Thinning operator training – why now?

Dominik Roeser

May 22nd 2025

THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Forestry

FOREST ACTION LAB
THE UNIVERSITY OF BRITISH COLUMBIA

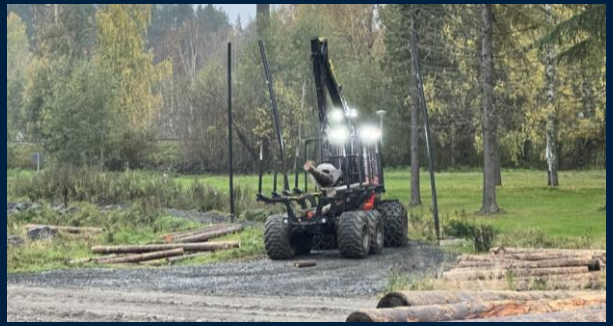
“PROGRESS IS IMPOSSIBLE WITHOUT CHANGE, AND THOSE WHO CANNOT CHANGE THEIR MINDS CANNOT CHANGE ANYTHING.” - GEORGE BERNARD SHAW

“CHANGE BEFORE YOU HAVE TO.” - JACK WELCH

“CHANGE BECAUSE YOU HAVE TO “ - DOMINIK ROESER

FINLAND TOUR 2023




Interim Guidance for Commercial Thinning –

Interior British Columbia

Office of the Chief Forester Division

British Columbia Ministry of Forests, Lands, Natural Resource Operations and Rural Development

May 2021

Thinning Guidance for British Columbia

Effective April 1, 2025

Office of the Chief Forester

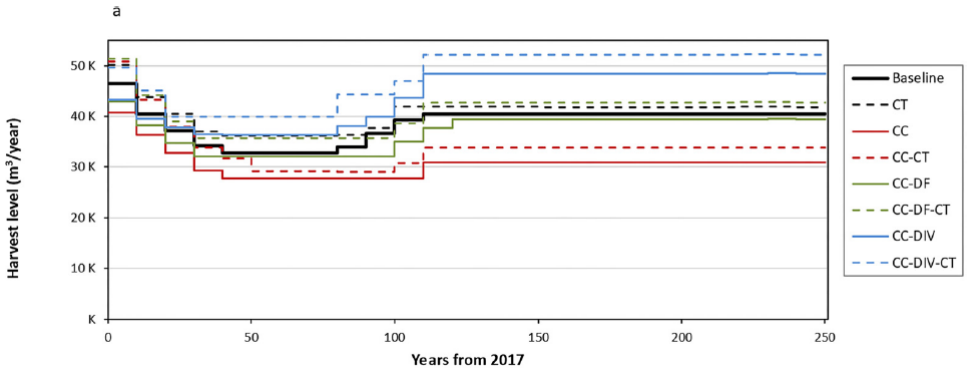
February 1, 2025

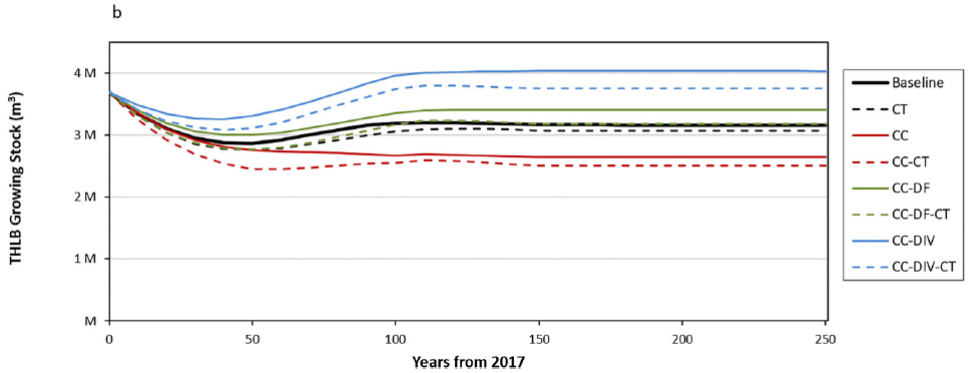
BRITISH COLUMBIA | Ministry of Forests

WHAT ARE THE CHALLENGES?

- Technology & Equipment
- Silviculture systems
- Worker safety
- Equipment safety
- Mindset
- Risk mgmt.
- Education
- Workforce development

WE HAVE SOLUTIONS – HOW DO WE GET TO IMPLEMENTATION?





Canadian Journal of Forest Research

OPEN ACCESS | Research Article

Combining thinning and diverse plantings to adapt to climate-change-induced timber supply shortage in British Columbia

Valentine Lafond[a,b], Adam D. Polinko[a,c], Cosmin D. Man[d], Caren C. Dymond[a], Gregory Paradis[a], and Verena C. Griess[f]

WHAT NEEDS TO BE CHANGED?

- Active Forest Management for multiple values
- Policy
- Jurisdiction
- Common objectives
- Common language
- Understanding of trade-offs
- Need for practical solutions

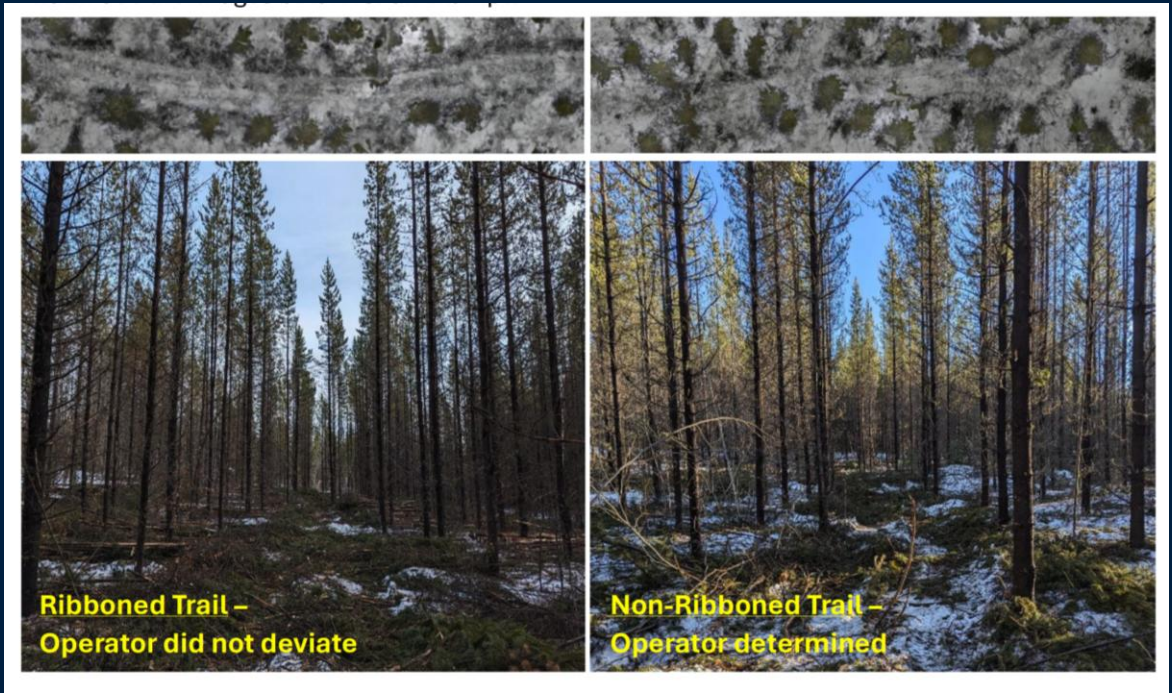
BURNS LAKE THINNING PROJECT HIGHLIGHTS

- **16.48 ha** of total treatment area
- **1995 m3** of volume was harvested
  - **59%** sawlog, **41%** biomass, with minimal harvesting residue left on-site
  - Total revenue $7440 (451/ha)

Key takeaways:

- Need for tree marking to maximize defect detection
- Payment to the operator should be hourly to best incentivize careful tree selection
- Need for pre-commercial thinning
- Need to balance equipment (3 harvesters, 2 forwarders
- Continued operation in similar stands at the prescribed target BA should be profitable and self-sustaining in a long-term program with **local** contractors

BURNS LAKE THINNING PROJECT HIGHLIGHTS



Bavis 2024

QUESNEL COMMERCIAL THINNING DEMONSTRATION PROJECT

Objectives:

1. **Comprehensive Field Data Collection:**
    - Collect critical data to compare three thinning scenarios:
        1. **Traditional Scenario (Baseline):** Standard thinning operations.
        2. **Biomass Scenario:** All biomass is piled by the harvester and removed by the forwarder.
        3. **"Rat Tail" Scenario:** Processor processes to a 2cm top.
    - Measure and assess fuel loading under each scenario, focusing on slash distribution and fire risk implications.
2. **Cost and Productivity Analysis:**
3. **Fire modelling**

QUESNEL COMMERCIAL THINNING DEMONSTRATION PROJECT

QUESNEL COMMERCIAL THINNING DEMONSTRATION PROJECT

QUESNEL THINNING STUDY OUTCOMES

- Harvester spent 7% of work time clearing undergrowth
    - Need for brushing?

- Need to balance machine productivities vs. mgmt. objectives (e.g. trail width)
    - In practice we don’t often have that luxury

- Increasing machine utilization rates needs to be the focus of future efforts to improve contractor productivity

Alonso 2025

10% retention, Whole-Tree harvesting

30% retention, Cut-To-Length harvesting

Feller-buncher Tigercat LX 830 X (FB01)

Log loader Tigercat 880 D (L02)

Harvester Tigercat 1185 (H01)

Log loader (hoe-chucker) Tigercat LS 855 E (L01)

Processor Tigercat H 855 C (P01)

Forwarder Ponsse Elephant King (FW01)

MKRF PRELIMINARY RESULTS

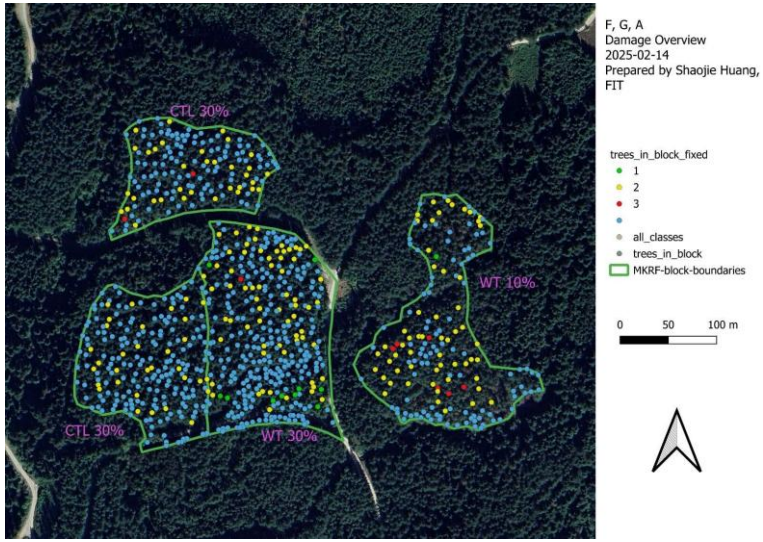
Treatment	Retention	Phase	Machine(s)	Shifts	Productive time (PMH_{15})	Productivity (m^3/PMH_{15})	Logging costs ($/$m^3$)	
WT	Low	Felling (hand felling)	-	2	9.6*	14.5*	3.68	
WT	Low	Felling	FB01	4	27.5	118.0		
WT	Low	Primary transport	L01; L02, S01	13	71.7	47.2	8.67	$29.65
WT	Low	Processing	P01	10	59.6	56.8	7.59	
WT	Low	Loading	L02	15	69.1	49.0	7.32	
WT	High	Felling	FB01	7	31.3	109.0	3.63	
WT	High	Primary transport	L01	12	77.1	44.3	9.51	$33.39
WT	High	Processing	P01	12	77.3	44.2	9.77	
WT	High	Loading	L02	18	77.0	44.4	8.09	
CTL	Low	Felling & processing	H01	9	53.6	46.4	9.49	
CTL	Low	Primary transport	FW01	8	70.3	35.4	10.68	$29.24
CTL	Low	Loading	L02	13	51.3	48.6	7.39	
CTL	High	Felling & processing	H01	9	54.3	43.3	10.18	
CTL	High	Primary transport	FW01	9	69.5	33.8	11.19	$30.93
CTL	High	Loading	L02	12	51.5	45.6	7.86	

Moving from low to high retention, the overall costs increased by 12.6% for the WT harvest system and by 5.8% for the CTL system

MKRF Preliminary results

Productivity in m^3/PMH_{15}.

Phase	Felling	Processing	Primary transportation	Loading
WT	88.6-138.8	42.2-58.3	25.4-60.5	40.4-53.7
CTL	41.2-56.4		32.3-36	37.8-56



Tree damages

- A total number of 2099 trees standing after harvesting. The total number of stems before harvesting is 8114.
- 1164 damages observed on 566 stems
- Percentage of residual trees damaged by treatment
- 13 trees slightly damaged (2%), 522 trees moderately damaged (93%), 31 trees severely damaged (5%)

	Overall
10%	31.85%
30%	25.55%
CTL	21.96%
WT	33.05%

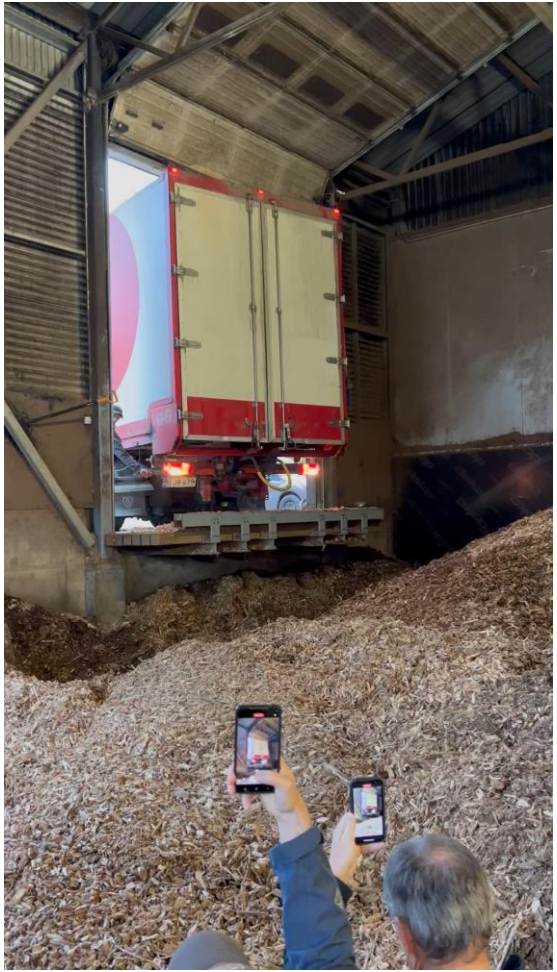
	Overall
CTL 10%	24.78%
CTL 30%	21.27%
WT 10%	38.37%
WT 30%	31.20%

THE WILLIAMS LAKE TRIBUNE

Touring the future of forestry at the Alex Fraser Research Forest

Visitors at the Knife Creek Forest learned about prioritizing forest health in logging practices

Andie Mollins, Local Journalism Initiative
about 14 hours ago




235 GAE

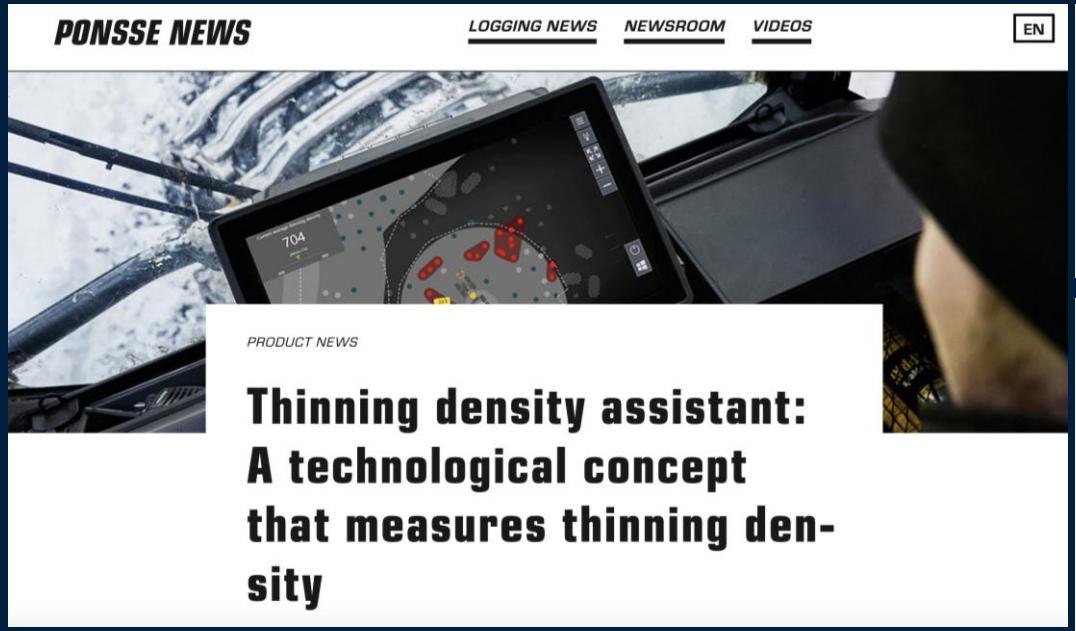

FPInnovations
Government of Canada
Gouvernement du Canada
UBC

Summary thoughts and key messages

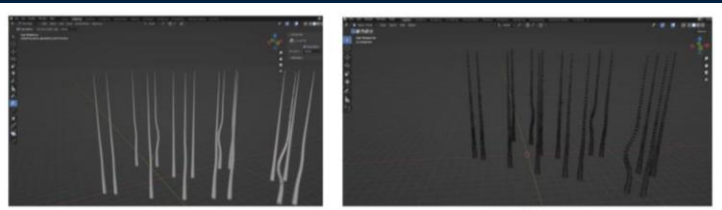
- We have not managed consistently beyond compliance
- How do we get there and what do we have to start doing different?

The new approach:

- INNOVATION for the forest sector – how might we do things differently?
- Holistic forest management; manage over the full rotation; value over volume on shrinking landbase
- Value comes from full product utilization, including bioenergy and biomass
- Expand on tools and technology
- Develop capacity
- STRENGTHEN a forestry culture
- Be willing to take measured risks



Sagar et. al 2024



(a) (b)

Figure 2. Blender view: 3D models (**a**) and point cloud created from the 3D models (**b**).

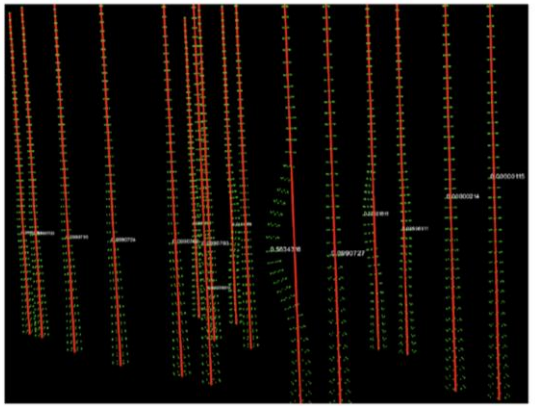


Figure 6. Illustrates the point cloud of the synthetic data, Green dots represent the point cloud, the red line represents the center line, the white text represents the value of the measurement.

THE CHAT GPT SOLUTION (2023):

What does Quesnel BC, Canada need to do to train the next generation workforce in forestry?

A multi-pronged approach should be taken that involves collaboration between government, educational institutions, industry partners, and local communities.

- Develop forestry-focused curriculum: **Integrate forestry-related subjects in primary, secondary, and post-secondary education**
- Establish training programs: **Partner with educational institutions, industry, and government agencies to create vocational and technical training programs tailored to the specific needs of the forestry sector in Quesnel**.
- Encourage experiential learning: **Promote internships, apprenticeships, and co-op programs with local forestry companies to provide hands-on experience** and expose students to the real-world challenges and opportunities in the industry.

THE CHAT GPT SOLUTION FROM 2023:

- **Provide incentives**: Offer scholarships, bursaries, or grants to students pursuing forestry-related education, especially those from underrepresented groups, to encourage more people to join the sector.
- Invest in research and innovation
- Promote awareness
- Strengthen industry partnerships
- Emphasize soft skills
- Support lifelong learning
- Focus on **sustainability**: Promote sustainable forest management practices and emphasize the importance of environmental stewardship in all forestry-related education and training programs.

UPCOMING FINLAND TOUR – COMMUNITY FOCUS

Thank you!

DOMINIK ROESER, PhD
Assoc. Dean Research Forest and Community Outreach
Professor Forest Operations

THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Forestry
dominik.roeser@ubc.ca

FOREST ACTION LAB UBC