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Caribou Forage Responses to Varying Tree Planting Densities

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Chu Cho Forestry takes immense pride in its roots as a forest management company wholly owned by the Tsay Keh Dene Nation.

Since our inception in 2017, we have been driven by a dual mission: to effectively manage Tsay Keh Dene's forestry tenures and foster economic growth while upholding our community's values and traditions.

In 2024, TKD purchased a new licence with an annual AAC of ~430,000m3

Woodland caribou are a species of cultural importance to the Tsay Keh Dene, who have used the species for food, materials, tools and ceremony since time immemorial.

Traditionally, the Tsay Keh Dene maintained the species for future generations through traditional management practices.

- Concerns have been raised regarding the impact of accelerated expansion of both natural and anthropogenic disturbance on caribou herd ranges

- Some herds have been extirpated and some show declining populations.

- There’s growing discussion around forestry practices, particularly the need to rethink how we plant conifer seedlings. One important shift gaining attention is the move toward lower planting densities and more flexible spacing between trees.

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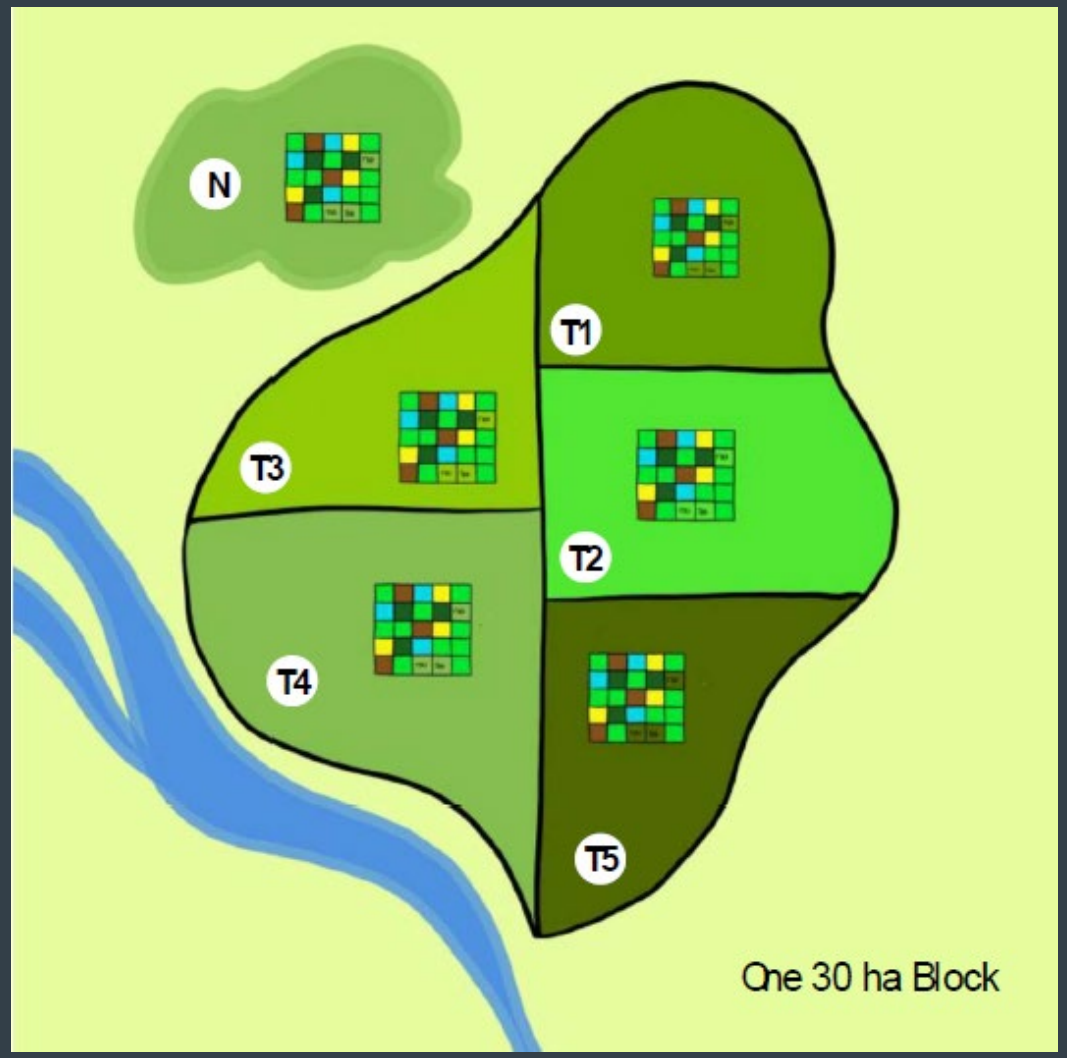
The extirpation of the Scott West caribou herd presents a unique opportunity to investigate large-scale habitat restoration and enhancement

In this field trial, we evaluate the impact of multiple conifer planting densities on the establishment and growth of caribou winter and summer forage species within post forest and post wildfire environments.

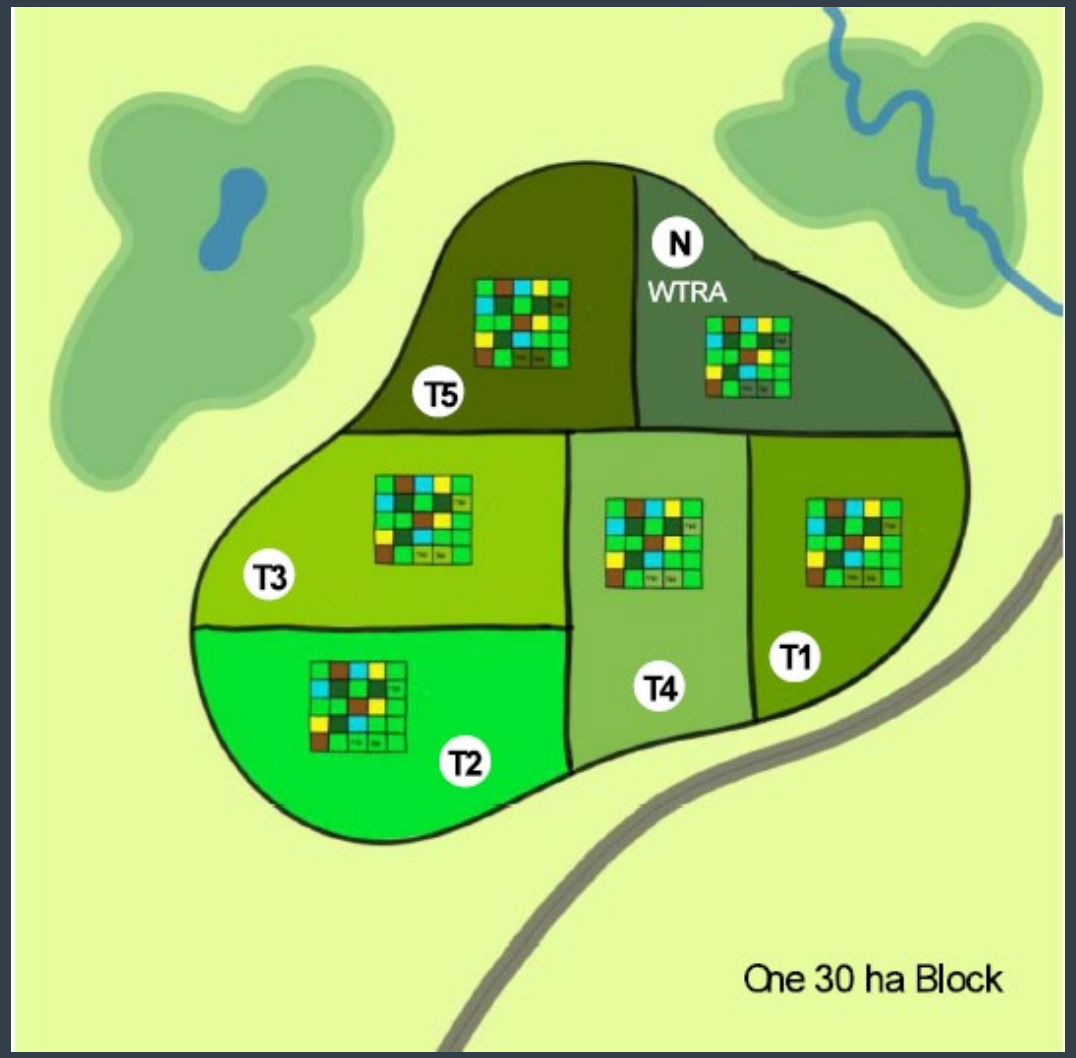
Objectives

- Evaluate the impact of conifer planting densities on the natural establishment, growth, and health of coniferous and deciduous trees,
- Evaluate the impact of conifer planting densities on the natural establishment and growth of vascular and non-vascular plant communities, with a specific focus on caribou winter and summer forage species, and
- Evaluate the effect of conifer planting densities on the survival and growth of transplanted caribou summer forage.

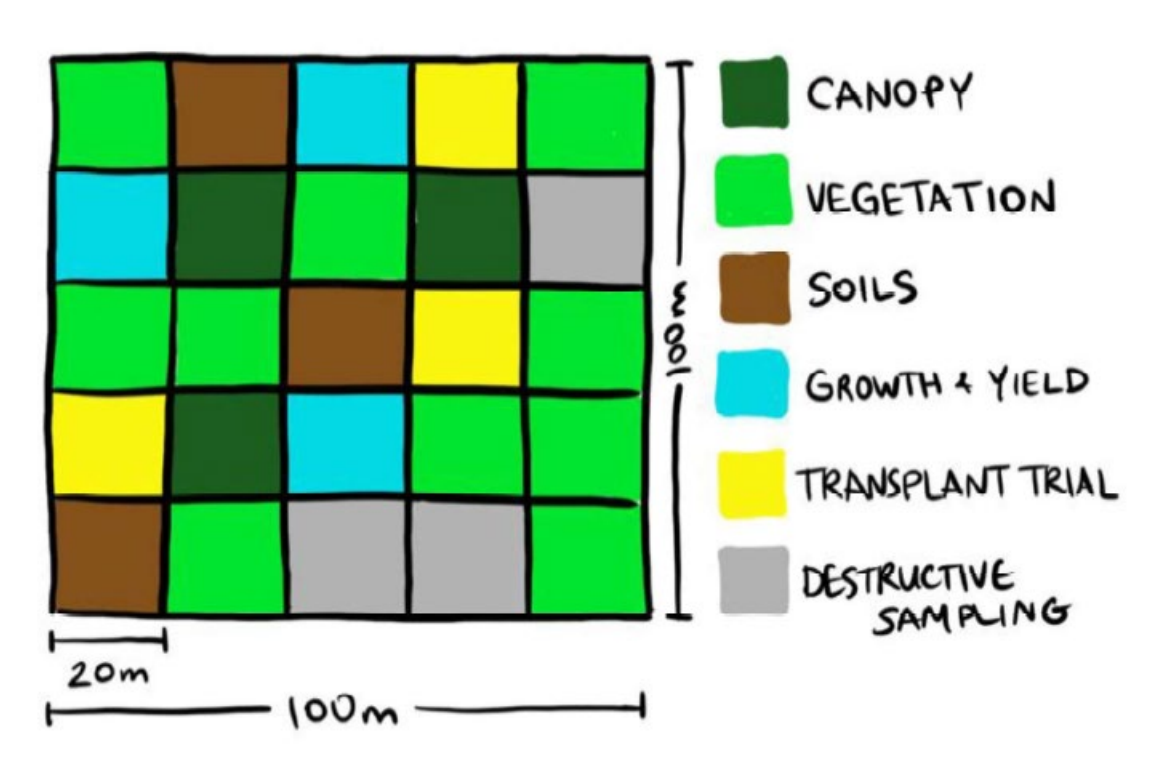
Wildfire Site Type

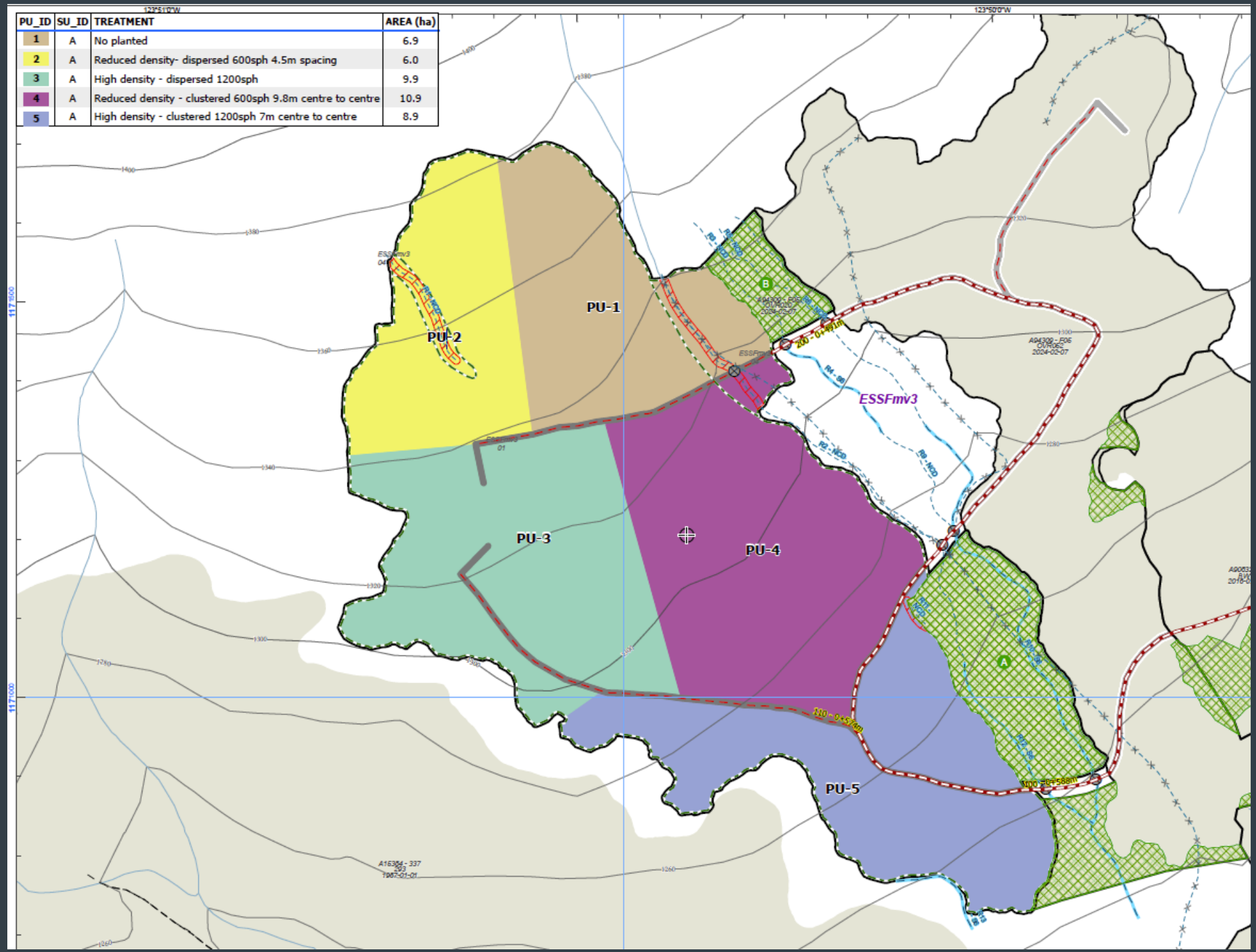


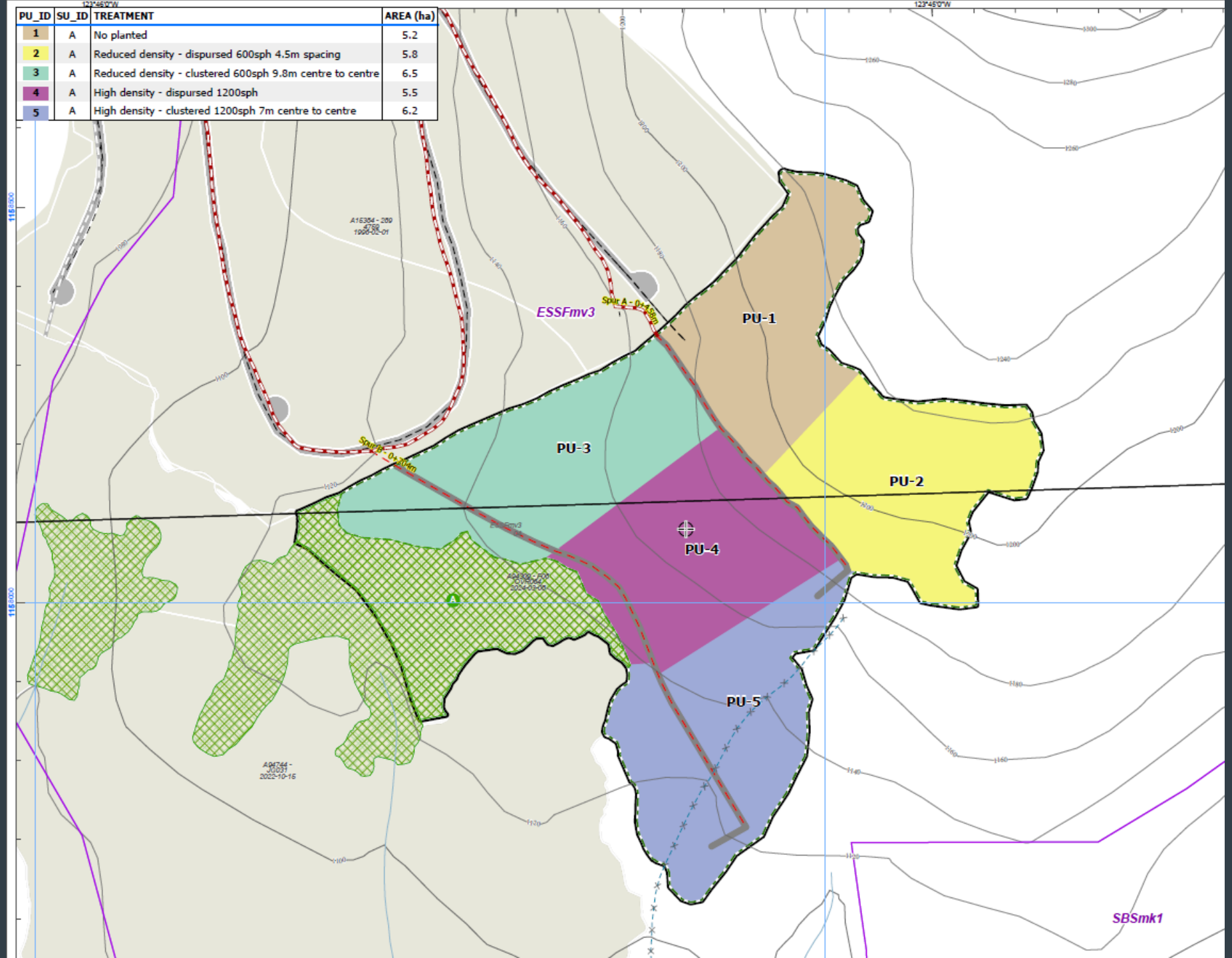
Post Harvest Site

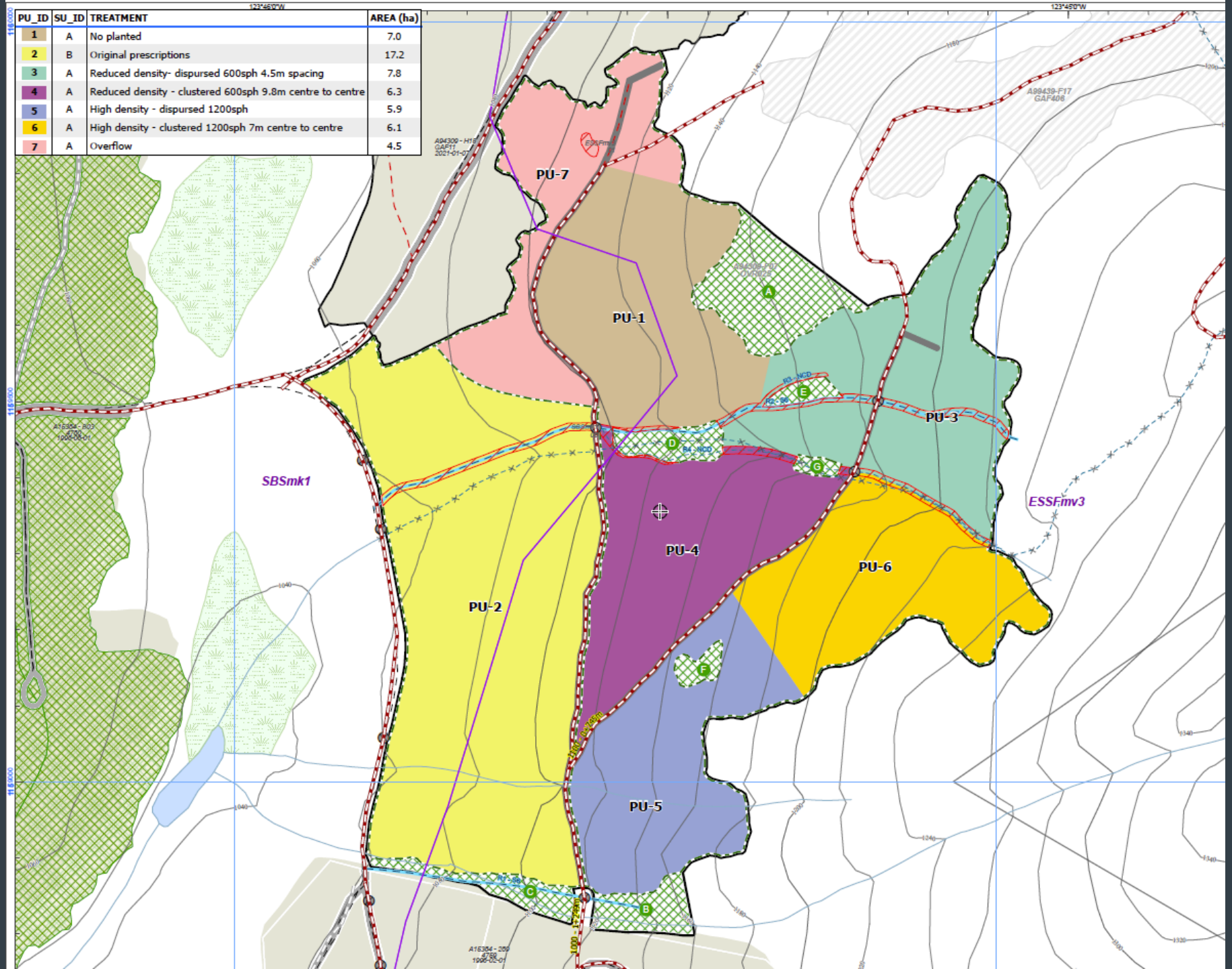


Example of the 1 ha plot and nested 20 m x 20 m quadrats




PU_ID | SU_ID | TREATMENT | AREA (ha)
1 | A | No planted | 6.9
2 | A | Reduced density- dispersed 600sph 4.5m spacing | 6.0
3 | A | High density - dispersed 1200sph | 9.9
4 | A | Reduced density - clustered 600sph 9.8m centre to centre | 10.9
5 | A | High density - clustered 1200sph 7m centre to centre | 8.9
PU-1
PU-2
PU-3
PU-4
PU-5
ESSFmv3
123°51'0"W
123°50'0"W
117°500
117°000


PU_ID | SU_ID | TREATMENT | AREA (ha)
1 | A | No planted | 5.2
2 | A | Reduced density - dispursed 600sph 4.5m spacing | 5.8
3 | A | Reduced density - clustered 600sph 9.8m centre to centre | 6.5
4 | A | High density - dispursed 1200sph | 5.5
5 | A | High density - clustered 1200sph 7m centre to centre | 6.2
PU-1
PU-2
PU-3
PU-4
PU-5
ESSFmv3
SBSmk1
Spur A - 0+1.58km
Spur B - 0+3.04km


PU_ID | SU_ID | TREATMENT | AREA (ha)
1 | A | No planted | 7.0
2 | B | Original prescriptions | 17.2
3 | A | Reduced density- dispursed 600sph 4.5m spacing | 7.8
4 | A | Reduced density - clustered 600sph 9.8m centre to centre | 6.3
5 | A | High density - dispursed 1200sph | 5.9
6 | A | High density - clustered 1200sph 7m centre to centre | 6.1
7 | A | Overflow | 4.5
PU-1
PU-2
PU-3
PU-4
PU-5
PU-6
PU-7
SBSmk1
ESSFmv3

Metric	Number of 400m² quadrats	Description	Number of nested plots within the sub-plot	Monitoring Frequency
Vegetation	10	Vegetation plots will be randomly assigned, where the impact of the treatment on the natural establishment and growth of vascular and non-vascular plant communities will be monitored. Randomly distributed plots must reflect the typical vegetation of the area. Separate canopy quadrats are set up to prevent trampling of sub-canopy species.	Herbaceous and woody vegetation <1m in height: 40 x 1m² sub-plots (4 per vegetation sub-plot) Shrub vegetation >1m in height and <10cm diameter at breast height (dbh): 10 x 25m² sub-plots (1 per vegetation sub-plot)	5 years
Canopy	3	The canopy layer will be monitored based on standard EMAN protocols.	N/A, entire 400m² quadrat will be monitored.	5 years
Soils	3	Soil will be monitored using British Columbia field manual for describing terrestrial ecosystems 2nd edition (British Columbia Ministry of Forests and Range and British Columbia Ministry of Environment, 2010).	Soil pits will be excavated randomly within each quadrat.	5 years

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Post Harvest Silviculture Surveys (i.e., Growth and Yield)	3	Silviculture regeneration surveys will be conducted to assess tree survival, stocking density, and species composition, ensuring that the treatments specified in the prescription have been successfully implemented. Monitoring will also include free-growing surveys at a later stage in the forest regeneration process to evaluate stand establishment and compliance with free-growing standards.	The final design will be determined based on the post harvest survey requirements determined by the managing forester.	1, and 5 years.
Caribou Summer Forage Transplant Trial	3	Quadrats will be randomly placed in the 1ha plot, where the effect of treatments on the survival and growth of transplanted caribou summer forage species is evaluated.	A series of sub-plots will be installed randomly. Final design to be determined based on number of species that will be trialled.	1, 3 and 5 years

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Operational challenges:

Scope of work

Operational timelines

Control- managing changing variables

Resources thin

Appreciation for the following:

Tsay Keh Dene Nation

Chu Cho Environmental

Apex Reforestation

Evan Dulux


Questions?
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