

# **Amending Prescriptions for Achieving Free-growing Forests**

**Special Investigation**



**FPB/SIR/17**

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# The Investigation

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Harvesting on Crown land in British Columbia comes with reforestation obligations. Following logging, forest companies are required to re-establish a “free-growing” stand of healthy, commercially valuable trees. The growth of the stand must not be impeded by competition from plants, shrubs or other trees. Timeframes and standards for achieving free-growing are provided in a pre-harvest silviculture prescription, silviculture prescription or site plan.

In 2003, the Forest Practices Board reported on the achievement of free-growing across British Columbia.<sup>1</sup> That report summarized the status of cutblocks that were to be free-growing by August 2002. Overall, the results of that study were very positive. Across the province, 85 percent of cutblocks were free-growing within the required timeframes.

In 2005, the Board updated that study to include cutblocks where achievement of free-growing had only recently become due.<sup>2</sup> Provincially, 92 percent of the cutblocks had achieved free-growing status. Free-growing was often not achieved with the original standards in place. The 2005 study found that 50 percent of all standards units (SUs)—a portion of a cutblock with similar stocking density and species requirements—had been amended before being declared free-growing.

Amendments can change standards such as the late free-growing date, stocking standards and acceptable species. Amendments can also make administrative changes, such as correcting the area of an SU. Amendments may be for only a small portion of a SU, or an entire SU.

The reasons for amendments were not available within the RESULTS<sup>3</sup> database until 2004, and so were not considered in the Board’s previous free-growing studies. To complete our analysis, this report investigates the reasons, for and implications of, amendments to prescriptions and site plans. The report provides an initial assessment of patterns regarding amending prescriptions for achieving free-growing. This preliminary scan was intended to determine whether a more detailed review was warranted.

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<sup>1</sup> *Reforestation BC’s Public Land – An Evaluation of Free-Growing Success*, Forest Practices Board, June 2003

<sup>2</sup> *Achievement of Free-Growing Forests – 2004 Provincial Update*, Forest Practices Board, April 2006.

<sup>3</sup> The RESULTS (Reporting Silviculture Updates and Land status Tracking System) application tracks silviculture information including openings, disturbances, silviculture activities and declaration of obligations achieved.

# Background

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Since 1987, forest companies have been legally required to establish a free-growing stand following harvesting. Forest companies must create a free-growing new forest within a defined time period after completion of harvest, known as the “late free-growing date”. The late free-growing date varies from ten to twenty years, depending on local growing conditions and the legislation in effect when the prescription was written.

To be considered free-growing, an SU must meet the standards specified in the prescription or site plan, based on the ecology of the site. MOFR forest regions compiled the earliest versions of stocking standards and tree species selection, publishing ecological field guides for each of the forest regions in the late 1980s and early 1990s. These standards were then correlated provincially, resulting in the 1994 publication of *Correlated Guidelines for Tree Species Selection (First Approximation)* and *Stocking Standards (Second Approximation) for Ecosystems of British Columbia*. With the advent of the Forest Practices Code in 1995, MOFR published a suite of Establishment to Free-growing Guidebooks that incorporated the most up to date guidelines for free-growing standards. Now, under the *Forest and Range Practices Act*, licensees can propose stocking standards to MOFR for cutblocks under a forest stewardship plan. The new standards may vary from previous guidebook standards to recognize specific situations and circumstances.

Free-growing standards include a minimum number of stems of “preferred” species per hectare—species that are ecologically well-suited to the site. Also, each SU must have a minimum number of trees of preferred plus “acceptable” species per hectare. Acceptable species are considered ecologically suitable, but are not usually managed for actively. For a tree of a preferred or acceptable species to be counted as free-growing, it must exceed a minimum distance from other free-growing trees, meet a minimum height, and achieve a height ratio to competing brush, where specified.<sup>4</sup>

Sometimes free growing standards are not achieved within the required timeframes. Licensees can propose amendments to the original free-growing standards that were specified in the silviculture prescription. This allows SUs that do not achieve free-growing by the late free-growing date, or that do not meet all the specified criteria, to still be declared free-growing subject to approval of the district manager.

Provincially, 2324 amendments were made between October 2004 (when reasons for amendments were first recorded in RESULTS) and July 2006. Eighty percent involved changing one or more of the free-growing standards, most commonly the late-free growing year, minimum height, and acceptable species. The remaining twenty percent of the amendments were made for administrative reasons, such as adjusting the net area to be reforested, and did not involve changing free-growing standards.

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<sup>4</sup> Some older silviculture prescriptions do not specify a minimum height, or height to brush ratio.

# Scope and Methods

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For each of the three forest regions, we selected the forest district that had the greatest number of amendments—North Island Central Coast Forest District, Quesnel Forest District and Prince George Forest District. We determined which amendments involved changing one or more of the free-growing parameters and examined a sample of those in detail.

We examined only the most recent amendment to each SU, to assess the most current management practices. The sample covered a broad range of licensees, geographic areas, biogeoclimatic zones and ecological site series. We used risk-based sampling to increase the likelihood of identifying any potential issues. The sample focused on i) amendments with limited supporting information in RESULTS, and ii) amendments considered more likely to affect future timber values, including:

- extensions to the regeneration date;<sup>5</sup>
- extensions to the late free-growing date of more than four years;
- amendments to accept species of lower timber value such as hemlock; and
- reductions in stocking standards of 200 stems per hectare or more.

For each SU in the sample, we reviewed the RESULTS database, reviewed the district file and discussed the amendment with district staff. The types of standards amended and the reasons for the amendments were tabulated. We qualitatively gauged the “reasonableness” of the amendments and the potential effect on timber resources. This subjective review provided an initial scan to determine if a more detailed analytical approach was warranted, which might include interviews with licensees, field examinations, quantifying timber supply implications, and developing widely accepted criteria for assessing reasonableness.

## Results

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### 1. What free-growing standards were amended?

For the North Island Central Coast, Prince George and Quesnel districts combined, 466 (82 percent) of the 565 amendments involved changing one or more free-growing standards—most commonly the late free-growing year, minimum height and acceptable species.

The remaining 99 (18 percent) of amendments were for administrative reasons, such as adjusting the net area to be reforested. Those amendments did not involve changing free-growing standards.

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<sup>5</sup> The maximum time allowed in a prescription to regenerate a site with acceptable, well-spaced trees.

<b>Free Growing Standard</b>	<b>Number of Times Amended<sup>6</sup></b>
Late free-growing date	290
Minimum height of free-growing stems	234
Acceptable and preferred species	169
Maximum number of free-growing stems per hectare	165
Minimum number of preferred free-growing stems per hectare	153
Minimum number of free-growing stems per hectare	95
Minimum horizontal distance between free-growing stems	85
Target number of free-growing stems per hectare	83
Earliest free-growing date	75
Minimum height of free growing stems relative to competing brush	62
Regeneration date	46

**Table 1. Types of Free-Growing Standards Amended for the North Island Central Coast, Prince George and Quesnel Forest Districts (amendments made between October 15, 2004, and July 6, 2006, for SUs that originally specified a late-free growing date of July 1, 2006, or earlier.)**

## **2. Why were amendments made?**

The Board sampled 110 (24 percent) of the 466 amendments changing one or more of the free-growing standards. Reasons for the amendments fell into eight categories. Some amendments were made for more than one reason, resulting in the total exceeding 100 percent.

### **Growing conditions varied from those described in the prescription (28 percent of the sample population)**

These amendments were made because a recent survey identified that growing conditions varied from those indicated in the original prescription. Those amendments often identified dry or wet areas of lower productivity that had not been recognized before harvesting. That is, amendments further stratified different management units to more fully account for variations in growing conditions.

### **Other species found to be ecologically appropriate for the site (21 percent)**

For this category, licensees found that a species not identified as suitable in the original prescription was performing well on site. Those species were added as “acceptable” or “preferred”. In all cases, we found the added species were listed as potentially ecologically suitable for the site according to the most recent guidance on species selection.

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<sup>6</sup> The total exceeds the 1857 amendments because amendments typically modified more than one of the free-growing standards.

### **More time needed to outgrow brush competition (20 percent)**

These amendments provided additional time for crop trees to outgrow competing brush on slow-growing sites, brushy sites and/or sites that had recently been fill-planted. SUs falling in this category are typically well-stocked with crop trees and do not require further treatment.

### **Updated free-growing standards adopted (17 percent)**

Free-growing standards have evolved since the original prescriptions were written. For this category, one or more of the free-growing standards were amended to be consistent with the updated standards.

### **Recent brushing or spacing treatments (12 percent)**

Recently brushed or spaced SUs are typically free-growing immediately following treatment, but cannot be declared as such until free-growing has been maintained two years after the treatment.<sup>7</sup> Consequently, prescriptions and site plans for these SUs were amended to extend the late free-growing date to add the two-year maintenance period.

### **Implementation of the policy on maximum stand density (6 percent)**

For part of the period surveyed, MOFR was reviewing a policy that specified the allowable maximum number of stems per hectare. While awaiting the outcome, MOFR policy allowed amendments to extend the late free-growing date. Once the new policy was introduced, amendments to increase the maximum allowable density were approved. Amendments in this category extended the late free-growing date, or changed the maximum allowable tree density, in accordance with policy. Affected sites are typically free-growing and do not require further treatments.

### **Forest health issues (4 percent)**

Amendments in this category extended the late free-growing date to allow for ongoing monitoring of disease such as stem rust, or to accept other species less susceptible to disease.

### **Other (16 percent)**

Silviculture prescriptions and site plans were also amended because SU surveys were not completed in time; the survey methodology was changed to recognize the multi-layer structure of the stand; standards were changed to line up with the planting prescription, and indistinguishable SUs were combined.

## **3. Were amendments reasonable?**

The Board deemed an amendment reasonable if two conditions were met. The first condition is that records indicated the SU was actively managed over time; in other words, there was evidence of periodic monitoring to identify any issues affecting the establishment of a free-

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<sup>7</sup> Establishment to Free-growing Guidebooks, 1995.

growing crop, and prompt action to address any issues. This was assessed using the Activities Screen in RESULTS.

The second condition is that the amended standards appeared reasonable relative to the growing conditions, policy and guidebooks. For example, an amendment to accept an alternate species was considered reasonable if it was supported by a rationale, and consistent with the discretion provided by the Establishment to Free-growing Guidebook.

RESULTS did not always provide sufficient information to reach conclusions. In particular, ecological reclassifications that could not be assessed through a limited office review. Overall, findings were inconclusive for 24 of the 110 amendments (22 percent). Excluding those from the population, 94 percent of the remaining amendments were reasonable (table 2). District records indicate that most sites were actively managed and amendments were generally supported by clear and logical rationales. Six percent of amendments were considered unreasonable because of evidence that the licensee had not actively managed the SU since logging, or because the amendment contradicted the advice of the free-growing guidebooks.

#### **4. What is the impact of amendments on timber values?**

Amendments can affect future timber values by:

- extending the timeframe to regenerate a site and establish a free-growing crop of trees,
- accepting species that are currently of lower commercial value such as western hemlock, or slow-growing species such as subalpine fir; or
- reducing stocking requirements, which may impact volume or value of the stand.

The amendments in the sample population were qualitatively assessed to determine the effect on stand-level timber values relative to the standards in the original prescription.

**No Impact (69 percent of the sample population)**—records indicate that the SUs were promptly reestablished with commercially valuable species, at the same stocking level as specified in the original prescription.

**Minimal Impact (18 percent)**—records suggest that, for a portion or all of the SU, establishment of well-spaced stems was delayed, tree growth might have been impacted by brush competition, or a component of stems of lower commercial value was accepted.

**Moderate Impact (11 percent)**—records indicate that, for a portion or all of the SU, significantly lower stocking standards were applied, crop trees were not promptly established (typically on problem sites), or a substantive component of stems of lower commercial value was accepted.

**High Impact (zero percent)**—records indicate that commercially valuable species are absent over most of the SU.



**Unknown (2 percent)**—there was insufficient information on the file to assess the impact. For sites with minimal or moderate impact, that impact typically applies only to a portion of the SU. In other words, the potential stand-level impact to timber values is lower than suggested by the percentages.

There was only one instance where a failure to actively manage an SU resulted in moderate impact on timber values. Table 2 demonstrates that most amendments were both reasonable and of no or minimal impact to stand-level timber values.

		Stand-Level Impact on Timber Values						Total	Proportion <sup>8</sup>
		None	Minimal	Moderate	High	Unknown			
Were Management Practices Reasonable?	Yes	60	16	5	0	0	<b>81</b>	94%	
	No	4	0	1	0	0	<b>5</b>	6%	
	Unknown	12	4	6	0	2	<b>24</b>	NA	
	<b>Total</b>	<b>76</b>	<b>20</b>	<b>12</b>	<b>0</b>	<b>2</b>	<b>110</b>		
	Proportion <sup>9</sup>	70%	19%	11%	0%	NA		100%	

Table 2. Sample Population Summary

## Conclusions

The Board found no reason for concern with regard to the free-growing amendments. A limited assessment of a sample of amendments from the North Island Central Coast, Prince George and Quesnel forest districts found that the vast majority of amendments were reasonable and will have limited impact on timber values. Amendments were made for many different, valid reasons and are generally appropriate relative to the growing conditions, policy and guidebooks. With few exceptions, SUs in the sample population were actively managed after logging. Since this overview assessment did not identify any issues, the Board did not carry out a more detailed analytical review.

<sup>8</sup> Excludes SU's where a conclusion could not be reached based on the limited office review.

<sup>9</sup> Excludes SU's where a conclusion could not be reached based on the limited office review