

# Thinning as a tool to increase resistance to stressors

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## Background

Commercial thinning (CT) is a versatile and widely implemented mid-rotation silvicultural treatment.

Despite the multiple benefits associated with CT, foresters struggle to implement CT for multiple reasons, mostly related to the profitability of the operations.

In the interior of British Columbia (BC), Canada, fibre supply shortages, unprecedented wildfires and insect outbreaks are challenging current management practice. Therefore, the interest in CT is high, but there is a lack of sufficient scientific knowledge of CT operations in BC.



CT operations in Oregon, US

Photo credit: Sabrina St-Onge

## Area of study

Quesnel TSA in pure and mix-conifer stands. This project is linked to other Silva21 projects, studying the influence of fire and the irregular shelterwood system, and remote sensing techniques.

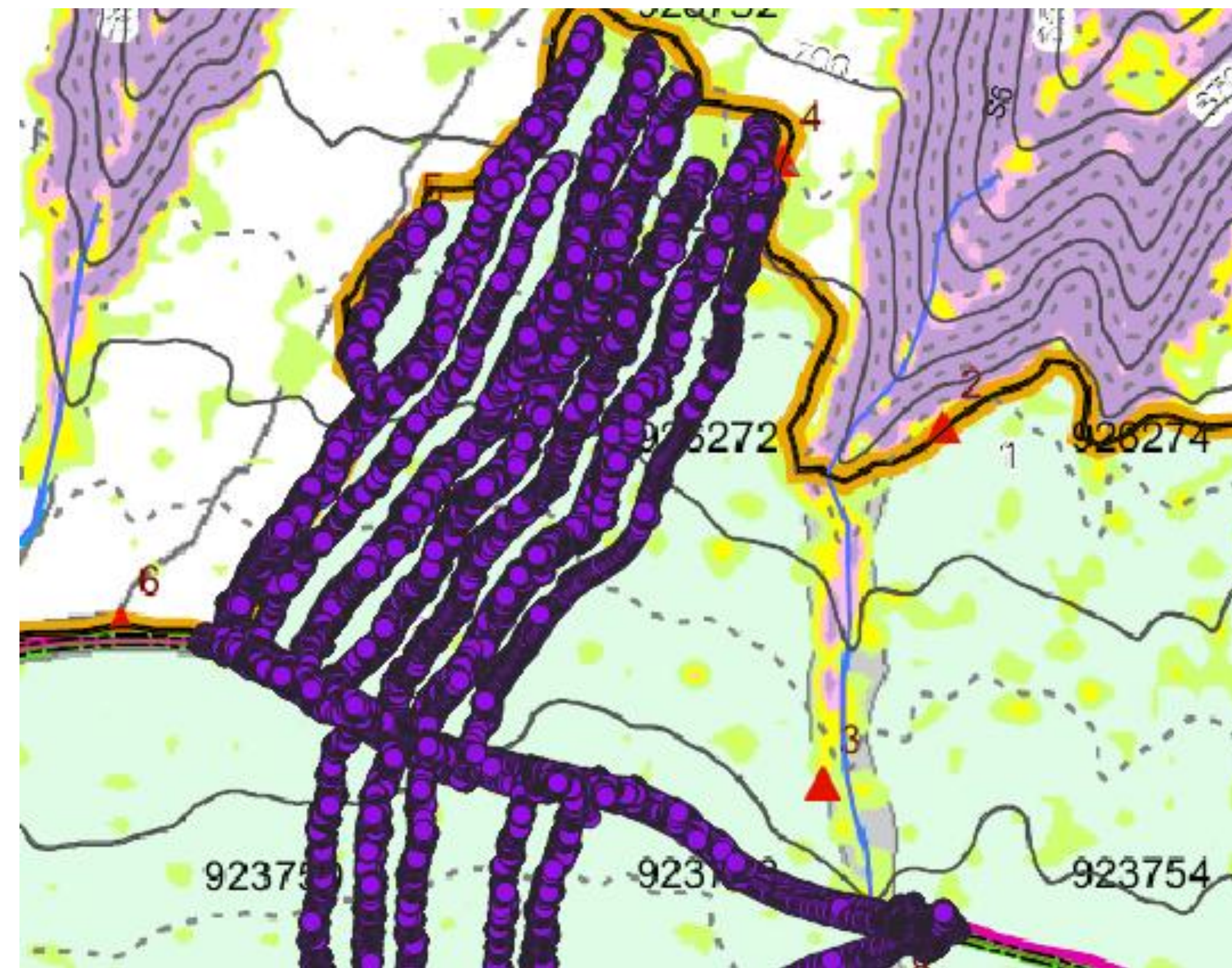
## Research objectives

This project aims to provide data, tools and practical solutions to improve CT operations in BC, in particular:

- Understand common approaches to CT
- Analysis of a detailed time study of harvester and forwarder machines
- Implement innovative CT harvesting methods and technology in BC to achieve multiple objectives
- Identify stand structures that are more resistant to stressors

## Methods

- Time study for productivity analysis
  - Video analysis at work element level
  - On-Board-Computer data + GNSS
- LIDAR inventory (pre & post-harvesting)
- Study of factors affecting productivity
- Residual stand damage plots



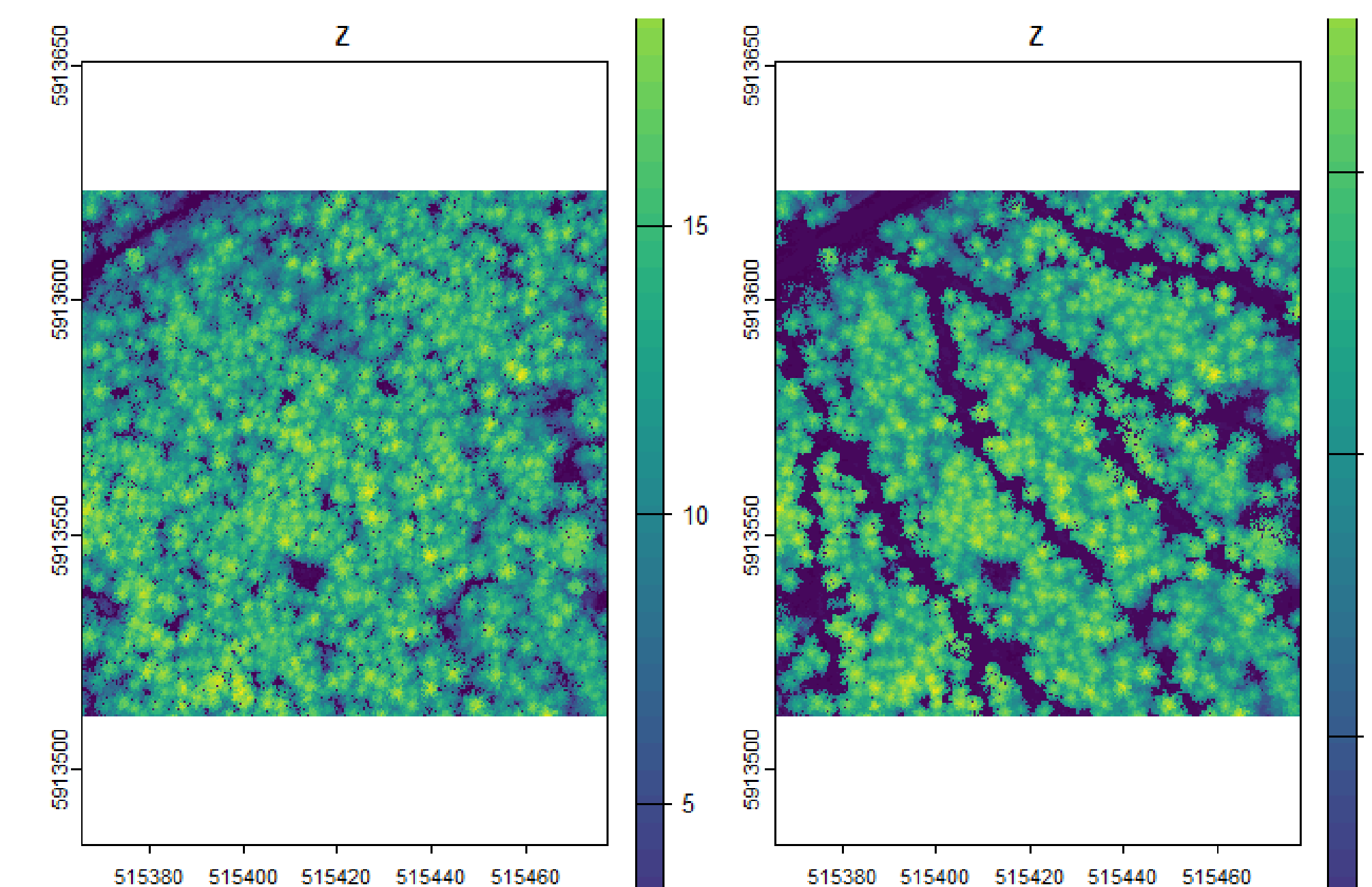
GNSS tracks of a forwarder

## Expected outcomes

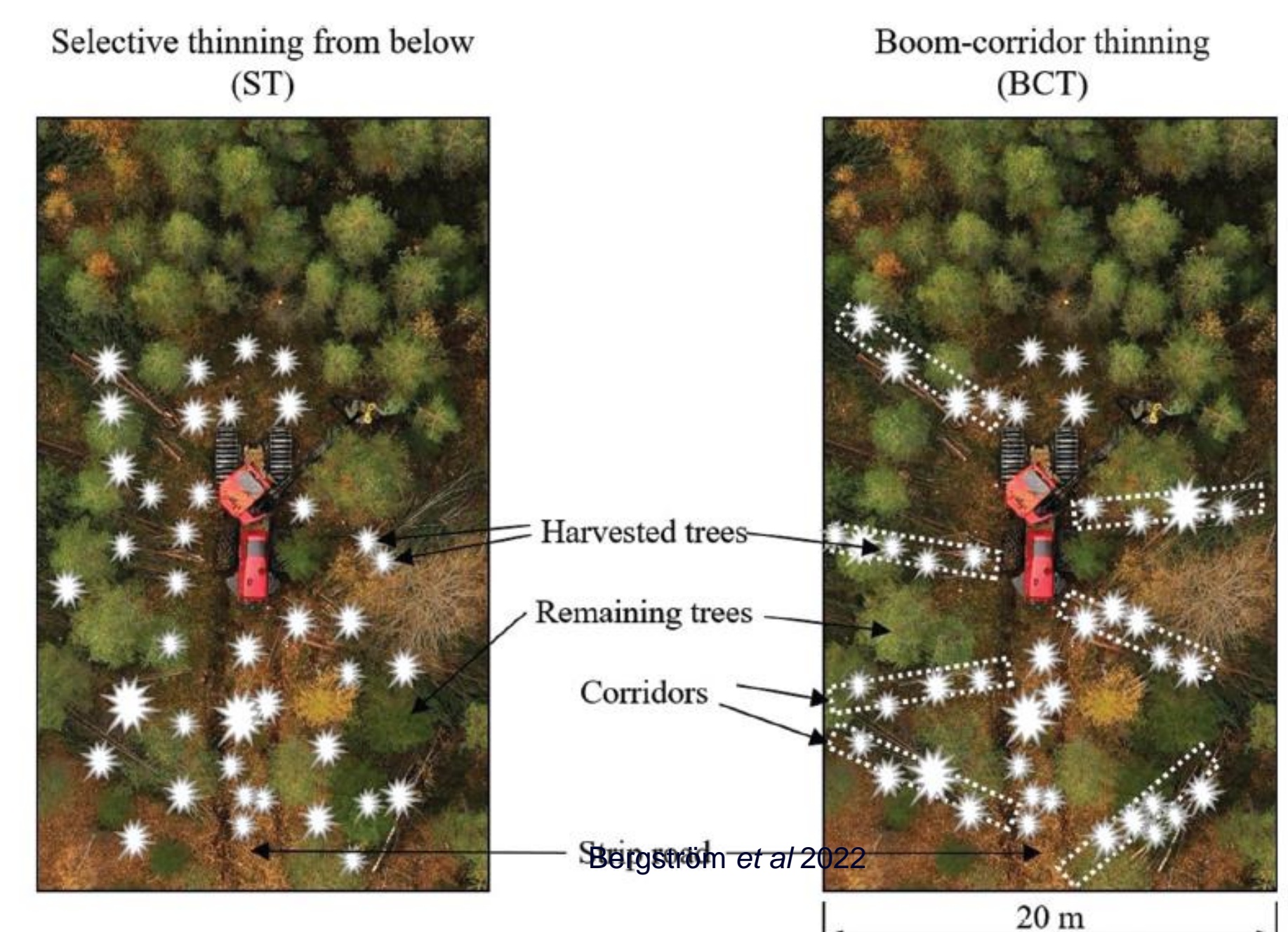
- Benchmark productivity of CT operations for a specific stand-machine-operator in BC
- Identify the main factors affecting the productivity of CT operations
- Regression model to predict productivity
- Cost & benefit analysis of CT operations
- Improve current CT practices (methods and technology)

## CT & associated values

- Increase vigour & growth of the residual stand
- Increase quality & timber value
- Remove mortality, reduce risks to stressors
- Off-set timber shortage
- Improve habitat



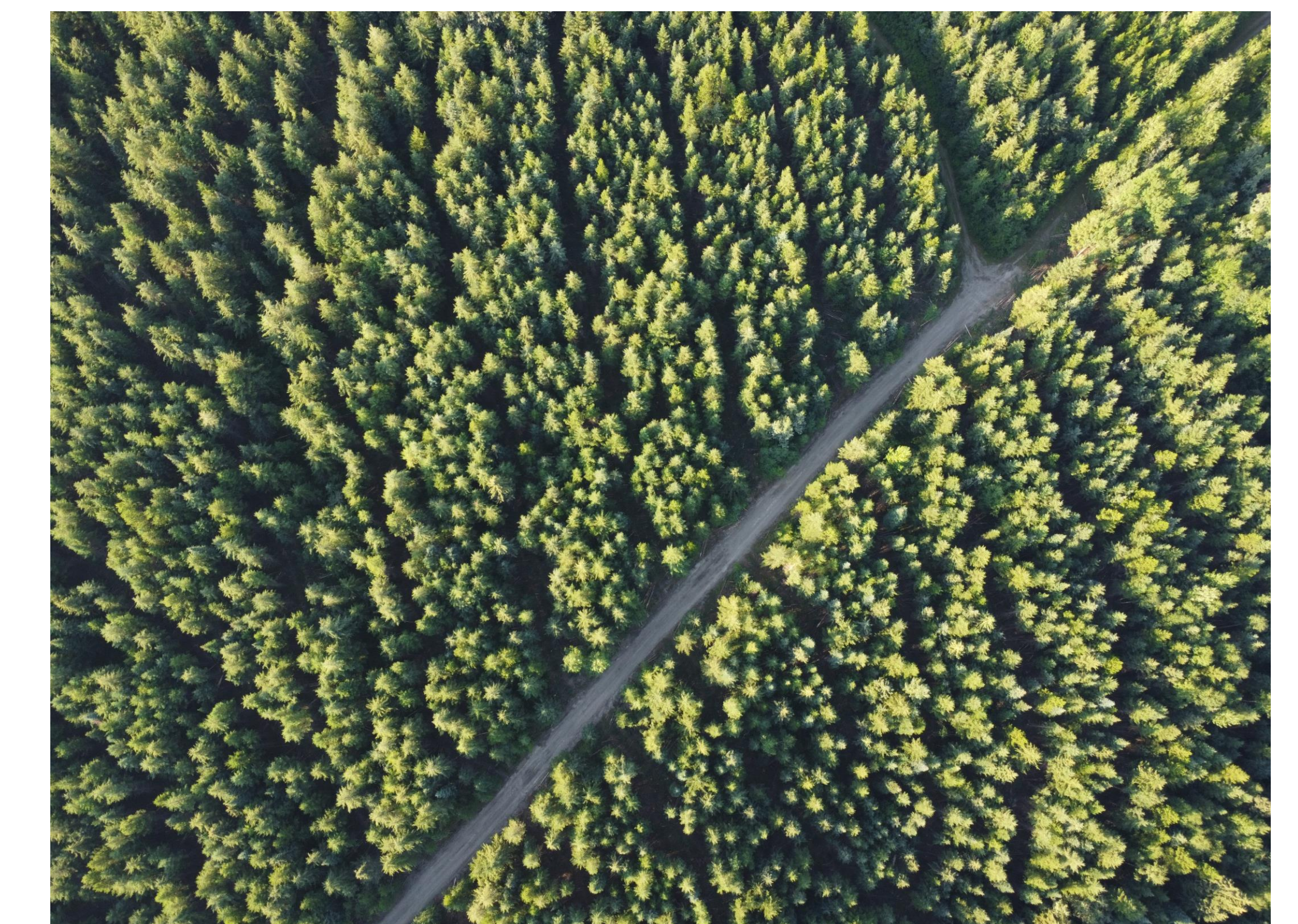
LiDAR pre & post-harvesting



Alternative harvesting methods for early thinning

## Other research questions

- Can we determine when is appropriate to leave fine woody debris on trails and when should they be removed considering fire risk?
- Can we prescribe thinning treatments beyond the current recommendations in BC?
- What is the appropriate way of bringing new technology to BC?



Aerial view of a thinned stand

## Reference / Bibliography

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