

Climate-Informed Investments for Forest Enhancement and Carbon

Information Note #6 Best Practices for Under-Planting

October 29, 2017

Introduction

Planting beneath fire or insect killed over stories is known as under-planting. For the purpose of creating a Greenhouse Gas (GHG) benefit, under-planting is a much better method of reforesting uneconomic dead over-stories than preparing such areas for planting by felling and piling over-stories.

Purpose

This Best Practices information note provides clear direction on where under-planting is appropriate, e.g., fire killed stands. It also discusses safety issues during planting and surveying, related to the over-story.

Criteria to Consider

While both fire and insect killed stands have been under-planted in BC, survey results show that seedlings do much better under fire killed over-stories than under insect killed over-stories. Therefore, under-planting is usually NOT recommended for insect killed stands. This is because the low light levels and unreduced grass and/or brush competition associated with insect-killed stands produces poor seedling growth conditions.

- Consider whether the fire has sufficiently increased light levels by burning branches and stems, and removed sufficient duff and vegetation to create good planting conditions; Is sufficient light reaching the forest floor to ensure seedling survival and growth?
- Pine-leading stands which are old enough to be producing cones, and for which a viable seed bed exists post-fire should not be planted immediately after a fire event. Forest professionals should do a regeneration assessment three years post-fire to estimate the amount of natural regeneration coming in.
- Leaving dead and live trees standing, as opposed to felling and piling, slows the rate of decay and emissions. In situations where slash pile burning is avoided, GHG emissions are significantly reduced.
- Laying to waste (falling/piling) treatments followed by burning results in immediate emissions of both carbon dioxide and more harmful greenhouse gasses and is expensive.
- Under-planting is a very cost-effective reforestation treatment, as there are no over-story removal costs.

Objectives

Proposals reflect beneficial practices when they help meet the following objectives:

1. Retaining carbon on site in the over-story while maintaining worker safety;
2. Reducing or avoiding the burning of forest debris;

3. Enhancing carbon sequestration in the planted stand; and,
4. Creating a resilient and diverse stand that is well adapted to the site as climate changes.

Strategic, Operational and Tactical Approaches

Proposals reflect beneficial practices when the following practices are planned:

Strategic Approaches

- Select fire-killed sites rather than insect-killed sites because the survival and growth rate of under-planted seedlings is generally higher under fire-killed over-stories;
- If it's necessary to remove an over-story to ensure seedling survival, it's better for the GHG balance to salvage the over-story than to lay the over-story timber to waste. Where salvage harvesting is feasible, high-utilization salvage mechanisms such as BCTS Innovative Timber Sale Licences should be considered;
- Select fire-killed stands with sufficient ground disturbance and adequate light;
- Use results of surveys to hone in on those areas which are not coming in to natural regeneration; and,
- It's more cost effective and efficient to have [wildlife danger tree assessments](#) (WDTA) done immediately prior to planting as part of the planting contract.

Operational and Tactical Practices

- Survey cone bearing pine stands with suitable seed beds 3-5 years after the fire to identify NSR areas;
- Focus under-planting on areas which are not coming back naturally;
- Avoid activities that have negative effects on forest carbon, such as felling and piling of over-stories, and avoid treatments that will result in the burning of waste piles;
- Include WDT assessment as part of the planting project, the same year;
- Use well-established and accepted wildlife danger tree protocols to ensure the safety of the planting crews; and,
- Use RESULTS to check survival statistics and forest health issues for similar strategies.

Cumulative Effects and Potential Impacts on Other Values

- Under-planting a fire killed stand without removing the over-story creates a huge carbon benefit without the emissions that would occur if the over-story was felled and piled; and,
- The structural diversity has co-benefits for habitat, shade, lichen, perching cover etc.

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