The Engelmann Spruce - Subalpine Fir (ESSF) Bioclimatic Zone is a high priority for backlog reforestation research in the northern interior of B.C. because of the poor record of past regeneration in this high elevation forest zone. Of the total ESSF denuded within the northern interior during the past 35 years, it is estimated that almost half (more than 39,000 ha) has failed to regenerate successfully. FRDA project 1.17 is a major research and demonstration effort aimed at identifying causes of NSR and developing effective silvicultural options for backlog rehabilitation within the northern ESSF. An initial problem analysis (Phase I) has been completed (see FRDA Memo No. 053). Craig Sutherland, Forest Science Officer with the Cariboo Forest Region, is now tackling Phase II of the project, which involves a benchmark research and demonstration trial.

The objectives of Phase II are:

1. test and evaluate silviculture system options (site preparation, planting, stand tending) for achieving tree-growing plantations on backlog brushfields in the northern ESSF zone;

2. develop treatment guidelines for reforesting ESSF backlog brushfields; and

3. establish one site to demonstrate the effectiveness of a variety of silviculture system options for backlog reforestation.

The study area is located at 1400 m elevation in the ESSFh subzone of the Quesnel Forest District, approximately 25 km east of Quesnel. The northwest-facing site is typical of backlog NSR areas in the ESSFh. It was logged in 1975-76 and now supports a dense cover of fireweed (Epilobium angustifolium), thimbleberry (Rubus parviflorus), lady fern (Athyrium filix-femina), Indian hellebore (Veratrum viride), and bluejoint reedgrass (Calamagrostis canadensis) with scattered patches of Sitka alder (Alnus viridis) and willow (Salix spp.)

The experimental design includes five methods of site preparation each replicated three times on 30 x 120 m treatment plots.

The treatments are:

1. brown and burn - backpack application of glyphosate (Vision®) followed by broadcast burning;

2. herbicide - backpack application of glyphosate (Vision®) at 2.1 kg a.i./ha;

3. mechanical mounding - using a modified 205 excavator;

4. mechanical scalping - using a modified 205 excavator; and

5. control - no site preparation.

All herbicide and mechanical treatments were carried out during the 1987 field season. Broadcast burning was done in June 1988.

During the 1988 field season each treatment area was planted to four different species/stock type combinations:

1. interior spruce 1+0 PSB 313A stock;
2. interior spruce 2+0 PSB 313A stock;
3. interior spruce 3+0 PSB 415B stock; and
4. lodgepole pine 1+0 PSB 211A stock

Brushing treatments using glyphosate (Vision®) will be applied, as required over the next 2 to 3 years, on half of each species/stock type treatment plot.

Vegetation, fuel loading, plant biomass, and soil assessments were made on all plots before site preparation treatments were applied. Post-treatment assessments of non-crop vegetation and seedling performance will be made after 1, 2, 3, 5, and 10 years. Within each site preparation treatment, microclimatic conditions (air temperature, soil temperature, soil moisture) are being continuously recorded by five on-site data loggers. Light conditions (photosynthetically active radiation) under the vegetation canopy will also be measured periodically.

Three-year results from the study will be incorporated into a research report and silvicultural guidelines scheduled for publication in 1990. One of the treatment blocks has been designated as a long-term ESSF demonstration site. Three formal tours of the site were conducted during 1988, and additional guided tours are planned for upcoming field seasons. The site will also be suitable for self-guided visits. Information signs and a descriptive brochure will be prepared.

For more information on this project, contact:

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