckleberry-Cladonia	4	Sx Pli Bl Fdi Lw	7	1000	5	500	300	185	174	**146**
1055565	n/a	n/a	33	SBSmc2 Fresh	01, 03, 05, 06,09	Huckleberry Feathermoss Twinberry-Coltsfoot Oak Fern Devil's Club	2	Sx Pli Bl Fdi Lw	7	1200	6	700	420	332	331	**298**
	1067423		33A	SBSmc2 Fresh	01, 03, 05,	Huckleberry Feathermoss Twinberry-Coltsfoot	2	Sx Pli Bl Fdi Lw	7	1600'	6	700	420	314	321	**289**
		1067424	33A	SBSmc2 Fresh	01, 03, 05,	Huckleberry Feathermoss Twinberry-Coltsfoot	2	Sx Pli Bl Fdi Lw	7	1800'	6	700	420	314	321	**289**
	1067425		33B	SBSmc2 Fresh	06, 09	Oak Fern Devil's Club	2	Sx Pli Bl Fdi Lw	7	1600'	6	700	420	368	361	**325**
		1067426	33B	SBSmc2 Fresh	06, 09	Oak Fern Devil's Club	2	Sx Pli Bl Fdi Lw	7	1800'	6	700	420	368	361	**325**
1055566	n/a	n/a	34	SBSmc2 Moist	07, 10	Scrub Birch Horsetail	2	Sx Pli Bl Fdi Lw Sb	4	1000	5	500	420	362	362	**322**
1055567	n/a	n/a	35	SBSmc2 Wet	12	Scrub Birch-Sedge (Forested Swamp)	6	Sx Pli Bl Sb	4	400	2	200	150	102	103	**84**

TSS[1] Target Stocking (ie Planting Density) for Enhanced Regimes is 1600 for spruce leading and 1800 (2000) for pine leading; M-value does not apply to enhanced standards

Appendix A - PIR - FSP- LRS - Oct 1, 2020

PIR Landscape Reforestation Standards (LRS) as Even-Aged Stocking Standards - Footnotes:

Suitable Species

Notes regarding the application of *"Suitable Species"*

Each Species is Color-Coded based on the following:

Black	Sx, Pli, Bl, Ba, Sxs	These species will be planted as part of the PIR program
Red	Fdi, Lw, Pa	These species will be planted as part of the PIR program (Fdi & Lw as Species Migration) and Pa as Species at Risk
Green	Cw, Ym	These species will NOT Likely, but may be planted, where appropriate as part of the PIR program
Blue	Hw , Hm, Sb	These species will NOT be planted as part of the PIR program

As all Species are considered as "*Ecologically Suitable Species*" for each Analysis Unit (AU) as these site series grouping , they will contribute to the stocking where they meet all required critria in these standards

Conifer Species

"Sx" means hybrid spruce or interior spruce; Sx is lmited to the AUs as defined above.

"Ss" means Sitka spruce; will not be planted, but "Naturals" will be considered as a "Suitable Species"; where it meets the Forest Health and Damage Criteria

"Pli" means Interior lodgepole pine; (Pli) will not be considered as a "Suitable Species" at Elevations > 1200m due to risk of snow damage

"Pli" means Interior lodgepole pine; (Pli) will not be planted at > 10 % Species Composition within the ICH Zones due to risk of Dothistroma

"Bl" means subalpine fir; Bl will not be considered as a "Suitable Species" at Elevations < 900m due to risk of moose browse

"Ba" means amabilis fir; Ba is lmited to the AUs as defined above.

"Lw" means Western Larch; Planting of Lw will be limited to appropriate sites of (SBSdk AU 28- 29-30) & (SBSmc2 AU 32- 33 -34) & (ICHmc1 AU 18-19) (ICHmc2 AU 21-22)

"Fdi" means Interior Douglas-fir; Planting of Fdi will be limited to appropriate sites of(SBSdk AU 28- 29-30) & (SBSmc2 AU 32- 33 -34) & (ICHmc1 AU 18-19) (ICHmc2 AU 21-22)

"Pa" means whitebark pine; will be limited to appropriate sites of the ESSFF and are limited to < 5 % of the Prescribed Planting Density

"Cw" means western red cedar; Cw May or May Not be planted , but "Naturals" will be considered as a "Suitable Species"; where it meets the Forest Health and Damage Criteria

"Yc" means Yellow cedar; Yc May or May Not be planted but "Naturals" will be considered as a "Suitable Species"; where it meets the Forest Health and Damage Criteria

"Hm" means mountain hemlock; will not be planted, but "Naturals " will be considered as a "Suitable Species"; where it meets the Forest Health and Damage Criteria

"Hw" means western hemlock; will not be planted, but "Naturals" will be considered as a "Suitable Species"; where it meets the Forest Health and Damage Criteria

General Standards

Minimum Height for Free Growing (FG) for Pl, Lw and Fdi is 1.6m and for all other species is 0.8m

Minimum Height for Other Crop tres for Pl, Lw and Fdi is 1.0 m and for all other species is 0.5 m

Crop Tree Height over deleterious competition Brush Height Ratio is: (125% on ESSF and MH BEC Zones) and (150% on All Other BEC Zones)

Minimum Stratum Size to Assess Minimum Density Standard at Regeneration Stage is 1.0 ha

Minimum Stratum Size to Assess Minimum Density Standard at Freegrowing Stage is 2.0 ha

Minimum Inter-Tree Distance (MITD) is 2.0 m, except as described in section 7.4 (Special Circumstances) of the FSP document

Minimum Inter-Tree Distance (MITD) is 1.5 m, Where • Mechanical Site Prep (MSP) has been applied• Cable or Aerial yarding systems have been applied• Fill-planting has occurred

Minimum Inter-Tree Distance (MITD) is 1.0 m, Where • *Cluster Planting* has been implemented, as prescribed by an RPF to enhance wildlife habitat

Special Circumstances referred to in Division 7.3 are:

(a) where harvesting within Core Ecosystems results in openings > 1 ha, the Reforestation Target Stocking Standard (TSS) will be equal to the Minimum Stocking Standards (MSS), as defined by Appendix A for the corresponding Analysis Unit (AU),

(b) deleterious competition at the time of Free Growing will be assessed using *Appendix 13 of the Silviculture Survey Procedures Manual, dated April 1, 2015* Appendix 13 will apply to all Analysis Units in the Bulkley Timber Supply Area; and

the definition of upland cottonwood in Appendix 13 will be taken to mean any cottonwood not growing on a floodplain or fluvial deposit;

(c) aspen, birch and cottonwood are not considered deleterious competition:

(i) within the riparian management area of a stream, wetland or lake; or

(ii) where there is an incidence of greater than 20% of spruce crop trees by number affected by Pissodes strobi (White Pine Weevil);

(d) brush species within 10 meters of a **Classified Riparian Feature** are not considered deleterious competition;

(e) exotic species planted in research trials, not exceeding the lesser of 2 hectares or 10% of the **NAR** of a cutblock, will be considered preferred trees;

Freegrowing Crop Trees (FCTs)- Other Crop Trees (OCTs) and and Non-Crop Trees (NCTs) are defined as:

(a) **"Free Growing Crop Trees (FCTs)"** are defined as coniferous trees identified in a silviculture survey conducted under the direction of this FSP that meet the following conditions:

(i) are considered a suitable species, as defined in this document,

(ii) are determined to be well spaced as defined by the MITD,

(iii) are considered a healthy tree as defined by the forest health and damage criteria of the Silviculture Survey Procedures Manual, (SSPM) dated April 1, 2016,

(iv) meet the vegetation competition criteria as defined by Appendix13 of the SSPM, and

(v) trees of the following species Pl, Fdi and Lw have a minimum height of 1.6 m and all other suitable species have a minimum height of 0.8 m.

(b) **"Other Crop Trees (OCTs)"** are defined as coniferous trees identified in a silviculture survey conducted under the direction of this FSP that meet the following conditions:

(i) are considered a suitable species as defined in this document ,

(ii) are considered a healthy tree as defined by the forest health and damage criteria of the Silviculture Survey Procedures Manual, (SSPM) dated April 1, 2016,

(iii) trees of the following species Pl, Fdi and Lw have a minimum height of 1.0 m and all other suitable species have a minimum height of 0.5 m, and

(iv) are NOT required to meet the well-spaced criteria or the vegetation competition criteria which are defined in Appendix 13 of the SSPM.

(c) **"Non-Crop Trees (NCTs)"** are defined as all coniferous trees that do not meet the definition of "**Free Growing Crop Trees**" or "**Other Crop Trees**"; as well as Aspen, Birch and Cottonwood

Appendix B: Partial Cutting Stocking Standards

The following standards apply to assessing regeneration and free growing success for standards units, where partial cutting silviculture systems have been implemented

1.0 When do the partial cutting stocking standards apply?

1.1 Standards Units with ≤ 5 m^2/ha of retained basal area:

a) Even-aged stocking standards, as per Appendix A, apply to standards units where the retained basal area of overstorey (Layer 1) trees is ≤ 5m^2 / ha.

1.2 Standards Units with ≥ 20 m^2/ha of retained basal area:

a) Where the basal area of acceptable retained overstorey (Layer 1) trees is ≥ 20 m^2/ha, the standards unit will be considered adequately stocked.
b) The free growing assessment of this standards unit may not be made until two (2) years after the harvest completion date.

1.3 Standards Units with > 5 m^2/ha and < 20 m^2/ha of retained basal area:

a) Where the basal area of acceptable retained overstorey (Layer 1) trees is > 5 m^2/ha and < 20 m^2/ha use the *Deviation from Potential Productivity Standards (DFP)* outlined below.

2.0 Definitions:

2.1 **Overstorey** (Layer 1) is all live trees with a diameter at breast height (dbh) ≥ 12.5 cm.
2.2 **Understorey** is all live trees with a diameter at breast height (dbh) < 12.5 cm. The understorey includes poles (Layer 2), saplings (Layer 3), and seedlings (Layer 4).
2.3 The deviation from potential productivity value is obtained from the attached **DFP (Table B).**

3.0 Tree Acceptability Criteria:

3.1 The following rules apply to measuring overstorey trees:

a) All live acceptable overstorey trees count in the overstorey basal area prism sweep.
b) No minimum inter-tree distance is applied to overstorey trees.

3.2 The following rules apply to tallying understorey trees

a) The even-aged minimum inter-tree distance (MITD) standard, for the standards unit, from Appendix "A", will apply.

b) **Minimum Height**:
(i) The minimum height at regeneration date must be ≥ 10 cm.
(ii) The minimum height at free growing must be ≥ 65% of the minimum free growing height in the even-aged stocking standard for the species for the standards unit.

c) **Understorey Minimum Stocking Standard (MSSp) requirement:**
Preferred species are those listed as preferred in the even-aged stocking standards, Appendix A, for the species for the standards unit. Preferred species must be ≥ 50% of the well-spaced, or free-growing, stems tallied in the stratum to meet minimum stocking requirements.

d) **M value:**
The maximum number of healthy, well-spaced trees that may be tallied in a plot is always 8.

4.0 Sample Size Rules and Declaration of Stocking:

a) Stratum size < 5 hectares: Declaration of stocking or free growing requires establishing a minimum of 5 plots that have a mean DFP ≤ 0.20.

b) Stratum size 5-20 hectares: Declaration of stocking or free growing requires establishing a minimum 1 plot per ha (or achieving a standard error of mean DFP ≤ 0.05) and a mean DFP ≤ 0.20.

c) Stratum size >20 hectares: Declaration of stocking or free growing requires establishing a minimum 1 plot per 2 ha (or achieving a standard error of mean DFP ≤ 0.05) and a mean DFP ≤ 0.20.

Table B: Deviation From Potential productivity (DFP) by Understorey tree density and Overstorey basal area.

OS Basal Area	Well-spaced trees in plot								
(m2/ha)	0	1	2	3	4	5	6	7	8
0	1.00	0.76	0.52	0.34	0.22	0.13	0.07	0.03	0.00
1	0.98	0.74	0.51	0.34	0.21	0.13	0.07	0.03	0.00
2	0.96	0.73	0.50	0.33	0.21	0.13	0.07	0.03	0.00
3	0.93	0.71	0.49	0.32	0.20	0.12	0.07	0.03	0.00
4	0.90	0.68	0.47	0.31	0.20	0.12	0.06	0.03	0.00
5	0.86	0.65	0.45	0.30	0.19	0.11	0.06	0.02	0.00
6	0.82	0.62	0.43	0.28	0.18	0.11	0.06	0.02	0.00
7	0.77	0.58	0.40	0.27	0.17	0.10	0.05	0.02	0.00
8	0.72	0.55	0.38	0.25	0.16	0.09	0.05	0.02	0.00
9	0.67	0.51	0.35	0.23	0.15	0.09	0.05	0.02	0.00
10	0.62	0.47	0.32	0.21	0.14	0.08	0.04	0.02	0.00
11	0.57	0.43	0.30	0.20	0.12	0.07	0.04	0.02	0.00
12	0.52	0.39	0.27	0.18	0.11	0.07	0.04	0.01	0.00
13	0.47	0.35	0.24	0.16	0.10	0.06	0.03	0.01	0.00
14	0.42	0.32	0.22	0.15	0.09	0.05	0.03	0.01	0.00
15	0.38	0.28	0.20	0.13	0.08	0.05	0.03	0.01	0.00
16	0.33	0.25	0.17	0.11	0.07	0.04	0.02	0.01	0.00
17	0.29	0.22	0.15	0.10	0.06	0.04	0.02	0.01	0.00
18	0.26	0.19	0.13	0.09	0.06	0.03	0.02	0.01	0.00
19	0.22	0.17	0.12	0.08	0.05	0.03	0.02	0.01	0.00
20	0.19	0.14	0.10	0.07	0.04	0.02	0.01	0.01	0.00
21	0.16	0.12	0.08	0.06	0.04	0.02	0.01	0.00	0.00
22	0.13	0.10	0.07	0.05	0.03	0.02	0.01	0.00	0.00
23	0.11	0.08	0.06	0.04	0.02	0.01	0.01	0.00	0.00
24	0.09	0.07	0.05	0.03	0.02	0.01	0.01	0.00	0.00
25	0.07	0.05	0.04	0.02	0.02	0.01	0.00	0.00	0.00
26	0.05	0.04	0.03	0.02	0.01	0.01	0.00	0.00	0.00
27	0.04	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00
28	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00
29	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C - Landscape Species Composition Targets (LSCTs)

PIR understands that there is risk and uncertainty relating climate change impacts to the growth and yield of our future growing stock, and that these impacts will have both positive and negative influences. As such, PIR agrees to implement planting strategies to trend toward the Landscape Species Composition Targets (LSCTs), as agreed to along with the provincial regional and local FLNRO staff on April 8, 2014 at a workshop held in Smithers.

"Ecologically Suitable Species" were defined for each BEC sub-zone variant within the Bulkley by a team of ecologists at this workshop to set Landscape Species Composition Targets (LSCTs). PIR has agreed to include these LSCTs and the corresponding Planting Strategies into our FSP as a commitment to trend toward the targets over time, as shown on the table below.

The LSCTs are based on the average area weighted percentage of "Total Tree" Densities for each BEC sub-zone variant, and for each species, as defined by the table below. As the LSCTs are considered a measure of tree species diversity at the Landscape-level, the measure will be assessed against the "Total Trees" densities of "Ecologically Suitable Species", including (Aspen, Birch and Cottonwood) deciduous trees that are consideration as unacceptable for contributing to the final crop harvest. The Total Tree densities are defined by the density values of Free Growing Inventory label.

Landscape Species Composition and Densities will be reported annually and the assessment against the Target will be based on a rolling 5-year average. However, as the targets were established in 2014, species compositions cannot be changed for those areas already planted, and, as such, the performance assessment of LSCTs cannot truly begin until (~2027), 12 growing seasons after this FSP Amendment is approved. In the meantime, PIR will report annually on the Composition of Species actually planted at the Time of Planting Regeneration Declaration, as well as at the time of Free Growing declarations.

PIR will also report annually on Site Limiting Factors that may act as constraints to meeting the species composition defined by our planting strategies for each variant.

Bulkley TSA - PIR - FSP - Landscape Species Targets - March 26, 2015

Bulkley TSA	BGC - BEC Subzone Varinat	At/Ac/Ep	Pl	Sx	Sxs	Bl	Ba	Cw	Hw	Hm	Fd	Lw	Sb	Pa	Total %	Notes
Agreed to Target	SBSmc2	5	30	45	0	15	0	0	0	0	5	0	0	0	100	Trace Hw and Sb from Naturals
Planting Strategy	SBSmc2	0	30	45	0	15	0	0	0	0	10	0	0	0	100	
Agreed to Target	ESSFmc	0	19	40	0	40	0	0	0	0	0	0	0	2	101	Pa (2%) Avoid Harvest Pa as Species at Risk
Planting Strategy	ESSFmc	0	24	40	0	35	0	0	0	0	0	0	0	1	100	Do NOT plant Pine > 1200 m & Increase Bl % as Elevation increases
Agreed to Target	ICHmc1	5	10	20	0	20	0	5	30	0	5	5	0	0	100	Hw (naturals)
Planting Strategy	ICHmc1	0	9	35	0	35	0	0	0	0	10	10	0	1	100	Keep PIne < 10 % due to risk of Dothistroma
Agreed to Target	ESSFwv	0	10	40	0	43	0	0	0	5	0	0	0	2	100	Pa (2%) & Hm from Naturals
Planting Strategy	ESSFwv	0	18	40	0	40	0	0	0	0	0	0	0	2	100	Do NOT plant Pine > 1200 m & Increase Bl % as Elevation increases
Agreed to Target	SBSdk	10	35	35	0	0	0	0	0	0	10	10	0	0	100	Deciduous, and Trace Bl and Sb (naturals)
Planting Strategy	SBSdk	0	40	40	0	0	0	0	0	0	10	10	0	0	100	Refer to Site Limiting Factors of Lw and Fdi
Agreed to Target	ICHmc2	10	10	30	0	10	0	10	20	0	5	5	0	0	100	Deciduous, (Cw and Hw) (naturals)
Planting Strategy	ICHmc2	0	9	55	0	16	0	0	0	0	10	10	0	0	100	Keep Pine < 10 % due to risk of Dothistroma
Agreed to Target	CWHws2	0	10	0	35	0	30	5	20	0	0	0	0	0	100	Hw and Sb from Naturals
Planting Strategy	CWHws2	0	10	0	50	0	40	0	0	0	0	0	0	0	100	Plant Sxs (Sitka cross) and (Ba -Amabalis)
Agreed to Target	ESSFmk	0	18	40	0	35	0	0	5	0	0	0	0	2	100	Pa (2%) Avoid Harvest Pa as Species at Risk Hw (naturals)
Planting Strategy	ESSkmk	0	18	40	0	40	0	0	0	0	0	0	0	2	100	Do NOT plant Pine > 1200 m & Increase Bl % as Elevation increases

Appendix D – Data-Excel Worksheets

Submitted as a separate document

This Page Intentionally Left Blank

Appendix E – Explanation of Appendix D-Data

Introduction

All Landscape Reforestation Standards, including the Alberta and Ft. St. John approaches follow four (4) Basic Steps:

1. Set Thresholds forecasted (Yields) (or MAI) for defined groups of stands, based on Timber Supply assumptions and Landscape-level sustainability objectives
2. Collect Information on regenerated stands (typically via Surveys) at defined early ages
3. Model relevant information as inputs to Forecast Actual Yields …. then
4. Compare these Actual Yields results to the Thresholds Yields

This Appendix "E" is meant to explain the calculations and assumptions in Appendix D (Data): used to set the Volume and Density Thresholds for the PIR – FSP Landscape Reforestation Standards for:

- Minimum Density Standards (MDS)
- Minimum Volume Standards (MVS), as Thresholds
- And Other Values used for the PIR – FSP Landscape Reforestation Standards

Note: Each Threshold Standard for each Analysis Unit (AU) stands alone and must be met for the Sample Population on an annual basis.
The Sample Population: is based on the Area Planted 12- Growing-Seasons prior conducting the FG Surveys.

Each item number below corresponds with each column number on:
Appendix D (Data): Tab –D-8

The sheet is divided vertically by the thick black boundaries into 3 sections including: (TSR Base Data; Density Data; Volume Data), and the sheet is divided horizontally into groupings of TSR Analysis Units (AUs), sorted by MAI Productivity Rankings.

Five 5-Key Elements of this rationale are:

a) **Land Base**
b) **Productivity**
c) **Densities**
d) **Crop Trees**
e) **Volumes**

Column #

a) Land Base

1. **Analysis Unit (AU) #** : same as TSR 3 THLB

2. **Analysis Unit (AU) Name:** same as TSR 3 **THLB**

3. **Analysis Unit (AU) Site Series Grouping:** same as TSR 3 **THLB**

4. **THLB Area (ha) of PIR Operations:** from TSR 3 Data **THLB**

5. **THLB Area (%) of PIR Operations:** from TSR 3 Data **THLB**

b) Productivity

6. **Mean Annual Increment (MAI) Productivity** (m3/ ha / year) is set by using the TSR- TSS to forecast the Yield of Net Merchantable Volume at stand- age -80 (NMV80). This stand age is NOT the projected Culmination (CMAI) Age or the Rotation Age 80. Stand-age 80 years was selected as this is a common point on the Volume over Age curve to compare productivity of all AUs, as it is close to the average of the CMAIs of all AUs. Future harvest may occur prior to, or beyond the CMAI, or not at all. The point of these Standards is to compare forecasted yield volumes to a set threshold, based on a common point in the future from the time of regeneration establishment.

7. **Productivity Rank, is based in increments of MAI as follows:**

Rank	MAI
1	> 5.00
2	4.00-4.99
3	3.00-3.99
4	2.00-2.99
5	1.00-1.99
6	0.00-0.99

Bulkley TSR Forecasted Yields / AU

8. **Timber Supply Review (TSR-3) Yield (Volume) = S:NMV80**

Note: The values of these first 8- columns, including columns 9 & 13, are identical to those used for the Bulkley TSR-3.
These ecologically-based TSR Analysis Units (AUs) form the base of the sample population for these Landscape Reforestation Standards
This "S" value has nothing to do with the Standards, but it is included here for comparison purposes.

c) Density

9. **Minimum Density Standard (MDS),** at the **Regeneration Stage** for each Analysis Unit (AU) will be the same values as defined by column- 9, as per the **Minimum Stocking Standard (MSS)** from the TSR -3.
10. **Percentage % (Deviation Factor)** based on MSS **Density** from the TSR-3
11. **Minimum Density Standard (MDS) at the FG Survey Stage,** are based on the following:
    - **(a)** Sort AUs by MAI-based Productivity Class (1 to 6)
    - **(b)** Sum and Average Current Minimum Stocking Standards for each Class
    - **(c)** Round Results to Nearest 100 SPH
    - **(d)** Set % Deviation from Current MSS, starting with **20** % for class # 1
    - **(e)** Add 10 % Deviation from Current MSS, for each productivity class less than the next class higher
    - **(f)** Multiply the results from Step 3 by the resultant % Deviation from the Current MSS, for each productivity class
    - **(g)** This equals the Minimum Density Standard (MDS)

Note: These minimum allowable densities (MDSs) are meant to allow for increased biodiversity and complexity across the Landscape and the area of lower stocking within any Analysis Unit (AU) is too large, the Volume Standard will not be met.

12. **Actual Density** values are based on **(FG m-capped)** values from the annual FG Survey Data
13. **Target Stocking Standard (TSS) Density** from **provincial stocking standards**
14. **M-Value:** is based on **(Target TSS column-13) / 200 plot multiplier value**

d) Crop Trees

This Standard defines (3) classes of Crop Trees, and (2) calculated values (FONTS)

- **F = "Free growing Crop Trees"**
- **O = "Other Crop Trees"**
- **N = "Non-Crop trees"**
- **T = Total Trees**
- **S = Sum of Crop Trees**

F = (FCT) Free growing Crop Trees must meet:

- Forest health criteria, as defined in the Silviculture Surveys Procedures Manual,2015 (SSPM)
- Vegetation competition criteria, as defined in the (SSPM)
- Minimum height at the time of FG survey for Pl, Fdi, Lw is **1.60 m.**
- Minimum height at the time of FG survey for all other species is **0.8 m.**
- **Minimum Inter-Tree Distance**
  - **(MITD) is 2.00 m for all AUs,**
    Except
    (MITD) is 1.50 m for areas **where:**
    (i) Mechanical Site Preparation has been applied;
    (ii) Cable or an Aerial Yarding Harvesting Systems have been applied or
    (iii) Fill Planting has occurred
    And
    (MITD) is 1.00 m where:
    Clumped or Cluster Planting has occurred for other resource values
    Such as Berry and or Grizzly Bear Habitat considerations

- **F = (FCT) Free growing Crop Tree** Densities are assumed to be:
  "Planted" at **Regular** distribution for **TASS-II** forecasting yield volumes

O = (OCT) Other Crop Trees must meet:

- Forest health criteria, as defined in the Silviculture Surveys Procedures, 2015
- Minimum height at the time of FG survey for Pl, Fdi, Lw is **1.00** m.
- Minimum height at the time of FG survey for all other species is **0.50** m.

- **(OCT) Other Crop Trees Do NOT need to meet**
- Vegetation competition criteria, as defined by the
  Appendix 13 the Silviculture Surveys Procedures, 2015, and or the
- Minimum Inter-Tree Distance (MITD), Well-Spaced (WS) Criteria
- **O = (OCT) Other Crop Tree** Densities are assumed to be:
  "Natural" at **Random** distribution for **TASS-II** forecasting yields volumes

N= (NCT) Non-Crop Tree Density includes:
Trees that do not meet the "Crop Tree" criteria for "F" or "O"

- Trees less than the minimum height
- Tree that do not meet Forest Health and or Damage Criteria
- Deciduous that are not considered as Commercial Species, and
- Do Not contribute to the Bulkley TSR / AAC

Two additional values (T and S) are calculated from the Field FG Survey Data, where:
T= Total Tree Density = (F + O + N) = T, as per the Inventory Label,
S = the Sum of Crop Trees where S= (F + O) or S = (T – N)

e) Volume

15. **Minimum Yield M: NMV80, (Volume) based on MSS,** Forecast from TSR 3 Data

16. **P Possible Yield P: NMV80, (Volume) is** based on TSS in from TSR 3 Data This Possible (P) yield for each Analysis Unit, is based on the assumption that the Target (TSS) values have been met across the entire AU sample area

17. **Maximum Deviation from Possible (MDFP)** factor is based on the (**MSS yield / TSS yield) (Columns 15/16).** This value determines lowest yield currently allowed by the Minimum (MSS) from the current FSP. This Maximum Deviation from Possible is only a test of the volume limits assuming that all densities were at MSS values across the entire AU sample area.

18. **Threshold of Deviation from Possible (TDFP) Factor,** is based on as a percentage % of the Maximum (MDFP), as managing to minimums is not acceptable, nor is it reasonable to achieve Target Densities across all AUs at all times. The Threshold yield **(Volume)** that must be met was set at **50 %** of the Maximum Deviation from Possible (MDFP), and Threshold (TDFP) was set at a minimum of **10 %**, but it could not exceed the Maximum (MDFP)

19. **T Threshold Yield T:NMV80 Threshold (Volume) (m3 / ha) is set by:**
Multiplying the TDFP factor (column 14) by the Possible (P) yield (column 12), for each Analysis Unit (AU)

20. **Ao Actual Yield A: NMV80 (Volume) is** proposed to be determined through averaging (Area Weighing) the TASS-II, **Output Yields** of each SU per AU per sample year.

21. **Ai Actual Yield A: NMV80 (Volume) is** proposed to be determined through averaging (Area Weighing) the TASS-II, **Input Density and Species Composition Values** of each SU per AU per sample year.

The proposed Free-Growing survey values would be used in TASS-II to forecast Actual Aggregated Yields using:

- *Freegrowing Crop Trees (FCT) (F) are assumed to be "Planted" Densities, at a Regular Distribution*

And

- *Other Crop Trees (OCT) (O) are assumed to be "Natural" Densities at a Random Distribution*

Note:
If comparisons are made between TSR S-Supply Yields and A-Actual Yields, then the A-Actual Ai yields based on the Average of Input Values should be used to ensure consistency of methods and procedures used.

For more detail as to the related assumptions and process, refer to:
Appendix "F" Forecasting Managed Stand Yields with TASS-II

As the **"TASS-III"** Model has been recently released to a select group for Beta testing, for consistency sake, we are proposing that TASS-3 be used to forecast future the Analysis Unit (AU) yield volumes, using the procedures for determining both Threshold and Actual yields. This process would use the same input values as defined by **Appendix D, Tab 2, TSR-III Input Assumptions and Values**
The same version of TASS that is will be used to project both the Actual volumes.
The model inputs for the threshold volumes will remain the same.
We would also like to recognize that what we are proposing is an interim process that uses the "tools" that are currently available.

Ideally, in the future, a completely new survey system that directly provides the inputs required by TASS-III and any additional information for inventory and silviculture purposes will be designed. For the present submission, the use of the well-known free-growing survey eases the transition to the landscape level approach as it provides a familiar basis for comparison with existing standards.

The proposed modified free-growing survey values would be used in TASS-III to forecast Actual Aggregated Yields using:

- ***Freegrowing Crop Trees (FCT) (F) are assumed to be "Planted" Densities, at a Regular Distribution***

And

- ***Other Crop Trees (OCT) (O) are assumed to be "Natural" Densities at a Random Distribution***

For more detail as to the related assumptions and process, refer to:
Appendix "F" Forecasting Managed Stand Yields with TASS-II

f) Compare and Assess..... Last Step

22. Forecast (Motoring Test, Analyse) and Compare Yields:
Actual forecasted Yield must be greater than the Threshold Yield.
(A-T) must be > 0

The ***Standard*** has reviewed the relationships between five (5) yields, for each of the 35- Analysis Units (AUs) used for managed stands in the most recent Bulkley Timber Supply Analysis.

- **S – Supply** Yields used in the most recent Timber Supply Analysis Bulkley (TSR-3)
  These values are set and will not change until the next TSR
- **M– Minimum** Yields reflects the desired practice, based on Current Minimum Standards (MSS)
  These values are set and will not change until the next TSR
- **P – Possible** Yields reflects the desired practice, based on Current Target Standards (TSS)
  These values are set and will not change until the next TSR
- **A – Actual** Yields will be generated annually from the FG survey data.
- **T – Threshold** Deviation from the P-Possible Yield as (T-DFP)
  These Threshold Yield values are calculated and shown by Appendix A
  They will not change until the next FSP or Amendment

Appendix F – Forecasting Yields with TASS-II

This Page Intentionally Left Blank

FOREST ANALYSIS AND INVENTORY BRANCH PROVINCE OF BRITISH COLUMBIA

Appendix "F"
Forecasting TASS II Yields for Pacific Inland Resources Landscape Level Reforestation Standards (PIR)

Procedures for TASS II runs to generate:
"Timber Supply (S)", "Possible (P)", "Minimum (M)" and "Actual (A)" yields

This version was edited Feb 5, 2018 to account for a typo on Analysis Unit (AU) – 8 Site Index value for Spruce (Se) was changed from 11.7 to 18.8.

C. Mario Di Lucca, & Ken Polsson
11/19/2015

Pacific Inland Resources Landscape Level Reforestation Standards (PIR)
Procedures for TASS II run to generate:
"Timber Supply (S)", "Possible (P)", "Minimum (M)" and "Actual (A)" yields

Note:
The Reforestation Performance Standard test of volume yields applies only to the Free-growing stage and the Free Growing Surveys occur 12 growing seasons after the Time of Planting (ToP) date.

A. Input Information

For the Timber Supply (S) yields:

1. Analysis Unit identifier that will be used as the TASS run identifier, along with the suffix "S".
2. Site Indices from the corresponding Analysis Unit TSR input assumptions.
3. Genetic Worth from the corresponding Analysis Unit TSR input assumptions.
4. Planting Densities and Species Composition from TSR input assumptions.
5. Natural Densities and Species Composition from the TSR input assumptions.
6. Regeneration Delay of 1 year and OAFs (0.85 & 0.95) from the TSR input assumptions.

For the Possible (P) yields:

1. Analysis Unit identifier that will be used as the TASS run identifier, along with the suffix "P".
2. Site Indices from the corresponding Analysis Unit TSR input assumptions.
3. Genetic Worth from the corresponding Analysis Unit TSR input assumptions.
4. Planting Densities from the current Target Stocking Standards (TSS) applicable to the Analysis Unit.
5. Planting Species Composition from the corresponding Analysis Unit TSR input assumptions
6. Natural Densities assumed to be zero.
7. Regeneration Delay of 1 year and OAFs (0.85 & 0.95) from the TSR input assumptions.

For the Minimum (M) yields:

1. Analysis Unit identifier that will be used as the TASS run identifier, along with the suffix "M".
2. Site Indices from the corresponding Analysis Unit TSR input assumptions.
3. Genetic Worth from the corresponding Analysis Unit TSR input assumptions.
4. Planting Densities from the current Minimum Stocking Standards (MSS) applicable to the Analysis Unit.
5. Planting Species Composition from the corresponding Analysis Unit TSR input assumptions
6. Natural Densities assumed to be zero.
7. Regeneration Delay of 1 year and OAFs (0.85 & 0.95) from the TSR input assumptions.

For the Actual (A) yields:

1. Survey identifier that will be used as the TASS run identifier.
2. Site Indices from the corresponding Analysis Unit TSR input assumptions.
3. Genetic Worth from the corresponding Analysis Unit TSR input assumptions.
4. Planting Densities and Species Composition from the uncapped well-spaced free-growing Densities (FGm+) from the annual Free-growing survey results.
5. Natural Densities and Species Composition from the "Other Crop Tree" Densities from the annual Free-growing survey results.
6. Regeneration Delay of 1 year and OAFS from the TSR input assumptions.

The above information is summarized Table 1.

Table1. Summary of TASS II runs input.

Input Value	S	P	M	A
Identifier	AU# - S	AU#-P	AU#-M	Survey ID
Site Indices	TSR AU inputs	TSR AU inputs	TSR AU inputs	TSR AU inputs
Genetic Worth	TSR AU inputs	TSR AU inputs	TSR AU inputs	TSR AU inputs
Planting Density	TSR AU inputs	AU TSS	AU MSS	Uncapped WSFG
Planted Species Composition	TSR AU inputs	TSR AU inputs	TSR AU inputs	Uncapped WSFG
Natural Density	TSR AU inputs	Zero	Zero	Other crop trees
Natural Species Composition	TSR AU inputs	N/A	N/A	Other crop trees
Regeneration Delay	1	1	1	1
OAF1	0.85	0.85	0.85	0.85
OAF2	0.95	0.95	0.95	0.95

Note: the TASS II Input values shown in Blue text do not change for each of the four runs per AU.

Refer to Tables 2, 3 and 4 for the TASS II Input values for site index, genetic worth, planting density and species composition used for the S, P, and M runs for each AU. As noted above the A runs will use the same site index, genetic worth, regen delay and OAF values. The species compositions and densities will come from the annual free-growing surveys.

B. TASS II Settings and Input Specifications

All S, P, M and A TASS II runs have the following settings and specifications:

1. Simulation size target is 1 hectare (100 m x 100 m). When the simulation includes planted trees, the actual dimensions of the simulation area are adjusted so that an integer number of rows and columns can be planted. TASS operates on a rectangle (usually square), but allows crowns at the edges to "wrap around" to the opposite side, resulting in no edge bias.

2. OAFs are applied to the final output, after a non-OAF'd stand is simulated.
    a. This results in the same OAF impacts as would be seen in TIPSY.
    b. OAF1 is 0.85 and OAF2 is 0.95.

3. The following species and species substitutions are used:
    a. Lodgepole pine (Pli)
    b. White spruce (Sw)
    c. Western hemlock interior (Hwi)
    d. Western red cedar (Cw)
    e. Douglas-fir interior (Fdi)
    f. Subalpine fir (Bl) and Engelmann spruce (Se) are modelled as white spruce (Sw)
    g. Western larch (Lw) is modelled as interior Douglas-fir (Fdi)
    h. Amabilis fir (Ba) and mountain hemlock Hm are modelled as interior western hemlock (Hwi)

i. Yellow cedar (Yc) is modelled as western red cedar (Cw)

4. Genetic Worth is applied to the vector of site heights/ages generated by the standard SINDEX[1] equations prior to tree growth.

5. Planting seedling age is 1 year and seedling height is 0.1 m.

6. Plantations are established in a square spacing grid pattern with some variation allowed about the intended locations. Trees are planted at the theoretical grid position with a standard deviation of 10 percent of the square spacing allowed along each axis.

7. Multiple species in a planted stand are handled by generating the total number of planting locations, then randomly assigning the species, based on the proportions indicated.

8. The natural component is established in random locations, with age variation determined by Normal distribution with a mean age of 3 years and standard deviation of 1.5 years. Full natural regeneration is achieved within a range of 7 to 9 years

9. TASS II can be run with the height vigor adjustment "on" or "off". For these runs, height vigor as "off" as this is necessary to allow the effects of genetic gain.

10. All requested species and establishment methods are incorporated into a single TASS II run.

While not specifically calibrated or validated for mixed species, TASS II is capable of simulating species mixtures and appears to behave logically in many mixed species situations where the component species are likely to be members of the main, upper canopy.

C. TASS II Outputs

1. For the S, P, and M runs there is one TASS run for each analysis unit, identified by the AU number and a suffix of S, P or M.

2. For each A-Actual run there is one TASS II run for each Standard Unit (SU) identified by the Free-growing (FG) survey identification provided by PIR.

3. For each TASS run the yield table output is by stand ages ranging from 5 to 100 in steps of 5 years and includes the following variables:
    a. Top Height
    b. Total volume (0.0 cm dbh +) per ha
    c. Merchantable volume (12.5 cm dbh + for Pl and 17.5 cm dbh + for all other species) per ha.
    d. Quadratic mean diameter at breast height (dbh)
    e. Total stems per ha

Refer to Table 5 for the TASS II age 80 net merchantable volume outputs generated for the:

[1] For a complete explanation of SINDEX see https://www.for.gov.bc.ca/hre/sindex/

S-Supply, P-Possible and M-Minimum runs.

Note: These procedures will be updated when TASS III becomes available for operational use.

Table 2. Species composition, densities, site indices and genetic worth for TASS II TSR Supply (S) runs.

AU	AU Name	Species	Genetic Gain	Reference Year	SI	Regen Type	Species%	Plant Density	Natural Density
1	CWHws2 -Dry	CW			10	P	20	120	
1	CWHws2 -Dry	HW			12	P	40	240	
1	CWHws2 -Dry	PL	7	10	12	P	40	240	
2	CWHws2 -Fresh	BA			21.3	N	20		460
2	CWHws2 -Fresh	HW			18.1	N	15		345
2	CWHws2 -Fresh	PL			19.7	N	15		345
2	CWHws2 -Fresh	SW			20	N	50		1150
2	CWHws2 -Fresh	BA			21.3	P	20	180	
2	CWHws2 -Fresh	HW			18.1	P	15	135	
2	CWHws2 -Fresh	PL	7	10	19.7	P	15	135	
2	CWHws2 -Fresh	SW	8	15	20	P	50	450	
3	CWHws2 -Moist	BA			24.8	N	20		500
3	CWHws2 -Moist	BL			24.8	N	20		500
3	CWHws2 -Moist	HW			24	N	20		500
3	CWHws2 -Moist	SW			24.8	N	40		1000
3	CWHws2 -Moist	BA			24.8	P	20	180	
3	CWHws2 -Moist	BL			24.8	P	20	180	
3	CWHws2 -Moist	HW			24	P	20	180	
3	CWHws2 -Moist	SW	8	15	24.8	P	40	360	
4	CWHws2 -Very Moist	BA			12	P	15	120	
4	CWHws2 -Very Moist	CW			12	P	15	120	
4	CWHws2 -Very Moist	SW	8	15	12	P	70	560	
5	CWHws2 -Wet	CW			10	P	20	80	
5	CWHws2 -Wet	PL	7	10	12	P	80	320	
6	ESSFmc -Dry	BL			13.3	N	20		689
6	ESSFmc -Dry	PL			13.5	N	80		2755
6	ESSFmc -Dry	BL			13.3	P	20	200	
6	ESSFmc -Dry	PL	7	10	13.5	P	80	800	
7	ESSFmc -Fresh	BL			13.7	P	40	440	
7	ESSFmc -Fresh	PL	7	10	16	P	20	220	
7	ESSFmc -Fresh	SE	8	15	15.3	P	40	440	
8	ESSFmc -Moist	BL			14.9	P	35	385	
8	ESSFmc -Moist	PL	7	10	18.3	P	20	220	
8	ESSFmc -Moist	SE	8	15	18.8	P	45	495	
9	ESSFmc -Wet	BL			10.8	P	45	450	
9	ESSFmc -Wet	SE	8	15	12.6	P	55	550	
10	ESSFmk -Dry	BL			9	P	20	200	
10	ESSFmk -Dry	PL	7	10	9	P	80	800	
11	ESSFmk -Fresh	BL			11.4	P	50	550	
11	ESSFmk -Fresh	HM			11.4	P	20	220	
11	ESSFmk -Fresh	SW	8	15	11.4	P	30	330	
12	ESSFmk -Moist	BL			12	P	50	550	
12	ESSFmk -Moist	HM			12	P	20	220	

12	ESSFmk -Moist	SE	8	15	12.8	P	30	330	
13	ESSFmk -Wet	BL			9	P	60	600	
13	ESSFmk -Wet	SE	8	15	9	P	40	400	

A typo for (AU 8- Site Index for Se) was revised from 11.7 to 18.8 – Jan 25, 2018 by Gary Quanstrom, based on advice from Eleanor McWilliams and confirmed by Jeff Stone, Senior Forest Analysis, FAIB

Table 2. Species composition, densities, site indices and genetic worth for TASS II TSR Supply (S) runs (cont.)

AU	AU Name	Species	Genetic Gain	Reference Year	SI	Regen Type	Species%	Plant Density	Natural Density
14	ESSFwv -Dry	BL			9	N	20		280
14	ESSFwv -Dry	PL			9	N	80		1120
14	ESSFwv -Dry	BL			9	P	20	220	
14	ESSFwv -Dry	PL	7	10	9	P	80	880	
15	ESSFwv -Fresh	BL			11.4	N	30		330
15	ESSFwv -Fresh	PL			15	N	20		220
15	ESSFwv -Fresh	SE			14.8	N	50		550
15	ESSFwv -Fresh	BL			11.4	P	30	330	
15	ESSFwv -Fresh	PL			15	P	20	220	
15	ESSFwv -Fresh	SE			14.8	P	50	550	
16	ESSFwv -Moist	BL	7	10	12	P	30	330	
16	ESSFwv -Moist	PL			12.4	P	20	220	
16	ESSFwv -Moist	SE	8	15	12.4	P	50	550	
17	ESSFwv -Wet	BL			9	N	60		1500
17	ESSFwv -Wet	SE			9	N	40		1000
17	ESSFwv -Wet	BL			9	P	60	600	
17	ESSFwv -Wet	SE	8	15	9	P	40	400	
18	ICHmc1 -Dry	HW			17.1	N	20		689
18	ICHmc1 -Dry	PL			19.6	N	80		2755
18	ICHmc1 -Dry	HW			17.1	P	20	200	
18	ICHmc1 -Dry	PL	7	10	19.6	P	80	800	
19	ICHmc1 -Fresh	BL			18.8	N	15		165
19	ICHmc1 -Fresh	HW			18.5	N	20		220
19	ICHmc1 -Fresh	PL			22.4	N	15		165
19	ICHmc1 -Fresh	SW			23.3	N	50		550
19	ICHmc1 -Fresh	BL			18.8	P	15	165	
19	ICHmc1 -Fresh	HW			18.5	P	20	220	
19	ICHmc1 -Fresh	PL	7	10	22.4	P	15	165	
19	ICHmc1 -Fresh	SW	8	15	23.3	P	50	550	
20	ICHmc1 -Wet	BL			15	P	25	250	
20	ICHmc1 -Wet	HW			15	P	20	200	
20	ICHmc1 -Wet	SW	8	15	21	P	55	550	
21	ICHmc2 -Dry	HW			12	P	20	200	
21	ICHmc2 -Dry	PL	7	10	15	P	80	800	
22	ICHmc2 -Fresh	HW			18.4	N	15		225
22	ICHmc2 -Fresh	PL			21.8	N	20		300
22	ICHmc2 -Fresh	SW			22.3	N	65		975
22	ICHmc2 -Fresh	HW			18.4	P	15	165	
22	ICHmc2 -Fresh	PL	7	10	21.8	P	20	220	
22	ICHmc2 -Fresh	SW	8	15	22.3	P	65	715	

23	ICHmc2 -Moist	BL			15	N	20		420
23	ICHmc2 -Moist	HW			15	N	15		315
23	ICHmc2 -Moist	SW			21	N	65		1365
23	ICHmc2 -Moist	BL			15	P	20	200	
23	ICHmc2 -Moist	HW			15	P	15	150	
23	ICHmc2 -Moist	SW	8	15	21	P	65	650	

Table 2. Species composition, densities, site indices and genetic worth for TASS II TSR Supply (S) runs (cont.)

AU	AU Name	Species	Genetic Gain	Reference Year	SI	Regen Type	Species%	Plant Density	Natural Density
24	MHmm2 -Dry	BA			10	N	20		729
24	MHmm2 -Dry	HM			10	N	80		2915
24	MHmm2 -Dry	BA			10	P	20	160	
24	MHmm2 -Dry	HM			10	P	80	640	
25	MHmm2 -Fresh	BA			12.6	N	70		2481
25	MHmm2 -Fresh	BL			12.6	N	15		532
25	MHmm2 -Fresh	HM			12.6	N	15		532
25	MHmm2 -Fresh	BA			12.6	P	70	630	
25	MHmm2 -Fresh	BL			12.6	P	15	135	
25	MHmm2 -Fresh	HM			12.6	P	15	135	
26	MHmm2 -Moist	BA			10	P	30	270	
26	MHmm2 -Moist	BL			10	P	20	180	
26	MHmm2 -Moist	HM			10	P	50	450	
27	MHmm2 -Wet	HM			10	P	80	640	
27	MHmm2 -Wet	YC			10	P	20	160	
28	SBSdk -Dry	PL			16.1	N	80		2000
28	SBSdk -Dry	SW			14.9	N	20		500
28	SBSdk -Dry	PL	7	10	16.1	P	80	880	
28	SBSdk -Dry	SW	8	15	14.9	P	20	220	
29	SBSdk -Fresh	PL			20.3	N	50		650
29	SBSdk -Fresh	SW			18.8	N	10		130
29	SBSdk -Fresh	AW			20.3	N	40		520
29	SBSdk -Fresh	PL	7	10	20.3	P	75	825	
29	SBSdk -Fresh	SW			18.8	P	25	275	
30	SBSdk -Moist	PL	7	10	21.7	P	20	200	
30	SBSdk -Moist	SW	8	15	20	P	80	800	
31	SBSdk -Wet	PL	7	10	12	P	20	80	
31	SBSdk -Wet	SW			14.6	P	60	240	
31	SBSdk -Wet	SW	8	15	14.6	P	20	80	
32	SBSmc2 -Dry	BL			12	N	20		660
32	SBSmc2 -Dry	PL			16.2	N	80		2640
32	SBSmc2 -Dry	BL			12	P	20	200	
32	SBSmc2 -Dry	PL	7	10	16.2	P	80	800	
33	SBSmc2 -Fresh	BL			15.6	N	15		165
33	SBSmc2 -Fresh	PL			19.3	N	50		550
33	SBSmc2 -Fresh	SW			19.3	N	35		385
33	SBSmc2 -Fresh	BL			15.6	P	15	165	
33	SBSmc2 -Fresh	PL	7	10	19.3	P	50	550	
33	SBSmc2 -Fresh	SW	8	15	19.3	P	35	385	
34	SBSmc2 -Moist	BL			19	P	30	300	

34	SBSmc2 -Moist	PL	7	10	18.8	P	20	200
34	SBSmc2 -Moist	SW	8	15	18.6	P	50	500
35	SBSmc2 -Wet	SW	8	15	12	P	50	200
35	SBSmc2 -Wet	SW			12	P	50	200

Table 3. Species composition, densities, site indices and genetic worth for TASS II Possible (P) runs.

AU	AU Name	Species	Genetic Gain	Reference Year	SI	Regen Type	Species%	Total Planting Density	Species Planting Density
1	CWHws2 -Dry	CW			10	P	20	600	120
1	CWHws2 -Dry	HW			12	P	40	600	240
1	CWHws2 -Dry	PL	7	10	12	P	40	600	240
2	CWHws2 -Fresh	BA			21.3	P	20	900	180
2	CWHws2 -Fresh	HW			18.1	P	15	900	135
2	CWHws2 -Fresh	PL	7	10	19.7	P	15	900	135
2	CWHws2 -Fresh	SW	8	15	20	P	50	900	450
3	CWHws2 -Moist	BA			24.8	P	20	900	180
3	CWHws2 -Moist	BL			24.8	P	20	900	180
3	CWHws2 -Moist	HW			24	P	20	900	180
3	CWHws2 -Moist	SW	8	15	24.8	P	40	900	360
4	CWHws2 -Very Moist	BA			12	P	15	800	120
4	CWHws2 -Very Moist	CW			12	P	15	800	120
4	CWHws2 -Very Moist	SW	8	15	12	P	70	800	560
5	CWHws2 -Wet	CW			10	P	20	400	80
5	CWHws2 -Wet	PL	7	10	12	P	80	400	320
6	ESSFmc -Dry	BL			13.3	P	20	1000	200
6	ESSFmc -Dry	PL	7	10	13.5	P	80	1000	800
7	ESSFmc -Fresh	BL			13.7	P	40	1200	480
7	ESSFmc -Fresh	PL	7	10	16	P	20	1200	240
7	ESSFmc -Fresh	SE	8	15	15.3	P	40	1200	480
8	ESSFmc -Moist	BL			14.9	P	35	1200	420
8	ESSFmc -Moist	PL	7	10	18.3	P	20	1200	240
8	ESSFmc -Moist	SE	8	15	18.8	P	45	1200	540
9	ESSFmc -Wet	BL			10.8	P	45	1000	450
9	ESSFmc -Wet	SE	8	15	12.6	P	55	1000	550
10	ESSFmk -Dry	BL			9	P	20	1000	200
10	ESSFmk -Dry	PL	7	10	9	P	80	1000	800
11	ESSFmk -Fresh	BL			11.4	P	50	1200	600
11	ESSFmk -Fresh	HM			11.4	P	20	1200	240
11	ESSFmk -Fresh	SW	8	15	11.4	P	30	1200	360
12	ESSFmk -Moist	BL			12	P	50	1200	600
12	ESSFmk -Moist	HM			12	P	20	1200	240
12	ESSFmk -Moist	SE	8	15	12.8	P	30	1200	360
13	ESSFmk -Wet	BL			9	P	60	1000	600
13	ESSFmk -Wet	SE	8	15	9	P	40	1000	400
14	ESSFwv -Dry	BL			9	P	20	1100	220
14	ESSFwv -Dry	PL	7	10	9	P	80	1100	880
15	ESSFwv -Fresh	BL			11.4	P	30	1200	360
15	ESSFwv -Fresh	PL			15	P	20	1200	240
15	ESSFwv -Fresh	SE			14.8	P	50	1200	600
16	ESSFwv -Moist	BL	7	10	12	P	30	1200	360
16	ESSFwv -Moist	PL			12.4	P	20	1200	240
16	ESSFwv -Moist	SE	8	15	12.4	P	50	1200	600
17	ESSFwv -Wet	BL			9	P	60	1000	600

17	ESSFwv -Wet	SE	8	15	9	P	40	1000	400

Table 3. Species composition, densities, site indices and genetic worth for TASS II Possible (P) runs (cont.)

AU	AU Name	Species	Genetic Gain	Reference Year	SI	Regen Type	Species%	Total Planting Density	Species Planting Density
18	ICHmc1 -Dry	HW			17.1	P	20	1000	200
18	ICHmc1 -Dry	PL	7	10	19.6	P	80	1000	800
19	ICHmc1 -Fresh	BL			18.8	P	15	1200	180
19	ICHmc1 -Fresh	HW			18.5	P	20	1200	240
19	ICHmc1 -Fresh	PL	7	10	22.4	P	15	1200	180
19	ICHmc1 -Fresh	SW	8	15	23.3	P	50	1200	600
20	ICHmc1 -Wet	BL			15	P	25	1000	250
20	ICHmc1 -Wet	HW			15	P	20	1000	200
20	ICHmc1 -Wet	SW	8	15	21	P	55	1000	550
21	ICHmc2 -Dry	HW			12	P	20	1000	200
21	ICHmc2 -Dry	PL	7	10	15	P	80	1000	800
22	ICHmc2 -Fresh	HW			18.4	P	15	1200	180
22	ICHmc2 -Fresh	PL	7	10	21.8	P	20	1200	240
22	ICHmc2 -Fresh	SW	8	15	22.3	P	65	1200	780
23	ICHmc2 -Moist	BL			15	P	20	1000	200
23	ICHmc2 -Moist	HW			15	P	15	1000	150
23	ICHmc2 -Moist	SW	8	15	21	P	65	1000	650
24	MHmm2 -Dry	BA			10	P	20	800	160
24	MHmm2 -Dry	HM			10	P	80	800	640
25	MHmm2 -Fresh	BA			12.6	P	70	900	630
25	MHmm2 -Fresh	BL			12.6	P	15	900	135
25	MHmm2 -Fresh	HM			12.6	P	15	900	135
26	MHmm2 -Moist	BA			10	P	30	900	270
26	MHmm2 -Moist	BL			10	P	20	900	180
26	MHmm2 -Moist	HM			10	P	50	900	450
27	MHmm2 -Wet	HM			10	P	80	800	640
27	MHmm2 -Wet	YC			10	P	20	800	160
28	SBSdk -Dry	PL	7	10	16.1	P	80	1100	880
28	SBSdk -Dry	SW	8	15	14.9	P	20	1100	220
29	SBSdk -Fresh	PL	7	10	20.3	P	75	1200	900
29	SBSdk -Fresh	SW			18.8	P	25	1200	300
30	SBSdk -Moist	PL	7	10	21.7	P	20	1100	220
30	SBSdk -Moist	SW	8	15	20	P	80	1100	880
31	SBSdk -Wet	PL	7	10	12	P	20	400	80
31	SBSdk -Wet	SW			14.6	P	60	400	240
31	SBSdk -Wet	SW	8	15	14.6	P	20	400	80
32	SBSmc2 -Dry	BL			12	P	20	1000	200
32	SBSmc2 -Dry	PL	7	10	16.2	P	80	1000	800
33	SBSmc2 -Fresh	BL			15.6	P	15	1200	180
33	SBSmc2 -Fresh	PL	7	10	19.3	P	50	1200	600
33	SBSmc2 -Fresh	SW	8	15	19.3	P	35	1200	420
34	SBSmc2 -Moist	BL			19	P	30	1000	300
34	SBSmc2 -Moist	PL	7	10	18.8	P	20	1000	200

34	SBSmc2 -Moist	SW	8	15	18.6	P	50	1000	500
35	SBSmc2 -Wet	SW	8	15	12	P	50	400	200
35	SBSmc2 -Wet	SW			12	P	50	400	200

Table 4. Species composition, densities, site indices and genetic worth for TASS II Minimum (M) runs.

AU	AU Name	Species	Genetic Gain	Reference Year	SI	Regen Type	Species%	Total Planting Density	Species Planting Density
1	CWHws2 -Dry	CW			10	P	20	400	80
1	CWHws2 -Dry	HW			12	P	40	400	160
1	CWHws2 -Dry	PL	7	10	12	P	40	400	160
2	CWHws2 -Fresh	BA			21.3	P	20	500	100
2	CWHws2 -Fresh	HW			18.1	P	15	500	75
2	CWHws2 -Fresh	PL	7	10	19.7	P	15	500	75
2	CWHws2 -Fresh	SW	8	15	20	P	50	500	250
3	CWHws2 -Moist	BA			24.8	P	20	500	100
3	CWHws2 -Moist	BL			24.8	P	20	500	100
3	CWHws2 -Moist	HW			24	P	20	500	100
3	CWHws2 -Moist	SW	8	15	24.8	P	40	500	200
4	CWHws2 -Very Moist	BA			12	P	15	400	60
4	CWHws2 -Very Moist	CW			12	P	15	400	60
4	CWHws2 -Very Moist	SW	8	15	12	P	70	400	280
5	CWHws2 -Wet	CW			10	P	20	200	40
5	CWHws2 -Wet	PL	7	10	12	P	80	200	160
6	ESSFmc -Dry	BL			13.3	P	20	500	100
6	ESSFmc -Dry	PL	7	10	13.5	P	80	500	400
7	ESSFmc -Fresh	BL			13.7	P	40	700	280
7	ESSFmc -Fresh	PL	7	10	16	P	20	700	140
7	ESSFmc -Fresh	SE	8	15	15.3	P	40	700	280
8	ESSFmc -Moist	BL			14.9	P	35	700	245
8	ESSFmc -Moist	PL	7	10	18.3	P	20	700	140
8	ESSFmc -Moist	SE	8	15	18.8	P	45	700	315
9	ESSFmc -Wet	BL			10.8	P	45	500	225
9	ESSFmc -Wet	SE	8	15	12.6	P	55	500	275
10	ESSFmk -Dry	BL			9	P	20	500	100
10	ESSFmk -Dry	PL	7	10	9	P	80	500	400
11	ESSFmk -Fresh	BL			11.4	P	50	700	350
11	ESSFmk -Fresh	HM			11.4	P	20	700	140
11	ESSFmk -Fresh	SW	8	15	11.4	P	30	700	210
12	ESSFmk -Moist	BL			12	P	50	700	350
12	ESSFmk -Moist	HM			12	P	20	700	140
12	ESSFmk -Moist	SE	8	15	12.8	P	30	700	210
13	ESSFmk -Wet	BL			9	P	60	500	300
13	ESSFmk -Wet	SE	8	15	9	P	40	500	200
14	ESSFwv -Dry	BL			9	P	20	600	120
14	ESSFwv -Dry	PL	7	10	9	P	80	600	480
15	ESSFwv -Fresh	BL			11.4	P	30	700	210
15	ESSFwv -Fresh	PL			15	P	20	700	140
15	ESSFwv -Fresh	SE			14.8	P	50	700	350

16	ESSFwv -Moist	BL	7	10	12	P	30	700	210
16	ESSFwv -Moist	PL			12.4	P	20	700	140
16	ESSFwv -Moist	SE	8	15	12.4	P	50	700	350
17	ESSFwv -Wet	BL			9	P	60	500	300
17	ESSFwv -Wet	SE	8	15	9	P	40	500	200

Table 4. Species composition, densities, site indices and genetic worth for TASS II Minimum (M) runs (cont.)

AU	AU Name	Species	Genetic Gain	Reference Year	SI	Regen Type	Species%	Total Planting Density	Species Planting Density
18	ICHmc1 -Dry	HW			17.1	P	20	500	100
18	ICHmc1 -Dry	PL	7	10	19.6	P	80	500	400
19	ICHmc1 -Fresh	BL			18.8	P	15	700	105
19	ICHmc1 -Fresh	HW			18.5	P	20	700	140
19	ICHmc1 -Fresh	PL	7	10	22.4	P	15	700	105
19	ICHmc1 -Fresh	SW	8	15	23.3	P	50	700	350
20	ICHmc1 -Wet	BL			15	P	25	500	125
20	ICHmc1 -Wet	HW			15	P	20	500	100
20	ICHmc1 -Wet	SW	8	15	21	P	55	500	275
21	ICHmc2 -Dry	HW			12	P	20	500	100
21	ICHmc2 -Dry	PL	7	10	15	P	80	500	400
22	ICHmc2 -Fresh	HW			18.4	P	15	700	105
22	ICHmc2 -Fresh	PL	7	10	21.8	P	20	700	140
22	ICHmc2 -Fresh	SW	8	15	22.3	P	65	700	455
23	ICHmc2 -Moist	BL			15	P	20	500	100
23	ICHmc2 -Moist	HW			15	P	15	500	75
23	ICHmc2 -Moist	SW	8	15	21	P	65	500	325
24	MHmm2 -Dry	BA			10	P	20	500	100
24	MHmm2 -Dry	HM			10	P	80	500	400
25	MHmm2 -Fresh	BA			12.6	P	70	500	350
25	MHmm2 -Fresh	BL			12.6	P	15	500	75
25	MHmm2 -Fresh	HM			12.6	P	15	500	75
26	MHmm2 -Moist	BA			10	P	30	500	150
26	MHmm2 -Moist	BL			10	P	20	500	100
26	MHmm2 -Moist	HM			10	P	50	500	250
27	MHmm2 -Wet	HM			10	P	80	500	400
27	MHmm2 -Wet	YC			10	P	20	500	100
28	SBSdk -Dry	PL	7	10	16.1	P	80	600	480
28	SBSdk -Dry	SW	8	15	14.9	P	20	600	120
29	SBSdk -Fresh	PL	7	10	20.3	P	75	700	525
29	SBSdk -Fresh	SW			18.8	P	25	700	175
30	SBSdk -Moist	PL	7	10	21.7	P	20	600	120
30	SBSdk -Moist	SW	8	15	20	P	80	600	480
31	SBSdk -Wet	PL	7	10	12	P	20	200	40
31	SBSdk -Wet	SW			14.6	P	60	200	120
31	SBSdk -Wet	SW	8	15	14.6	P	20	200	40
32	SBSmc2 -Dry	BL			12	P	20	500	100
32	SBSmc2 -Dry	PL	7	10	16.2	P	80	500	400
33	SBSmc2 -Fresh	BL			15.6	P	15	700	105

33	SBSmc2 -Fresh	PL	7	10	19.3	P	50	700	350
33	SBSmc2 -Fresh	SW	8	15	19.3	P	35	700	245
34	SBSmc2 -Moist	BL			19	P	30	500	150
34	SBSmc2 -Moist	PL	7	10	18.8	P	20	500	100
34	SBSmc2 -Moist	SW	8	15	18.6	P	50	500	250
35	SBSmc2 -Wet	SW	8	15	12	P	50	200	100
35	SBSmc2 -Wet	SW			12	P	50	200	100

Table 5. Net merchantable volume at age 80 by analysis unit for the TASS II S, P and M runs

		Net Merch Vol Age 80 (NMV80) (m^3/ha)		
AU	**AU Name**	**S**	**P**	**M**
1	CWHws2 -Dry	58	58	40
2	CWHws2 -Fresh	386	365	294
3	CWHws2 -Moist	554	537	471
4	CWHws2 -Very Moist	120	116	82
5	CWHws2 -Wet	41	41	21
6	ESSFmc -Dry	143	139	97
7	ESSFmc -Fresh	228	224	197
8	ESSFmc -Moist	315	317	278
9	ESSFmc -Wet	141	142	111
10	ESSFmk -Dry	43	43	28
11	ESSFmk -Fresh	123	121	108
12	ESSFmk -Moist	152	150	131
13	ESSFmk -Wet	46	45	38
14	ESSFwv -Dry	39	45	32
15	ESSFwv -Fresh	186	189	157
16	ESSFwv -Moist	155	155	131
17	ESSFwv -Wet	41	46	39
18	ICHmc1 -Dry	270	258	176
19	ICHmc1 -Fresh	446	442	393
20	ICHmc1 -Wet	373	380	296
21	ICHmc2 -Dry	138	138	89
22	ICHmc2 -Fresh	425	422	387
23	ICHmc2 -Moist	396	391	319
24	MHmm2 -Dry	21	32	22
25	MHmm2 -Fresh	111	122	85
26	MHmm2 -Moist	50	50	34
27	MHmm2 -Wet	34	36	24
28	SBSdk -Dry	211	205	155
29	SBSdk -Fresh	300	317	265
30	SBSdk -Moist	382	385	331
31	SBSdk -Wet	141	147	91
32	SBSmc2 -Dry	185	174	119

33	SBSmc2 -Fresh	332	331	289
34	SBSmc2 -Moist	362	362	284
35	SBSmc2 -Wet	102	103	66

Appendix G – Previously Approved Stocking Requirements

As Approved on July 27, 2007

7.0 STOCKING REQUIREMENTS

7.1 Definitions

In Part 7.0:

(a) **"NSR"** means not containing a regenerated stand meeting the stocking standards in Divisions 7.3 and 7.4 and Appendices A and B of this FSP;

(b) **"M Value for Stocking and Free Growing Surveys"** means the maximum number of healthy, well-spaced trees that may be tallied in a single plot as calculated by dividing the target stocking standard for the standards unit by the plot multiplier, which, if not a whole number, is rounded to the nearest higher whole number; and

(c) **"Countable Conifer"** means a conifer tree with a height that is:

(i) 30 % of the median height of the preferred and acceptable well-spaced trees in the same survey plot, if that median height is less than 2 meters; or

(ii) 50 % of the median height of the preferred and acceptable well-spaced trees in the same survey plot, if that median height is 2 meters or greater.

7.2 Election

For the purposes of section 16(1) of the FPPR, section 44(1) of that regulation will apply to each area to which this FSP applies where the FSP Holder is required to establish a free growing stand.

7.3 General Standards

For the purposes of section 16(3) of the FPPR, for each area to which this FSP applies where the Agreement Holder is required to establish a free growing stand:

a. the applicable regeneration date and applicable stocking standards referred to in section 44(1)(a) of the FPPR, and
b. the applicable free growing date and applicable stocking standards referred to in section 44(1)(b) of the FPPR, and
c. for the purposes of regeneration surveys and free to grow surveys the M Value for Stocking and Free Growing Surveys and Countable Conifer as defined in Division 7.1 will apply,

are, subject to the special circumstances in Division 7.4, as set out in Appendix A opposite the **BEC** site series that occupies the largest portion of the standards unit.

7.4 Special Circumstances

The special circumstances referred to in Division 7.3 are:

(a) where harvesting within Core Ecosystems results in openings > 1 ha, the Reforestation Target Stocking Standard (TSS) will be equal to the Minimum Stocking Standards (MSS), as defined by Appendix A for the corresponding BEC site series of the site.

(b) where a standards unit does not meet the tree height over deleterious competition at free growing specified in Appendix A:

- (i) deleterious competition at the time of free growing will be assessed using *Appendix 9 of the Prince Rupert Region Establishment to Free Growing Guidebook, May 2000*; and
- (ii) the individual tree free growing assessment method (quadrant method) in *Appendix 9* will apply to all **BEC** subzones in the Bulkley Timber Supply Area; and
- (iii) the definition of upland cottonwood in *Appendix 9* will be taken to mean any cottonwood not growing on a floodplain or fluvial deposit;

(c) aspen, cottonwood and birch, are not considered deleterious competition:

- (i) within the riparian management area of a stream, wetland or lake; or
- (ii) where there is an incidence of greater than 20% of spruce crop trees by number affected by Pissodes strobi (White Pine Weevil);

(d) brush species within 10 meters of a **Classified Riparian Feature** are not considered deleterious competition;

(e) for a standards unit comprised of more than one **BEC** site series:

- (i) the preferred and acceptable species for the standards unit includes all of the preferred and acceptable species for all of the **BEC** site series comprising the standards unit;
- (ii) the preferred and acceptable species will be planted only where they are ecologically suited within the standards unit; and
- (iii) the target stocking standards (stems per hectare), minimum preferred and acceptable (stems per hectare), minimum preferred (stems per hectare), minimum inter-tree distance (m) and minimum height at free growing (m)will be those of the dominant site series;

(f) the maximum density of countable coniferous stems is 10,000 per hectare for all **BEC** site series;

(g) The minimum inter-tree distance may be reduced to 1.6 meters for Standards Units (SUs) where:

- (i) Will be reduced from 2.0 m to 1.6 m for Standard Units (SUs) where Mechanical Site Preparation has been applied; or
- (ii) For hygric and sub-hygric Standard Units (SUs) identified by Appendix A, the Minimum Inter Tree Distance (MITD) is:
  1.0 metre for a pair of well-spaced trees, if the next well-spaced tree is
  1.6 meters from either well-spaced tree in the pair.

(h) exotic species planted in research trials, not exceeding the lesser of 2 hectares or 10% of the **NAR** of a cutblock, will be considered preferred trees;

(i) for crop trees to be acceptable at the Regeneration Date and the Free Growing Date they must meet the:

- (i) Appendix 10: Advance Regeneration Acceptability Criteria from the *Prince Rupert Region Establishment to Free Growing Guidebook, May 2000;* or
- (ii) Prince Rupert Forest Region, Regional Operating Standards # 1, Acceptability Criteria for Balsam Advanced Regeneration, July 22, 1997; and
- (iii) Appendix 5: Free growing Damage Criteria for BC from the *Prince Rupert Region Establishment to Free Growing Guidebook, May 2000*; and
- (iv) the revised damage criteria for assessing Dothistroma in the ICH and CWH sub-zones,

(set at 50 % defoliation), as defined by the FPC Bulletin Number 44, Oct 6, 2003.

(j) Partial Cutting Silviculture Stocking Standards, Appendix B, may be applied to standards units, where partial cutting silviculture systems have been implemented, and where the retained stems greater than 12.5 centimeters diameter at breast height have a combined basal area greater than 5 metre^2/hectare;

(k) Division 7.3 does not apply to an area:
  (i) where the timber harvested was in danger of being significantly reduced in value, lost or destroyed; and
  (ii) the harvested area, when taken together with an adjoining harvested area, will not result in an opening with a contiguous NSR greater than or equal to 1 hectare.

7.5 No Intermediate Cutting or Special Forest Products

The Agreement Holder does not propose to carry out timber harvesting on an area that is restricted to:

(a) commercial thinning, removal of individual trees, or a similar type of intermediate cutting, or

(b) harvesting of special forest products, and as such, section 16(4) and 44(4) of the FPPR have no application to this FSP.

(as approved on July 27, 2007)

Appendix A: Even Aged Stocking Standards Nov 1, 2007

MOFR Stocking ID	Stocking ID Name	BEC Zone, Subzone, Variant	Site Series	Preferred Species	Acceptable Species	Target preferred and acceptable (sph)[1]	Minimum preferred and acceptable (sph)[1]	Minimum preferred (sph)[1]	Minimum inter-tree distance (m)	Regeneration Delay (maximum years)	Minimum height at free growing (m)		Tree height over deleterious competition at free growing (minimum %)
1014545	Bramble	CWHws2	01	Ba Bl Cw Hw Sxs	Pl Hm	900	500	400	2.0	6	Pl Hw Others	2.00 1.30 1.00	150%
1014546	Kinnikinnick	CWHws2	02	Pl Hw	Cw Hm	600	400	400	2.0	6	Pl Others	1.40 0.80	150%
1014547	Feathermoss Major Species[4]	CWHws2	03	Pl Hw	Ba[4] Bl[4] Hm Cw	900	500	400	2.0	6	Pl Hw Others	2.00 1.30 1.00	150%
1014548	Feathermoss	CWHws2	03	Pl Hw	Cw Hm	900	500	400	2.0	6	Pl Hw Others	2.00 1.30 1.00	150%
1014549	Oak Fern	CWHws2	04	Ba Bl Cw Hw Sxs	Hm	900	500	400	2.0	3	Hw Others	1.30 1.00	150%
1014550	Queen's Cup	CWHws2	05	Ba Bl Cw Hw Sxs		900	500	400	2.0	6	Hw Others	1.30 1.00	150%
1014552	Devil's Club	CWHws2	06	Ba Bl Cw Hw Sxs		900	500	400	2.0	3	Hw Others	1.30 1.00	150%
1014552	Fluvial Benchs	CWHws2	07/08/09	Ba Bl Cw Sxs Hw		900	500	400	2.0	3	Hw Others	1.30 1.00	150%
1014553	Spagnum - Peat Moss Bog	CWHws2	10	Pl	Cw Hm Hw	600	300	200	1.0	3	Pl Others	1.40 0.80	150%
1014554	Skunk Cabbage	CWHws2	11	Cw Sxs	Ba Hw	1000	500	400	1.0	3	All	0.80	150%
1014555	Huckleberry - Liverwort Below 1200m[3]	ESSFmc	01	Bl Sx Pl[3]		1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1014556	Huckleberry Above 1200m[3]	ESSFmc	01	Bl Sx	Pl[3]	1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1014557	Juniper Major Species[4]	ESSFmc	02	Bl[4] Sx[4] Pl		1000	500	400	2.0	7	Pl Others	1.20 0.60	125%
1014558	Juniper	ESSFmc	02	Pl	Bl Sx	1000	500	400	2.0	7	Pl Others	1.20 0.60	125%
1014557	Huckleberry-Crowberry Major Species[4]	ESSFmc	03	Bl[4] Sx[4] Pl		1000	500	400	2.0	7	Pl Others	1.20 0.60	125%
1014558	Huckleberry-Crowberry	ESSFmc	03	Pl	Bl Sx	1000	500	400	2.0	7	Pl Others	1.20 0.60	125%
1014561	Huckleberry-Heron's Bill	ESSFmc	04	Bl Sx Pl		1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1014562	Huckleberry-Thimbleberry Below 1200m[3]	ESSFmc	05	Bl Sx Pl[3]		1200	700	600	2.0	4	Pl Others	1.60 0.80	125%
1014563	Huckleberry-Thimbleberry Above 1200m[3]	ESSFmc	05	Bl Sx	Pl[3]	1200	700	600	2.0	4	Pl Others	1.60 0.80	125%
1014562	Oak Fern-Heron's Bill Below 1200m[3]	ESSFmc	06	Bl Sx Pl[3]		1200	700	600	2.0	4	Pl Others	1.60 0.80	125%
1014563	Oak Fern-Heron's Bill Above 1200m[3]	ESSFmc	06	Bl Sx	Pl[3]	1200	700	600	2.0	4	Pl Others	1.60 0.80	125%
1014566	Devil's Club -Lady Fern	ESSFmc	07	Bl Sx	Pl	1200	700	600	2.0	4	Pl Others	1.60 0.80	125%
1014567	Valerian - Sickle Moss	ESSFmc	08	Bl Sx		1200	600	400	1.0	4	All	0.60	125%
1014567	Horse Tail -Glow Moss	ESSFmc	09	Bl Sx		1200	600	400	1.0	4	All	0.60	125%
1014567	Horse Tail - Leafy Moss	ESSFmc	10	Bl Sx		1200	600	400	1.0	4	All	0.60	125%
1014570	Twisted Stalk	ESSFmk	01	Bl Sx	Hm Ba Pl	1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1014571	Pine - Lichen Major Species[4]	ESSFmk	02	Pa Pl Bl[4] Hm[4] Sx[4]		1000	500	400	2.0	7	Pl Others	1.20 0.60	125%
1014572	Pine - Lichen	ESSFmk	02	Pa Pl	Bl Hm Sx	1000	500	400	2.0	7	Pl Others	1.20 0.60	125%
1014573	Balsam - Lichen Major Species[4]	ESSFmk	03	Pa Pl Bl[4] Hm[4] Sx[4]	Ba	1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1014574	Balsam - Lichen	ESSFmk	03	Pa Pl	Ba Bl Hm Sx	1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1014575	Oak Fern	ESSFmk	04	Bl Sx	Hm Ba Pl	1200	700	600	2.0	4	Pl Others	1.60 0.80	125%
1014576	Devil's Club -Lady Fern	ESSFmk	05	Bl Sx	Hm Ba Pl	1200	700	600	2.0	4	Pl Others	1.60 0.80	125%
1014577	Horse Tail - Leafy Moss	ESSFmk	06	Bl Sx	Ba Hm	1200	600	400	1.0	4	All	0.80	125%
1014578	Lady Fern - Horse Tail	ESSFmk	07	Bl Sx	Ba	1200	600	400	1.0	4	All	0.80	125%

MOFR Stocking ID	Stocking ID Name	BEC Zone, Subzone, Variant	Site Series	Preferred Species	Acceptable Species	Target preferred and acceptable (sph)[1]	Minimum preferred and acceptable (sph)[1]	Minimum preferred (sph)[1]	Minimum inter-tree distance (m)	Regeneration Delay (maximum years)	Minimum height at free growing (m)		Tree height over deleterious competition at free growing (minimum %)
1015230	Azalea	ESSFwv	01	Bl Sx	Hm Hw Pl	1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1015231	Lichen Major Species[4]	ESSFwv	02	Pl Bl[4] Sx[4]	Hm	1000	500	400	2.0	7	Pl Others	1.20 0.60	125%
1015232	Lichen	ESSFwv	02	Pl	Hm Bl Sx	1000	500	400	2.0	7	Pl Others	1.20 0.60	125%
1015233	Feathermoss Major Species[4]	ESSFwv	03	Pl Bl[4] Sx[4]	Hm Hw	1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1015234	Feathermoss	ESSFwv	03	Pl	Hw Hm Bl Sx	1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1015253	Heron's Bill Major Species[4]	ESSFwv	04	Pl Bl Sx[4]	Hm	1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1015254	Heron's Bill	ESSFwv	04	Pl Bl	Hm Sx	1200	700	600	2.0	7	Pl Others	1.60 0.80	125%
1015255	Oak Fern - Heron's Bill	ESSFwv	05	Bl Sx	Hm Hw Pl	1200	700	600	2.0	4	Pl Others	1.60 0.80	125%
1015255	Devil's Club - Lady Fern	ESSFwv	06	Bl Sx	Hm Hw Pl	1200	700	600	2.0	4	Pl Others	1.60 0.80	125%
1015257	Valerian - Sickle Moss	ESSFwv	07	Bl Sx	Hm Hw	1200	600	400	1.0	4	All	0.60	125%
1015258	Horse Tail -Glow Moss	ESSFwv	08	Bl Sx		1200	600	400	1.0	4	All	0.60	125%
1015258	Lady Fern - Horse Tail	ESSFwv	09	Bl Sx		1200	600	400	1.0	4	All	0.60	125%
1015260	Step Moss	ICHmc1	01	Hw Sx Bl	Pl	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015261	Kinnikinnick-Lichen	ICHmc1	02	Pl	Bl Hw	1000	500	400	2.0	7	Pl Others	1.40 0.80	150%
1015303	Oak Fern	ICHmc1	03	Hw Sx Bl Ba	Pl	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015303	Devil's Club	ICHmc1	04	Hw Sx Bl Ba	Pl	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015351	Cottonwood - Dogwood	ICHmc1	05	Sx Bl Ba		1200	700	600	2.0	4	All	1.00	150%
1015352	Azalea - Skunk Cabbage	ICHmc1	06	Sx Bl Ba	Hw	1200	600	400	1.0	4	All	0.80	150%
1015355	Bramble	ICHmc1a	01	Hw Sx Ba	Pl Bl	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015355	Oak Fern	ICHmc1a	02	Hw Sx Ba	Pl Bl	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015355	Devil's Club - Lady Fern	ICHmc1a	03	Hw Sx Ba	Pl Bl	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015357	Step Moss	ICHmc2	01	Hw Sx Cw Bl	Pl Ba	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015359	Kinnikinnick-Lichen	ICHmc2	02	Pl	Bl Hw Ba	1000	500	400	2.0	7	Pl Others	1.40 0.80	150%
1015357	Oak Fern	ICHmc2	03	Hw Sx Cw Bl	Pl Ba	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015360	Devil's Club -Oak Fern	ICHmc2	04	Cw Sx Bl	Ba Pl Hw	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015360	Devil's Club - Lady Fern	ICHmc2	05	Cw Sx Bl	Ba Pl Hw	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015361	Cottonwood - Dogwood	ICHmc2	06	Cw Sx	Hw Ba Bl	1200	700	600	2.0	4	All	1.00	150%
1015362	Horse Tail - Skunk Cabbage	ICHmc2	07	Sx Cw Bl Ba	Hw	1200	600	400	1.0	4	All	1.00	150%
1015363	Scrub Birch - Sedge	ICHmc2	08	Sb Sx	Pl	600	300	200	1.0	4	Pl Others	1.40 0.80	150%
1015364	Feathermoss	ICHmc2	51	Bl Hw Pl	Ba Sx	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015365	Thimbleberry - Hazelnuts	ICHmc2	52	Hw Sx Cw Bl	Pl Ba	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015366	Dogwood	ICHmc2	53	Hw Sx Cw Bl	Pl Ba	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015367	Devil's Club	ICHmc2	54	Cw Sx Bl	Ba Pl Hw	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015370	Spirea-Peavine	SBSdk	01	Pl Sx	Fd	1200	700	600	2.0	7	Pl Fd Others	2.00 1.40 1.00	150%
1015371	Juniper	SBSdk	02	Pl	Sx	1000	500	400	2.0	7	Pl Others	1.40 0.80	150%
1015372	Feathermoss - Lichen	SBSdk	03	Pl	Sb Sx	1200	700	600	2.0	7	Pl Others	2.00 1.00	150%
1015373	Fd- Soopalallie - Feathermoss	SBSdk	04	Fd Pl Sx		1200	700	600	2.0	7	Pl Fd Others	2.00 1.40 1.00	150%

MOFR Stocking ID	Stocking ID Name	BEC Zone, Subzone, Variant	Site Series	Preferred Species	Acceptable Species	Target preferred and acceptable (sph)[1]	Minimum preferred and acceptable (sph)[1]	Minimum preferred (sph)[1]	Minimum inter-tree distance (m)	Regeneration Delay (maximum years)	Minimum height at free growing (m)		Tree height over deleterious competition at free growing (minimum %)
1015405	Spirea - Feathermoss	SBSdk	05	Pl Sx	Fd	1200	700	600	2.0	7	Pl Fd Others	2.00 1.40 1.00	150%
1015406	Twinberry - Colts Foot	SBSdk	06	Pl Sx	Fd	1200	700	600	2.0	4	Pl Others	2.00 1.00	150%
1015407	Horse Tail	SBSdk	07	Sx	Pl	1200	600	400	1.0	4	Pl Others	1.40 0.80	150%
1015408	Cotton Wood - Dogwood Flood Plains	SBSdk	08	Sx		1200	700	600	2.0	4	All	1.00	150%
1015409	Shagnum - Peat Moss with Snowberry	SBSdk	09	Pl Sb	Sx	600	300	200	1.0	4	Pl Others	1.40 0.80	150%
1015410	Shagnum - Peat Moss with Sedge	SBSdk	10	Pl Sb Sx		600	300	200	1.0	4	Pl Others	1.40 0.80	150%
1015431	Huckleberry	SBSmc2	01	Pl Sx Bl		1200	700	600	2.0	7	Pl Others	1.60 0.80	150%
1015432	Huckleberry - Lichen	SBSmc2	02	Pl	Bl Sx	1000	500	400	2.0	7	Pl Others	1.20 0.60	150%
1015433	Feathermoss	SBSmc2	03	Pl Sx Bl	Sb	1200	700	600	2.0	7	Pl Others	1.60 0.80	150%
1015434	Twinberry - Colts Foot	SBSmc2	05	Pl Sx Bl		1200	700	600	2.0	4	Pl Others	1.60 0.80	150%
1015434	Oak Fern	SBSmc2	06	Pl Sx Bl		1200	700	600	2.0	4	Pl Others	1.60 0.80	150%
1015435	Scrub Birch - Feather Moss	SBSmc2	07	Pl Sb Sx	Bl	1200	600	400	1.0	4	Pl Others	1.20 0.60	150%
1015436	Devil's Club	SBSmc2	09	Sx Bl	Pl	1000	500	400	2.0	4	Pl Others	1.60 0.80	150%
1015437	Devil's Club Frost Prone[2]	SBSmc2	09	Sx Bl Pl[2]		1000	500	400	2.0	4	Pl Others	1.60 0.80	150%
1015438	Horse Tail	SBSmc2	10	Sx Bl	Pl	1200	600	400	1.0	4	Pl Others	1.20 0.60	150%
1015439	Horse Tail Frost Prone[2]	SBSmc2	10	Sx Bl Pl[2]		1200	600	400	1.0	4	Pl Others	1.20 0.60	150%
1015440	Scrub Birch - Sedge	SBSmc2	12	Sb Sx	Bl Pl	600	300	200	1.0	4	Pl Others	1.20 0.60	150%

Footnotes for Appendix A

1 Average well-spaced trees per hectare.

2 In the SBSmc2 09 and 10, Pl is a preferred species on sites which are frost prone

3 In the ESSFmc 01,05 and 06 site series, Pl is a preferred species up to 1200 m elevation, and above 1200 m Pl is an acceptable species.

4 "Major Species" standards regimes will be applied only to standards units in which the footnoted species occurs as a major species, defined as greater than 20% of the total merchantable stems per hectare taken from the cutblock cruise data, in a pre-harvest natural stand.

Conifer Tree Species

"Ba" means amabilis fir;
"Bl" means subalpine fir;
"Cw" means western red cedar;
"Fd" means Douglas-fir;
"Hm" means mountain hemlock;
"Hw" means western hemlock;
"Pl" means lodgepole pine;
"Ss" means Sitka spruce;
"Sx" means hybrid spruce or interior spruce;
"Sxs" means hybrid Sitka spruce;
“Pa” means whitebark pine;
“Sb” means black spruce;
“Se” means Engelmann spruce;
“Sw” means white spruce;

Appendix H: Maps

Map 1: Pacific Inland Resources Existing Cutting Permit and Road Permit Obligations in the Bulkley TSA.

Map 2: Bulkley TSA Amalgamated Resource Management Zone Map
Showing designations in effect 4 month before the Date of Submission

Map 3: Bulkley TSA Scenic Areas and Viewpoints

Map 4: Pacific Inland Resources Bulkley Forest Development Unit

This Page Intentionally Left Blank

Appendix I: Approved Cutting Permits and Road Permits held by the Agreement Holder (FPPR section 14(3)(j))

Table 1: Approved cutting permit and blocks under which the FSP Holder still has timber harvesting to be completed:

Licence	Cutting Permit	Block
A16830	070	018
A16830	078	043
A16830	078	047
A16830	078	055
A16830	081	119
A16830	081	121
A16830	081	123
A16830	081	124
A16830	086	315
A16830	087	139
A16830	087	140
A16830	117	016
A16830	117	018
A16830	117	022
A16830	117	023
A16830	117	049
A16830	117	050
A16830	118	001
A16830	118	003
A16830	118	300
A16830	621	001
A16830	621	002
A16830	621	003
A16830	621	004
A16830	621	005
A16830	621	006
A16830	631	1
A16830	661	020
A16830	661	021
A16830	661	022
A16830	661	035
A16830	661	083
A16830	661	156
A16830	661	222
A16830	661	238
A16830	661	239
A16830	663	001
A16830	663	002
A16830	663	003
A16830	663	004
A16830	663	005

Licence	Cutting Permit	Block
A16830	663	006
A16830	663	091
A16830	663	625
A16830	674	001
A16830	678	001
A16830	678	017
A16830	679	001
A16830	679	002
A16830	679	003
A16830	679	004
A16830	679	006
A16830	697	364
A16830	760	001
A16830	760	002
A16830	760	004
A16830	760	005
A16830	760	006
A16830	760	007
A16830	762	001
A16830	762	002
A16830	791	004
A16830	845	004
A16830	845	005
A16830	845	007
A16830	845	008
A16830	845	009
A16830	845	010
A16830	845	028
A16830	912	042
A16830	914	011
A16830	914	015
A16830	914	016

Table 2: Approved Road Permits and Sections under which the FSP Holder still has timber harvesting to be completed:

Licence	Road Permit	Section
A16830	R07775	CP117-017-SP1
A16830	R07775	CP117-023-SP1
A16830	R07775	CP117-049-SP1
A16830	R07775	CP117-049-SP9
A16830	R07775	CP117-050-SP5
A16830	R07775	CP621-002-SP6
A16830	R07775	CP621-003-SP1
A16830	R07775	CP621-004-SP2
A16830	R07775	CP621-005-SP1

Licence	Road Permit	Section
A16830	R07775	CP621-006-SP3
A16830	R07775	CP661-083-SP1
A16830	R09511	418-4-6
A16830	R09511	CP070-018-SP1
A16830	R09511	CP070-018-SP2
A16830	R09511	CP070-018-SP3
A16830	R09511	CP070-018-SP4
A16830	R09511	CP070-018-SP5
A16830	R09511	CP083-059-SP2
A16830	R09511	CP083-133-SP1
A16830	R09511	CP083-133-SP5
A16830	R09511	CP083-134-SP3
A16830	R09511	CP661-020-SP1
A16830	R09511	CP661-020-SP3
A16830	R09511	CP661-156-SP1
A16830	R09511	CP661-156-SP4
A16830	R09511	CP663-003-SP1
A16830	R09511	CP663-004-SP1
A16830	R09511	CP663-005-SP1
A16830	R09511	CP663-006-SP1
A16830	R09511	CP663-625-SP1
A16830	R09511	CP678-001-SP1
A16830	R09511	CP678-001-SP2
A16830	R09511	CP679-003-SP7
A16830	R09511	CP679-004-SP1
A16830	R09511	CP679-006-SP9
A16830	R09511	CP697-364-SP1
A16830	R09521	CP760-004-SP1
A16830	R09521	CP760-007-SP2
A16830	R09521	CP760-007-SP3
A16830	R09521	CP762-002-SP1
A16830	R09533	70-1
A16830	R09533	CP914-011-SP2

Appendix J: Blocks Where Layout was Completed Prior to January 1, 2018

CP	Block	Status	CP	Block	Status
79	55	Timber harvesting completed.	TBD	Ha90	Timber harvesting completed.
79	56		TBD	Ha89	
79	64		TBD	Ha106	
79	66		TBD	Ha81	
79	72		TBD	Ha83	
79	73		TBD	Ha84	
79	74		TBD	Ha85	
79	79		TBD	Ha102	
79	93		TBD	Ha107	
79	94		TBD	Ha115	
79	95		TBD	Ha118	
79	98		TBD	Ha127	
79	101		TBD	Ha132	
79	108		TBD	Ha135	
79	127		TBD	Ha137	
79	128		TBD	Ha138	
79	129				
79	348				
94A	1	Timber harvesting completed.			
94A	2				
94A	3				
94A	4				
94A	5				
377	1	Timber harvesting completed.			
378	3				
396	2				
396	3				
910	1	Timber harvesting completed.			
910	2				
910	3				
910	4				

Appendix K: Pacific Inland Resources (PIR) Public, Stakeholders, and First Nations Communication and Engagement Commitments

PIR is committed to communicating and engaging with the public, stakeholders, and First Nations that may be directly affected by their forestry activities. PIR recognizes to make these communication and engagement efforts valuable, the public, stakeholders, and First Nations require suitable information to fully understand and respond to forestry activities occurring in areas in which they have an interest. This information is not only required at the time that a Forest Stewardship Plan is proposed for approval but on an ongoing basis. The timely provision of best available information on the location of future cut blocks and roads, and the likely schedule of operations for activities (including changes to access such as road reactivation/deactivation) is required for interested parties to determine if and how they may be affected.

To facilitate communication of this information PIR is intending to implement the following strategies going forward. These strategies may be amended from time to time to reflect changes in Government policy and technological methods for communicating and distributing information. Communication and engagement efforts made by PIR are documented and tracked on a continual basis.

Public Communication

PIR is committed to making available to the public, at a minimum on an annual basis, the location of its proposed forestry operations. Currently this is being facilitated through the use of the Bulkley Web Map Service (BWMS) https://maps.forsite.ca/bml_infoshare/ that is being used by all major licensees in the Bulkley and Morice TSAs. The BWMS embraces the following principles:

- Provides a simple, single access point for most forest development (i.e., roads and blocks) information to the public, stakeholders, and First Nations.
- Encourages collaboration among forest operators.
- Demonstrates information that is up-to-date and reliable.
- Combines and make data readily available to participating members for further planning and analysis.

PIR is providing updated information to the BWMS twice per year, in approximately May and November. If for some unforeseen circumstance the BWMS service is discontinued PIR will implement an alternative method to annually communicate its forestry operations to the public.

First Nations

As part of the FSP process, PIR attempted to start an FSP information sharing process involving affected First Nations, and FLNRORD in March 2017 well prior to the start of the 60-day public review period. However, attempts at initiating this process did not culminate, therefore PIR sent out letters and maps to the affected First Nations describing the proposed plan during the public referral period and followed up with meetings where interest was expressed. The efforts

made and the success of this process is documented in the FSP referral package submitted to the FLNRO on December 6, 2017.
The provisions of the FSP in regards to Cultural Heritage Resources include commitments to communicate with an affected First Nation the general areas that are proposed for timber harvesting or road construction under this FSP. PIR envisions this to be a flexible process that is dependent on the type of development and the capacity of the First Nation affected. In most cases, efforts will be made to gather site level information from affected First Nation groups prior to the final design and layout of a cutting permit or road. Depending on the cultural importance of the area and the capacity of the First Nation this process may involve sending letters and maps, holding meetings, on-site inspections with First Nation representatives, or the transfer of digital block and road design data. All efforts to gather and communicate this information will be documented by the agreement holder. Processes will also be influenced and may require amending due to government policy and agreements made between First Nations and Government such as Forest Consultation and Revenue Sharing Agreements (FCRSA) and Strategic Engagement Agreements (SEA).

Trapping Tenure Holders

During the 60-day Forest Stewardship Plan public review period PIR sent out letters to all trapline tenure holders that overlap PIR's forest development units. The letters described the proposed plan and that the proposed FSP and associated maps could be found at the following website; http://www.westfraser.com/responsibility/local-forest-management/divisional-plans-publications-0/pacific-inland-resources-fsps. As well that the blocks and roads PIR is proposing for development over approximately the next 3 years can be found at the following website: http://services.forsite.ca/BML_infoshare. The efforts made and the success of this process is documented in the FSP referral package submitted to the FLNRO on December 6, 2017.
PIR has and will continue to notify trapline tenure holders of proposed harvesting operations prior to operations commencing. The process for this is to send out annual notification letters, usually in May and June each year, to all trapline tenure holders that overlap PIR's operations outlining PIR's proposed harvest schedule for the upcoming year. In this letter PIR lists specific blocks that are planned for harvest within the trapline holders' territory in the next 12 months. Maps that accompany these letters outline blocks planned for harvest in the next 3 years so the tenure holder is aware of PIR's longer term planned activities, and can provide feedback if they desire. As well PIR will be refencing the Bulkley Morice Web Map Service (BMWMS) https://maps.forsite.ca/bml_infoshare/ that is being used by all major licensees in the Bulkley and Morice TSAs.

Guiding Tenure Holders

During the 60-day Forest Stewardship Plan public review period PIR sent out letters to all guide tenure holders that overlap PIR's forest development units. The letters described the proposed plan and that the proposed FSP and associated maps could be found at the following website; http://www.westfraser.com/responsibility/local-forest-management/divisional-plans-publications-0/pacific-inland-resources-fsps. As well the blocks and roads PIR is proposing for development over approximately the next 3 years can be found at the following website:

http://services.forsite.ca/BML_infoshare. The efforts made and the success of this process is documented in the FSP referral package submitted to the FLNRO on December 6, 2017.
PIR has and will continue to notify guide tenure holders of proposed harvesting operations prior to operations commencing. The process for this is to send out annual notification letters, usually in May and June each year, to all guide tenure holders that overlap PIR's operations outlining PIR's proposed harvest schedule for the upcoming year. In this letter PIR lists specific blocks that are planned for harvest within the guide holders' territory in the next 12 months. Maps sent out with these letters outline blocks planned for harvest in the next 3 years so the tenure holder is aware of PIR's longer term planned activities, and can provide feedback if they desire. As well PIR will be refencing the Bulkley Web Map Service (BWMS) https://maps.forsite.ca/bml_infoshare/ that is being used by all major licensees in the Bulkley TSA.

Range Tenure Holders

During the 60-day Forest Stewardship Plan public review period PIR sent out letters to all range tenure holders that overlap PIR's forest development units. The letters described the proposed plan and that the proposed FSP and associated maps could be found at the following website; http://www.westfraser.com/responsibility/local-forest-management/divisional-plans-publications-0/pacific-inland-resources-fsps. As well the blocks and roads PIR is proposing for development over approximately the next 3 years can be found at the following website: http://services.forsite.ca/BML_infoshare. The efforts made and the success of this process is documented in the FSP referral package submitted to the FLNRO on December 6, 2017.
PIR has and will continue to notify range tenure holders of proposed harvesting operations prior to operations commencing. The process for this is to send out annual notification letters, usually in May and June each year, to all range tenure holders that overlap PIR's operations outlining PIR's proposed harvest schedule for the upcoming year. In this letter PIR lists specific blocks that are planned for harvest within the range tenure holders' territory in the next 12 months. Maps sent out with these letters outline blocks planned for harvest in the next 3 years so the tenure holder is aware of PIR's longer term planned activities, and can provide feedback if they desire. As well PIR will be refencing the Bulkley Web Map Service (BWMS) https://maps.forsite.ca/bml_infoshare/ that is being used by all major licensees in the Bulkley TSA.

Appendix L:

ORDER – Wildlife Habitat Area
 # 6-333
Northern Caribou – Telkwa Herd
Skeena-Stikine and Nadina Natural Resource Districts

This order is given under the authority of sections 9 (2), 10 (1) and 10 (2) of the *Government Actions Regulation* (B.C. Reg. 582/04).

1. The Skeena Regional Executive Director of Forests, Lands and Natural Resource Operations, being satisfied that:

   i. the following area contains habitat that is necessary to meet the habitat requirements for northern caribou – Telkwa herd (*Rangifer tarandus caribou*);

   orders that:

   a) the area shown in the attached Schedule A (WHA 6-333) and contained in the wildlife habitat area (WHA) spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) is established as wildlife habitat area WHA 6-333 for northern caribou (Telkwa herd). The centre point of the line on the attached Schedule A is what establishes the WHA boundary; and

   b) if there is a discrepancy between the areas shown in the map set out in the attached Schedule As and the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY), the areas as detailed in the WHA spatial layer will take precedent; and

   c) pursuant to section 7(3) of the *Forest Planning and Practices Regulation*, the person(s) required to prepare a forest stewardship plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* to the extent that WHA 6-333 address the amount included for northern caribou (Telkwa herd) in the Notice for the Morice timber supply area.

2. The Skeena Regional Executive Director of Forests, Lands and Natural Resource Operations, being satisfied that:

   i. the general wildlife measures (GWMs) described below are necessary to protect or conserve northern caribou (Telkwa herd) and the habitat of northern caribou (Telkwa herd); and

   ii. GAR or another enactment does not otherwise provide for that protection or conservation;

   orders that:

   a) the GWMs outlined in Schedule 1 are established for WHA 6-333;

   b) for woodlot licensees, only GWM 6 outlined in Schedule 1 is applied to the area specified as WHA 6-333;

c) for the Bulkley and Morice timber supply areas (TSAs), LRMP management zones with legal "Objectives Set by Government" exist within WHA 6-333. Their legal management direction will continue to apply following enactment of this Order. The landbase within these areas within WHA #6-333 shall contribute to achievement of WHA #6-333 General Wildlife Measures. Seral stage thresholds as directed by this Order are applicable by biogeoclimatic zone and variant (ESSF, SBSmc and SBSdk) by timber supply area within the WHA. Small areas of CWH and ICH biogeoclimatic zones will be grouped with SBSmc or SBSdk for management direction. Temporary mature plus old seral retention targets areas should be planned and designed to include desirable caribou habitat attributes per Schedule 1, items 2(c), 3(c) and 4(c), and to maintain an even distribution pattern across the WHA; and

3. The Skeena Regional Executive Director of Forests, Lands and Natural Resource Operations, being satisfied that:

   i. the wildlife habitat area requires special management that has not otherwise been provided for under GAR or another enactment;

   orders that:

   a) the objectives outlined in Schedule 2 are established for WHA 6-333.

Definitions

Words and expressions not defined in this order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made there under, unless context indicates otherwise.

a) General Road Class Definitions:

   i. Mainline road – A mainline road is an artery road providing access to a watershed, or a given geographic area. A mainline road is usually a long-term permanent road that may be used continuously or intermittently.

   ii. Operational roads – An operational road branches off a mainline road or another operational road. This class of road provides access to cut blocks which are part of one or more cutting permits or timber sales. An operational road is normally considered to be a medium term road.

   iii. Block roads – A block road is located wholly within a cut block boundary and does not provide access to timber beyond the cut block. A block road is a temporary road.

b) Deactivated refers to either partial or complete treatment of roads and trails with the intent to deter motor vehicle access, while taking into account site specific operating constraints.

c) Motor Vehicle means a device in, on or by which a person or thing is being or may be transported or drawn, and which is designed to be self-propelled, and includes an ATV or snowmobile, but does not include:

   i. a device designed to be moved by human, animal or wind power,

   ii. a device designed to be used exclusively on stationary rails or stationary tracks, or

   iii. a boat propelled by motorized power.

d) "Trees with abundant arboreal lichens" refers to class 3 to class 5 as per Land management Handbook FIELD GUIDE INSERT #7.

e) Security Cover is defined as sufficient vegetation cover and/or terrain features that prevent displacement or disturbance behaviour in caribou, despite adjacent activities or predator movement that might otherwise elicit these behaviours.

f) Mineral or Coal Exploration and Development Activities are activities related to the exploration and development of a mineral, coal or placer tenure that may involve cutting trees, or construction and/or maintenance of roads or trails.

Schedule 1–General Wildlife Measures

GWMs 1 through 6 apply to primary forest activities as authorized under the *Forest Act* and *Forest and Range Practices Act* and associated regulations. GWM 7 applies to *Forest Act* and *Forest and Range Practices Act* and associated regulations that are required to facilitate Mineral or Coal Exploration and Development Activities as authorized under the *Mines Act*.

(1) Telkwa Caribou No Timber Harvest Zone.

Within the Telkwa Caribou No Timber Harvest Zone:

a. Timber extraction is not permitted.

b. Road or trail construction or improvement is not permitted.

(2) Within the WHA :

A. Primary forest activities will focus in-block retention to:

c. include key caribou habitat features including, but not limited to, mature forest conditions, wetland and meadow forested buffers, terrestrial lichen sites, groups of trees with abundant arboreal lichens;

d. provide sufficient forest retention to provide visual screening, if available, around wetland and meadow complexes greater than 5 ha in size, and next to roads and cut blocks to limit snowmobile and ATV access, and to provide security cover for caribou;

B. Road development, access, and deactivation will be planned to minimize the amount of accessible roads to promote caribou seclusion from human-use and predators.

a. Deactivate new operational roads within five (5) years following harvest completion date by cutting permit area or timber sale licence.

b. Deactivate new block roads within two (2) years following harvest completion date by cutting permit area or timber sale licence.

c. Road deactivation should be planned to limit human or wildlife travel on the highest elevation portions as soon as possible and as a first priority.

d. Existing roads providing access to private property or government tenured cabins are not to be deactivated unless part of an access management strategy.

(3) Within the Bulkley TSA:

A. Primary forest activities within the WHA, excluding the Bulkley Valley Landscape Unit, will result in or provide for:

a. more than 60% of the SBSmc within the WHA being older than 80 years;

b. less than 28% of the SBSmc within the WHA being younger than 40 years;

c. more than 45% of the SBSdk within the WHA being older than 80 years;

d. less than 39% of the SBSdk within the WHA being younger than 40 years.

B. Primary forest activities within the Bulkley Valley Landscape Unit portion of the WHA will result in or provide for ≥10% of this portion being more than 140 years old.

(4) Within the Morice TSA:

A. Primary forest activities within the WHA, outside the No Harvest Zone, and excluding the Thautil Zone as shown in the attached Schedule A map, the Thautil/Gosnell Rivers High Biodiversity Emphasis Area (HBEA), the Upper Morice River HBEA, and the Lower Morice River HBEA, will result in or provide for:

a. more than 17% of the SBSmc within the WHA being older than 140 years;
b. less than 48% of the SBSmc within the WHA being younger than 40 years;
c. more than 8% of the SBSdk within the WHA being older than 140 years;
d. less than 64% of the SBSdk within the WHA being younger than 40 years.

B. Primary forest activities within the Thautil Zone as shown in the attached Schedule A map, will be consistent with a Caribou Management Plan prepared by licensees and/or BCTS manager, and approved by the Director of Resource Management, FLNRO. Caribou Management Plans must be prepared and approved in advance of harvesting and show how activities will effectively meet the objectives outlined in Schedule 2.

C. Primary forest activities within the Thautil/Gosnell Rivers High Biodiversity Emphasis Area (HBEA), the Upper Morice River HBEA, the Lower Morice River HBEA, or within areas of ESSF outside of the no harvest zone will be managed in a way that is consistent with the direction in the Morice LRMP.

(5) Woodlots

A. Within woodlot licences, primary forestry activities will result in:

a. 33% or more of the woodlot to be comprised of forest stands of 80 years of age or older and

b. small openings, 1 to 3 ha in size with a maximum opening size of 5 ha.

(6) Caribou Management Plan

A. GWMs 2-5 do not apply if licensees and/or BCTS manager prepare a Caribou Management Plan for the Telkwa herd recovery area, in whole or in part, to the satisfaction of the Director of Resource Management, FLNRO that demonstrates effectively meeting the Wildlife Habitat Area Objectives outlined in Schedule 2.

(7) Mineral or Coal Exploration and Development Activities

All applications for mineral or coal exploration and development activities within the caribou WHA will include a caribou mitigation and monitoring plan (CMMP) that

outlines all efforts to avoid, minimize and restore impacts to caribou and caribou habitat. At a minimum, the CMMP will include the following:

a. Within the ESSF, subalpine and alpine (BAFA) biogeoclimatic zones , no mineral or coal exploration and development activities are permitted between September 15 and July 15.

b. The building or improvement of trails and roads in the Telkwa Caribou No Timber Harvest Zone as identified on the attached Schedule A and all associated subalpine and alpine (BAFA biogeoclimatic zone) may occur under the following conditions:
   - Options for helicopter supported mineral or coal exploration and development are explored and deemed not practicable as determined by the Inspector of Mines – Permitting, and in consultation with Resource Management Division, FLNRO;
   - Only personnel directly related to mineral or coal exploration and development are permitted beyond access control points;
   - Full trail and road decommissioning and restoration (see 7e. below) to occur within the shortest time frame and:
     i. prior to removal of access control point; or
     ii. within two years following the cessation of mineral or coal exploration and development for which the associated trail or road was required.

c. Use existing clearings, trails and roads for mineral or coal exploration and development unless no other practicable option exists.

d. New trails and roads will not exceed a running width of 3.5m.

   - Restrict access to new or improved roads and trails at the time they become accessible. Measures to restrict access may include, but are not limited to, the use of signage and gates on active trails and roads.

e. New trails and roads must be deactivated within 2 years following the cessation of development activities. Clearings and linear features must be restored within 1 year following the cessation of development activities. Restoration and deactivation actions may include, but are not limited to:

   - Removing bridge spans, culverts and other water-management structures.
   - Replanting linear features with trees.
   - Making trails/roads impassible to predators by creating large, long and frequent rough piles of coarse-woody-debris, and other materials.
   - Providing visual breaks along edges of linear features until such time as they are fully restored to original condition. Features include berms, dense conifer planting, rough piles of coarse-woody-debris, rocks and stumps.
   - Blocking off linear features at the intersection with other linear features to minimize utility to predators.
   - Recontouring slopes and restoring drainage systems and stabilize for erosion.

f. Limit attracting early-seral ungulates and predators to mineral or coal exploration and development areas by:

- Limiting seeding for revegetation, or where revegetation is required to achieve erosion objectives and/or to prevent establishment of invasive species, select less palatable native plant species for re-vegetation such as non-leguminous species. Avoid use of species that will result in a dense cover of mat-forming graminoids with the preference for short lived species that will allow for natural species re-colonization. Where agronomic species are necessary, ensure the species mix includes only annual, non-mat-forming, and non-leguminous species.
- Facilitating the re-establishment of lichens in appropriate habitats.

g. Do not remove trees from mature stands (≥ 80 years old) and do not remove lichen-bearing trees, unless it is not practicable to do so.

h. Within the defined no-harvest zone, individual forest openings (defined as the total tree harvested area created for the purposes of mineral or coal exploration and development) must not be greater than one (1) ha. This does not include forest openings for the purposes of building trails and roads. Exploration activities should be designed to minimize the total number of forest openings.

i. Prevent project-related displacement or disturbance of caribou by:

- Reducing project-related noise;
- Having a qualified professional involved in the preparation and implementation of the Caribou Mitigation and Monitoring Plan (CMMP);
- Implementing a program to monitor wildlife sightings and ensure that a stop work order is in place in the event that caribou are observed within the mineral or coal exploration and development area;
- Restricting development activities and industrial traffic around known caribou migration corridors during migration periods;
- Avoiding activities in areas where recent caribou use is observed; and
- Maintaining a minimum of 500 m vertical distance above ground, and a minimum of 2000 m horizontal separation from observed caribou while using helicopter and fixed-wing aircraft.

j. Prior to completion of road construction, establish road restrictions and road safety protocols, including signage for speed restrictions and traffic calling protocols.

Schedule 2– Wildlife Habitat Area Objectives

GWMs 2-4 do not apply if licensees or BCTS manager prepare a Caribou Management Plan for the Telkwa herd recovery area, in whole or in part, to the satisfaction of the Director of Resource Management, FLNRO that demonstrates effectively meeting the Wildlife Habitat Area Objectives outlined in this Schedule 2.

(1) Maintain forests within the Telkwa Caribou WHA that:

a. contain mature and old-forest characteristics (eg. diversity of structure and species) that are consistent with the near natural-disturbance patterns by biogeoclimatic zone;

b. support a long-term supply of terrestrial and arboreal lichen forage; and

c. provide security cover;

(2) Design primary forest activities to result in or provide for:

a. primary forest activities that will result in large patches and at least equivalent size connected leave areas of appropriate forest stand type as suitable for the natural disturbance regime for the area; and

b. avoidance of caribou displacement and mortality, by reducing human, caribou and predator interactions.

Signed this 30 day of Nov, 2015
Eamon O'Donoghue, Regional Executive Director, Skeena Region
Ministry of Forests, Lands and Natural Resource Operations

8

Appendix 1– General Information

The following information is intended to provide background information and support to the legal order establishing WHA 6-333. This appendix is not part of the legal order.

Forestry & Associated Permits:

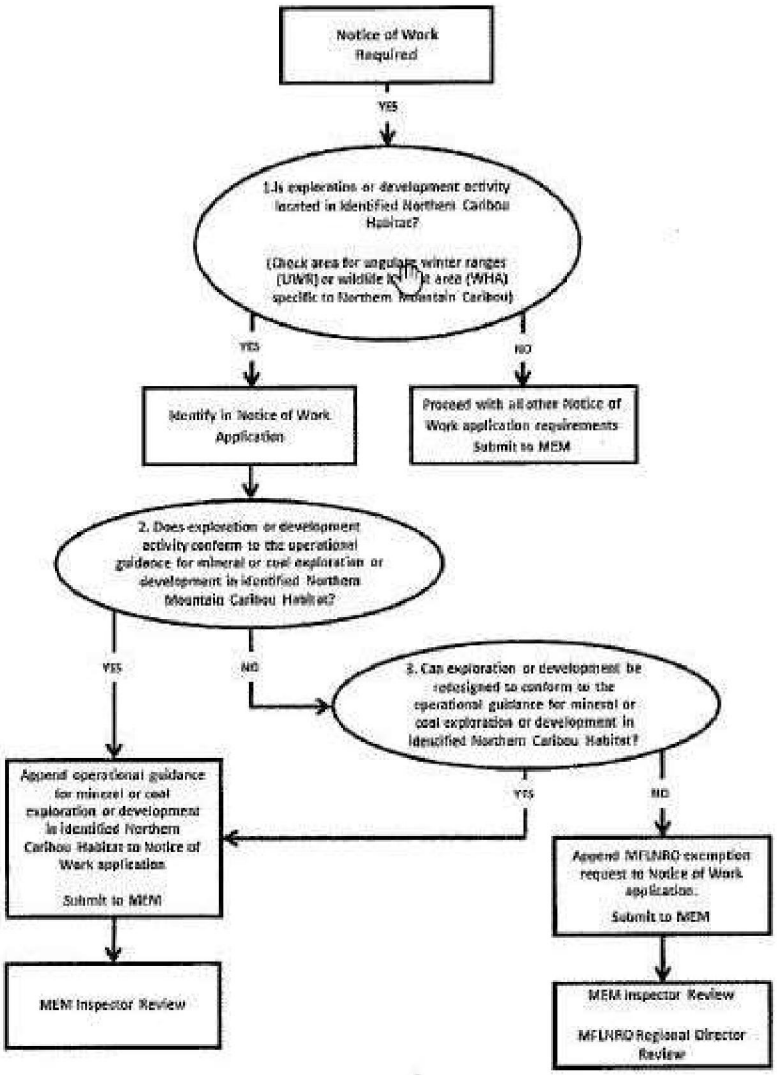
1. As per section 2(2) of the *Government Actions Regulation*, the order entitled "ORDER – Wildlife Habitat Area # 6-333" does not apply to:
    a. any of the following entered into before the order takes effect:
        i. a cutting permit;
        ii. a road permit;
        iii. a timber sale license that does not provide for cutting permits;
        iv. a forestry license to cut issued by a timber sales manager under section 47.6(3) of the *Forest Act*;
        v. subject to subsection (3), a minor tenure.
    b. a declared area;
    c. areas described in section 196(1) of the FRPA; and
    d. areas referred to in section 110 of the FPPR.

    In these instances the requirement to comply with the order and the general wildlife measures does not apply.
2. Authority to consider an exemption from these general wildlife measures is provided in section 92(1) of the *Forest Planning and Practices Regulation*, section 70(1) of the *Woodlot Licences Planning and Practices Regulation*, and section 36(3) of the *Range Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the general wildlife measure will be achieved or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area. This exemption process can be applied to any authorization under the *Forest and Range Practices Act* regardless of the type of industrial activity (e.g. may be applied to FRPA authorizations required to access mineral or coal tenure rights).
3. An exemption application should be submitted to the Minister's delegate (Regional Executive Director–Ministry of Forests, Lands and Natural Resource Operations) with a rationale describing the nature of the problem and options to integrate caribou habitat conservation with proposed forestry practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities.
4. Plan timber harvesting activities to result in large harvested patches and at least equivalent size connected leave areas of appropriate forest stand type as suitable for the natural disturbance regime for the area. Timber harvest activities should be concentrated within a relatively short time frame, followed by extended periods of no harvest activity within the operating area. Silvicultural activities should also be temporally concentrated and followed by extended periods of no activities, wherever practicable. Operators should work co-operatively and meet these objectives wherever practicable.

5. Minimize the total amount of vehicle accessible roads within the WHA. The primary intent is to maintain all mainline roads in operable condition and to restrict vehicle access on all operational and block roads. Deactivation should consider the timing, location, and mechanism to best restrict vehicle-access, and the potential requirement for future road-use for primary forestry activities. High-elevation roads (e.g., within 2km of the ESSF) to be deactivated as a first priority.
6. Mature standing-dead conifers that are more than 80 years old qualify for meeting forest seral retention targets for up to twenty (20) years post natural disturbance date - not including fire. Qualifying stands should be comprised of a minimum of 70% volume by the affected conifer species and have experienced a minimum of 50% stand volume mortality.
7. For primary forest activities associated with removal of vegetative cover, avoid operations within sites having high abundance of either terrestrial or arboreal lichen relative to the WHA # 6-333.
8. Best practices of protecting high quality potential caribou foraging sites should be employed in planning layout and harvest design.
9. Prescribing foresters should assess block design, road layout options and caribou habitat value to follow SBSmc management direction for resource development activities occurring within the Coastal Western Hemlock biogeoclimatic zone.
10. Woodlot licence holders should manage towards a 120 year rotation, (i.e. one third of the stand being maintained as 80 years of age or older). Single tree and group selection harvesting techniques are recommended. Where operationally feasible, woodlot tenure holders are encouraged to employ techniques or strategies related to increasing or retaining terrestrial and arboreal lichen and providing for wetland, meadow or roadside screening as best possible.
11. With respect to related timber supply impacts (associated with this Order), exceeding Land & Resource Management Plan and other Higher Level Plan/Order agreements, timber supply offsets will be determined and documented within five year increments.

Mineral or Coal Exploration and Development:

Exemptions to GWM 7 will be reviewed under the following Notice of Work application process for exploration activities in northern caribou habitat. Refer to ***Skeena Region's Notice of Work Operational Guidance for Mineral or Coal Exploration and Development Activity in Northern Caribou Habitat*** for more detail.



11

MEMORANDUM

TO: Matt Sear, Woods Manager
Pacific Inland Resources
Box 3130
Smithers BC V0J 2N0

Date: June19, 2015

From: Karen Diemert
Head, Landbase Stewardship
Resource Management Division, Skeena Region

RE: TELKWA CARIBOU WILDIFE HABITAT AREA

The following details the resolution of concerns that were outlined in PIR's letter regarding the proposed Telkwa Caribou WHA order (hereafter: The Order) of December 19, 2014.

1. **TSR impacts with the proposed offset package.**
   FLNRO and PIR agree that an a offset to timber supply impacts associated with the Order is required over a 20 year time-frame. We collectively agree the offset amount is 553,660 m3.

   Resolution: FLNRO will work collaboratively with PIR to locate timber supply to offset timber-supply-impacts associated with The Order with the following conditions:

   - Offsets for the first 20 years will be calculated in 10 year increments and found every 5 years.
   - FLNRO will work with PIR to ensure that the offsets are consistent with the 10% balance as outlined in the Bulkley LRMP. These offsets are to be allocated by providing PIR with access to harvest timber currently not available for harvest. This may be done by providing PIR the opportunity to harvest in areas currently reserved from harvest under the Bulkley LRMP-Objectives Set by Government approved November 6, 2006. Alternately, it may be done by facilitating amendments to the results and strategies in PIR's approved FSP to provide additional management flexibility.
   - If necessary, FLNRO will lead any process to amend objectives in the Bulkley TSA.

2. **Exclusion of No-harvest zone (NHZ) contribution to seral stage constraints.**
   PIR recommends that the NHZ contribute to seral stage constraints. Several options were explored including (a) prorating the seral stage targets and setting one number for the entire ESSF within the WHA area, and (b) expanding the NHZ to include the entire ESSF.

Option (a) was explored and rejected by PIR. Option (b) was explored by FLNRO and resulted in an unacceptably high impact to timber supply. A follow up meeting on March 5, 2015 between PIR and FLNRO led to the following resolution.

Resolution: The entire ESSF zone within the Telkwa WHA area will become part of the Caribou No Timber Harvest Zone (NHZ) within the Bulkley TSA portion of the WHA. This is in recognition of the ESSF zone having a high habitat value for caribou. In trade, FLNRO agrees to remove from The Order the GWMs that provide practice requirements to meet early and mid-seral stage targets within the SBSmc & dk subzones of the Bulkley Valley Landscape Unit (BVLU) portion of the WHA. The seral stage requirements for the BVLU portion of the WHA, outside of the NHZ, would revert back to the late-seral stage constraint as outlined in the Bulkley LRMP (that is 10% >140 yrs). As agreed upon by both FLNRO and PIR, no further timber supply analyses are required.

Unresolved issue: PIR requests to have the SBS portions of the Bulkley Landscape Unit removed from the WHA boundary. FLNRO intends to maintain the WHA boundary as presented for the following reasons.

a) Telkwa caribou use the SBS mc & dk subzones, particularly during the spring when fresh herbaceous vegetation emerges.

b) FLNRO has a responsibility to manage Type 2 matrix habitat (habitat that contributes to the maintenance of natural predator-prey dynamics) as a part of the Province's obligations under the Federal Recovery Strategy.

This unresolved issue will be presented to the decision maker during the briefing for decision.

3. **Schedule 2 – Wildlife habitat area objectives: large inactive areas**

PIR is of the opinion that the objectives in Schedule 2 are achieved by sections 2, 3, and 4 of Schedule 1. In addition, Schedule 2, objective (2)a. in combination with all other constraints limits the licence holders ability to focus harvesting and have alternative areas of inactivity.

The intent of including Schedule 2 was to provide an alternative to following the GWMs if the licensees can present a more creative way of achieving caribou habitat conservation. GWM #5 provides direction that GWMs 2, 3 and 4 do not apply if a CMP is submitted by the licensees that meets the objective. It is therefore not redundant. FLNRO agrees to reword Schedule 2, Objective (2)a to provide clarity and operational flexibility.

Resolution*:* Wording in Schedule 2, Objective (2)a has been changed to: 'primary forest activities will result in large patches and at least equivalent size connected

leave areas of appropriate forest stand type as suitable for the natural disturbance regime for the area'. In addition, a caveat has been added to schedule 2 to explicitely state that GWMs 2-4 do not apply if objectives outlined in schedule 2 are met.

4. **Road Permit Obligation and Maintenance**

   Given the proposed constraints and associated low volume available for timber harvesting in the area, a road management and relief of all road obligations agreement between PIR and the Skeena-Stikine District will be required. Further discussion between PIR and the Skeena Stikine District Manager will determine the details on PIR's road obligations. It is anticipated that FLNRO will relieve PIR of all road maintence and liability obligations held under both road permit and cutting permit in the Telkwa Caribou WHA, without PIR incurring any additional costs. The exception being roads required to access approved cutting permits and declared areas (CP701 and CP 707). This discussion should be concluded prior to the WHA being approved.

5. **Access management**

   PIR is of the opinion that it is unreasonable to expect forest licensees to entirely prevent other users from using the road network.

   Resolution: Under Definitions part b), the word 'prevent' will be replaced with the word 'deter'.

   A definition of 'motor vehicle' as written in the wildlife act will be included as part c) under Definitions, as follows:

   > **"motor vehicle"** means a device in, on or by which a person or thing is being or may be transported or drawn, and which is designed to be self propelled, and includes an ATV or snowmobile, but does not include
   >
   > (a) a device designed to be moved by human, animal or wind power,
   > (b) a device designed to be used exclusively on stationary rails or stationary tracks, or
   > (c) a boat propelled by motorized power;

   PIR agrees to recognize and adhere to this as the definition of motor vehicle for the WHA area. However, PIR will use its definition from the FSP for all other areas managed under PIR's approved FSP. This definition will be:

   > **"Motorized Access"** means access that permits the passage of insurable 2 wheel drive or 4 wheel drive motor vehicles not intended for off-road usage;

6. **In block retention**

The requirement as stated in sections (2)c.ii, (3)c.ii. and (4)c.ii of The Order to '*provide poles and saplings for security cover for caribou and to reduce moose forage*' is not measurable.

Resolution: Section (2)c.ii, (3)c.ii. and (4)c.ii will be removed from The Order.

7. **Changing of assessment process and extirpation definition**

The order that was originally distributed as part of the review and comment period included a section in the appendix 1 (general information, not part of the legal order) that detailed the intent of the Province to reassess caribou recovery efforts and results. The section has subsequently been removed from The Order following legal advice. In addition, substantial changes have been made to the concept of assessment and extirpation as it pertains to The Order. PIR is of the opinion that those changes should be communicated to both industry and the public prior to The Order being put forward for decision.

Resolution: The Province worked with provincial caribou experts to define extirpation and to outline the timeline of actions to determine extirpation, and actions that would be taken should the determination of extirpation be made. These definitions and actions are as follows:

Extirpation will be confirmed if all of the following occur:

- An observed and ongoing decline that is approaching 0.
- A census where no animals or tracks are recorded.
- Several subsequent surveys over 5 years where no animals or tracks are recorded.
- No indication of re-colonization from other adjacent herds.
- No intent for herd augmentation.

Timeline of management actions:

- The success of the Telkwa Caribou Recovery efforts will be re-assessed in 5 year increments.
- New recovery actions may not be considered if the herd is declining and fewer than 10 animals are observed with no indication of calf recruitment over several subsequent surveys.
- Previously existing actions will be maintained, and augmentation actions may be considered, until the herd is considered to be extirpated.

- Habitat protection mechanisms, including the WHA, will remain until the herd is extirpated.

These definitions and timelines have been circulated extensively to licensees and the general public through email. In addition, FLNRO included these concepts in presentations to the Bulkley Valley Community resources board (BVCRB) in December 2014 and April 2015, the Voluntary Recreation Access Management group in December 2014, and the Smithers Exploration Club in March 2015.

8. **Changing to the proposed no harvest area**

In December 2014 it appeared as if two versions of the no harvest area were being used for analysis.

Resolution: A comparison of analyses revealed that the same version had been used for all analyses.

Karen Diemert
Head, Landbase Stewardship
Resource Management
Skeena Region

Appendix M:

ORDER – UNGULATE WINTER RANGE
#U-6-007
Bulkley Mountain Goats – Skeena-Stikine Natural Resource District

This order is given under the authority of sections 9(1), 9(2) and 12(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004) (GAR).

The Regional Executive Director of Forests, Lands, Natural Resource Operations and Rural Development – Skeena Region being satisfied that

i. the following area contains habitat that is necessary to meet the habitat requirements for mountain goat (*Oreamnos americanus*); and
ii. the habitat requires special management that is not otherwise provided for under GAR or another enactment;

orders that:

a) the GWMs outlined in Schedule 1 are established for UWR U-6-007
b) the area shown in the map set out in the attached Schedule A (#U-6-007) and contained in the Ungulate Winter Range (UWR) spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_UNGULATE_WINTER _RANGE_SP) are established as Ungulate Winter Range #U-6-007 for mountain goats. The centre point of the line on the attached Schedule A is what establishes the UWR boundary;
c) if there is a discrepancy between the areas shown in the map set out in the attached Schedule A and the UWR spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_UNGULATE_WINTER _RANGE_SP), the areas as detailed in the UWR spatial layer will take precedent;
d) the GWMs 4, 5, 6 and 7f. outlined in Schedule 1 are applied to the area specified in that GWM; and
e) for the purposes of section 2(3)(a) of the *Government Actions Regulation*, the general wildlife measures outlined in Schedule 1 apply to minor tenures.

Schedule 1 – General Wildlife Measures

Definitions

Words and expressions not defined in this order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made under it, unless otherwise defined in the order.

In this schedule:

a) **Primary Forest Activity** is defined as in the *Forest Planning and Practices Regulation*.

b) **Material or Adverse Disturbance** is the consequence of an action that has a negative effect or impact on mountain goat behaviour or mountain goat habitat utilization/occupancy. For purposes of interpretation, if an animal appears to have been displaced from its habitat due to disturbance or more adversely impacted, it will be regarded as having experienced a material or adverse disturbance.

c) **Winter Ground Only** is defined, if timber is logged during the snow free period, the soil disturbance hazard of either soil erosion, soil displacement or soil compaction is likely to exceed 5% soil disturbance for the net area to be reforested in accordance with the *Soil Conservation Guidebook* and the *Hazard Assessment Keys for Evaluating Site Sensitivity to Soil Degrading Processes Guidebook*.

d) **Forest Harvest Completion Date** is the date of all the timber harvested (completion of felling, forwarding, processing and hauling) within a timber harvest block (i.e. cutblock) in accordance with the site plan.

e) **Deactivated** or **Deactivation** refers to either partial or complete treatment of roads and trails with the intent to prevent motor vehicle access, while taking into account site specific operating constraints. Forest licensee's work would be regarded as sufficient if, without extensive effort, a motorized vehicle is inhibited from entry.

f) **Motor Vehicle** means a device in, on or by which a person or thing is being or may be transported or drawn, and which is designed to be self-propelled, and includes an ATV or snowmobile, but does not include:

   i. a device designed to be moved by human, animal or wind power,
   ii. a device designed to be used exclusively on stationary rails or stationary tracks, or
   iii. a boat propelled by motorized power.

General Wildlife Measures

1. Subject to General Wildlife Measure 3, timber harvesting must not occur within mountain goat winter range.

2. Road construction must not occur within mountain goat winter range.

3. Felling of single trees, such as a danger, guy line anchor, or tail hold trees is permitted within a mountain goat winter range when it is required to address worker safety.

4. Primary forest activities that occur within one (1) kilometre horizontal distance of a mountain goat winter range must not result in material or adverse disturbance to goats. Primary forest activities within one (1) km horizontal distance of a mountain goat winter range must not occur during the period starting November 1 and ending June 15, unless the following conditions are met:
   i) the timber is considered winter ground only, and
   ii) limit timber harvesting in a given winter season (starting Nov.1 and ending June 15) to a maximum of 10% of the area within the 1 km horizontal distance Specified Area.

5. New roads and structures required for primary forest activities within one (1) kilometre of mountain goat winter range will be constructed in a manner that will facilitate effective deactivation. All roads or structures within one (1) kilometre of mountain goat winter range that have not been exempted will be deactivated as soon as practical, and no more than two (2) years following forest harvest completion date by timber harvest block, inclusive of the access road to the timber harvest block. Access control points are to be established if deemed that road deactivation will not be effective as a stand alone measure.

6. Heli-logging or blasting must not occur within two (2) kilometres of mountain goat winter range during the period starting November 1 and ending June 15 where there is potential for material or adverse disturbance to mountain goats.

7. **Specific to mineral exploration and development**: to maintain habitat supply and to minimize mountain goat displacement and predation.

   In identified mountain goat winter range:

   a. Time mineral or coal exploration and development to occur between the Least Risk Window for mountain goats (June 16 and October 31).
   b. The building or improvement of trails and roads in UWR-U-6-007 may occur under the following conditions:
      - Options for helicopter supported mineral or coal exploration and development are explored and deemed not practicable as determined by

the Inspector of Mines – Permitting, and in consultation with Resource Management Division, FLNRORD;

- Only personnel directly related to mineral or coal exploration and development are permitted beyond access control points;
- Full trail and road decommissioning and restoration (see 7e. below) to occur within the shortest time frame and:
  - i. prior to removal of access control point; or
  - ii. within two (2) years following the cessation of mineral or coal exploration and development for which the associated trail or road was required.

c. Use existing clearings, trails and roads for mineral or coal exploration and development unless no other practical option exists.

d. New trails and roads will not exceed a width of 3.5m.

- Restrict access to new or improved roads and trails at the time they become accessible. Measures to restrict access may include, but are not limited to, the use of signage and gates on active trails and roads.

e. New trails and roads must be deactivated within two (2) years following the cessation of development activities. Clearings and linear features must be restored within one (1) year following the cessation of development activities. Restoration and deactivation actions may include, but are not limited to:

- Removing bridge spans, culverts and other water-management structures.
- Replanting linear features with trees.
- Minimizing utility by predators on roads and trails by creating large, long (>400m) and frequent, rough piles of coarse woody debris, and other materials.
- Providing physical and visual breaks along edges of linear features until such time as they are fully restored to original condition. Physical and visual breaks include berms, dense conifer planting, rough piles of coarse-woody-debris, rocks and stumps.
- Blocking off linear features at the intersection such as debris piling to minimize utility to predators.
- Recontouring slopes and restoring drainage systems and to stabilize the ground and prevent erosion.

f. Helicopter and fixed-wing aircraft must maintain a minimum of 500 m vertical distance above ground, and a minimum of 2000 m horizontal separation from observed mountain goat at all times.

Signed this 17 day of July, 2019
Geoff Recknell, Regional Executive Director
Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Appendix 1 – General Information

The following information is provided as background information and support to the order establishing UWR #U-6-007. This appendix is not part of the legal order.

1. Improvements in scientific and biological information may lead to amendment(s) consistent with the *Government Actions Regulation* of the defined mountain goat UWR measures including:
    a. the addition of new, or deletion of existing, mountain goat winter range polygon units,
    b. the adjustment of mountain goat winter range unit boundaries including their associated specified area, and
    c. modification of a specific measure to address operational constraints while protecting mountain goat populations and their habitat.

Forestry & Associated Permits:

2. **Activities to which the order does not apply:** Section 2(2) of the *Government Actions Regulation* states

    An order under any of sections 5 to 15 does not apply in respect of
    (a) any of the following entered into before the order takes effect:
        (i) a cutting permit;
        (ii) a road permit;
        (iii) a timber sale licence that does not provide for cutting permits;
        (iv) a forestry licence to cut issued by a timber sales manager under section 47.6 (3) of the *Forest Act*;
        (v) subject to subsection (3), a minor tenure,
    (b) a declared area,
    (c) areas described in section 196 (1) of the Act, and
    (d) areas referred to in section 110 of the *Forest Planning and Practices Regulation*.

3. Authority to consider an exemption from these GWMs is provided in section 92(1) of the *Forest Planning and Practices Regulation*, section 79(1) of the *Woodlot Licenses Planning and Practices Regulation* and section 36(3) of the *Range Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the general wildlife measure will be achieved or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area. This exemption process can be applied to any authorization under the *Forest and Range Practices Act* regardless of the type of industrial activity (e.g. may be applied to FRPA authorizations required to access mineral or coal tenure rights).

    An exemption application should be submitted to the Minister's delegate (FLNR Regional Director of Resource Management for the Region within which the UWR is located) with a rationale describing the nature of the problem and options to integrate UWR conservation with proposed forest and/or range practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination

will normally be made within 14 days of arrival. Incomplete packages will be returned to the proponent for re-submission.

A spatially explicit strategy for conservation of mountain goat winter range will assist in timely consideration of the exemption request when submitted to the Minister's delegate, and will inform the conditions, if any, of the exemption that may be granted.

Exemptions may be considered for:

a) The construction of roads or trails in a defined mountain goat UWR polygon, including the harvest of associated right-of-way timber, where it can be demonstrated that no other access options exist.

   These roads and trails will be:
   i. designed, as much as possible, to prevent all motorized vehicle access outside of the June 16th to October 31st timing window, and
   ii. will be deactivated (consistent with the definition for "deactivation" in the order) as soon as practicable, and no later than one year, following primary forest activities.

b) The construction of semi-permanent mainline roads within 1 kilometer horizontal distance of a defined mountain goat UWR polygon when it can be demonstrated that no other road location options exist to access timber beyond a specific mountain goat winter range.

   These roads and trails will be:
   i. designed, as much as possible, to prevent all motorized vehicle access outside of the June 16th to October 31st timing window, and
   ii. will be deactivated (consistent with the definition for "deactivation" in the order) as soon as practicable, and no later than two years following following forest harvest completion date by cutting permit area.

c) For heli-logging where it can be demonstrated that topographical features can mitigate the effects of noise disturbance.

d) An extension of the early period of the timing window. Singular, site-specific extensions may be granted outside the normal timing window opening where it can be demonstrated by a qualified professional biologist that, due to exceptional circumstance(s), there is no risk to goats.

e) The Wetzin'kwa Community Forest Specified Area (1 km buffer) in proximity to the downhill and Nordic ski areas given minimal mountain goat occupancy on that side of the mountain.

4. Retention of forest cover in mountain goat winter range is required to deliver habitat attributes critical to the survival of this species. These attributes include patches of mature/old forest in areas adjacent to escape terrain that provide winter forage production, snow interception, and thermal/security cover.

5. Primary forest activities (as defined in the *Forest Planning and Practices Regulation*) should avoid road or trail construction within 1 kilometer horizontal distance of a defined mountain goat UWR polygon. Where no other practicable

access options exist, roads and trails should utilize strategies to protect goats and their habitat from disturbance including:

a. placing adequate timber buffers around defined mountain goat UWR polygon boundaries,
b. locating a road or trail no closer to defined mountain goat UWR polygon than made necessary by operational site constraints, or
c. other suitable techniques.

6. It is recommended that where forests within defined mountain goat UWR polygons have been disturbed either by forest fire or prior logging, and where habitat is limited, these units be silviculturally treated to accelerate their restoration and rehabilitation to achieve mature and old forest habitat attributes (snow interception, security and thermal cover, and forage production). Treatments should be based on the recommendations of a qualified professional forester and qualified professional biologist.

7. It is recommended that existing roads and trails within 1 kilometer of a defined mountain goat UWR polygon be assessed for disturbance risk to mountain goat populations. Where assessment determines that access to defined mountain goat UWR polygons on such roads and trails has increased risk to goats, plans for the deactivation of these roads should be developed and implemented. Where the deactivation of specific existing roads conflicts with operational activities, the licensee and the Minister's designate should work cooperatively to develop strategies which address both operational objectives and minimize disturbance to mountain goats without constraining operational activities. This may include access restrictions on permanent roads through the development and implementation of an official Access Management Plan.

8. Although the "*intent to prevent motor vehicle access*", as defined in the definition section of the UWR Order, is somewhat interpretive, it is expected that communication between the licensee/permit holder and the provincial government, along with joint field inspections, will resolve any differences of opinion. Examples of partial or complete deactivation of roads and trails include:

   - removing bridge spans, culverts and other water-management structures;
   - replanting linear features with trees;
   - creating large, long (>400m) and frequent, rough piles of coarse woody debris, stumps and/or rocks;
   - recontouring slopes and restoring drainage systems;
   - winter roads with high stumps.

9. It is recommended that historic and planned (FRPA S. 196(1)) primary forest activities within defined mountain goat UWR polygons be assessed to determine if these activities have, or will, place mountain goat populations and their habitat at risk. Where an assessment determines that winter range is, or will be, limited relative to historic levels, the Minister's designate and the licensee(s) should work cooperatively to develop short and long-term strategies aimed at offsetting and re-establishing winter range shortfalls (e.g. temporarily reserving mature or old

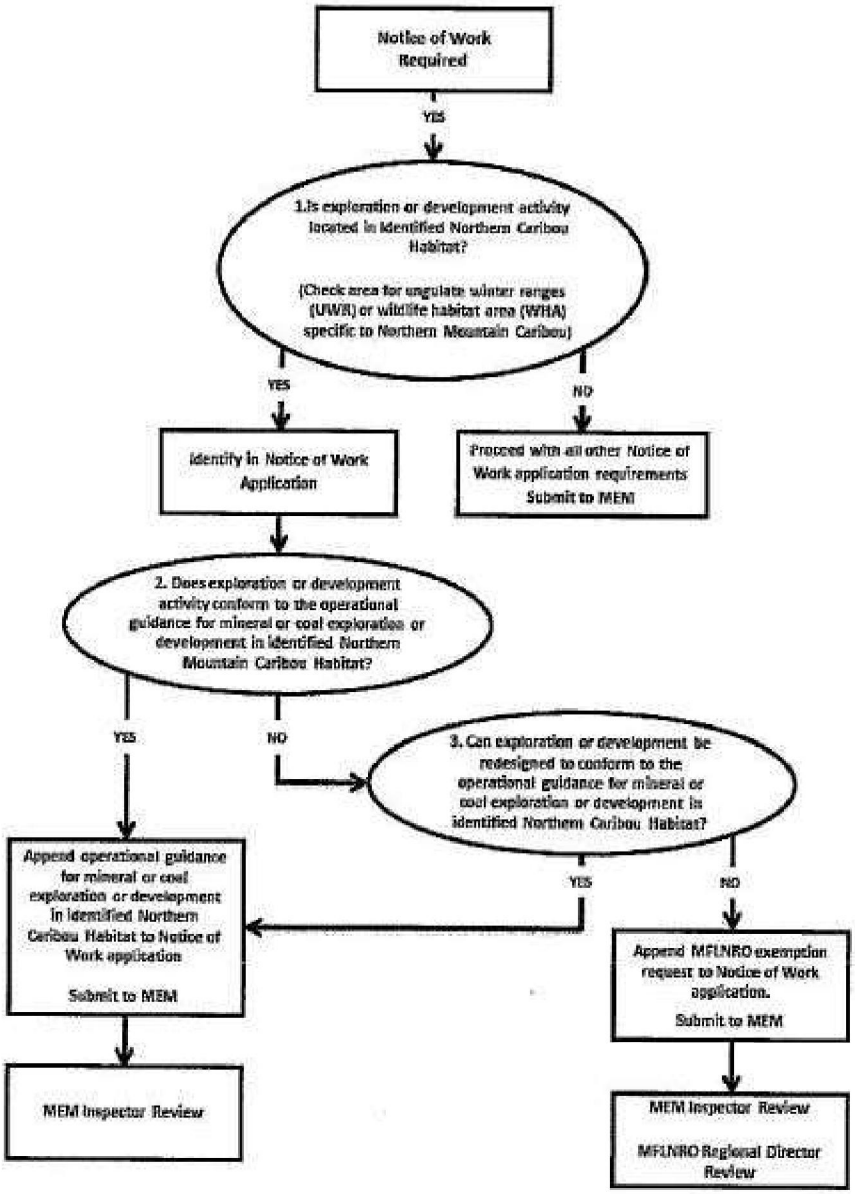
forest reserves, silivicultural treatments [see item 6 above], and others as deemed appropriate). Where necessary, strategies should include the establishment and implementation of spatially explicit plans.

10. It is recommended that extra diligence is required to limit disturbance associated with industrial activities when operating in close proximity to canyon and escarpment winter ranges. The habitat model and aerial validation work may not fully capture foraging habitat near the cliffs and escarpments within these habitat types.

11. Where a permit or license is reasonably necessary to give effect to activities approved in a prior-existing Environmental Assessment Certificate, the Order will not be applied so as to prevent issuance of the permit or licence, or make acting under the permit or licence, impracticable or contrary to the overall project approved pursuant to the Environmental Assessment Certificate.

Mineral or Coal Exploration and Development:

12. Exemptions to GWM 7 will be reviewed under a similar process as for northern caribou: refer to ***Skeena Region's Notice of Work Operational Guidance for Mineral or Coal Exploration and Development Activity in Northern Caribou Habitat*** for more detail.


Notice of Work Required
YES
1.Is exploration or development activity located in Identified Northern Caribou Habitat?
(Check area for ungulate winter ranges (UWR) or wildlife habitat area (WHA) specific to Northern Mountain Caribou)
YES
NO
Identify in Notice of Work Application
Proceed with all other Notice of Work application requirements Submit to MEM
2. Does exploration or development activity conform to the operational guidance for mineral or coal exploration or development in identified Northern Mountain Caribou Habitat?
YES
NO
3. Can exploration or development be redesigned to conform to the operational guidance for mineral or coal exploration or development in identified Northern Caribou Habitat?
YES
NO
Append operational guidance for mineral or coal exploration or development in identified Northern Caribou Habitat to Notice of Work application
Submit to MEM
Append MFLNRO exemption request to Notice of Work application.
Submit to MEM
MEM Inspector Review
MEM Inspector Review
MFLNRO Regional Director Review