

## 2.9 Biodiversity Indicator 8. Species Composition

### 2.9.1 Background:

The intent of this LRMP biodiversity indicator is clarified by Bulkley Landscape Unit Plans as being to “maintain a diversity of coniferous and deciduous species that represents the natural species composition of each BEC subzone”.

### 2.9.2 Measure:

A comparison of [tree species present on existing plantations] against [tree species representation in undisturbed forest in the BEC subzone].

### 2.9.3 Results:

Prior to introduction and discussion of the results, two provisos must be considered:

- Most openings were created prior to 1998, when Landscape Unit Plans (LUP’s) came into effect that required maintenance of natural species diversity. LUP reforestation strategies include provisions for increased retention of advanced regeneration and deciduous stand components. Older plantations were established without this direction.
- Species composition of recently planted cutblocks won’t necessarily be reflective of species composition at maturity, because of stand changes including natural regeneration and succession.

In view of these provisos, Figures 13 and 14 illustrate the results of a comparison of [tree species present on existing plantations]<sup>1</sup> against [tree species representation in undisturbed forest in the BEC subzone]<sup>2</sup>, by BEC subzone. Species composition of the “undisturbed” forest in each BEC subzone has been grouped into different seral stages (i.e. mid, mature and old seral) to enable assessment of which species are naturally present, and which naturally fall out of the species mix as stands in that subzone mature. This in turn facilitates assessment of whether or not the species composition in plantations is reflective of the “natural” species composition.

### 2.9.4 Discussion:

CWHws2: spruce and pine dominate plantations, which is a logical trend because until the last few years all plantations have been planted to a spruce/pine mix (i.e. species that are commercially valuable as sawlog upon maturity) with an assumption that other species will establish naturally. However, pine is virtually absent from the “natural” forest, and spruce is present but at significantly lower levels. Conversely, hemlock is a major component of “natural” CWH forests but is noticeably absent in plantations.

---

<sup>1</sup> The species composition of plantations is the composition (by area) from the inventory label of all openings tracked by the Ministry of Forests’ Integrated Silviculture Information System (ISIS).

<sup>2</sup> The “undisturbed” forest species composition is the weighted average (by volume) of [species composition of mature forest greater than 20 years of age] and [species composition of 1993-2002 harvested volumes]. Harvested volumes have been weighted in because the “natural” species composition in the mature forest is potentially skewed by historical harvest. The years 1993-2002 have been selected as a representational period for historical harvest, in part because data are available for that period.

This skew isn't viewed as a major concern, because feedback from field reviews by silviculturists is that a component of natural hemlock and balsam regeneration isn't included in the inventory label because it doesn't meet countable height rules. These stems will comprise the understorey of maturing stands, and may eventually co-dominate.

ESSFmc: plantation composition trends slightly towards increased spruce and decreased balsam compared to the "natural" forest, else correlation is good. Pine is at a higher composition in early seral stages, but this is logical from an ecological viewpoint because pine is naturally succeeded by longer-living species over time.

ESSFmk: no ISIS results were available for comparison.

ESSFwv: same comments as for ESSFmc.

ICHmc1: plantation composition trends slightly towards increased spruce and decreased aspen and birch, else correlation is good. This trend is logical: removal of competing deciduous stems is a common silvicultural practice. The decreased aspen and birch composition is not a concern because (as Figure 13 shows) mid, mature and old seral species distributions indicate these species are naturally succeeded over time.

ICHmc2: same comments as for ICHmc1.

MHmm2: results indicate that plantations have a higher spruce component and a lower balsam component than the natural forest. These results are not of concern because at present there is minimal harvest in this BEC variant (ISIS records indicate only 30 hectares), and a reportable trend has yet to establish.

SBSdk:

- aspen trends from high composition at mid seral to no composition by old seral. Plantations have an aspen component, but at lower levels than may be natural in reference to mid seral composition levels. Because aspen is still present at significant levels (i.e. defined as >10% composition for this analysis), silviculturists do not view this development as a concern.
- cottonwood trends from very low composition at mid seral to relatively high composition by old seral (16%). Plantations have little or no cottonwood component at present, but this matches the seral trend.
- pine trends to be a higher component in plantations than in the natural forest. However, pine is still present to significant levels in the natural forest so this is not viewed as a major concern.
- results indicate that a component of hemlock is present in old seral (9%). Stands with high hemlock composition are generally absent from the SBSdk, so the location of these stands was investigated. It was determined that a minor component of hemlock is reasonable considering certain portions of the SBSdk are transitional to ICHmc1.

SBSmc2: plantation species compositions correlate well to seral trends.

Some thought has been put into the need for establishing tree species composition targets by BEC subzone. However, as this analysis illustrates, adherence to preferred and alternative species recommendations from past and present Establishment to Free Growing Guidelines has resulted in an early seral forest whose composition is, for the most part, strongly reflective of seral trends in the natural forest. The need for targets is not apparent.

#### 2.9.5 Data sources:

Plantations – ISIS (DBCSIL80, current to December 2002).

Mature forest - TSR3 dataset (2000 update forest cover)

Harvested volumes – [1993-1999 openings from 1999 update MOF forest cover] PLUS [recently harvested cutblocks shown on licensee Forest Development Plans], overlain on MOF forest cover (with depletion update < 1993) to determine previous mature forest composition.

TBEC – the most recent version of Biogeoclimatic Ecosystem Classification mapping. A discrepancy in the location of the boundary between the ICHmc1 and the SBSdk was noted during analysis for this section of the State of the Forest report, and corrected in consultation with the Regional Ecologist.



Figure 14 – Species Composition by BEC Variant by Seral Stage

