



# Spacing Standards Effective April 15, 2012

These standards apply, in addition to the General Standards for Ministry Funded Programs (FS 1001) or FS1000 for internal Ministry contracts, to all juvenile spacing activities carried out under Ministry Funded Programs.

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## ARTICLE 1: DEFINITIONS

### Definitions

- 1.1 In this document, the following words shall have the following meanings unless alternative definitions are approved by the Ministry Representative in a treatment prescription, a treatment plan or a work plan.
- 1.2 **“Approved Spacing Quality Inspection System”** means the Ministry of Forests, Lands and Natural Resource Operations’ current Juvenile Spacing Quality Inspection system <http://www.for.gov.bc.ca/isb/forms/lib/fs251.pdf> in effect immediately prior to the commencement of Work **or** another similar system approved in writing by the Ministry Representative prior to the commencement of Work. References to specifications contained in a stand management prescription in the Juvenile Spacing Quality Inspection system shall be interpreted to mean specifications in a treatment prescription, treatment plan or work plan.

**“Crop Tree”** means a tree that is:

- (a) Specified as a preferred or acceptable species;
- (b) equal to or greater than the Minimum Inter-tree Distance from any other Crop Tree
- (c) equal to or greater than a Specified minimum cutting height;
- (d) selected from among adjacent trees in accordance with the specifications required under this standard;
- (e) not damaged by the Contractor to the extent it would be a non-reworkable error; and
- (f) is not a Leave Tree, unless the Leave Tree is actually a Crop Tree because it satisfies paragraphs (a) to (e) above (*i.e. Pw are to be retained on the South Coast and a Pw is retained as a Crop tree*).

“**Inter-tree Distance**” means the horizontal distance between two trees on a centre to centre basis, calculated or measured to the nearest 1/10<sup>th</sup> of a metre unless otherwise Specified.

“**Leave Tree**” means a tree other than a Crop Tree that is Specified as not to be cut.

“**Ministry Representative:**” means

- (a) a person appointed as a Ministry Representative pursuant to the Recipient Agreement,
- (b) a person who is authorized through an implementation contract to act on behalf of the Ministry Representative for purposes of these Spacing Standards, or
- (c) a Ministry of Forests, Lands and Natural Resource Operations employee who is appointed to act as the Ministry Representative for purposes of these Spacing Standards.

The person who will be the Ministry Representative for purposes of these Spacing Standards must be identified to the Recipient and the spacing contractor prior to the commencement of Work.

“**Minimum Inter-tree Distance**” means a Specified Minimum Inter-tree Distance that must exist between Crop Trees.

“**Natural Opening**” means an area in the original stand that has no trees above the Specified minimum cutting height, and has an average diameter greater than twice the Target Inter-tree Distance.

“**No Treatment Zone**” means an area within which no Spacing takes place.

“**Over Cutting**” means when, Spacing has reduced the number of Crop Trees within a plot to less than the target number of Crop Trees per plot.

“**Slash Removal Zone**” means an area within which slash created as a result of the Work is removed.

“**Spacing**” means the reduction of the number of trees per hectare of the original stand within the Treatment Area to within a Specified range of post-spacing densities.

“**Spaced Stand**” means the portion of the Work Area on which Spacing took place.

“**Specified**” means, as the context so requires, specified in this standard, another applicable standard, a treatment prescription, treatment plan, work plan or a map attached to a prescription or plan.

“**Target Inter-tree Distance**” means, unless otherwise Specified, the target distance between Crop Trees as determined by the formula:

$$\sqrt{\frac{11,547}{\text{Target \# of Crop Trees/ha}}}$$

“**Void**” means an area within a Spaced Stand that, as a result of Over Cutting, has no Crop Trees within the Target Inter-tree Distance measured in a circle around the stump of a Crop Tree that was cut.

**ARTICLE 2: SPACING STANDARDS**

**General Requirements**

2.1 Despite any requirement that is Specified on a per hectare basis, all spacing and density requirements must be met throughout the entire Treatment Area, so that Crop Trees are as well distributed as possible.

2.2 Motorized tracked or wheeled thinning machinery must not be used without the prior written approval of the Ministry Representative.

**Work Plans**

2.3 Where any of the following is not specified in a treatment prescription or treatment plan for Spacing it must be specified by Treatment Unit in a work plan:

- (a) the Crop Tree species to be retained, in the order of preference;
- (b) the Target number of Crop Trees per hectare to be retained;

- (c) the minimum and maximum number of Crop Trees per hectare to be retained;
- (d) a minimum cutting height below which trees are not required to be cut;
- (e) the Minimum Inter-tree Distance between Crop Trees;
- (f) a description of any Leave Trees and any circumstances when they are not to be cut; and
- (f) the locations and widths of any Slash Removal and No Treatment Zones.

**[Notes:** In naturally regenerated stands in the interior, the Minimum Inter-tree Distance could be as low as zero (0) centimetres to maximize the retention of the largest, healthiest Crop Trees within clumps and to facilitate the retention of sufficient Crop Trees around openings.

**Section 51(3)(c) of the Forest Planning and Practices Regulation prohibits juvenile spacing in the riparian reserve zone of a stream, wetland or lake.]**

**Selection of Crop Trees**

2.4 The average number of Crop Trees per hectare retained in the Spaced Stand must be:

- (a) as near as is possible to the Target number of Crop Trees per Hectare to be retained;
- (b) not less than the Specified minimum number of Crop Trees per hectare to be retained; and
- (c) not more than the Specified maximum number of Crop Trees per hectare to be retained.

2.5 When Spacing adjacent to a boundary of a Treatment Area, the Spaced Stand must not have a Crop Tree that is closer than the minimum Inter-tree Distance to a tree above a Specified minimum cutting height that is within a No Treatment Zone or just outside the boundary of a Treatment Area.

2.6 Crop Trees must be selected that are as close as possible to the Target Inter-tree Distance from each other, but the distance between Crop Trees must be varied within allowable spacing criteria so as to select those trees having the best overall possible combination of:

- (a) Crop Tree species in the Specified order of preference; and
- (b) the tallest trees having good form and vigour and which can be expected to continue exhibiting superior growth in comparison to adjacent trees.

**[Note:** Consistently selecting Crop Trees that are close to the Minimum Inter-tree Distance will likely result in exceeding a Specified maximum number of trees per hectare to be retained, whereas consistently selecting trees that are further apart than the Target Inter-tree Distance risks not achieving the Specified minimum tree retention requirement.]

2.7 When evaluating Crop Trees for good form and vigour the selected trees must optimize as many of the following characteristics as possible:

- (a) free of unacceptable insect damage, injury or disease;
- (b) healthy live crown of good colour;
- (c) straight stem with no forks or multiple tops;
- (d) a sturdy stem in relation to height, suited to resisting potential wind and snow damage after spacing;
- (e) small branch diameters; and
- (f) good terminal leader growth.

**Additional Crop Trees Around Natural Openings**

2.8 Additional Crop Trees must be left uncut around the edge of a Natural Opening equivalent to the number of trees that the opening could accommodate at the Target Inter-tree Distance. The distance between such Crop Trees must not be less than the minimum Inter-tree Distance.

**Trees Not to be Cut (Leave Trees)**

2.9 Except to provide worker safety, the following trees must not be cut or damaged:

- (a) a tree within a Natural Opening;
- (b) a Wildlife Tree;
- (c) a tree larger than a Specified maximum cutting diameter, if one has been established;

- (d) a pacific yew tree or another Specified tree species; or
- (e) other Specified trees which meet Specified criteria.

2.10 A tree within a Treatment Area that is Specified as not to be cut in the preceding section may be less than the minimum Inter-tree Distance to a Crop Tree.

**Trees Not Required to be Cut**

2.11 The following trees are not required to be cut:

- (a) a tree less than a Specified minimum cutting height; or
- (b) a tree that is not a Crop Tree that is more than the Target Inter-tree Distance from a Crop Tree.

2.12 If a tree that is not required to be cut is cut, it must be cut to the specifications contained herein.

**Trees to be Cut or Girdled**

2.13 All trees in a Work Area that are not Crop Trees, Leave Trees, or trees Specified as not required to be cut, must be cut.

2.14 Subject to section 2.18, a tree that is required to be cut must be girdled if it cannot be cut without damaging a Crop Tree or a Leave Tree.

**Cutting Specifications**

2.15 Unless otherwise Specified, a tree that is cut must be cut so that:

- (a) it is cut completely through (i.e., must not be hinged);
- (b) the stump is not higher than 30 cm from the point of germination;
- (c) no live limbs remain on the stump;
- (d) the stump cut angle is not greater than 30° (thirty degrees) from the horizontal;
- (e) it does not lean against a standing tree; and
- (f) it does not fall onto a fence or into a stream.

2.16 A forked or multiple-stemmed tree selected as a Crop Tree must not have any of the stems cut.

**Girdling Specifications**

2.17 Unless otherwise Specified, if trees are girdled, the girdle must

- (a) be located below the lowest live limb, and
- (b) consist of a single, continuous girdle band around the entire tree trunk that is a minimum of 1.5 cm in vertical width and that completely severs the bark and cambium over its entire width.

2.18 Despite any other requirement herein, unless otherwise Specified, a tree must not be girdled if it is within one tree length of a road or trail that provides vehicle access or is frequented by hikers.

**Treatment of Slash**

2.19 Unless otherwise Specified, slash or debris must be removed and redistributed within the Spaced Stand if, as a result of the Work, it occupies:

- (a) a Slash Removal Zone;
- (b) a road, road-bank, stream, ditch, or fireguard;
- (c) a cattle or game trail; or
- (d) adjacent standing timber.

## **ARTICLE 3: INSPECTION AND ACCEPTANCE**

### **Spacing Quality Inspection**

3.1 All Work must be inspected by a person (the "Inspector") who is:

- (a) the Registered Professional Forester (RPF), or operates under the direction of the RPF, who will sign and professionally seal reports for the Work;
- (b) experienced and competent in conducting inspections of spacing operations;
- (c) familiar with the treatment prescriptions, treatment plans or work plans for the Work Areas; and
- (d) not engaged in the direct conduct of the spacing operations.

3.2 An Inspector must inspect the Work in accordance with an Approved Spacing Quality Inspection System in a timely manner to ensure all Work is performed to the Standards.

### **Determination of Satisfactory Treatment**

3.3 An area may be declared satisfactorily treated when:

- (a) the average performance quality of all plots is 85% or higher;
- (b) the number of Crop Trees per hectare does not exceed the Specified maximum and is equal to or greater than the Specified minimum number of trees per hectare to be retained;
- (c) unless otherwise Specified by the Ministry Representative, there are no contiguous areas greater than one tenth (1/10) hectare that do not meet the performance quality and density requirements.

### **Requirement to Notify the Ministry Representative**

3.4 Further to the notification requirements contained in the General Standards for Ministry Funded Programs (FS 1001), a Recipient must immediately notify the Ministry Representative whenever an inspection reveals on any contiguous area greater than one-tenth (1/10) hectare (or larger minimum area that may be Specified by the Ministry Representative):

- (a) performance quality to be less than the minimum acceptable standard of eighty-five percent (85%), and the nature and extent of the errors are such that performance quality cannot be raised to at least 85%; or
- (b) the Specified minimum number of Crop Trees per hectare to be retained has not been retained.