

A Short History of the Control of Species Selection for Reforestation in BC

By Kevin Astridge, RPF and Ralph Winter, RPF, Resource Practices Branch
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If you would understand anything, observe its beginning and its development. -Aristotle

The purpose of this document is to provide a record of how the Ministry has controlled the deployment of tree species on denuded areas through policy, regulation and standards over the past 30 years. This document records some key dates and the associated policy, regulation or standards changes that were made at that time to control tree species composition or related stocking standards.

1984

The Ministry of Forests Act required that the Ministry manage, protect and conserve the forest resources of the Crown. The Forest Act obliged licensees to establish a crop of commercially valuable species of timber on the area harvested. Funding of the reforestation was largely by government.

In 1984, the ministry created the Basic Silviculture Stocking Standards Policy and the Basic Silviculture Monitoring Performance Policy to ensure the Crown forest land had a suitable crop of trees growing after denudation.

The Basic Silviculture Stocking Standard Policy contained basic elements that are very similar to what is commonly used today:

- Preferred Species
- Acceptable Species
- Minimum well spaced density
- Maximum density for lodgepole pine
- Regeneration delay
- Free growing assessment parameters
 - Size of trees compared to brush and weed competition
 - Early free growing date
 - Late free growing date
- Target well spaced density
- Target leader growth

Preferred species were defined as species which are acceptable for the new forest and which treatments should favour, while acceptable species are those which are acceptable but less desirable for the new forest.

Ministry policy at the time was that a silvicultural assessment be made for any Crown land prior to harvest commencement, and that site specific standards to achieve Basic Silviculture would be set prior to harvest. The site specific standards were considered to be an integral part of the licence agreement. Licensees were expected to propose standards for areas they were planning to harvest.

The Regional Manager developed guidelines for Basic Silviculture Stocking Standards. The District Manager was responsible for evaluating stocking standard proposals from licensees, ensuring that standards set were within regional guidelines, and approving them. If a proposal was not received the District Manager was responsible for setting the stocking standards for an area to be harvested. Standards could be set outside Regional guidelines, but the District manager was accountable for this decision.

The Ministry funded Basic Silviculture through Section 88 of the Forest Act, and industry requested funding for planned treatments. The Ministry controlled nurseries and what species/stock types were available. There were limited species choices available due to technology, budgets/available funds. In 1984 about 15 species were grown in nurseries for planting. In 2010, about 19 species were grown for planting

The District Manager was responsible for monitoring the performance of licensees in meeting their Basic Silviculture obligations. If obligations are not met the District Manager could recommend a reduction in AAC to the Regional Manager who then had the authority to reduce the AAC accordingly.

1986

In 1986 the Pre-Harvest Silvicultural Prescription (PHSP) processes along with the FS1072 form were developed. Licensees were required to complete a PHSP for an area prior to harvest, and cutting permits were not issued until the government approved the PHSP. Section 88 funding for basic silviculture was tied to PHSP approval.

Stocking standards in PHSPs contained similar elements:

- Preferred and Acceptable Species
- Target and Minimum well spaced density
- Minimum intertree distance
- Target leader height

The Free Growing cylinder, based on work by David Brand and Gordon Weetman, as assessment for assessing the status of a crop tree in relation to competing vegetation was introduced.

1987

In 1987, Section 129.2 of Forest Act was created to impose basic silviculture obligations on those who harvest timber. PHSP content was further developed and contained block by block specific regimes containing:

- Planned treatments
- Planned planting stock and density
- Stocking standards with the same content as the past including preferred and acceptable species.

The PHSP remained subject to Government approval. Basic Silviculture funding was provided through the appraisal system:

- Appraisal regimes for cost estimates developed for 10-16 different silviculture regimes for the Interior
- Appraisal cost estimates on Coast based on average silviculture cost per cubic metre in each district

1990

In 1990 the “First Approximation of Correlated Guidelines for Free Growing Stocking Standards for Ecosystems of British Columbia” was published. This correlated existing regional guidelines into provincially correlated stocking standards for minimum and target densities, conifer/brush ratio, and earliest and late free growing dates. Some of the main assumptions of the guidelines were:

- Sawlogs as a primary objective
- Safe pathological rotation age based on projected pest risks
- Management units with differing approved timber product objectives could have different stocking standards

Information was organized based on the updated BEC classification system with the new subzones and variant coding. Species selection information was not correlated, and was provided as part of the Regional Ecological field guides. A new PHSP was developed using the new correlated standards format. Block by block approval of stocking standards by the Ministry of Forests remained.

1992

As part of an ongoing tree species correlation project, the ministry produced the report entitled “**British Columbia’s Forests: Monocultures or Mixed Forests**”¹. This was the first provincial report on tree species diversity on denuded areas. The report highlighted a number of key TSAs where deployment of one species was a concern. The Prince Rupert Region was noted as having significant increases in monocultures of tree species. Since that time there have also been significant issues with *Dothistroma* and Rust concerns in that area.

The report was used as background information identifying the need for foresters to establish a minimum number of trees of a preferred species while still allowing other acceptable trees on site to contribute to stocking and biodiversity.

1993

In 1993 the “Guidelines for Tree Species Selection and Stocking Standards for British Columbia” were published. It included the second approximation of stocking standards as well as the first correlated set of tree species selection guidelines, and there were no changes in the basic assumptions on which the stocking standards were based. There was no change in:

- Regeneration delay and free growing assessment dates
- Concept of well spaced tree
- Definition and assessment of a free growing tree
- Most minimum and target well spaced densities

The major change involved the development of correlated species lists and forest health charts for each major species. The correlated species list categorized species by BEC subzone and variant as Primary, Secondary, or Tertiary. Species were categorized based on a combination of their:

- Maximum sustainable productivity
- Crop reliability
- Silvicultural feasibility

Primary species were considered best suited to timber production. A secondary species ranked lower than a primary species in reliability, feasibility and/or productivity and often had a restriction of some kind on a site. Finally tertiary species ranked lower still and were expected to make up a minor component of a stand or a minor component of all stands in an area.

During development of the PHSP preferred and acceptable species from the primary/secondary/tertiary list were expected to be selected based on the objectives, the BEC unit and site series, and species restrictions.

A requirement for a minimum number of well spaced preferred species at free growing and at regeneration was introduced. This was to ensure that the most desirable species occupy the site, and to promote active management of the preferred species and to avoid over deployment of less desirable species.

1994

In 1994 minimum height standards for species and sites throughout BC were developed, replacing minimum leader lengths. The minimum heights were intended to complement the seedling/brush ratio as it recognized that deleterious factors other than light could negatively impact of seedling growth, and encouraged a high standard of silviculture to overcome these restrictions on growth rate.

Minimum heights were also expected to be an indicator for the future health of a seedling as many problems that afflict young trees only become evident once the trees reach a certain diameter and height or once they have been present on the site for sufficient time.

Minimum heights were set at different levels depending on the species and the site on which it was established, to reflect the differing early growth rates and to level the playing field between fast growing pioneer species and other tree species.

1995

In 1995 the Forest Practices Code was enacted and a mass migration to British Columbia of forestry people from across Canada began because of the workload associated with the new regulatory regime. The information from the Guidelines in 1993 and 1994 were consolidated into regionally specific Establishment to Free Growing Guidebooks.

The Ministry continued block by block approval of stocking standards, but PHSPs were replaced by Silviculture Prescriptions. Along with similar stocking standard information as PHSPs these prescriptions were required to contain:

- Treatment regimes
- Planting information
- Seedlots

The Forest Practices Code required management of blocks with the intent of achieving target stocking levels, and required a mix of species to be regenerated if a mix of species was present on the site prior to harvest. Maximum density limits were also expanded to include all tree species, not just lodgepole pine.

1997

In 1997, the Forest Practices Code was streamlined. This resulted in the removal of the silviculture treatment regime from the SP. Instead the regime of treatments was expected to be maintained on file, and was not subject to government approval. The maximum density requirement was amended to allow the Regional Manager to vary from the default provincial level where local conditions warranted it.

2000

In 2000 the Establishment to Free Growing Guidebooks were revised to include:

- Wider range management objectives
- Boreal broadleaves species
- Variation on stocking standards for Grizzly Bear habitat
- Appendix 9 standards for allowable countable broadleaves

Appendix 9 provided the ability for a tree to be considered free growing even if it is overtopped by a broadleaf tree species provided the density of broadleaves above the countable height was a below a

threshold. The density thresholds varied depending on crop tree species and the BEC subzone/site series.

2002

In 2002 stocking standards became required content in Forest Development Plans. Silviculture prescriptions were replaced by site plans and the site plan was no longer subject to approval there was no longer block by block approval of stocking standards. Decisions on stocking standards were now made by the DM when determining whether FDPs adequately managed and conserved forest resources. The Operational and Site Planning regulation required that stocking standards to be consistent with:

- Any higher level plans for the area
- Establishing a healthy, ecologically suitable stand of trees that is commercially valuable
- The current and future timber supply for the area.

FDP standards could be approved with pre-defined variations that could be applied by the professional forester based on specific situations and circumstances (“approved variations”) without any subsequent DM review and approval

Default provincial FDP stocking standards were created and published in the Chief Forester’s Reference Guide for FDP stocking standards. These standards included the conventional elements from the tables in the Establishment to Free Growing Guidebooks and a set of preferred and acceptable tree species. The OSPR still required a mix of species to be planted and the THSPR still required spacing of a stand if the maximum density was exceeded.

2004

The year 2004 marked the end of the Forest Practices Code, as it was replaced by the Forest and Range Practices Act. Forest Stewardship Plans are required to specify the regeneration date, stocking standards, and free growing height. Many of the conventional stocking standard elements are no longer required content. The late free growing date was replaced with a regulatory requirement to achieve free growing 20 years following the commencement of harvest. The legislated tests that stocking standards must meet for approvals by the Minister are prescribed in FPPR 26:

- The area being stocked with ecologically suitable species that address immediate and long-term forest health issues on the area, to a density or to a basal area that, in either case,
 - is consistent with maintaining or enhancing an economically valuable supply of commercial timber from British Columbia's forests, and
 - is consistent with the timber supply analysis and forest management assumptions that apply to the area covered by the plan on the date that the plan is submitted for approval
- The free growing height is of sufficient height to demonstrate that the tree is adapted to the site, and is growing well and can reasonably be expected to continue to do so.

Density and distribution of tree species established or retained on a site are listed in the factors in FPPR that apply to the development of stocking standards, but it is not a requirement to address any or all of the factors listed.

The information on forest health and the allowable countable broadleaves from Appendix 9 remain as best information for forest health professionals to consider. The requirement to establish a mix of species where a mix was present prior to harvest was not included in FRPA.

Licensees have been given the option of specifying whether a stocking standard applies at a stand level or whether they apply to a group of cutblocks. This enables management of species composition at scale larger than the individual stand.

2008

The ministry published the “**Species Diversity and Composition for British Columbia**”² which examined the question: are our forest management practices resulting in a substantial change in the tree species composition of our forests? With increased intensity of silviculture practices, increased use of planting and decreased reliance on natural regeneration, are we affecting change that will result in outcomes that we do not understand? If we are simplifying forest ecosystems, are we reducing biological diversity? Maintaining diversity to manage risk is a practical approach to managing uncertainty. The report provides insight on trends in tree species composition as we move from natural to managed forests.

Silviculture in British Columbia has been undertaken under different policy regimes and it was important to understand the impacts of those regimes. For this reason, information is presented in this report pertaining to three major time periods:

1. For all time periods
2. Prior to 1987, when government had the primary silvicultural obligation; and
3. Post 1987, representing the period when the majority of silviculture obligations resided with BCTS and licensees.

Since 1987, there are 16 management units in BC where there has been an increase in stands dominated by one species. The report recommended that the ministry and industry need to more carefully monitor and manage species deployment practices.

Conclusion

The ministry has used a variety of policy, regulatory and standard approaches to managing tree species. What is clear is that is very limited local monitoring and strategic management of tree species at the management unit level. Very few compliance and enforcement actions have been taken to rectify species issues. There are very few forest level goals for species deployment in management units in BC.

If government wishes to change species management, it must have

1. Clear species goals and targets
2. Consistent administration and reporting processes that are followed annually over many years.
3. Dedicated staffing to carry out point 1 and 3

Reference links

¹**1992 – British Columbia’s Forests: Monocultures or Mixed Forests**

<http://www.for.gov.bc.ca/hfp/publications/00030/monocult.pdf>

2008 - Species Diversity and Composition for British Columbia

<http://www.for.gov.bc.ca/hfp/frep/publications/reports.htm#rep14>