

Project Statement

BC Coastal Forest Sector Development Initiative

Program	Resource Characteristics
Project Title	Develop Options for Margin Improvement Through Improved Log Quality and Merchandizing Practices
Project Number	R.02
Project Leader	Björn Andersson
Project Team	Tony Sauder, Colin Campbell, Ray Krag, Gerry Middleton, Peter Lister and Paul Bicho
Start Date	October 1, 2007
Completion Date	March 31, 2009

Rationale:

To maximize sawmill production and efficiently produce the products required by the market, logs being delivered to the conversion facility must meet the desired fibre characteristics (grade) and have a minimal amount of waste. When mills receive a random assortment of log grades and/or poorly manufactured logs, time is required to pre-sort the logs prior to their entry into the mill, or continually revise cutting sequences as each log enters the mill. When a mill tries to produce its cutting order file from inappropriate log grades or poorly manufactured logs, low value offcuts and residues increase and the production of desired products is reduced.

Log grades have been established for two purposes. The first and main purpose is to provide information to the Province on the value of fibre extracted from Crown land and thereby extract the appropriate value from the tenure holders. The second purpose is to provide information to the sawmill industry on the type of products that can be extracted from a particular log. Log grades are currently assessed visually using a complex grading criteria based on species, log dimensions, log characteristics (knot size and distribution, presence of rot and sweep). The current coast log grades were established in the early 1970s and revised in the 1980s and may not meet the needs of a market-focused sawmilling industry.

Today, a variety of tools are used in other locations around the world to extract the maximum values from highly variable stems (both tree to tree and within tree). Hand held computers that contain sophisticated bucking optimization programs are utilized to ensure a log is bucked to optimize its value to a sawmill. Hand held tools that measure the acoustic speed in logs and stems are being used to assess wood stiffness and enhance product grade recoveries in New Zealand. Portable x-ray devices in field applications are also being evaluated for their effectiveness in detecting defects inside the log.

A number of these tools are commercially available and would require calibration to assess their role in enhancing log manufacturing in coastal BC. Other devices are still in the development stage and would require modeling or qualitative evaluation to assess their potential.

To ensure the mills are receiving logs manufactured to their specifications, it is important to understand how the log quality programs of different companies have or have not been integrated into the larger organizations that now exist, to determine how effective the log quality programs are, and (if required) to make recommendations on how to improve. It is also important to identify operations where log manufacturing meets mill needs to determine whether more sophisticated log segregation, based on new information on fibre properties, can improve product outturn.

This project will demonstrate how optimally manufactured hem-fir logs with specific wood characteristics can be produced and directed to the most appropriate sawmill.

Key Objectives:

- To determine the lost margin due to current log manufacturing, grading and log sorting practices, and identify metrics for evaluation.
- To identify and evaluate alternate harvesting and processing practices and/or strategies that have the potential to increase sawmill outturn values by delivering the appropriate mix of logs to the right mills.
- To identify, evaluate and demonstrate tools that have the potential to increase sawmill outturn through improved detection of stem defects prior to log bucking and through value-optimized log manufacturing.

Project Methodology:

- Review and revise objectives, deliverables and project outline if findings of completed studies warrant.
- Determine the lost margin due to current log manufacturing, grading and log sorting practices, and identify metrics for evaluation.
 - a. Visit a selected number of sawmills and in cooperation with mill quality control personnel and Forintek scientists, identify the characteristics of the currently delivered logs from ‘best to worst’.
 - b. From the information obtained in (a), select three measurable natural or man-made defects (faults) that adversely affect sawmill outturn.
 - i. Quantify the impact on sawmill outturn for each of the selected faults using, e.g., Optitek log simulation program (Forintek scientists to assist).
 - ii. Identify at which phase and/or location in the wood supply chain the faults occur.
 - c. Conduct up to three field studies to evaluate current operations and identify and evaluate alternative bucking and processing methods/strategies that can potentially improve log quality.
 - i. Determine the cost and product output of current and alternate forest operation practices.
 - ii. Quantify the difference in sawmill outturn between current and alternate methods in each study using, e.g., Optitek log simulation program (Forintek scientists to assist).
 - iii. Summarize the results and make recommendations to improve log grade recovery; distribute to all cooperators and other project leaders.
 - iv. Assist all cooperators to implement recommended changes to their forest operation practices.
- Evaluate tools to improve log manufacturing, grading and sorting old growth hemlock amabilis fir, mature second growth hemlock and young second growth hemlock:
 - i. Identify and contact users of the technology to determine how it is used, challenges when incorporating the information into the value chain, and the benefits obtained.
 - ii. Obtain, calibrate and test the most appropriate units; segregate sufficient logs for a mill run to demonstrate results. Devices to test include:
 - Director HMST200 – log segregation by stiffness.
 - Director ST300 – stiffness assessment of standing trees.
 - Handheld log bucking optimization tools.
 - iii. Demonstrate the use of the new tools evaluated to the forest industry and BC MoFR.

- iv. Assess the new technology currently in development to determine its potential to increase margin.
- v. Summarize the results and distribute to cooperators and project leaders.

Project Milestones:

Activities	Planned Completion Date
Determine lost margin for 3 current manufacturing defects, grading and log sorting practices at 2-3 mills.	March 2009
Design and conduct up to 4-6 field studies to evaluate current and alternate manufacturing practices at the defined log quality problem location. Interim reports to cooperators and FPInnovations.	March 2009
Set up and conduct tests and/or demonstrations of portable tools for improved log manufacturing.	March 2009
Collect stand data; evaluate optimization software for mechanical processors.	March 2009

Key Deliverables:

- Recommendations for revising log quality specifications and their implementation.
- Recommendations for new or revised log grades based on more detailed quality assessments of logs and the value of products they may represent.
- Demonstrations of innovative tools and techniques to improve log manufacturing and assessment of the fibre properties of logs.
- Demonstrations of the effectiveness of improved on log fibre quality information on increased margins at sawmills, veneer mills and pulp mills.
- Demonstrate the potential for a central merchandizing facility to increase margins.

Expected Long-term Outcomes:

- Improved product grade recoveries, increased quantity of machine stress graded timber and increased out-turn of high stiffness veneers that can be used to justify new investment in LVL plants.
- Improved sawmill efficiencies: less time spent producing the desired products, with minimal waste.

Potential Impact:

- Extensive trials of the sonic hand held devices developed in New Zealand have resulted in increases of up to 20% of machine stress graded timber meeting stiffness specifications for unsegregated sawlogs; a 50% increase in Grade 1 and 2 veneer when peeling segregated compared to unsegregated logs; and the ability to produce premium low coarseness fibres for fibre cement pulps.
- A trial of long log merchandizing on northern Vancouver Island in the mid '90s showed a \$22/m³ increase in grade recovery when long logs were bucked under the direction of a grader-scaler compared to in-woods bucking.

Collaboration:

1. External contacts:
 - Log quality staff at WFP corporate, regional and divisional levels and at Teal Jones (manufacturing and woodlands): provide information on log quality for specific mills and logging operations' log quality monitoring; recommendations for study sites; contacts at sawmills and logging divisions.
 - BC MoFR Scaling and Revenue Branch (Paul Nuttall to co-ordinate): information on log quality assessment (Revenue Branch); small business log quality monitoring programs.
 - Oregon State University: Dr. Glen Murphy, Professor in Forest Operations Analysis.
2. Internal contacts:
 - Gerry Middleton, Darrell Wong, Bruce Lehmann – Forintek
 - Tony Sauder, Colin Campbell, Ray Krag, Marv Clark – Feric
 - Paul Bicho – Paprican
3. Linkages to other projects:
 - Products and markets program: results for R.02 will provide logs with the wood quality and fibre attributes required to produce new products.
 - Resource characterization: R.01 – Characterization of hem-fir wood attributes in standing trees
 - Harvesting and conversion program: optimally manufactured logs with defined wood quality and fibre attributes can be directed to specific mills for conversion.
 - Bioenergy and biorefinery program: logs with defined fibre attributes can be directed to specific pulping lines.