



# **Bear Creek Unit 13 SPRUCE FILL PLANT**

**Silviculture Treatment Plan**



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## Abstract

The Bear Creek Operating Unit 13 is located northwest of Haines Junction, the access road starts approximately 13 km down the Alaska Highway from Haines Junction. The area was salvage harvested from 2013-2016 due to spruce beetle activity killing a large number of the white spruce stands in the area. During the salvage harvest, loggers targeted cutting standing dead trees, and windthrow.

The proponent for the Silvicultural Treatment Plan is the Yukon First Nation Wildfire who is a delivery partner for Canada's 2 Billion Trees planting program. The following is a quote from the Federal Government's website on the project: **"Planting two billion trees is taking a significant step forward in Canada's journey to tackle the twin crises of climate change and biodiversity loss. The 2 Billion Trees program is committed to partnering with governments and organizations to plant two billion trees over 10 years – trees that will capture and store carbon from the atmosphere, improve air and water quality, help to restore nature and biodiversity, cool our urban centres and create and support thousands of green jobs."**

There are several applicable First Nations Final Agreements and higher-level plans that were taken into consideration in developing this Silviculture Treatment Plan; Champagne and Aishihik First Nations Final Agreement, The Champagne and Aishihik Traditional Territory Strategic Forest Management Plan, and guidance from the Bear Creek Harvest Planning Area Timber Harvest Plan (THP), and several site plans.

The objectives of this silviculture treatment plan are to restore and enhance forest regeneration in accordance with local forest management plans and Yukon stocking standards, and increase carbon sequestration by planting trees. We plan to bring the stand density up to the YG standard of 1400 trees/ha as per the "Coniferous leading" stocking standard. This will increase carbon sequestration on the site more quickly than simply waiting for natural regeneration to take place.

Prior to the project area being damaged by insects and subsequently being salvage harvested, the forest was mature white spruce stand (80% of the live vegetation) with pockets of trembling aspen (20%). Some natural regeneration of aspen and white spruce has occurred but will require areas to be "fill planted" as opposed to full planting. This means that seedlings will be focused on available plantable spots and seedling densities will vary. The treatment will consist of planting an initial 20,000 White Spruce trees, covering an area of up to 57 hectares (ha), and possibly another ~ 9,070 trees of either white spruce or trembling aspen. White Spruce has been selected because A) This site is outside of Haines Junction's stand conversion zone, and B) it is the most likely seed stock to be available for the project. Using data available at the time of writing, a full estimate of trees to be planted in this block area is ~ 29,070, however, due to the variable nature of the regeneration throughout the area, YFNW would like to enter the 2025 planting treatment with the lower 20,000 target. The benefit of this is that it is very unlikely that variability will lead to the operation having too many seedlings for the site.



Once the initial 20,000 are planted, the remaining open area, if any, can be re-evaluated to be planted in either 2026/2027 dependent upon seedling logistical timelines and nursery capacity. Because the remaining area will be smaller, a more refined/accurate seedling number can be produced from surveys to inform this second round of orders, this approach limits the risk of wasted seedlings/capital. Additionally, while the first 20,000 trees planted at this site will be White Spruce, with consultation with the Forest Management Branch, if the local ecosystem would benefit from additional diversity the second round of planting could be Aspen. Also of note for this project, YFNW is organizing with the Forest Management Branch to access the Territory's seed stockpile, this means that the trees grown for use on this project will be sourced from a local provenance acceptable to the territorial standards.

This treatment is planned to begin the Spring or Fall of 2025, with additional surveys later that year, and additional trees to likely be planted in either 2026 or 2027.

## Background

### Disturbance history

During the 1990's/2000's spruce beetle outbreak many of the white spruce in the stand died of beetle attack. There was 61% by volume that was killed by the outbreak. Between 2013 and 2016 the Yukon Government allowed salvage harvesting in this site. Loggers were able to cut standing dead trees and windthrow in the area for removal. After the completion of the logging in this operating unit, the road into this block area was deactivated to reduce impact of access to the area. There is a non-reclaimed resource road that is passable for the first 3km of access from the highway turn off to the front of the Treatment Unit's access, however, the route has been partially blocked by a berm ~200m from the border of the treatment area. Beyond that point, quads will be used to move resources.

### Previous Silviculture Prescriptions

The previous reforestation plan as outlined in the 2014 BC-13 Site Plan was natural regeneration up to a minimum of 700 stems per hectare. This Silviculture Treatment intends to bring the reforestation density up to a higher level with the goal of sequestering additional carbon emissions more quickly than would otherwise be the case.



## Treatment location

Access to this area is located northwest of Haines Junction, along Alaska Highway 13 kilometers from Haines Junction. The Treatment Unit is within the Ruby Ranges Boreal Cordillea Ecozone (Figure 1). For detailed plan maps see Appendix 1-3.

Margins of three Pleistocene glaciations emanating from the St. Elias Mountains are visible in the Ruby Ranges. This ecoregion is one of Yukon's driest, as it lies in the rain shadow of the St. Elias Mountains. Kluane Lake, the largest lake in the Yukon, lies in the Shakwak Trench along the southwest edge of this ecoregion. Dall sheep, wolves and grizzly bears are relatively abundant. Swans, geese and ducks use the wetlands in the Shakwak Trench for nesting while other migratory birds use the wetlands for staging enroute to and from breeding grounds in Alaska. Below is a map of the proposed treatment area showing the outline of the treatment area, and where the road reclamation begins.

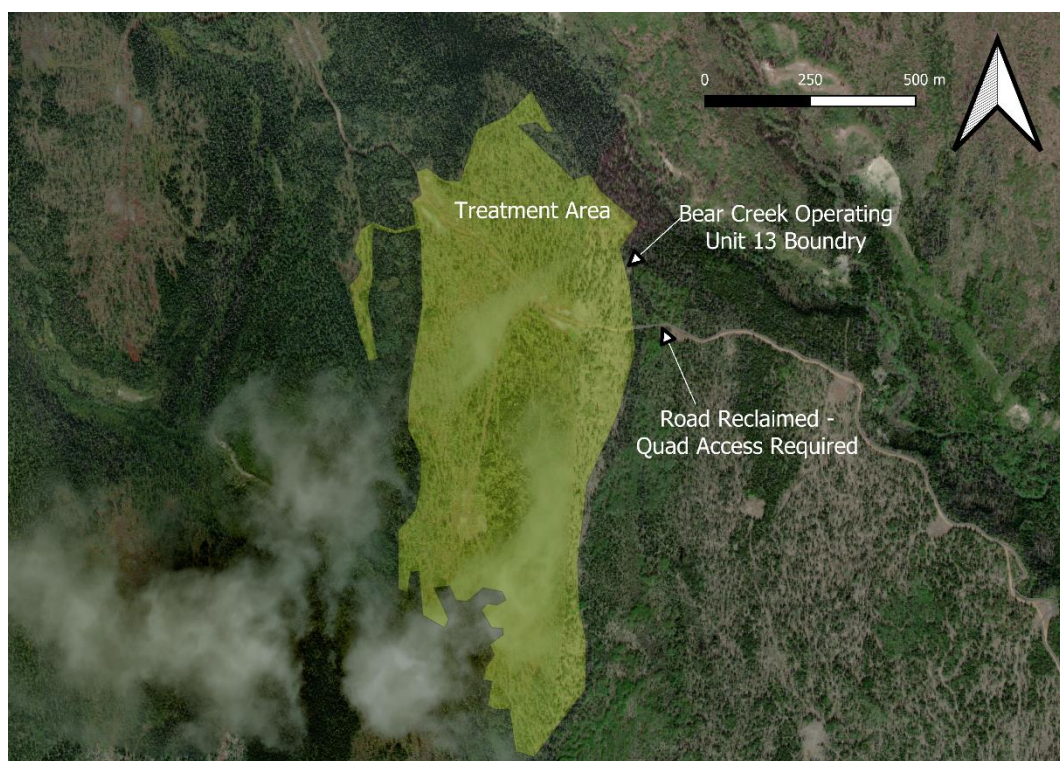


FIGURE 1 BEAR CREEK OPERATING UNIT 13 OVERVIEW



## Site conditions

- The unit was salvage harvested between 2013 and 2016, leaving a mosaic of small openings in place of standing dead spruce trees.
- During surveys completed in the fall of 2022 it was found that the site has partially regrown through natural regeneration. In the areas of logged openings, the average stocking level found was 890 stems per Hectare. The majority of the post-harvest regeneration were Aspen trees (84% of recorded trees)
- Slopes are generally flat 0 to 5%, and the planting sites are located on level terrain. Soil at this site has imperfect drainage, 7 cm LFH (organics), and a silty clay loam composition. The imperfect drainage means that water drains slowly from the site and is moist most of the growing season. The silty clay loam soil is fine textured with few coarse fragments but is not gleyed.
- Water seepage is not evident, but suspect surface water pools after the snow melts.
- The pre-insect attack vegetation inventory for the area shows a predominately white spruce stand (75-85%), and trembling aspen (15-25%), at average heights ranging from 10 meters to 14 meters.
- According to the Yukon Vegetation Inventory 5K the site class in the treatment area is rated as “Medium”.
- The timber harvesting left some exposed mineral soil to provide sufficient seedbed for white spruce and patches of aspen revegetated. Competition from grass, willow, wild roses, and alder. The density of competing species ranges over the site from little/none to heavy competition.
- This site is within the Klondike Plateau Boreal Low Subzone; BOLkp/01.
- A 2022 survey found a major component of current regeneration at the site is shrub and grass species (*Salix spp.*, *Poa spp.*, *Rosa acicularis*, *Alnus viridis*) (Figure 2).
- There is a pre-existing resource road the passes through the treatment area that currently has been de-activated post-harvest.



**FIGURE 2- IMAGES OF THE BEAR CREEK OPERATING UNIT 13  
AND THE COMPETING VEGETATION**



## Planning considerations

This proposed treatment plan meets or exceeds the goals, strategies, objectives, and requirements set out in the following plans, agreements, and considerations:

### Forest Resources Act

- As per section 57.(1) of the Forest Resource Act, this Silviculture Treatment Plan will be/has been submitted to the Forest Management Branch for approval from the Director

### Strategic Forest Management Plan for the Champagne and Aishihik Traditional Territory

- Planting from a local seed source supports the ecosystem's ability to maintain normal genetic diversity and therefore natural processes (Goal A - Objective 2).
- Planting spruce and thereby maintaining a coniferous component on the landscape will help maintain and enhance ecosystem regeneration and (Goal A - Objective 1) by having tree diversity and potentially improving site productivity via nutrient cycling.
- By conducting this planting activity, and training Yukon locals (non-imported staff) YFNW is building capacity for a sustainable forestry sector in the CAFN territory, and in the entirety of the YT. The local capability to re-forest areas rapidly after commercial cutting is a crucial step towards building a sustainable forestry sector in the CAFN region (Goal B – Objective 1,5)





## Site Plans

- Natural regeneration is the primary reforestation method, but an appropriate reforestation strategy is now developed based on the current stocking levels, and the funding opportunity to reforest this area to a carbon sequestration standard. The typical re-forestation density standard in the Yukon is 1200-1400 stems per hectare. We will be using the 1,400 stems/Ha figure defined as “Coniferous leading” target standard.
- Fill planting is the secondary reforestation method.
- Mechanical site preparation could be used on this site; however, none is planned for this treatment plan. Grasses and willow are expected to be major competitor for seedlings.
- Worksite Preparation: No site preparation is required for this site. To simplify the logistics of this project, YFNW will be providing all employees on site with wildlife danger tree assessment orientation. While working on the site, all employees will be able to progressively assess and classify any dangerous trees on site and label them as a no-work zone when necessary.
- Site survivability study markers: to increase the validity of later survivability studies in the complex fill plant operating area, during the time of planting, plot centers will be established and marked by GPS and a physical wood marker so that subsequent survivability studies can more accurately track planted tree survivability in the area.
- Pre-existing Resource Road: The Forest Management Branch has advised that they intend to use the existing deactivated resource road again in the future for other timber harvest projects. To avoid un-necessary waste of resources, the resource road area, and a buffer of 2 meters to either side will not be planted.
- Preferred species
  - White spruce
  - Trembling Aspen
- Acceptable species
  - White Birch
  - Black spruce
  - Balsam poplar

## Stocking Standards

The stocking standard for this site is the coniferous leading mixed wood:

- This planting treatment’s target density 1400s/ha as per YG standard



## Treatment area

As of November 2022, the total net area to be reforested is 57.05 hectares. Below is a list of the openings and their relative area (Table 1).

**TABLE 1 OPENING NUMBER AND RELATIVE AREA FOR THE 2025 BEAR CREEK BLOCK 13 FILL PLANT**

Opening	Area (ha)
1	57.05
<b>Total</b>	<b>57.05</b>

## Treatment objectives

This treatment is to assist with the objective of restoring and meeting regeneration target stocking to enhance lagging natural regeneration and sequester additional carbon on this medium productivity site.

## Planned Treatments

This site will undergo the following planned treatments:

- Fill planting of up to approximately 29,070 white spruce seedlings, the initial planting will only include 20,000 seedlings. After initial planting the remaining area will be re-surveyed and additional seedlings will be ordered, this approach limits potential for over-sourcing seedlings due to the complex nature of this block area.



## Treatment schedule

- May/June OR August/September 2025 - fill planting with white spruce
- July/August 2026 - seedling survival assessment
- May/June OR August/September 2026/2027 – Follow-up fill planting to fill remaining space (if any).

Note: The above notes of “May/June OR August/September” is left unspecified due to the unconfirmed logistics of ordering seedlings. Additionally, final selection of treatment time (Spring or Summer) will be made in connection with the Forest Management Branch to ensure best possible seedling survival.

## Trials or research

No trials or research are scheduled for this treatment plan. Monitoring of seedling initial establishment, survival, and growth will occur.

**Robin Clark,**  
**BC Registered Professional Forester**  
**# 2225**  
**Robin B. Clark Inc.**

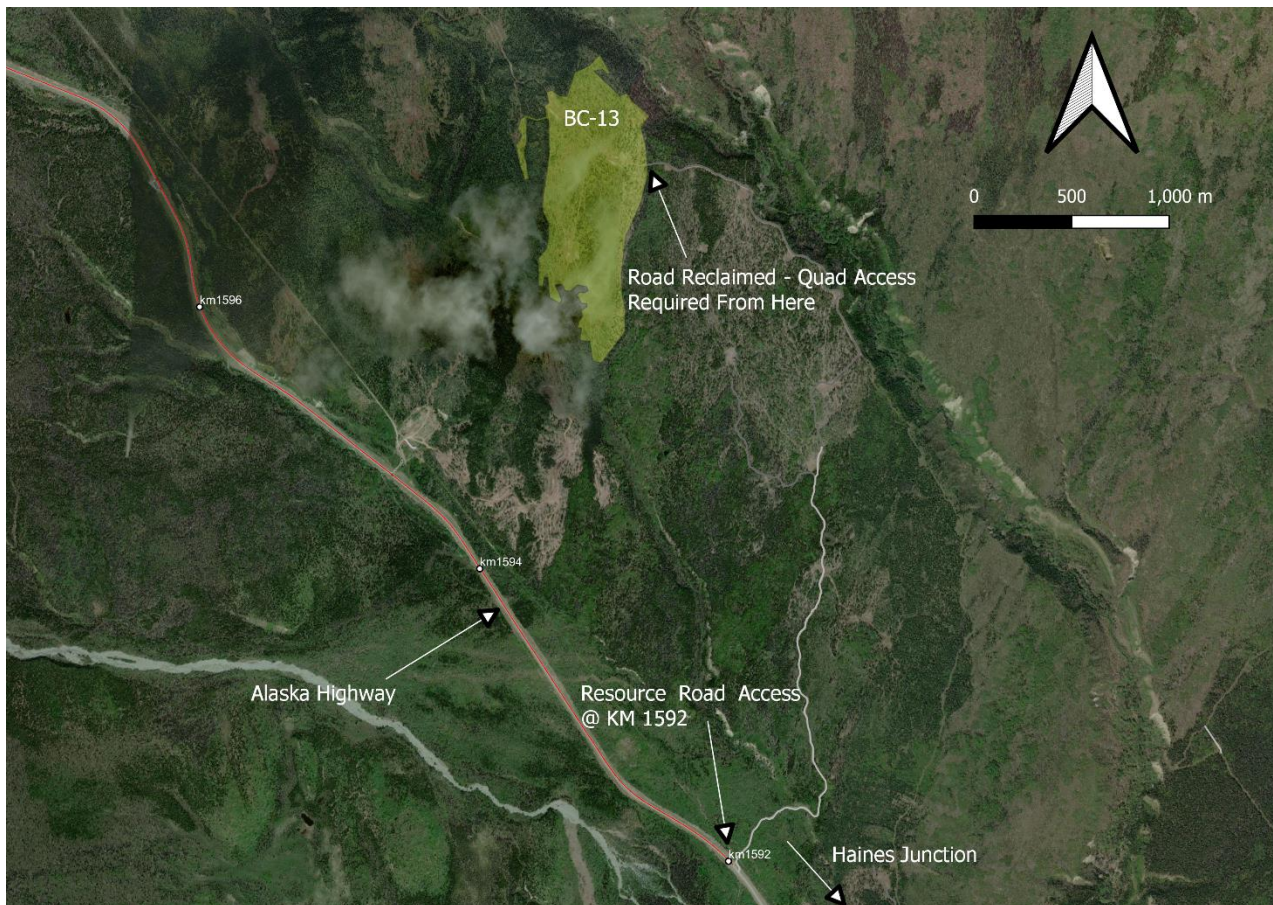
A handwritten signature in black ink, appearing to read "Robin Clark".

Nick Brooks

Yukon First Nations Wildfire



## Appendix 1 - Treatment Plan Overview Map





## Appendix 2 - Treatment Plan Tight View Map

