



**Forest
Practices
Board**

Planting Seedlings on Harvested Sites

*Compliance with the Chief Foresters Standards
for Seed Use*

Special Investigation

FPB/SIR/35

March 2012

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Introduction

In British Columbia, the *Forest and Range Practices Act* (FRPA) requires licensees and timber sales managers to re-establish a stand of trees after harvesting on Crown land. Though it is possible to let a harvested stand regenerate naturally, stand re-establishment is usually done by planting. When planting seedlings, it is important that the seedlings are suited to the location and climate of the planting site to ensure they will grow well and become healthy trees. To ensure that appropriate seedlings are planted, FRPA requires that the seed used to grow the seedlings meet the requirements prescribed in the *Chief Forester's Standards for Seed Use* (the CF Standards.)

One of the functions of the Forest Practices Board is to audit licensees' and government's compliance with FRPA. Recent Board audits have found a number of non-compliances with the transfer limits¹ of the CF Standards. This special investigation was conducted to determine if these findings indicate a trend, or if they are isolated instances.

Background

CF Standards

The following is a summary of the CF Standards.² Any seed used to grow seedlings to be planted on Crown land must be registered with the Ministry of Forests, Lands and Natural Resource Operation's Tree Improvement Branch (TIB.) TIB assigns the collection of seed a unique seedlot identifier in the Seed Planning and Registry (SPAR) database and TIB identifies the appropriate Seed Planning Zone³ (SPZ) or zones for the seedlot. SPAR also includes the transfer limits from the CF Standards that apply to each seedlot. The transfer limits restrict movement horizontally (geographically) and vertically (elevation) within each SPZ. In some cases, seed can be moved into other SPZs if its biogeoclimatic zone⁴ of origin is the same as where the seedlings are to be planted. These rules are outlined in Appendices 3 – 6 of the CF Standards.

To comply with the CF Standards, licensees⁵ must plant at least 95 percent of the seedlings in a management unit⁶ within the transfer limits.

Reporting

FRPA requires licensees to keep records about where they plant seedlings. They must report the seedlot identifier of the seedlings planted; the number of seedlings planted; and the number of seedlings planted outside the transfer limits. The report is submitted to the government

¹ Where the seedlings or cuttings may be planted, based on where the seedlings or cuttings originated.

² The CF Standards are available upon request from TIB, or from the internet:

http://www.for.gov.bc.ca/ftp/HTI/external/publish/Chief_Foresters_Standards_for_Seed_Use/CFstds03jun2010.pdf

³ SPZs are large contiguous geographic areas with similar climate.

⁴ BEC zones are also large climate based zones, but not contiguous areas.

⁵ Licensees and timber sales managers have equivalent requirements, but for this report the term licensees refers to both licensees and timber sales managers.

⁶ A management unit is a timber supply area (TSA) or tree farm licence (TFL). Other area-based tenures, such as a woodlot licence, were assumed to be included within the area of a TFL or TSA for this investigation.

silviculture database, called Reporting Silviculture Updates and Land Tracking System or RESULTS.

Scope and Methods

Scope

This investigation reviewed all seedlings planted between January 1, 2008, and December 31, 2009, that were reported to RESULTS before June 1, 2010.

Method

Although licensees are required to report information about the seeds they use, they are not required to report other information such as the exact location of the seedlings they plant. As a result, it is not possible to use the information in government information systems to directly assess compliance with the CF Standards. For example, the Board approximated the location and elevation of the planted seedlings from Terrain Resource Information Management Program (TRIM)⁷ base mapping of the cutblocks in which the seedlings were planted. The Board used the information from TRIM, SPAR and RESULTS to assess compliance with both the transfer limits and the 95 percent rule.

Since the information needed to check compliance was an approximation, the Board sent the dataset out for review and comment. TIB reviewed the full dataset. Selected licensees (participants) answered a questionnaire and reviewed their applicable portion of the dataset. The participants were selected from what appeared to be the most non-compliant of a range of licence sizes and types. After TIB and participants responded, the Board corrected the analysis accordingly. Finally, the Board interviewed TIB staff; a tree breeder; a tree planting contractor; and government enforcement staff to obtain their views with regards to the CF Standards. The following summarizes the results of the investigation.

Findings

The Board examined about 42 000 records that identified over 1900 seedlots used to plant over 350 million seedlings. Licensees reported in RESULTS that they planted 2.3 million non-compliant seedlings (NCS), but the investigation found 6.1 million of the 350 million seedlings or 1.7 percent to be non-compliant. About 11 percent of the time licensees failed the 95 percent rule⁸. A more detailed discussion of the results can be found in Appendix 1.⁹

Government has guidance about what constitutes a non-trivial¹⁰ non-compliance with the seed transfer limits. Only 0.3% of the seedlings fell into the “non-trivial” category.

⁷ <http://archive.ilmb.gov.bc.ca/crgb/pba/trim/>

⁸ This dropped to 2.7 percent if trivial NCS were removed. However, the Board’s view is that figure is not relevant as the 95 percent rule by its nature already allows tolerance for exceeding the transfer limits.

⁹ The licensees that failed the 95 percent rule were generally smaller licensees that planted relatively small numbers of non-compliant seedlings.

¹⁰ A trivial non-compliance is a non-compliance that is not in the public interest to pursue.

Discussion

The Board undertook this investigation to determine if there is an ongoing tendency towards inappropriate seed transfer. The investigation found a high degree of compliance with the transfer limits, with over 98 percent of the trees planted in the province being within them. This figure increased to over 99 percent when trivial non-compliant seedlings (NCS) were removed.

Although most licensees show a high degree of compliance with the transfer limits, the investigation noted that 11 percent of the time, individual licensees failed the 95 percent rule and the investigation found some issues for consideration. (See Appendix 2 for more detailed discussion of the issues.) A sample of what appeared to be the most non-compliant licensees were consulted further and asked to complete a questionnaire. They provided feedback that led to some corrections of the data. After correcting the data, half of the sampled licensees were actually compliant. The questionnaires showed that, when compared to the non-compliant participants, the compliant participants: understood the CF Standards better; knew how to use SPAR better; and, more frequently planned for future seed requirements. Also, while compliant participants said they check the transfer rules before planting, non-compliant participants usually said they do not check or they rely on advice from others. This demonstrates the importance for licensees and, especially for those that were not in compliance, to ensure that they use staff or contractors who are familiar with the CF Standards. TIB advises that it offers annual training, training upon request and has staff available for consultation about SPAR and the CF Standards.

Licensees are required to report the NCS in RESULTS, but the investigation found that less than 40 percent were reported. Two common reasons participants gave for this failure were because they didn't know they were in non-compliance or they thought the non-compliance was trivial. However, FRPA requires licensees to report all NCS, no matter how trivial.

This investigation could not directly assess compliance because latitude, longitude, elevation, SPZ, and BEC zone of the seedlings planted had to be estimated. Licensees need that same information to report the NCS and it would take little effort for licensees to report that information at the same time. However, currently there is nowhere within the RESULTS database where this information can be captured. Also, although there is no requirement for licensees to submit maps of where any seedlings were planted, including NCS, and since the effects of planting NCS may not be apparent until after the licensee's reforestation obligation is complete, it would be useful if this map information was also captured in RESULTS.

Conclusion

The Board is pleased with the overall results of this investigation, which found that 98 percent of the seedlings planted between January 1, 2008, and December 31, 2009, followed the Chief Forester's Standards for Seed Use. However, the Board encourages licensees that may not be following the CF Standards to take greater care to follow the CF Standards and to fully report, as required by FRPA. The Board will continue to assess this issue in future compliance audits.

Appendix 1 – Explanation of the Results

The Board examined about 42 000 records that identified over 1900 seedlots used to plant over 350 million seedlings. Less than 1 percent, or about 2.3 million trees, were self-reported as non-compliant seedlings (NCS) in RESULTS, while the Board's analysis found about 10 million, or 2.9 percent, of the 350 million seedlings were NCS. Based on this initial review, the Board concluded that less than 25 percent of NCS were being reported. The analysis found that, of 964 population units,¹¹ 16 percent were non-compliant with the 95 percent rule.

The Board sent the data out to selected participants to verify the dataset and corrected the data set after the participants review.

There were three general reasons that the dataset needed to be corrected. The first two were due to data entry errors¹² and systematic errors;¹³ however the third and most substantial change was because the analysis had not compensated for historical changes to CF Standards that are not available in SPAR.¹⁴ For example, due to the results of progeny tests, the TIB reduced the allowable elevation band for some orchard seed to maximize gains in productivity. As TIB interprets section 8.10 of the CF Standards to mean that seed can be deployed up to its widest historical transfer limits, the Board's dataset¹⁵ was corrected accordingly.

After correcting the dataset, the provincial average dropped to 1.7 percent NCS planted. Still, more than 60 percent of the NCS were not reported in RESULTS and 11 percent of the population units were non-compliant with the 95 percent rule.

Since the effects of planting beyond the transfer limits gradually become larger with a larger violation of the transfer limit, the Board used the government's 2000 *Forest Practices Code General Bulletin 26 – Enforcement of Seed and Vegetative Material Transfer* (Bulletin 26) to determine 'trivial' NCS and remove them from the analysis. For example, if elevation was out by less than 50 metres, the non-compliance was considered trivial.¹⁶

After taking out these trivial violations, the average reduced to 0.3 percent, with only 2.7 percent of the population units showing as non-complaint with the 95 percent rule. (See table 1).

¹¹ A population unit is a licensee operating in a management unit in one year.

¹² Errors such as incorrect mapping of the cutblocks or transposition of numbers in a seedlot were corrected for each record. However, the entire dataset could not be corrected for these types of errors.

¹³ Errors occurred from the method used. For example, the mapped boundary for a BGC zone ran through a portion of the cutblock but the analysis routine picked the centre of the cutblock which was in another BGC zone. Again, errors such as this were accounted for on a case by case basis but correcting the entire data set was not practical.

¹⁴ The Chief Forester amended the transfer limits in April 2009 to compensate for climate change. In its review and comment of the initial analysis, TIB had also identified a number of seedlots that had changed. The analysis was updated to account for those changes.

¹⁵ Only seedlots that were planted by licensees found to be in non-compliance with the 95% rule were check for historical changes to the transfer limits.

¹⁶ The bulletin also indicates that being within 2 kilometers of a SPZ boundary is trivial but the data set did not include information on distance from the seed planning zone boundary so the analysis did not assess distance from seed planning zone boundary.

Table 1 Compliance broken down by year

Year	Planted Trees (Millions)	NCS Reported in Results (Millions)	NCS Reported in Results %	FPB analysis NCS (Millions)	FPB analysis NCS %	Non Trivial NCS (Millions)	Non Trivial NCS %
2008	199	1.1	0.5	3.4	1.7	0.4	0.2
2009	157	1.2	0.8	2.7	1.7	0.8	0.6
Total	356	2.3	0.6	6.1	1.7	1.2	0.3

Appendix 2 – Issues for Consideration

The Board wanted to know if there is a trend toward inappropriate seed transfer. The investigation found a high degree of compliance with the transfer limits, with over 98 percent of the trees planted being within the transfer limits, which further increased to over 99 percent if trivial non-compliances were removed.

However, examination of the compliance levels of individual licensees and timber sales managers still showed that 11 percent of the population units were non-compliant with the five percent rule. When trivial non-compliance was considered, that figure was reduced to 2.7 percent. However, since the 95 percent rule already allows for a margin of error for non-compliance, also allowing for trivial NCS was considered overly generous. So, even though there appears to be a high rate of compliance with the transfer rules, since a significant number of licensees have trouble complying with the 95 percent rule, the investigation did identify some issues for consideration.

Understanding the CF Standards and planning for future seed needs

After corrections were made, about half the participants were found to be compliant with the 95 percent rule. The compliant participants said that they completely understood the CF Standards; owned their own seed; and would regularly plan for future seed needs. They also regularly ordered seedlings from commercial nurseries for specific blocks, and had a good idea of where recent harvesting had occurred.

The non-compliant participants said they understood the CF Standards, but they did not understand them as well as the compliant participants. They generally found it harder to keep up-to-date with CF Standards and associated computer applications, and they also tended to rely on seed collected by other licensees, or buy surplus seedlings as they needed them, making it sometimes difficult to find suitable seedlings.

The Board concluded that, in order to avoid non-compliance, forest licensees or their consultants need to fully understand the CF Standards; be able to use SPAR; and should regularly plan for future seedling requirements.

TIB has indicated that, to address this need, seed planning staff holds annual training sessions, will hold training sessions upon request and are available for consultation.

Checking the transfer limits before planting

All compliant participants said they check the transfer rules before planting, while non-compliant ones either do not check or they rely on advice from others. Some noted that it would help to have consistent labels that contain the transfer limits for the seedlings on the planting boxes.

Reporting and monitoring seedlings planted beyond the transfer limits

Reporting of information

The investigation found that more than 60 percent of the NCS were not being reported in RESULTS. Although all participants used forest professionals to report in RESULTS, most who didn't report NCS said they didn't realize they were planting beyond the limits. The few who were aware, but didn't report planting beyond the limits, viewed this lapse as insignificant.

The Board and FLNR use Bulletin 26 as a guide to assess the significance of a given non-compliance. However, FRPA requires people to report all NCS, regardless of the margin of error.

Section 43(8) of the *Forest Planning and Practices Regulation* requires that people keep records about where they plant seedlings. About 85 percent of those questioned said they keep planting maps that usually contain information needed to check compliance with transfer limits, such as latitude, longitude, elevation, and SPZ. But even if the information is not on the planting map, the licensee or timber sales manager needs to know that information to report the NCS. The same information would be useful in RESULTS; if this data were entered, then an automated routine linking SPAR to RESULTS could be developed that could monitor compliance.

Monitoring Growth

Licensees and timber sales managers do silviculture surveys to monitor the stands they establish. Although a few participants said they put notes on file to alert surveyors when trees are planted outside the transfer limits, most do nothing. However, unless the violation of the transfer rules is very large, it is unlikely the effects of non-compliance will be evident until after the cutblock is free growing; and, even if the results can be seen, a surveyor would need to know what to look for in order to monitor them. For example, Douglas fir seed from the interior dry belt planted in the ICH BGC may show signs of a reduced live crown because of needle cast, but this would not be noticeable until after late free growing.

Once the area meets the free growing stocking standard, the Crown takes back the responsibility for the established stand; however, information about where the seedlings were planted is not transferred to the Crown for further monitoring.

Compliance and Enforcement

At the time of the investigation, none of the participants had been subject to compliance and enforcement (C&E) action for non-compliance with CF Standards. However, recently C&E staff had brought a few violations of the CF Standards forward for determinations.

Prior to the realignment of the land ministries, C&E foresters spent significant time doing forestry work. Even then, they would only check CF Standards if there were forest health issues, or if non-compliance had been reported. Now, with ministry changes, they spend only 20 percent of their time on forestry operations. Therefore, if licensees and timber sales managers do not report the information needed for C&E foresters to check compliance, there is a low likelihood of enforcement actions.



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