Thinning Over-Dense Stands in the Kitimat Valley

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Project funded by Forest Enhancement Society of BC

The Problem

Unmanaged Stands:

- Logging in 1950's- 1970's in Kitimat valley by Eurocan and others.
- Left to regenerate naturally
- Came back extremely dense
- Spacing done in 1990's with FRBC funds, but not all stands thinned
- Anecdotally >1000ha like this in area
- They are a widespread problem – how to address these?

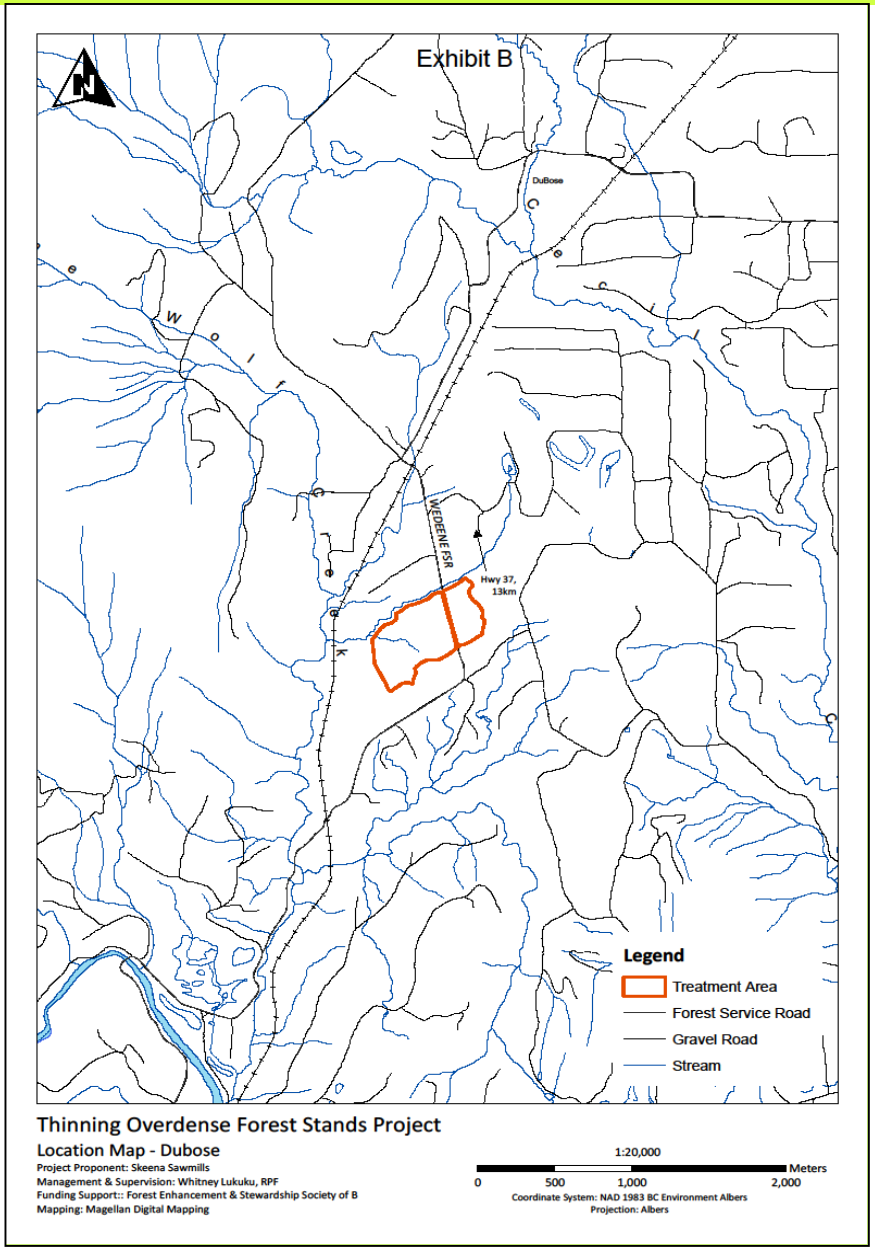
A TYPICAL OVERDENSE STAND

Unmanaged Stands

- Overdense stand over 3000 stems per hectare
- Dispersed tree volume increment
- Poor vertical and horizontal stand structure
- Minimal wildlife use due to stand density

PROJECT

- 30ha test block located on Wedeene FSR
- Received funding from FESBC
- Project Plan:
  - Commercial Thin area
  - Recover merchantable timber
  - Recover useable biomass
  - Manage for provincial program objectives



FEASIBILITY STUDY PARTIALLY FUNDED BY FOREST ENHANCEMENT SOCIETY OF B.C.

OBJECTIVES

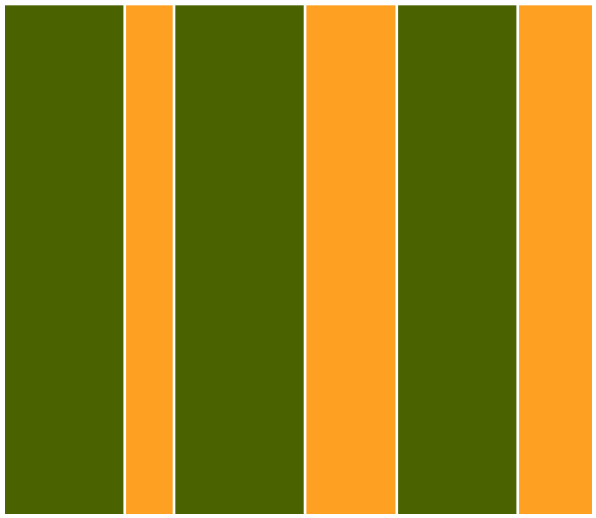
- **Stand structure improvement**
- **Wildlife habitat improvement**
- **Test out thinning and extraction methods**
- **Utilization of the fiber for biomass and sawlogs**
- **Cost-benefit evaluation**

BENEFITS OF SPACING OVERDENSE STANDS

- **The remaining trees will grow bigger thereby producing more lumber & sequestering more carbon.**
- **The logs harvested will be used in long lasting structures.**
- **Biomass used in pellets will reduce carbon emissions by replacing fossil fuels**
- **Spaced strips will regenerate trees that will be ready for harvest at rotation**
- **Improved wildlife habitat**

IMPLEMENTATION

METHOD 1: Thinning to density following selection criteria. Variable cut and leave strip spacing

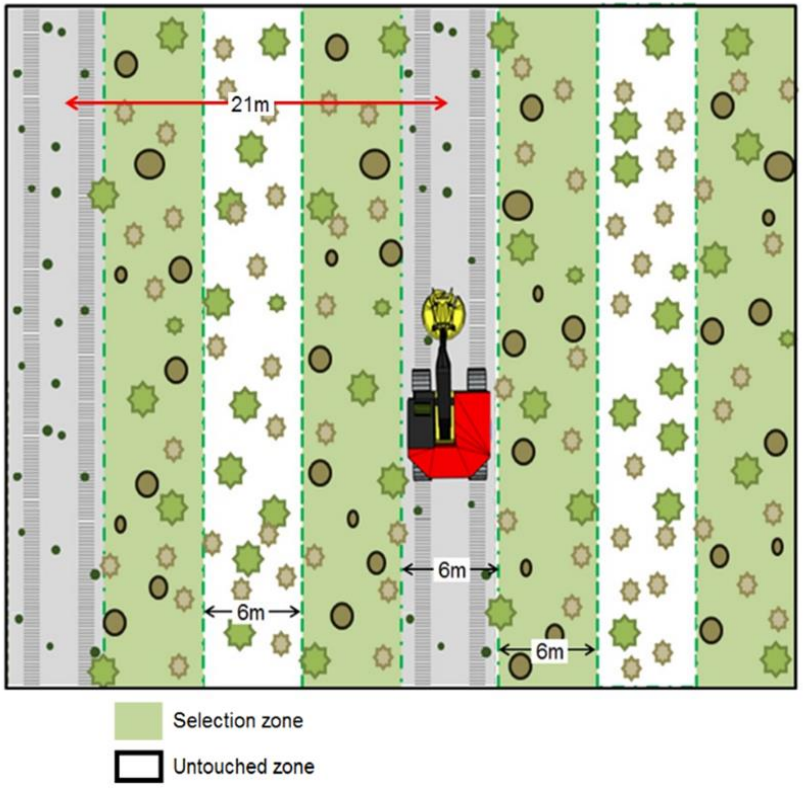


- **Conventional size feller buncher**
- **Operator turning to sides, thinning to density**
- **Operational issues (small trees, old stumps) made this difficult**

RESULTS

NARROW CUT & WIDE LEAVE STRIPS

METHOD 2 Leave strips with unspaced interior



- Zero-swing Feller Buncher, cutting narrower strips. Minimal turning to sides to thin; this increased productivity
- Used iPad with Avenza Maps

END RESULT: Improved Stand Density

AERIAL VIEW CLOSE UP

EXTRACTION & PROCESSING

EXTRACTED MATERIAL

EXTRACTION & PROCESSING

Small trees – minimal sawlog, mostly non-merch

EXTRACTION & PROCESSING

Processor limbing and topping bunches of small trees to reduce green content in bush grind

GRINDING AND LOADING

CHIP ROAD

- Residual material (stumps, etc.) ground up to make chip road
- Held up much better under wet conditions than local soil
- Overlanded, no excavation
- No reclamation, material will decay
- Not pure bark, so no leachate expected

LOG TRANSPORTATION

PROJECT LEARNINGS

- Feedstock quality (ash % content) depended heavily on amount of needles/tops left on:
  - When bushy tops removed, content acceptable 1-2% ash content
  - Unprocessed trees similar to hog fuel 3-4%
- Additional processing to remove needles not cost effective on small trees. Was tested, but high cost
- Leaving piles to season 1 year would reduce needles for free

PROJECT LEARNINGS

- 54’ walking floor truck hauling 24 tonnes was weighting out vs. volume out
- Hauling costs high due to moisture content of green trees 50-53%. Costs could be reduced by about $5/ODT per hour of cycle if material could be dried to 25% moisture by aging (as per PI in Prince George)
- Hauling costs could be reduced if B-Train trucks can access the site

PROJECT LEARNINGS

- Thinning overdense stands not financially self-funding:
  - Cost of thinning treatment and tree processing exceeds value of logs and biomass
- Biomass grinding near Terrace marginally economical, depending on:
  - Purchase price for material (not final)
  - Must eliminate need for processing trees
  - moisture % of material
  - Efficient setup/staging of operations
  - Cycle time for trucking