Mechanical and Chemical Site Treatment Effects on Plantation Success in the ESSF Zone - Project No. 3.40

Reforestation of 70,000 ha of backlog NSR area in the Engelmann Spruce Subalpine Fir biogeoclimatic zone is currently receiving high priority for research in the Kamloops Forest Region. These higher elevation forest types are becoming more important to the Southern Interior timber supply as lower elevation supplies are depleted. Unfortunately, site conditions in these areas do not favour prompt regeneration, especially in the ESSFm and ESSFw subzones of the Clearwater and Salmon Arm Forest Districts. Strong vegetation competition, low soil temperatures and poor soil nutrient conditions are some of the factors believed to contribute to plantation failure. Dennis Lloyd, Research Ecologist with the BCFS Kamloops Region, is studying and comparing the effectiveness of different mechanical and chemical site preparation techniques in ameliorating these conditions and improving survival and growth of lodgepole pine and Engelmann spruce plantations.

The objectives of this project are:

1. to create an ESSF site preparation demonstration area for the Salmon Arm Forest District, and neighbouring districts;
2. to describe the environmental conditions and factors limiting seedling establishment in backlog ericaceous brush sites; and
3. to contribute to the development of regeneration guidelines for these sites.

The study area is located 25 km N of Anglemont, B.C., at 1580 m elevation in the ESSFm biogeoclimatic variant. The site is uniformly covered with native vegetation; predominantly white rhododendron (Rhododendron albiflorum), lesser amounts of blueberry (Vaccinium membranaceum, V. ovalifolium) and false azalea (Menziesia ferruginea), and a well-developed herb layer. This ecological type is representative of extensive NSR areas in the Kamloops, Nelson, and Cariboo Forest Regions.

In the 1986 field season, four different 20 m x 80 m treatment areas were established:

1. a no-treatment control;
2. mechanical scalping of all vegetation and surface organic matter;
3. manual patch scarification, removing alternate 50 cm² square areas of vegetation and organic matter; and
4. ground application of 6 L glyphosate herbicide per hectare.

In June of 1987, each treatment area was planted with 120 lodgepole pine (1+0 PSB 211 stock) and 120 Engelmann spruce seedlings (2+0 PSB 313 stock). One half of the seedlings in each treatment area were fertilized with 30 g of slow-release Osmocote (18-6-12) at the time of planting.

Five permanent 2-m² vegetation plots, and one central photo point were established in each treatment replication to monitor changes in vegetation species, cover, height, and phenology. All planted seedlings were tagged and measured for height, caliper, crown diameter and condition after planting and at the end of the first growing season (1997). In one herbicide replication, 20 tagged plants of each major shrub and tree species were also measured before the herbicide was applied and will be remeasured annually. First year root growth and foliar nutrient status are being assessed from destructive samples of 12 seedlings per treatment replication. General climatic and soil microclimatic data are being continuously recorded with an on-site climate station and data logger.

This study of ESSF site treatments is intended to be a long-term research project. Demonstration field tours of the site have been conducted to discuss the methods and preliminary results. The first year results and observations are being summarized and will be presented at the Southern Interior Silviculture Committee Winter Workshop in March 1988.

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