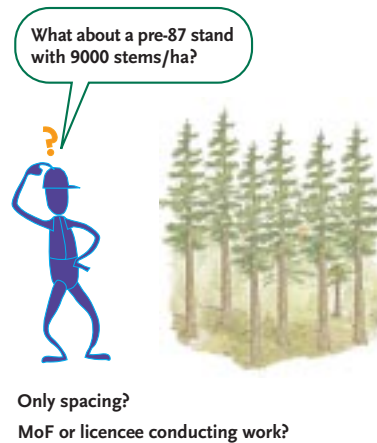


Appendix 3. Considerations for Spacing Prescriptions and Projects

Do all spacing projects require an SMP?

Legally – only required for stands designated as free growing.



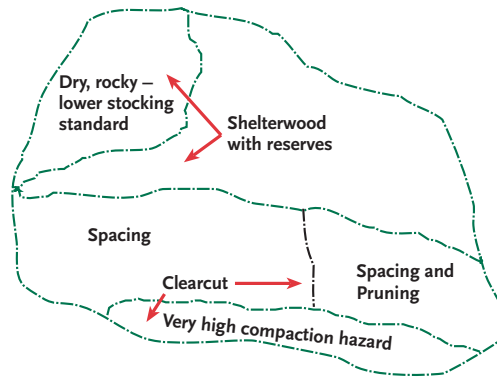
JUVENILE SPACING WORKSHOP 3 • 12

What about a stand established pre-87 with 9000 stems/ha?

- An SMP is not legally required, just a 770 can be used to guide the project – especially if the stand is only going to be spaced.
- An SMP will be required for any subsequent treatments since the quality plots completed on the spacing project will be used as a free growing survey to declare the stand free growing.
- Therefore, the development of an SMP is strongly recommended if you anticipate subsequent treatments, such as pruning, fertilization, commercial thinning, to avoid going through the prescriptive process twice.
- **For licensees:** the MoF may require an SMP regardless, as a matter of course, which is quite within their right to do so. Since the licensee will be taking on the spacing voluntarily (as an incremental project), and they are acting as a contractor to the Crown, the MoF can ask them to do this. It will provide the ministry with a better working document.

What is expected for stratification?

Stratify by standards unit (SU) based on:

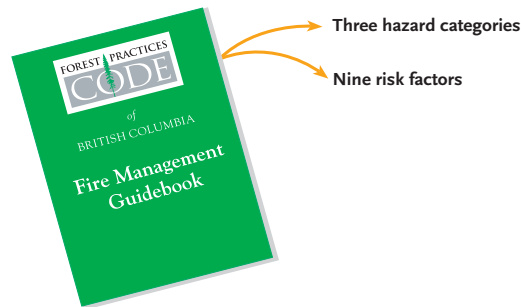


JUVENILE SPACING WORKSHOP 3 • 7

- Stratify by standards unit (SU) based on:
 - Uniform application of a *silvicultural system*, *post-treatment densities*, and *soil conservation standards* (when applicable).
- The SU will form the basis for compliance inspections.
- Often, SUs in spacing areas are quite large – but this is not always the case.

.....

Fire Hazard and Risk Evaluation Prior to Juvenile Spacing



Fire hazard: A function of slash loading.

Fire risk: Approximation of the uncertainty that no fires will occur.

..... JUVENILE SPACING WORKSHOP 3 • 8

- The current data collection procedures for pre-stand tending information provides enough information to assess fire hazard.
- The *Fire Management Guidebook* (August 1995) defines:
 - three hazard categories; and
 - nine factors that influence risk.
 - You can read these in the guidebook.

Note: The guidebook is confusing in the manner in which it interchanges the terms hazard and risk. Remember this:

- **Fire Hazard** is a function of the slash loading after spacing. Basically, the fire potential based on fuel load.
- **Fire Risk** is an estimation of uncertainty that a fire will not occur (similar, but not quite the same as the probability that it will). Risk is related to a number of factors related to people as well as fuels.

Strategies to Reduce Fire Risk from Spacing

Smaller blocks

Unspaced buffer strips

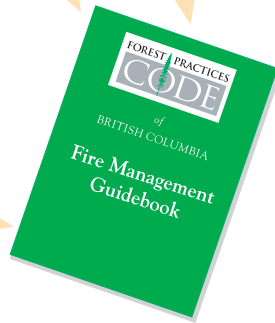
- 20 m (highways and major roads)
- 10 m (lesser travelled roads)

Fuel modification

- No-slash buffer – pull back to road
- No-slash buffer – pull back to stand
- Retain deciduous
- Buck, lop and scatter
- Others

Prevention

Access restriction



JUVENILE SPACING WORKSHOP 3 • 9

The guidebook outlines actions that may include:

- Block size – smaller blocks where applicable.
- Buffer strips along roads – unspaced buffers (wider, the more well-traveled):
 - A 20 m leave strip along highways, main rural roads, and major industrial/recreational corridors.
 - A 10 m strip may be adequate along lesser traveled roads.
- Fuel modification:
 - Pull back slash to roads (pile and burn) to create a no-slash buffer.
 - Pull back slash into the stand for the same effect.
 - Retain deciduous component or other natural fuel breaks.
 - Chip slash or use for recovery or utilization (firewood, posts, rails etc.).
 - Directionally fall away from roads (often very difficult).
 - Buck, lop and scatter to reduce fuel depths and speed decomposition.
 - Underburn???
- No spacing allowed – in very high risk areas.
- Access restriction – deactivate or close roads during high fire danger.
- Prevention:
 - Space during low fire danger.
 - During high fire danger; post signs, ban campfires, increase patrols, close forest (if fire danger extreme).

How broad can you set the range for post-spacing density?

Key: A range is needed to allow for spacer error and stem selection.

Target	Minimum	Maximum
800 sph	700	900
	↔ +/- 100 sph	
1200 sph	1000	1400
	↔ +/- 200 sph	



Should probably never go beyond +/- 200 stems per ha, but be sure to leave the best trees. If you must go over this range to ensure this, do so.

JUVENILE SPACING WORKSHOP 3 • 10

- You need a range to allow for some error since the spacer can not be expected to be perfect when only using his calibrated eyes.
- The maximum and minimums should be multiples of 100 to fit with the plot multiplier and allow for a range of “whole trees” in the plot.
- The range can be higher with higher densities, but should probably never get beyond +/- 200 stems per ha.

Examples:

- Target density = 800 (min = 700, max = 900)
- Target density = 1200 (min = 1000, max = 1400)

Examples of Inter-tree Spacing Variations



JUVENILE SPACING WORKSHOP 3 • 11

- Inter-tree spacing should fit with the objectives for the stand and the stand and site characteristics.
- Your focus will rarely be on making your stand uniformly spaced.
- You want the focus to be on choosing the absolute best trees to utilize the growing spacing and the best growing microsites.
- You want to leave the trees best suited to meet your management objectives.
- You do not want spacers cutting quality merchantable trees that will be available to cut in the next harvesting entry.
- **There should be room for lots of variation when clear and appropriate justification is provided.**
- You may have different criteria for different species or size categories.

Intent of the Preferred and Acceptable Columns in the SMP

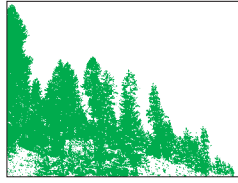
LICENCE NO.	CP	BLOCK	OPENING NO.	DATE	Y	M	D	STANDARDS UNIT	J	M			
D-1. POST-TREATMENT STANDARDS													
Use the table below to enter the schedule of stand-level treatments and post-treatment standards. Complete only the relevant columns.													
TARGET				SCHEDULE				STRUCTURAL ATTRIBUTES					
YEAR	AGE / HEIGHT	DBH	LARGE	TREATMENT	AREA (M ²)	SPECIES		MIN. TOTAL SPACES	MIN. FREE SPACES	MAX. TOTAL SPACES	MAX. FREE SPACES	MIN. DBH	MIN. HEIGHT
						PREFERRED	ACCEPTABLE						

Preferred	Acceptable
<ol style="list-style-type: none"> 1. Fdi 2. Lw 3. Pli 4. Cw 	<ol style="list-style-type: none"> 1. Se 2. Pl

- To allow you to rank your species.

- The term “Preferred” is used to imply what are the best crop tree species for this site.
- “Acceptable” means, what other tree species on site will make a good crop tree if there are no preferred species available for that microsite.

Multi-storied Stands SMP and Schedule C



Example:

Stand data – Douglas-fir

Layer 1 375 total trees

Layer 2 548 total trees

Layer 3 2314 total trees

Layer 4 2645 total trees

Considerations for spacing

- Only space layers 2 and 3.
- Occasionally you may have different criteria for the layers.
- What about future thinning/spacing entries in an uneven-aged regime? Should these be in an SMP?

JUVENILE SPACING WORKSHOP 3 • 13

- You only write in standards for layers 3 and 2 into section D-1 of the SMP since these are the only layers you will be treating under the SMP.
- If you anticipate commercial thinning under an uneven-aged regime in the future, which is likely the schedule of thinnings (cutting interval), all of the information associated with the CT (residual basal area, etc.) should be in an SP, either completed previously, or after the SMP.
- If no SP was done in the past with acceptable information for future commercial thinning entries, you may set up the future harvesting regime by describing a strategy in the Target Stand Conditions and Strategy Section. However, an SP will still have to be done before the first harvest in the future.

Note: You may have different criteria for layer 3 trees compared to layer 2.

- Inter-tree spacing may be less for layer 2 to allow you the opportunity to leave larger trees when they are scattered amongst layer 3 – as in a previous overhead.
- You may wish to have different post-spacing densities where you have clumps of each layer and perhaps you do not wish to open up one more than the other for some biological reason (e.g., you have very high densities of layer 3 and you fear they may be damaged by snow breakage).

How do I deal with even-aged clumpy stands?

Clumped = well-distributed clumps of SR in NSR matrix



Naturally clumped

- If NSR >50% of block – do a backlog SP
- If NSR <50% of block – SMP (may prescribe some planting too)

Cluster planted areas:

- Check original SP to choose plot radius:
 - 5,64 for >100 clusters/ha
 - may be larger for <100 clusters/ha

JUVENILE SPACING WORKSHOP 3 • 14

Naturally clumpy stands

- If the entire block is basically SR, there is no issue. You should be able to collect data and develop your contract specifications as per normal SMP and contract clauses.
- What about a pre-87 stand that is clumpy with interspersed small openings of NSR?
 - If the NSR openings make up > 50% of the block, the area should be prescribed under a backlog SP, not an SMP. Both planting the openings and spacing the clumps may be prescribed under the SP if the clumps are excessively dense. Remember, this is a MoF responsibility – not the licensees, unless they volunteer to take it on.
 - Small, but significant patches of NSR in a free growing stand may also be fill-planted as part of an SMP. Remember, this is an incremental activity.

Cluster planted stands

These are generally distinctly even-aged, but established in relatively uniformly shaped and spaced clusters to address several objectives including specialized habitat requirements (grizzly bear), and biodiversity (mix of tree/shrub species and development of vertical layers).

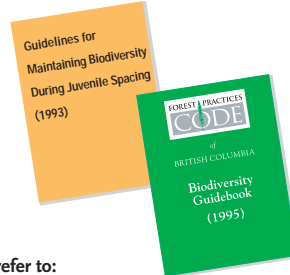
- The even-aged nature and relative uniform spacing of these stands make them easy to address with normal SMP and contract language. However:
 - Check the original prescription for the design of the clusters to choose a plot radius (for pre-stand tending and quality assessment plots) that will adequately reflect the distribution of clusters.
 - Use a 5.64 m radius plot for stands with more than 100 clusters per ha.
 - A plot radius greater than 5.64 m should be used for stands with less than 100 clusters per ha.

Basically, biodiversity should not be approached any differently at the

How do I approach managing for biodiversity?

Was a previous SP developed under the current FPC requirements?

- If yes – only fine tuning in the SMP
- If no – must develop an SMP considering FPC biodiversity requirements:



Also refer to:

- “... *Identified Wildlife*” guidebooks
- *Riparian Management Guidebook*
- *SMP Guidebook*
- *Spacing Guidebook*

JUVENILE SPACING WORKSHOP 3 • 15

time of SMP development for spacing than during the development of the SP for harvesting.

- ***If an SP was developed previously under the current Code requirements and guidelines***, consider the objectives and block design for biodiversity. You may have to do some fine tuning.
- ***If no previous SP was prepared, or the previous SP was not prepared considering the current requirements for biodiversity***, you will have to assess the block and develop a prescription considering the requirements of the *Biodiversity Guidebook*.

STEPS where no previous SP in place under the Code:

(Refer to: *Biodiversity Guidebook*, and *Guidelines for Maintaining Biodiversity During Juvenile Spacing*.)

Steps to Address Biodiversity in SMPs

A. Project planning

1. Consult previous plans

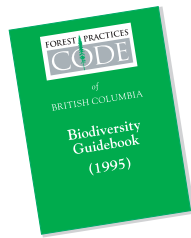


Objectives and locations for:

- identified species
- riparian areas
- wildlife tree patches
- other protected areas.

2. Determine the natural disturbance (NDT) and identify:

- Wildlife tree requirements (% of cutblock area)
- Other biodiversity requirements.



JUVENILE SPACING WORKSHOP 3 • 16

Addressing biodiversity in spacing projects

A. Project Planning Steps

1. Consult previous planning documents – prescriptions, higher level plans, development plans and other relevant information sources to locate:

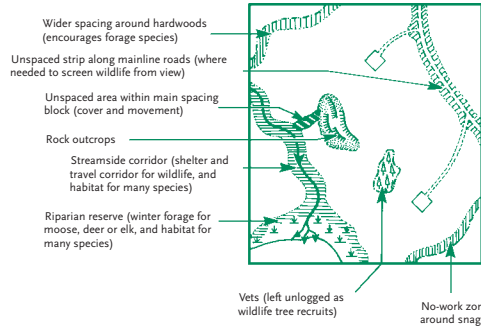
- Objectives and areas specific to management for identified (feature) species, such as deer or elk winter range, grizzly forage areas, caribou winter range, goshawk nesting areas, spotted owl nesting areas.
 - Refer to page 24, *Guidelines for Maintaining Biodiversity during Juvenile Spacing* for examples of the potential influence of such areas.
- Objectives and specific locations of other special areas such as riparian habitat, designated wildlife tree patches, and other protected ecosystems.

2. Determine the natural disturbance type (NDT) using the *Biodiversity Guidebook*, if not already provided in a landscape unit or higher level plan:

- *To determine the % cutblock area required in wildlife tree patches.*
- *To determine NDT – specific biodiversity recommendations.*

Steps to Address Biodiversity in SMPs

B. SMP and Contract Development



1. During the pre-stand tending survey, locate mappable units for biodiversity:
 - previously identified (e.g., FENS), and
 - previously unidentified (rock outcrops, clumps of vets, etc.).
2. Plan wildlife tree patches, riparian management reserves and other reserves.

JUVENILE SPACING WORKSHOP 3 • 17

Addressing biodiversity in spacing projects

B. SMP and Contract Development

1. **Locate mappable units for biodiversity and identify other reference points** - that can be mapped during the pre-stand tending walkthrough and data collection (FENs, etc.):
 - Streams, lakes, wetlands (classify), wildlife trails, cliffs and rock outcrops (potential denning), clumps of certain tree species, concentrated standing snags, or coarse woody debris, clumps of large old veterans, open forage areas, etc.
2. **Note general stand level attributes** that may be a priority to maintain or enhance – also during the pre-stand tending walkthrough:
 - Woody forage species (willow, saskatoon, elderberry etc.),
 - Deciduous species, and
 - Diversity of vertical layers, etc.

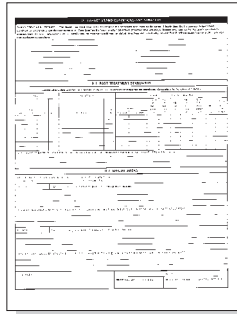
Steps to Address Biodiversity in SMPs

Planning Wildlife Tree Patches and Other Reserves



Key Principles:

- Make reserves work for more than one objective.
- Minimize logistical problems for future harvesting.



In the SMP Form:

- Include as special areas (Section D-2)
- Include as a separate SU if you want to do a treatment.

JUVENILE SPACING WORKSHOP 3 • 18

Key principles:

- Try to make the reserves work for more than one objective (i.e., wildlife trees and riparian).
- Try to minimize logistical problems for future harvesting if the reserves will remain beyond that time period (i.e., if you are commercial thinning).
- In the SMP form:
 - Include these as *Special Areas* (section D-2). Note: no treatments are to occur in special areas. Include as a separate SU if a treatment is to be prescribed.
 - For example, you may want to do some spacing in the RMA to encourage the typical riparian characteristics (diversity of vertical layers, shrubs and deciduous species, etc.). This specific criteria will be included in the contract as well as the SU form in the SMP.

Steps to Address Biodiversity in SMPs

C. Block Layout



1. Ribbon out all special areas
 - see *Boundary Marking Guidebook*
2. Identify and mark scattered individual wildlife trees.
3. Address potential danger trees

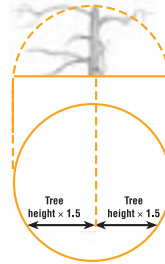
There are two choices:

- Designate as a wildlife tree and mark a “no-work” zone around it.

OR

- Fall the tree with a qualified faller.

You may want to assess the site with a qualified assessor first.



JUVENILE SPACING WORKSHOP 3 • 19

Addressing biodiversity in spacing projects

C. Block Layout:

1. **Ribbon out all of your designated *Special Areas*** in the SMP. Follow the *Boundary Marking Guidebook* procedures.
 - For riparian reserve zones beside riparian management zones that will receive some treatment, special “RRZ” ribbon will be required.
 - Where you wanted to leave, for example, 40% of the block unspaced (perhaps for hiding or thermal cover), reserves should be planned and distributed throughout to best achieve these goals. **These should also be marked.**
2. **Identify and mark individual wildlife trees** that you wish to remain uncut in the work area – non-dangerous snags and other important trees.
 - Wildlife trees scattered individually throughout the block, outside of WTPs, may be marked for retention if they exhibit many characteristics important for wildlife. These should generally not be excessive in numbers, if WTPs have already been designated where they are the most concentrated.
 - It may be a good idea to get a qualified wildlife tree assessor to first assess each of the designated individual wildlife trees to determine if a potential risk exists.

3. Address potentially dangerous snags or trees with dead tops –
in the *Special Area* reserves, along block boundaries, or scattered throughout the stand.

You have **two choices** for trees designated as *danger trees*:

- a) ***Designate as a wildlife tree and delineate a no-work zone around them*** (radius = 1.5 × the height of the snag or 1.5 × the height of the dead top).

Refer to page 12, *Guidelines for Maintaining Biodiversity During Juvenile Spacing*.

- b) ***Fall them with a qualified faller*** prior to the spacing project.



Steps to Address Biodiversity in SMPs

What if I have to space a large old burn with a *sea of snags*?



This situation poses several problems

- The snags may not be useful for wildlife.
- Excessive no-work zones may mean **NO WORK!**
- Snags may be a bigger hazard if left standing.



You need a strategy.

- Do a broad scale assessment.
- Work with WCB to determine an appropriate mix of:
 - snag falling
 - sound snag retention
 - wildlife trees and no-work zones.

JUVENILE SPACING WORKSHOP 3 • 20

What if I have a large area to space with a *sea of snags* from an old burn?

This situation poses several problems:

- The snags may not be useful for wildlife – particularly if they are fire-hardened (depending on their species, size, etc.)
- No-work zones around each snag will effectively mean **NO WORK!**
- The snags may pose a greater threat to worker safety on the ground than standing due to the incredible slash loads with large obstacles for spacers.

Such a situation requires a strategy to be developed as follows:

- a) Do a broad scale assessment of the entire area with wildlife tree assessors or other similarly qualified people to get a sense of:
 - The general soundness of the snags, and
 - The usefulness of the snags for wildlife.
- b) Using the results of this assessment, consult with WCB to develop a strategy that satisfies their requirements as well as yours by determining the appropriate mix of:
 - Snag falling,
 - Sound snag retention, and
 - *Wildlife tree* and *no-work zone* designation.