

Powell River Community Forest Ltd.
FOREST STEWARDSHIP PLAN
for
Community Forest License K3G



Appendix 1
Stocking Standards

1.0 FORWARD

Pursuant to the Forest Planning and Practices Regulation section 16, the following tables are the stocking standards that are to be applied to cut blocks harvested under this Forest Stewardship Plan (FSP) for the areas included under this plan within the Sunshine Coast Timber Supply Area that may be harvested under Powell River's Community Forest License K3G. These standards are to be used in-conjunction with site plans where required under the Forest and Range Practices Act.

The standards recognize several silviculture systems and regeneration situations that may occur as a result of harvesting or other disturbances.

The tables and standards herein are based on the Provincial publications:

- Tree Species and free Growing Stocking Standards Guidelines (May 2000) for the Vancouver Forest Region;
- Establishment to Free Growing Guidebook (Version 2.2, revised May 2000);
- A Field Guide for Site Identification and Interpretation for the Vancouver Forest region (1994, Land Management Handbook Number 28)

2.0 EVEN-AGED MANAGEMENT

The following standards apply to blocks and/or standards units where even aged management is practiced and are applicable to the following silviculture systems:

- Clear-cut;
- Clear-cut with (Group and/or Disbursed) Reserves;
- Retention, where edge influence is less than 100%, within openings only.

The tables cover site series commonly found within the Sunshine Coast Timber Supply Area for the following biogeoclimatic (BEC) variants: CDFmm, CWHxm, CWHdm, CWHvm2, & MHmm1

2.1 Stocking Standards for K3P, Sunshine Coast Forest District. The following tables outline the stocking standards that apply to even-aged management and layer 4 of multi-layered stands.

Table 1			Regeneration Guide					Min	
ID # Assigned	BGC Classification		Species		Stocking			Inter-tree Spacing (m)	Regen. Delay (Max yrs)
	Zone/SZ	Series	Species/Minimum FG Height (m)		Target	MIN p&a	MIN p		
			Preferred (p)	Acceptable (a)	(well-spaced/ha)				
35000	CDFmm	01	Fd/2.0 Pl ⁶ /1.25	Cw/1.0	900	500	400	2.0	3
35001		02	Fd/2.0 Pl ⁶ /1.25		400	200	200	2.0	3
35002		03	Fd/2.0 Pl ³ /1.25		800	400	400	2.0	6
35003		04	Fd/3.0	Bg/1.75 Cw/1.5	900	500	400	2.0	3
35004		05	Fd/3.0	Cw/1.5	900	500	400	2.0	3
35005		06	Cw/2.0 Fd/4.0	Bg/2.25	900	500	400	2.0	3
35006		07	Cw/2.0 Fd/4.0	Bg/2.25	900	500	400	2.0	3
35007		08	Cw ¹ /2.0	Bg ¹ /2.25	900	500	400	2.0	3
35008		10	Pl ¹ /1.25	Cw ¹ /1.0	400	200	200	2.0	3
35009		11	Cw ¹ /1.0		800	400	400	2.0	3
350010		12	Cw ¹ /2.0 Fd ¹ /4.0	Bg ¹ /2.25	900	500	400	2.0	3
350011		13	Bg ¹ /2.25 Cw ¹ /2.0 Fd ¹ /4.0		900	500	400	2.0	3
350012		14	Cw ¹ /1.0	Bg ¹ /1.4	800	400	400	2.0	3
350013		Root Rot Sites All		Cw/1.5 Pw/2.5	Pl/1.25	900	500	400	2.0

Table 1			Regeneration Guide					Min	
ID # Assigned	BGC Classification		Species		Stocking			Inter-tree Spacing (m)	Regen. Delay (Max yrs)
			Species/Minimum FG Height (m)		Target	MIN p&a	MIN p		
	Zone/SZ	Series	Preferred (p)	Acceptable (a)	(well-spaced/ha)				
35014	CWHdm	01	Fd/3.0 Hw ²⁴ /3.0	Cw/1.5 Pw ³¹ /2.5	900	500	400	2.0	3
35015		02	Pl/1.25 Fd/2.0		400	200	200	2.0	3
35016		03	Fd/2.0	Cw/1.0 Hw/2.0	800	400	400	2.0	3
35017		04	Fd/3.0	Cw/1.5 Pw ³¹ /2.5	900	500	400	2.0	3
35018		05	Cw/2.0 Fd/4.0	Hw/4.0 Pw ³¹ /2.5	900	500	400	2.0	3
35019		06	Cw/1.5 Hw/3.0	Fd ¹ /3.0	900	500	400	2.0	6
35020		07	Cw/2.0 Fd/4.0 Bg/3.5	Hw/4.0 Ss ^{35,56} /4.0	900	500	400	2.0	3
35021		08	Bg/3.5 Cw/2.0	Ss ^{35,56} /3.5	900	500	400	2.0	3
35022		09	Cw ¹ /2.0	Bg ¹ /3.5 Ss ^{35,56} /3.5	900	500	400	2.0	3
35023		11	Pl ¹ /1.25	Cw ¹ /1.0	400	200	200	2.0	3
35024		12	Cw ¹ /1.0	Hw ^{1,2} /2.0 Pw ³¹ /2.5 Ss ^{35,56} /3.0	800	400	400	2.0	3
35025		13	Bg/3.5 Cw/2.0 Fd ¹ /4.0	Ss ^{35,56} /4.0	900	500	400	2.0	3
35026		14	Bg ¹ /3.5 Cw ¹ /2.0	Ss ^{35,56} /3.5	900	500	400	2.0	3
35027		15	Cw ¹ /1.0		800	400	400	2.0	3
35028		Root Rot Sites All		Cw/1.5 Pw/2.5 Dr/4.0	Pl/1.25	900	500	400	2.0

Table 1			Regeneration Guide					Min	
ID # Assigned	BGC Classification		Species		Stocking			Inter-tree Spacing (m)	Regen. Delay (Max yrs)
	Zone/SZ	Series	Species/Minimum FG Height (m)		Target	MIN p&a	MIN p		
			Preferred (p)	Acceptable (a)	(well-spaced/ha)				
35063	CWHvm2	01	Fd ^{1,9,23} /2.25 Hw/2.50	Ss ^{7,15,35} /3.0	900	500	400	2.0	6
35064			Cw/1.5 Yc/1.5	Hm ¹³ /1.0					
35065		02	Pl/1.25 Cw/1.0	Hw/1.75	400	200	200		
			Fd ^{9,16} /1.5 Yc/1.0	Hm ¹³ /0.75					
35066		03	Cw/1.0 Hw/1.75	Pw ^{16,31} /2.5	800	400	400		
			Fd ^{9,16} /1.5 Yc/1.0	Hm ¹³ /0.75					
35067		04	Cw/1.0 Hw/1.75	Ba/1.5 Pw ¹⁶ /2.5	900	500	400		
			Fd ^{9,16} /1.5 Yc/1.0	Hm ¹³ /0.75					
35068		05	Cw/1.5 Hw/2.5 Yc/1.5	Fd ^{1,8,9,23} /2.25	900	500	400		
			Ba/1.75	Ss ^{15,35} /3.0					
35069		06	Cw/1.5 Hw/2.5 Yc/1.5	Hm ¹³ /1.0	900	500	400		
	Ba/1.75		Fd ^{1,9} /2.25						
35070	07	Cw/2.0 Hw ² /3.5	Ss ^{15,35} /4.0	900	500	400			
		Yc/2.0 Ba/2.25	Hm ¹³ /1.0						
35071	08	Cw ¹⁴ /2.0 Hw ^{2,30} /3.5	Ss ^{30,35} /4.0	900	500	400			
		Yc/2.0 Ba/2.25	Hm ¹³ /1.0						
35072	09	Cw ¹ /1.0 Hw ¹ /1.75	Ba/1.5 Hm ¹³ /0.75	800	400	400			
35073		Yc ¹ /1.0	Hm/0.75						
35073	10	Pl ¹ /1.25 Yc ¹ /1.0	Hw ¹ /1.75	400	200	200			
			Ss ³⁵ /2.0						
35073	11	Cw ¹ /1.0 Yc ¹ /1.0	Hm ^{13,53} /0.75	800	400	400			

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ID # Assigned	BGC Classification		Species		Stocking			Inter-tree Spacing (m)	Regen. Delay (Max yrs)	
			Species/Minimum FG Height (m)		Target	MIN p&a	MIN p			
	Zone/SZ	Series	Preferred (p)	Acceptable (a)	(well-spaced/ha)					
35074	CWHxm	01	Fd/3.0	Hw ²⁴ /2.0 Cw/1.5 Pw ³¹ /2.5	900	500	400	2.0	3	
35075		02	Pl/1.25 Fd/2.0		400	200	200	2.0	3	
35076		03	Fd/2.0 Pl ⁶ /1.25		800	400	400	2.0	3	
35077		04	Fd/3.0		900	500	400	2.0	3	
35078		05		Cw/1.5 Pw ³¹ /2.5						
35079		06		Hw/1.75 Pw ³¹ /2.5 Bg ⁵³ /3.5	900	500	400	2.0	3	
35080		07		Cw/2.0 Fd/4.0						
35081		08		Cw/1.5 Hw/2.0 Fd ¹⁸ /3.0	900	500	400	2.0	6	
35082		09		Cw/2.0 Fd/4.0	Bg/3.5 Hw/1.75 Ss ^{35,56} /4.0	900	500	400	2.0	3
35083		11		Cw/2.0 Ss ³⁵ /4.0	Bg/3.5	900	500	400	2.0	3
35084		12		Cw ¹ /2.0	Bg ¹ /3.5 Ss ^{35,56} /3.5	900	500	400	2.0	3
35085		13		Pl ¹ /1.25	Cw ¹ /1.0	400	200	200	2.0	3
35086		14			Hw ¹ /2.0 Pw ³¹ /2.5 Ss ^{35,56} /2.5	800	400	400	2.0	3
35087		15		Cw/2.0 Bg/3.5 Fd/4.0	Ss ^{35,56} /4.0	900	500	400	2.0	3
35088		Root Rot Sites All		Bg ¹ /3.5 Cw ¹ /2.0	Ss ^{35,56} /3.5	900	500	400	2.0	3
			Cw ¹ /2.0		800	400	400	2.0	3	
			Cw/1.5 Pw/2.5 Dr/4.0	Pl/1.25	900	500	400	2.0	3	

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ID # Assigned	BGC Classification		Species		Stocking			Inter-tree Spacing (m)	Regen. Delay (Max yrs)
			Species/Minimum FG Height (m)		Target	MIN p&a	MIN p		
	Zone/SZ	Series	Preferred (p)	Acceptable (a)	(well-spaced/ha)				
35089	MHmm1	01	Ba/0.6 Hm/1.0 Yc/1.0	Se ²³ /1.0 Hw ^{14,53} /1.0	900	500	400	2.0	7
35090		02	Hm/.75 Yc/.75	Ba/.6 Se ²³ /0.75	800	400	400	2.0	4
35091		03	Ba/.6 Hm/1.0 Yc/1.0	Hw ^{14,53} /1.0	900	500	400	2.0	4
35092		04	Ba/0.6 Hm/1.0 Yc/1.0	Hw ^{14,53} /1.0	900	500	400	2.0	7
35093		05	Ba/0.6 Yc/1.0	Hm/1.0 Hw ^{14,53} /1.0	900	500	400	2.0	4
35094		06	Hm ¹ /0.75 Yc ¹ /0.75	Ba ¹ /0.6	800	400	400	2.0	7
35095		07	Ba ¹ /0.6 Yc ¹ /0.75	Hm ¹ /0.75	900	500	400	2.0	4
35096		08	Hm ¹ /0.75 Yc ¹ /0.75		400	200	200	2.0	4
35097		09	Yc ¹ /0.75	Hm ¹ /0.75	800	400	400	2.0	4
Riparian Treatment	CWH	All	Cw/2.0 Ss/4.0 Hw/4.0 Bg/3.5 Ba/2.5 Fd/4.0	Act/4.0 Dr/4.0	600	300	200	2.0	3
Alder Management	CWH	See Below	Dr/4.0		1500	1000	1000	2.0	3
Alder Management	CWH	See Below	Dr/4.0		1100	700	700	2.0	3
Deciduous Management	CWH	See Below	Dr/4.0	Mb/4.0	1500	1000	800	2.0	3

Sub zones and Site series suitable for Alder/ Deciduous management	
CWH dm	01(non salal), 05, 06 (non salal), 07, 08, 09, 13, 14
CWH xm	05, 06 (non salal), 07, 08, 09, 13, 14

Conifer Tree Species

"Ba" means amabilis fir;
"Bg" means grand fir;
"Bl" means subalpine fir;
"Bp" means noble fir;
"Cw" means western red cedar;
"Fd" means Douglas-fir;
"Hm" means mountain hemlock;
"Hw" means western hemlock;
"Lt" means tamarack;
"Lw" means western larch;
"Pa" means whitebark pine;
"Pl" means lodgepole pine;
"Pw" means white pine;
"Py" means ponderosa pine;
"Sb" means black spruce;
"Se" means Engelmann spruce;
"Ss" means Sitka spruce;
"Sw" means white spruce;
"Sx" means hybrid spruce or interior spruce;
"Sxs" means hybrid Sitka spruce;
"Sxw" means hybrid white spruce;
"Yc" means yellow cedar.

“Biogeoclimatic unit” or “BGC classification”

means the zone, subzone, variant and site series described in the most recent field guide published by the Ministry of Forests for the identification and interpretation of ecosystems, as applicable to a harvested area.

“**MIN** or “**Min**” means minimum

Broadleaf Tree Species

“Acb” means balsam poplar;
“Act” means black cottonwood;
“At” means trembling aspen;
“Dr” means red alder;
“Ep” means common paper birch;
“Mb” means bigleaf maple;
“Qg” means garry oak;
“Ra” means arbutus;

Footnote

- 1 elevated micro sites are preferred
- 2 suitable on thick forest floors
- 3 restricted to coarse-textured soils
- 4 restricted to medium-textured soils
- 5 footnote retired
- 6 restricted to nutrient-very-poor sites
- 7 restricted to nutrient-medium sites
- 8 restricted to steep slopes
- 9 restricted to southerly aspects
- 10 restricted to northerly aspects
- 11 restricted to crest slope positions
- 12 suitable on cold air drainage sites
- 13 restricted to upper elevations of biogeoclimatic unit
- 14 restricted to lower elevations of biogeoclimatic unit
- 15 restricted to northern portion of biogeoclimatic unit in region
- 16 restricted to southern portion of biogeoclimatic unit in region
- 17 restricted to western portion of biogeoclimatic unit in region
- 18 restricted to eastern portion of biogeoclimatic unit in region
- 19 restricted, not in Queen Charlotte Islands
- 20 restricted, not near outer coast
- 21 restricted to mainland
- 22 restricted to southern Gardner Canal-Kitlope area
- 23 restricted to trial use
- 24 suitable (as a major species) in wetter portion of biogeoclimatic unit
- 25 suitable on sites lacking salal
- 26 suitable minor species on salal-dominated sites
- 27 partial canopy cover required for successful establishment
- 28 limited by moisture deficit

- 29 risk of heavy browsing by moose
- 30 risk of porcupine damage
- 31 risk of white pine blister rust
- 32 limited by growing-season frosts
- 33 footnote retired and replaced with footnote 'a'
- 34 risk of snow damage
- 35 risk of weevil damage
- 36 suitable major species on salal-dominated sites
- 37 risk of heart rots
- 38 footnote retired
- 39 avoid exposed and windy sites
- 40 risk of redheart
- 41 limited by poorly drained soils
- 42 restricted to fresh soil moisture regimes
- 43 suitable on mainland coast only (QCI only)
- 44 suitable in areas with stronger maritime influence
- 45 suitable in areas with stronger continental influence
- 46 restricted to area north of the Dean Channel
- 47 risk of balsam wooly adelgid
- 48 risk of heavy browsing by deer
- 49 applies only to rust resistant, planted stock.
- 50 restricted to sites where the species occurs as a
major species in a pre-harvest, natural stand
- 51 restricted to areas with proven PI performance
- 52 restricted to sheltered micro sites with deep soil
- 53 minor component
- 54 risk of unsuccessful release of advance regeneration
- 55 acceptable in sx-sm portion of site series
Must be present in the pre-harvest stand
and be restricted to weevil resistant stock
- 61 acceptable on cold air drainage sites only
- # **Broadleaf Management Constraints**
- a productive, reliable, and feasible regeneration option
- b limited in productivity, reliability and/or feasibility

2.2 Rules for Modifying General Stocking Standards (as modified with new sites under rule 3, and add Rule #5 & #6)

RULE NUMBER ONE - Site Series Mosaics/Complexes

Where more than one site series is located within a logical standards unit area the standard that applies will be that of the dominant site series. This standard can be modified with the inclusion of additional species selected from the standard of the subdominant site series for those specific areas of the mosaic or complex. These additional components to the standard will be supported by a rationale, documented and should be incorporated into the Site Plan.

RULE NUMBER TWO - Transitional Sites

On transitional sites occurring between two BEC units the standard that applies will be that of the dominant BEC unit. This standard can be modified with the inclusion of components of the standard associated with the sub-dominant BEC unit. These additional components to the standard will be supported by a rationale, documented and should be incorporated into the Site Plan.

RULE NUMBER THREE - Minimum Inter-tree Distance (MITD)

The general MITD of 2.0 meters can be reduced down to 1.5 meters for any given site where productive and plantable sites are limited by pre-harvest site characteristics. These can include but are not limited to:

Colluvial sites are those with large surface rocks or boulders or sub-surface rocks. On these sites soil is either shallow or limited to gaps between rocks. These sites can be very localized or extensive in nature such as large deposition zones from historic slides, talus slopes, avalanche tracks or boulder veneers.

Wet sites are those with high or fluctuating water tables and growing season water surpluses. Productive growing sites are generally less frequent and found mainly on elevated mounds. Under the BEC system the soil moisture rating (SMR) for these sites ranges from very moist (6) to wet (7).

Disturbed roadside areas are those within the road prism where productive growing sites are less frequent because of broken rock, talus, heavy slash or other unfavorable soil materials caused by road building and harvesting operations.

Stream Riparian areas are areas adjacent to a stream within the RMA zone.

Areas of heavy elk use are those where heavy elk use is apparent during site plan field work. These areas may include, but are not limited to Haslam Lake and Lang Creek. Reducing the MITD will allow for more trees to be planted and more flexibility in implementing obstacle planting, to reduce browse exposure.

Areas of shallow soils over rock are those where bedrock is close to the soil surface creating shallow soils. Productive growing sites will be limited in these areas and reducing MITD will allow for full utilization of productive growing sites.

MITD may also be reduced on other sites where conditions may preclude the attainment of the target stocking standards. Justification for a reduced MITD will be supported by a rationale, documented and should be incorporated into the Site Plan.

RULE NUMBER FOUR - Leave Trees

The minimum characteristics of any leave trees that contribute toward the free growing stand must be of good form, health and vigor and otherwise meet the stocking standards for that site. In situations where leave trees will not contribute to the free growing stand the leave trees within the harvest area must have characteristics appropriate to meet forest management objectives developed for the site. The forest management objectives must be supported by a documented rationale and should be incorporated into the site plan.

RULE NUMBER FIVE – HEAVY ELK Browse Areas

In heavy Elk Browse areas the intertree spacing is reduced to 1.5 m and MSS is 50% of normal standards. Heavy Elk Browse areas are defined as units where browse or damage is chronic and ongoing. Elk damage will include; a) groups of >4 damaged trees per hectare, averaged across a SU or b) at least once per standard unit where the number of trees damaged is 10 or more.

RULE NUMBER SIX – Riparian Management and Wildlife Habitat

The Forest Planning and Practices Regulations allow for flexibility within riparian management areas (RMA). Timber production objectives may be secondary to the protection or enhancement of riparian, biodiversity, wildlife and fisheries values. Accordingly, stocking standards may be modified to meet forest management objectives. Changes to the stocking standards may include adjustments to preferred and acceptable species, the acceptance of broadleaf species, and adjustments to target and minimum densities and minimum inter-tree distance. The forest management objectives and the associated changes to the stocking standards must be supported by a documented rationale.

2.3 Forest Health Factors

Laminated Root Rot - Alternate stocking standards have been listed for sites infected by laminated root rot and armillaria in the CWH dm and CWHxm subzones of the Sunshine Coast Forest District. These standards will be applied to infected sites when an alternate species management strategy is prescribed.

White Pine Blister Rust - Western White Pine (Pw) occurs naturally within the plan area and is susceptible to White Pine Blister Rust. In order for Pw to be an acceptable crop tree at free growing it must be either grown from resistant stock or first-lift pruned, where pruned means that the lowest live branches have been removed to a height of 1.3m when trees are greater than or equal to 2.5m tall. For trees < 2.5m tall, at least 40% of tree height will remain as live crown.

Spruce Weevil (Pissodes strobi) - Risk for Spruce Weevil is high for most of the plan area below 700m in elevation. For this reason, Sitka spruce and spruce hybrids will be limited to minor components (<20%) of planted and regenerated stands. Planted spruce is to be from seed which has been selected for resistance to spruce weevil.

2.4 Red Alder Management Strategy:

Regeneration with alder will be targeted to not only root rot pockets but Alder Management will also take place on suitable ecological sites. Regeneration with alder as an ecological suitable species under the stocking standards defined for the management for the total area harvested during the term of the FSP.

Management Objectives

The primary objective is to provide quality saw logs for processing and sale to market in rotations of 25 to 40 years. The implementation of an alder management strategy will help avoid a supply deficit in the medium-term (25 to 40 years) and promote a supply of saw logs in the long-term through the establishment of alder plantations.

Stand Establishment

The establishment of red alder plantations will be restricted to suitable sites as outlined in the attached alder stocking standards. The primary focus will be on sites under 300 m in elevation which are nutrient-rich and do not suffer from moisture deficits. Preferred sites are rich and moist (05 and 07) sites and richer zonal sites although alder can be established in root rot centers on other suitable sites.

Stand Density Management

To establish a *more valuable* Free Growing stand of red alder, where the number of alder trees per hectare greater than 4m tall exceeds the upper density maximum of 1500 sph at survey time, a spacing treatment *can* be carried out on the area before the late free growing date to reduce the number of alder trees per hectare to within the range of 500-900sph. Spacing, *although not mandatory*, is recommended to ensure that target rotations and product objectives are *optimized*. *Ideally*, spacing should occur at about 10m in top height and before the live crown has dropped below 40%.

Red Alder Stand Management regimes (i.e. Spacing) currently being administered under the government's FIA account are meeting the investment criteria for spacing of alder plantations after meeting Free to Grow status. It is the intention of the Holder of this FSP to continue the spacing programs under the FIA stand tending programs.

3.0 UNEVEN-AGED MANAGEMENT

The following standards apply to blocks and/or standards units where uneven-aged management is practiced and are applicable to the following silviculture systems:

- Single Tree Selection;
- Retention (group and/or dispersed), where edge influence is 100%; and
- Group Selection.

The tables cover site series commonly found within the Sunshine Coast Timber Supply Areas for the following biogeoclimatic (BEC) variants: CDFmm, CWHxm, CWHdm, CWHvm2 and MHmm1 in the license holder’s operating area.

Table 2 – Stocking Standards for Multi-storied Stands				
Target	Layer*	Stocking (well spaced/Ha)		
		Target p & a	Minimum p & a	Minimum p
900	1	400	200	200
	2	500	300	250
	3	700	400	300
	4	900	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

3.1 Applying Uneven-Aged (Multi-layered) Stocking Standards

The multi-storied stocking standards may be applied, where ecologically suitable, to partial harvesting silviculture systems that include single or multiple entry harvesting designated to create multi-storied stands. Multi-storied stands generally have two or more dominant age classes or layers that are created by partial cutting silviculture systems in both even and uneven aged stands. The purpose of these standards is to allow retention trees from different layers to contribute towards the stocking and to avoid additional stocking in the under-story that will never attain acceptable growth and vigor. The “Standards for Retained Trees” section outlines the criteria for trees that count towards stocking.

To apply the multi-layered stocking standards, first select the appropriate site from the biogeoclimatic ecosystem classification (BEC) site series (Table 1) to determine the preferred and acceptable tree species (p & a) and applicable free growing heights. Then select the set of target and minimum stocking densities from the Stocking Standards for Uneven-Aged Stands (Table 2) that correspond to the target density in Table 1. Where standards units (SU) are comprised of more than one site series, the practice will be to manage the stocking standards of the dominant site series provided that the tree species are suitable for all the site series contained in the SU.

Uneven-aged stocking standards may be applied in partial harvesting plans that are designed to meet specific management objectives. Some examples where these standards are appropriate include:

- when operating in visually constrained areas;
- partial harvesting of an area to remove a percentage of the stand volume while meeting non-timber forest management objectives (e.g. recreational trails, riparian buffers (sensitive streams), retention patches, buffering of wildlife habitats, etc.);
- wildlife enhancement areas where the removal of some stand volume is appropriate;
- partial cutting in stands with a naturally occurring multi-storied stand structure; and
- feathering of cut-block edges to meet wind-throw or riparian management objectives.

Openings created using partial cutting silviculture systems will generally not exceed one hectare. The establishment and growth of the regeneration layer occurs under the influence of existing leave trees of one or more additional age classes.

***Stand Layer Definition**

Layer 1 Mature trees \geq 12.5 cm dbh

Layer 2 Pole trees 7.5 cm to 12.4 cm dbh

Layer 3 Sapling trees \geq 1.3 height to 7.4 cm dbh

Layer 4 Regeneration trees < 1.3 m height

3.2 Regeneration Date / Free Growing Height

Maximum regeneration delay is one year more than what is listed in the even-aged stocking standards. The free growing heights where applicable are as listed in the even-aged stocking standards. Regeneration delay can be met immediately following harvest if the residual stand has no significant damage or pest problems and meets the minimum stocking standards. If regeneration is achieved immediately following harvest, earliest free growing date is 12 months after completion of harvest.

3.3 Preferred and Acceptable Species

The preferred and acceptable species listed in the even-aged stocking standards by biogeoclimatic zone, variant and site series are to be considered “preferred” with the exception of locally shade-intolerant species Douglas-fir (Fd) which in layer 4 is considered “acceptable”.

3.4 Standards for Retained Trees:

Leave trees retained through various silviculture systems may contribute to the stocking of the future stand and/or provide biodiversity value.

For mature (layer 1), pole size (layer 2), sapling (layer 3), and regeneration (layer 4) trees to contribute to stocking in the future stand and be considered free growing they must have the following minimum characteristics:

- Have good form, health, and vigor and otherwise meet the stocking requirements for the site.
- Scars and damage should be minimal and there should be no stem infection caused by dwarf mistletoe; no other externally visible pathological indicators should be present including broken tops, frost cracks, conk, extreme basal sweep, or unacceptable forks and crooks.
- Continuous live crown must be greater than 20% for layers 1 and 2 and 30% for layer 3 trees.
- Layer 3 trees will be free of significant disease or insect damage, have potential for post harvest release, and no open injuries (scars) with a horizontal width greater than 25% of the circumference of the tree at that point.
- A higher percentage of stem defect, scars, and rot are acceptable for layer 1 and layer 2 western red cedar and yellow cedar leave trees. The forest products derived from Cw and Yc are unique and these trees will likely provide economic value to the next stand entry.

3.5 Trees Retained for Biodiversity

Trees left for biodiversity, that will not contribute to the free growing stand, may include very old dominant trees (veteran trees), trees with broken tops, candelabras, heart rot, as well as under-story trees and advanced regeneration if deemed safe to do so. These trees will add structural value, potential wildlife habitats, and coarse woody debris inputs to the next stand. Leave trees infected with dwarf mistletoe or root rot should not be retained for biodiversity.

When significant levels of western hemlock are expected to contribute to the future crop, a sanitation treatment at the time of harvest in multi-storied stands or in leave areas within a block may be considered in stands with moderate or high incidence of hemlock dwarf mistletoe. Alternately, non-host species (Fd, Cw, Yc) or less susceptible species (Hm, Ba, Ss) will be planted and/or targeted to mitigate the effects of DMH on the regenerating stand.

4.0 STOCKING STANDARDS FOR HIGH RETENTION HARVESTING (DISPERSED RETENTION / SMALL OPENINGS)

4.1 Dispersed Retention

The minimum acceptable stocking level of layer 1 and layer 2 for dispersed retention when a stocking standard for established regeneration is not required is;

- Second Growth Stands: Trees are well distributed (with no gaps exceeding twice the normal spacing for a given density), healthy and be 150-200 stems/ha; or
- Old growth Stands: Trees are well distributed (with no gaps exceeding twice the normal spacing for a given density), healthy and be >200 stems /ha.

Species composition of the retained trees in layers 1 and 2 are similar as or comprised of, or will promote, a greater proportion of species more ecologically suitable to the *standards unit* than, the species composition on the *standards unit* immediately prior to the harvesting.

4.2 Small Openings

The following minimum opening size or situation applies to small openings;

- When opening size or gap size is > 0.1 ha. then even age stocking standards apply.
- Small openings or gaps \leq 0.1 ha do not require stocking standards.

5.0 INTERMEDIATE CUTTING – SINGLE STEM HARVESTING

Single Stem Harvest is the removal of individual stems or small groups of trees using either “standing stem” harvest by helicopter, or conventional falling and yarding by helicopter or other equipment. The residual stand that remains following an intermediate cut (even-aged management) does not have a free growing requirement. There are no reforestation requirements for intermediate cutting.

This type of silviculture system may be used in constrained areas to address cut-block adjacency, terrain stability, wildlife, riparian and visual management issues.

5.1 Stocking Standards for Intermediate Cutting

The regular FSP stocking standards do not apply to Intermediate Cutting. Stocking standards for the retained trees in an intermediate cut stand are as follows:

For intermediate cuts, the following criteria for application and stocking standards will be met:

1. This type of harvesting will be limited to \leq 10% of the total timber volume harvested under this FSP over a 5 year period.
2. There will be a maximum \leq 50% reduction in preharvest stand basal area (m²/ha), and/or a maximum 50% reduction in pre-harvest merchantable stand volume (m³/ha). Residual stand composition will be listed in the Site Plan for each Standards Unit.

3. Preferred and acceptable species will be consistent with the corresponding site classification listed in Table 1 and be based on the species composition substantially the same as or comprised of, or will promote, a greater proportion of species more ecologically suitable to the *standards unit* than, the species composition on the *standards unit* immediately prior to the harvesting.
4. Leave tree form, health, and vigor will be representative of the original stand condition.
5. Openings ≤ 0.25 ha will not require a stocking standard.
6. To meet the requirement for Wildlife Trees, a component of stand structures suitable for wildlife habitat (snags, broke tops, LOD, veteran trees,) will be left in the stand. Only those snags and danger trees determined to be hazardous to crews will be felled.
7. Justification for intermediate cuts will be based on site limitations (visual, terrain, operability, plantability, Salvage rules etc...) and specific management objectives (high value timber, maintenance of wildlife habitat, etc...) will be listed in the Site Plans.

The quantity and distribution of trees retained must be to a level that will ensure the area will remain adequately stocked for a period of 12 months after completion of harvest (FPPR s.44(4)) such that a stand has future growth potential considering the objectives for the site and the health and vigor of the existing stand.

5.2 Standards for Retained Trees:

The preferred and acceptable species listed in the even-aged stocking standards by biogeoclimatic zone, variant and site series may be considered “preferred” and be based on the pre-harvest stand composition.

Leave tree form, health and vigor will be representative of the original stand condition. Excessively scared and/or damaged trees caused by harvesting should also be removed.

6.0 Free Growing Stand Exemption under s. 91 FPPR from FPPA s. 29

FPPR s. 44(1) applies in all situations or circumstances under the FSP where a free growing stand is required to be established under FRPA s. 29. *Except where as follows:*

In addition to the circumstances established under FPPR s 44(3): within areas that will be considered for salvage removal of special forest products (products as described in the Coastal Appraisal Manual) or the removal of endemic wind thrown trees; stocking standards will not be applicable in harvesting areas where trees are completely removed in a contiguous unit of less than 1 ha. Or; where the contiguous area is not applicable (i.e. single tree removal) and the volume in the general area (logical unit) is $<500m^3$, no stocking standards will be applicable.

6.1 Site Plan Exemption under s. 91 FPPR from FPPA s. 10

Where salvaging of wind thrown trees and special forest products meets the above criteria ($<1ha$ and $< 500m^3$), no site plan is required. If salvage is adjacent to the licensee’s recently harvested blocks and is operating under an existing site plan establishing a free growing stand under FRPA s. 29, the active Site Plan will be amended to include the salvage area prior to denudation being called in an effort to manage the combined area under one site plan.

Where salvage areas, together with an adjoining cut block that has been clear-cut and is subject to an exemption under this FSP and will result in a contiguous clear-cut exceeding 1 ha, stocking standards will apply.