Cariboo Region Stocking Standards Supporting Document (July 24, 2018)

Section 44(1) of the Forest Planning and Practices Regulation (FPPR) applies to all areas harvested under the Forest Stewardship Plan except where exempted from the requirement of Section 29(1) or (2) of the Forest and Range Practices Act.

The stocking standards specified in the Cariboo Region Stocking Standards (CRSS) and its addendum shall apply to areas harvested under the Forest Stewardship Plan (FSP). These stocking standards may also be applied to areas harvested under a previous FSP or Forest Development Plan. The stocking standards approved under this FSP will apply to an area harvested under a previous plan when the stocking standard identification number applicable to a Standard Unit (SU) is submitted to RESULTS.

GENERAL STANDARDS

1) Crop Tree Assessment

Regeneration and free growing surveys will be conducted under the oversight of a Forest Professional and/or Accredited Surveyor. Survey methodologies and tree acceptability criteria are as specified in the *Resource Practices Branch, Silviculture Survey Procedures Manual* and the *FS660- Silviculture Survey Reference* field card, as amended from time to time, unless specified or varied through provisions of this FSP.

2) Site Identification for the Purpose of Determining Stocking Standard

When determining the appropriate stocking standard in the CRSS, site identification will be completed based on the procedures and site descriptions contained in Land Management Handbook Number 39 (1997) – *A Field Guide to the Forest Site Identification and Interpretation for the Cariboo Forest Region*, as amended from time-to-time. For biogeoclimatic subzones that are not contained in the Cariboo Region field guide Handbook Number 23 (1990) – *A Guide to the Site Identification and Interpretation for the Kamloops Forest Region* and Handbook Number 24 (1993) – *A Field Guide for Site Identification and Interpretation for the Southwest Portion of the Prince George Forest Region,* as amended from time-to-time, shall be used.

3) District Policies That May Apply

Unless otherwise specified in the this FSP, where a District approves a policy that varies the standards or procedure described in the *Resource Practices Branch, Silviculture Survey Procedures Manual*, the policy may be applied in the applicable District at the discretion of the obligation holder.

4) Deviation from Potential (DFP) Survey Methodology to Assess Stocking Levels

Where harvesting on a SU having **even aged stocking standards** has resulted in partial cutting as a result of:

a) forest health management, or
b) where retention of crop trees is required to achieve a result or strategy in the FSP to address an objective set by government,

the deviation from potential (DFP) survey methodology may be used to assess compliance with stocking standards provided:

a) the stratum contains between five (5) and twenty (20) m^2/ha of residual basal area in stems ≥ 12.5 cm dbh, of preferred and/or acceptable species; and
b) the stratum is greater than 1 ha in size; and
c) the SU is not being managed to uneven-aged standards.

Where the DFP survey methodology is used the applicable stocking standard in the CRSS, with regard to preferred and acceptable species, minimum tree heights, minimum inter tree distance, stocking targets, regeneration period and free growing period, continue to apply with the following exceptions:

a) minimum inter tree distance for stems ≥ 12.5 cm dbh is 0.0 m; and,
b) subject to d) trees contributing to the retained basal area must be a preferred or acceptable species in the applicable stocking standard or another commercially valuable coniferous species, and
c) trees contributing to stocking targets must be preferred or acceptable species specified in the stocking standard; and,
d) any tree species specifically reserved to address a result or strategy in the FSP will contribute to the measurable basal area on the site.

5**) Intermediate Harvest**

Where a stand is harvested consistent with FPPR section 44 (4), other than harvesting for the purpose of uneven-aged management, it shall be deemed an intermediate harvest where the harvested stand complies with the conditions specified below for a minimum period of 12 months following the completion of harvesting.

a) greater than 20 m^2 average basal must be retained in trees with a diameter at breast high of ≥ 12.5 cm; and
b) no area > 2 ha or 10% of the SU area, whichever is less, has a retained basal area less than 20 m^2; and
c) trees contributing to the retained basal area must be the species identified as preferred and acceptable in the CRSS; and

d) greater than 50% of the contributing retained basal area must be a preferred tree species as defined in the CRSS, if it existed on site prior to harvest; and
e) trees contributing to the retained basal area comply with the attributes defined in *FS 660 - Free growing damage criteria for multi-storey conifer stands*.

If during the 12 months period following the completion of harvesting the conditions specified below are not maintained, the licensee shall hold a free growing obligation on the harvested area and the appropriate stocking standards in the CRSS shall be applied.

6) Uneven Aged Management

The uneven-aged stocking standards in the CRSS will be applied in situations where:

a) the biogeoclimatic (BEC) zone/subzone is IDF, SBSdw2 or MSxk and Douglas-fir is the leading species pre-harvest; and
b) the silviculture system for the stand is single tree or the removal of small groups of trees resulting in openings < 0.25 ha in size and the stand is being managed for multi-aged stand structure; and
c) following completion of harvesting:
    i. three (3) distinct layers are present
    ii. layers 1 and 2 combined is either
        a. ≥ 6% crown closure, or
        b. > $5m^2$/ha of basal area in layer 1, and
    iii. layers 3 and/or 4 are present.

If upon the completion of harvesting a continuous area ≥ 1 ha within the NAR area does not meet the requirements of c) above a separate standards unit will be created and even-aged stocking standards shall be applied to the area.

7) Conversion of Multi-Story Douglas-fir Stand to Even Aged Management Following a Wildfire

Where a SU or a portion thereof is impacted by a wildfire to the extent that the conditions specified in Section 5(c*) "Uneven Aged Management"* are no longer met, the impacted portion shall be defined as a separate SU and even-aged stocking standards shall be applied to the area.

8) Mixed Wood Stocking Standards

A mixed wood stocking standard may only be applied in situations where:

a) the net merchantable cruise volume is greater than 30% net deciduous; and
b) the merchantable deciduous volume will be utilized; and

c) the pre-harvest objective specified in the site plan is to manage the SU for mixed wood timber values.

Broadleaf forest health free growing criteria are as specified in the *FS660- Silviculture Survey Reference* field card.

The applicable stocking standard in the CRSS for a SU shall be converted to a mixed wood stocking standard based on Table 1. Broadleaf species contained in a mixed wood stocking standard shall be considered preferred species.

Table 1: *Conversion Table for Conifer Standards to Mixed Wood Standards*

Target from Conifer Standards	**Species**	**Target Stocking (well-spaced/ha)**	**Minimum Stocking Standards (well-spaced/ha)**			**Minimum Height at Free Growing (m)**		**Regen Delay (yrs)**	**Latest Free Growing (yrs)**
			Min. Preferred & Acceptable	**Min. Preferred**	**Min. Preferred Conifers**	**Dec.**	**Con.**		
400	As defined by a productive, reliable and feasible regeneration option (footnote "a") in Reference Guide for FDP Stocking Standards	400	200	200	200	2.0	From CRSS for applicable site series	7	20
600		800	500	400	400	2.0		7	20
1000		1200	700	600	400	2.0		7	20
1200		1600	1000	800	600	2.0		7	20

Where mixed wood standards are applied, black cottonwood, trembling aspen, and common paper birch trees not tallied as well-spaced or free-growing trees will be considered "competing vegetation" for the purpose of assessing the free growing status of the coniferous crop trees, unless Variation from General Standard 13) *Standard for the Reduction of Weevil Damage* is applied.

9) Broadleaf Stocking Standards

Broadleaf stocking standards may only be applied in situations where:

a) the net merchantable cruise volume is greater than 70% net deciduous; and
b) the merchantable deciduous volume will be utilized; and
c) the pre-harvest objective specified in the site plans is to manage the SU for broadleaf timber value.

Broadleaf forest health free growing criteria are as specified in the *FS660- Silviculture Survey Reference* field card.

The applicable stocking standard in the CRSS for a SU shall be converted to a broadleaf stocking standard based on Table 2. Broadleaf species contained in a broadleaf stocking standard shall be considered preferred species.

Table 2: *Conversion Table for Conifer Standards to Broadleaf Standards*

Target from Conifer Standards	**Species**	**Target Stocking (well-spaced/ha)**	**Minimum Stocking Standards (well-spaced/ha)**			**Minimum Height at Free Growing (m)**		**Regen Delay (yrs)**	**Latest Free Growing (yrs)**
			Min. Preferred & Acceptable	**Min. Preferred**	**Min. Conifers**	**Dec.**	**Con.**		
400	As defined by a productive, reliable and feasible regeneration option (footnote "a") in Reference Guide for FDP Stocking Standards	600	400	400	n/a	2.0	From CRSS for applicable site series	7	20
600		1000	500	400	n/a	2.0		7	20
1000		1600	1000	800	n/a	2.0		7	20
1200		2000	1200	1000	n/a	2.0		7	20

10) Brush Competition

Where specified in the site plan as leave trees, layer one (≥ 12.5 cm dbh), black cottonwood, trembling aspen, and birch trees, retained at the time of harvest are not considered competing vegetation at the time of the free growing assessment of coniferous crop trees.

Black cottonwood, trembling aspen and birch trees, and shrubs species being managed to achieve an objective, result or strategy of the FSP as specified in the site plan, are not considered competing vegetation at the time of free growing evaluation of coniferous crop trees.

Trembling aspen, black cottonwood, birch, willow, and alder are not considered competing brush when conducting a free growing survey within 5 m of S4, S5, and S6 streams and all wetlands greater than 0.25 ha in the ICH and ESSF BEC zones, and within 10 m of S4, S5, and S6 streams, and all wetlands greater than 0.25 ha in all other BEC zones.

Where a brushing treatment has been undertaken, and a visual buffer is required to achieve a result or strategy, aspen, cottonwood, birch, willow and alder will not be considered competing brush when conducting a free growing survey where survey plots fall within the buffer.

For the purposes of free growing assessments in the SBPS BEC zone scrub birch will be considered non-competing when assessing the free growing status of crop trees.

Where the uneven-aged stocking standard applicable to a site specifies a minimum free growing height of 0.4 m for Douglas-fir, snow berry, soopalallie, common juniper, vaciniums sp. saskatoon, birch-leafed spirea, herbaceous vegetation, and grasses are not considered competing vegetation at the time of free growing evaluation of the well-spaced Douglas-fir.

Where required to assess the free growing status of a crop tree the conifer to brush ratio shall be 125% for the ESSF, IDF and MS biogeoclimatic zones, and 150% in the ICH, SBPS and SBS biogeoclimatic zones.

11) Lodgepole Pine Dwarf Mistletoe

In SUs where lodgepole pine is the only preferred species, when assessing the free growing status of a well-spaced lodgepole pine crop tree in regard to its proximity to mistletoe infected over topping pine stems, only stems located within the net area to reforest (NAR) portion of the block being surveyed will be considered overtopping stems. Therefore, well-spaced lodgepole pine trees that do not have visible evidence of mistletoe infection remain eligible as potential free growing trees regardless of their proximity or height relative to visibly infected stems that are located outside of the NAR.

12) Retained Mistletoe Infected Lodgepole Pine to Address a Result or Strategy

Where lodgepole pine stems are retained consistent with the South Chilcotin Stewardship Plan, for the purpose of visual screening modelled moose habitat or where specifically required by a result or strategy in the FSP, the free growing damage criteria for even-aged coniferous trees as specified in the FS 660 field card, with regard to dwarf mistletoe, will not apply to retained lodgepole pine and subsequent lodgepole pine regeneration, provided that the portion of the block where pine are retained as a visual screen or to achieve a result or strategy in the FSP is defined as a unique SU.

13) Limitations on the Use of Larch

The use of western larch must be consistent with the *Chief Forester's Standards for Seed Use*, as amended from time to time. (i.e., western larch restricted to 10% of planting program on an annual basis).

Despite western larch being listed as an acceptable species in the CRSS for various biogeoclimatic subzones/site series, western larch shall only be considered an acceptable species where it is established consistent with the LW1 and LW2 seed planning zones.

Larch shall not be considered preferred or acceptable in mule deer winter range (MDWR).

14) Limitations on the Use of White Pine

The use of white pine is restricted to rust resistant seedlots.

Despite white pine's inclusion in a stocking standard, where white pine is planted outside of an "A" Class seed planning zone for white pine the seedlings are considered to be non-compliant with the *Chief Forester's Standard for Seed Use*.

15) Enhanced Stocking Standards

Enhanced stocking standards contained in the CRSS can be applied at the discretion of the obligation holder.

16) Maximum Density Limits at Free Growing

The maximum allowable density at the time of free growing declaration

a) for pine leading strata where pine is ≥ 80 percent of the inventory is 25,000 countable conifers per hectare;
b) for all other species and mixed pine stands where pine is less than 80% of the inventory is 10,000 countable stems per hectare; and
c) for SUs to which uneven-aged stocking standards apply, the maximum density of stems in layer 3 is 1,0000 stems per hectare.

Where salvage harvesting has occurred following a wildfire disturbance the free growing obligation holder is exempt from clauses a) and b) above.

VARIATIONS FROM GENERAL STANDARDS

A Forest Professional may vary the stocking standard listed in the CRSS as defined below in the following situations and circumstances:

1) Multiple Years to Harvest a Standard Unit

Where harvesting occurs over multiple years on a SU with a 4-year regeneration delay, regeneration delay may be extended to 4 years after the start of the last harvest entry to a maximum of 7 years from the initial disturbance date. The late free growing date will be 20 years from the harvest start date of the initial harvest entry.

2) Seven Year Regeneration Delay

Within three (3) years following harvest commencement, and where based on a post-harvest field assessment, if a portion of a SU with a 4 year regeneration delay is planned to be regenerated by natural regeneration or direct seeding, the area being managed for natural regeneration or direct seedling may be defined as a separate standards unit with regeneration delay period of 7 years.

3) **Changes to Milestones Due To Damage Caused By Wildfire**

Where any portion of a standards unit larger than 1 ha is disturbed by wildfire such that the SU is left **Not Satisfactorily Restocked (NSR)** according to the currently approved stocking standard then:

a) a new disturbance shall be reported for that opening;
b) the NSR portion of the original standards unit may be defined as a new standards unit; and
c) the appropriate stocking standards from CRSS shall apply to the disturbed area with the exception that;

   i. if the Regeneration Delay period has not elapsed, then Regeneration Delay and Late Free Growing shall be calculated from the new disturbance date, or
   ii. if the Regeneration Delay period has elapsed, then a new Regeneration Delay period will not apply and only Late Free Growing shall be calculated from the new disturbance date.

4) Pine as a Preferred Species in IDF Subzones

Where in the IDF biogeoclimatic zone an area is being managed with an uneven-aged silviculture system and the pre-harvest gross volume is greater than 40% lodgepole pine, and lodgepole pine is an acceptable species in the CRSS for the applicable site series, lodgepole pine may be elevated to a preferred species to a maximum of 50% of the well-spaced stems.

5) Spruce as a Preferred Species in IDF Subzones

Where in the IDF biogeoclimatic zone the pre-harvest gross volume is greater than 40% spruce, and spruce is an acceptable species in the CRSS for the applicable site series, spruce may be elevated to a preferred species to a maximum of 50% of the well-spaced stems.

6) Reduced Minimum Inter-tree Distance

The minimum inter tree-distance (MITD) for a SU may be varied from the standard defined in the CRSS in the following situations and circumstances.

a) Where mechanical site preparation, other than slash piling, has been undertaken to create microsites prior to planting the MITD can be reduced to 1.6m.

b) On slopes >20% in the ESSF BEC zone where protected microsites are critical for successful reforestation due to snow creep, MITD may be reduced to 1.0 m where the SU has been planted to target density or greater.

c) Where based on a silvicultural survey a SU or portion thereof which has previously been planted has failed to maintain minimum stocking densities, due to the impacts of cattle or horses, the affected area maybe designated as a separate SU. In the newly designated SU the MITD may be reduced to 1.0 m if planting will be completed.

d) For areas that are identified and mapped as a root disease polygon, which may include up to a 30 m buffer, a separate SU may be created and the MITD may be reduced to 1.6 m where a stump avoidance strategy is employed to manage root disease.

e) Where salvage harvesting has been undertaken in the IDF biogeoclimatic zone following a stand initiating wildfire, which is defined as having a level of disturbance such that the stand is NSR prior to salvage harvesting, and where the objective is to restore Douglas-fir and even-aged management is required, the MITD for Douglas-fir may be reduced to 0.5 m. The reduced MITD shall apply to the distance between natural or planted Douglas-fir stems and any other preferred or acceptable crop tree species. The MITD between non-Douglas-fir crop trees species (e.g., pine to pine) remains as specified in the CRSS.

f) On rocky sites where a plantibility survey has determined that the target stocking cannot be achieved due to the presence of rock when assessed at the applicable MITD, the MITD may be reduced to 1.6 m.

7) Grizzly Bear Habitat

Where consistent with a result and/or strategy in the FSP and prescribed in a site plan pre-harvest, a clumped tree distribution is required for the management of grizzly bear habitat, the target density, minimum preferred and acceptable and minimum preferred values in the stocking standards in the CRSS shall be modified by the factors of 0.67. For example a stocking standard of 1000/500/400 shall become 670/335/268. The minimum intertree distance shall be 1.0 m and maximum density of countable conifers shall be 4,000/ha.

The site plan must prescribe the number of trees in a cluster, the number of clusters/hectare and the spacing between clusters.

8) GAR Consistency

Where stocking standards included in this FSP conflict with the management objectives/direction of an Order under the Government Action Regulation (GAR), the stocking standards will be varied to the extent that they do not conflict with management objectives/direction of the applicable GAR Order.

Achievement of a stocking standard does not supersede the obligation holder's obligation to be consistent with all requirements specified in the GAR Order.

9) Benchmark Grasslands Standards

Areas harvested within the identified Cariboo-Chilcotin Grassland Strategy benchmark area shall have no regeneration or free growing obligation.

10) Bighorn Sheep Management Area Standards

For SUs located within the identified Churn Creek Big Horn Sheep Migration Corridor stocking standards may be varied to the extent recommended in writing by a FLNRO&RD Habitat Biologist.

11) Standard for the Reduction of Weevil Damage

If,

a) there is an active white pine weevil (*Pissodes strobi)* population on the block or an adjacent managed opening as evidenced by the presence of weevil damaged trees, and
b) the spruce trees being assessed are of acceptable form and vigour and meet all other acceptability criteria (i.e., preferred or acceptable species, minimum height, MITD),

then for the purpose of assessing the free growing status of spruce crop trees, all deciduous vegetation shall be assessed as non-competing brush.

12) Variations to Preferred or Acceptable Species

The preferred and/or acceptable species in the stocking standards in the CRSS may be varied to the extent specified below in the following situation and circumstances.

a) Where greater than 10% of the total merchantable volume on the area of a SU, based on a timber cruise, is of a conifer species not identified in the approved stocking standards, that species may be designated an acceptable species where it is ecologically suitable.

b) Where prior to harvest lodgepole pine is greater than 50% of the total merchantable volume lodgepole pine can be designated as a preferred species in the following biogeoclimatic subzone/site series:

i. ESSFdc2/06 and /07
ii. ESSFxc/07 and /08
iii. ICHmk3/04 and /06
iv. ICHmw3/01
v. IDF dk/04

vi. IDF mw2/01 and 03
vii. IDFxm/06, 07 and /08
viii. MSxk/09

13) BEC Site Series Mosaics

Where an area consists of a mosaic of two or more biogeoclimatic site series, which cannot be clearly delineated or mapped (i.e., site series are less than one contiguous hectare in size), the stocking standard that applies to the area is the stocking standard for the dominate site series. The applied stocking standard may be varied such that a preferred species from the applicable stocking standard for either site series may be considered a preferred species and an acceptable species from the applicable stocking standard for either site series may be considered an acceptable species.

14) Douglas-fir Preferred on Mule Deer Winter Ranges

Within all mule deer winter range units to which this FSP applies, Douglas-fir may be considered a preferred species for the purposes of the stocking standards in addition to the species listed in the stocking standards in the CRSS.

15) Management of Root Disease Sites

For standard units that consist solely of areas that are identified and mapped as a root disease polygon, which may include up to a 30m buffer surrounding the area of infection, an alternate ecologically suitable, commercially valuable species that are moderately susceptible, tolerant, or immune may be specified as preferred and/or acceptable to maximize species diversity on site at the time of planting.

Due to the risk of increased inoculum levels, which may result from a conifer release treatment, on areas that have been identified and mapped and managed as a root disease polygon, which may include up to a 30 m buffer, for the purpose of assessing the free growing status of a conifer crop tree, all trembling aspen, paper birch, black cottonwood, willow and alder shall be assessed as non-competing brush.

16) Wildfire Urban Interface (WUI) Stocking Standards

(Currently under development)

17) Extension to Regeneration Delay Period Required to Reduce Pressure on Seed Supply and Nursery Capacity as a Result of 2017 Wildfires

Areas managed for natural reforestation may have regeneration delay extended to 9 years when all the following conditions are met:

a) A regen survey is completed on the site in year 5 or 6 post-harvest start.
b) The average stocking of preferred and acceptable species is greater than 500 well-spaced/ha.
c) The regeneration survey has demonstrated that there are significant numbers of germinants on the site that will contribute to the stocking targets.
d) The regen delay milestone date is not extended beyond 2028.

18) Extension to Regeneration Delay Period When Standards Units with a 4 Year Regen Delay are a Minor Component of the Cut Block

Where a cut block:

a) is located in either the ESSFxv1, ESSFxv2, MSxv, SBPSdc, SBPSmc, SBPSmk or SBPSxc biogeoclimatic subzones, and
b) contains SU's that have a 4 year regeneration delay and 7 years regeneration delay periods, and
c) less than 25 percent (25%) of the NAR area of the cut block has a 4 year regeneration delay period,

all standards units within the block may be managed with a 7 year regen delay period.

19) Intermediate Harvest Standards

Where harvesting is deemed to be an intermediate harvest, as per clause *General Condition clause 4) Intermediate Harvest* of this document, the applicable stocking standard in the CRSS may be varied such that:

a) there shall be no regeneration objective, and
b) the minimum basal area objective shall be set at $20m^2$/ha or greater.

20) Uneven Aged Management Required to Achieve a Result of Strategy in the FSP

Where required to achieve a result or strategy in the FSP any Douglas-fir leading stand may be managed for uneven aged stand structure. The stocking standard that shall apply will be the applicable even aged stocking standard, based on biogeoclimatic subzone and site series, from the CRSS as modified consistent with Table 3 below.

Table 3 *Stocking Standard Conversion Table*

Target Stocking from CRSS standards	Layer	Target Stocking	Minimum Stocking (P+A)	Minimum Stocking (P)
(stems/ha)		(well-spaced/ha)		
1200	1	600	300	250
	2	800	400	300
	3	1000	500	400
	4	1200	700	600
1000	1	400	200	200
	2	600	300	250
	3	800	400	300
	4	1000	500	400
800	1	300	150	150
	2	400	200	200
	3	600	300	300
	4	800	400	400
600	1	300	150	150
	2	400	200	200
	3	500	300	300
	4	600	400	400
400	1	200	100	100
	2	300	125	125
	3	300	150	150
	4	400	200	200