Conifer Regeneration in the *Rhododendron-Vaccinium-Menziesia* Brush Community of South Central B.C. - Project No. 3.31

Many backlog areas in the ESSF zone of South-Central B.C. are dominated by the well-developed *Rhododendron-Vaccinium-Menziesia* brush community which inhibits conifer regeneration. Little is known about how the brush responds to silvicultural treatments. Dave Coates of Skeena Forestry Consultants in Smithers, with the help of the Clearwater Forest District office, is conducting a FRDA project to investigate this problem.

His main objective is to study the effects of different site treatment methods and intensities on brush development, seedling microclimate, and subsequent survival and growth of planted Engelmann spruce and lodgepole pine. Understanding competitive interactions and growth responses on high-elevation sites will help improve strategies for forest regeneration in these areas.

The study site is located at 1550 m elevation in the ESSFm1 biogeoclimatic subzone, 25 km north-east of Clearwater. In July 1986, eight treatments representing a range of shrub and herb competition levels, with and without soil disturbance, were created using mechanical site preparation (crawlers tractor with a brush blade) and manual slashing (with brush and chain saws). The treatments are arranged in 14 plots of 24 m² each; 8 have been planted with Engelmann spruce (1+0 PSB 313, seedlot 4060) and 6 with lodgepole pine (1+0 PSB 211, seedlot 27029). All 14 treatment-species combinations have been replicated three times.

The following are some preliminary results after two growing seasons:

- Survival of both spruce and pine exceeded 97%, except in the undisturbed brush community (control) where survival averaged 84%.
- Spruce trees in the brush-free treatments grew more than those in the untreated controls both years, and performance was equally good regardless of soil disturbance.
- Pine growth varied little between treatments in the first year, but was significantly greater in the brush-free plots in the second year.
- Tree diameter was the growth measure most responsive to reductions in competing vegetation.
- Spruce suffered frost damage in mid-August of the first season; pine was unaffected. The damage was least severe on the mechanically scarified plots and greatest in those plots with no vegetation removal.
- Vegetation removal increased growing season soil temperatures and the magnitude of daily temperature fluctuations; exposure of the mineral soil intensified these effects.
- Shrub re-growth in all of the treatments was limited, but the herb Sitka valerian (*Valeriana sitchensis* Bong.) regained 30% of its original height and 85% of its crown diameter by the end of the first growing season, and had completely recovered to pretreatment levels by early in the second growing season.
- In the manual cutting treatment, 50-80% of the cut shrub stems (depending on the species) produced some new growth by the end of the first growing season.
- When all of the above-ground parts of the shrubs were removed, there was no regrowth from the roots after one growing season.

A sample of trees within a range of brush densities was selected for more detailed tree growth and microclimate measurements. Frequency, size and spatial distribution of competing species were also recorded. Data from one growing season was not sufficient to develop useful predictors of conifer performance, based on these competition indices and microsite descriptors. Even at low competition levels, some trees performed poorly suggesting that other unexplained factors may be influencing their growth. There is some evidence, however, that pine tree volume growth is inhibited above a critical percent cover of *Rhododendron* (*Rhododendron albidulum* Hook.). The effects of varying levels of shrub and herb competition on conifer growth and survival may not become clear for several growing seasons. The treatment plots will therefore be maintained and monitored for at least five years.
Dave Coates has conducted several tours of the study site and discussed the experiments with UBC faculty and graduate students, high school students, and BCFS operational and research staff. The early results will be presented at the Vegetation Management Working group meeting in February 1988 and the Southern Interior Silviculture Committee (SISCO) meeting in March 1988.

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