Enhancing value recovery in tolerant hardwood logging operations

Keywords
Hardwoods, Veneers, Logs, Recovery, Value added, Sort yards, Roundwood.

Abstract
Tolerant hardwood forests provide a wide array of products, such as logs varying in value from $45-1 700/m³. Using production models suitable for commodity based forests does not maximize the value coming from this type of forest.

By marketing the wood basket in terms of an enhanced product range and new market opportunities, more wealth can be generated from this resource. This report presents results from a study aimed at increasing the recovery of high-value logs from a roundwood operation in Central Ontario. During the study, the overall focus on maximizing high-value log recovery at the stump increased the total volume of preferred grades available for local mills while less than 1% of harvested log and veneer grades were sold outside of Ontario. Log makers and logging staff were trained in the identification and specifications of new grades. Extracting and protecting these products was supported by the interaction and communication of the various logging staff. This created a feedback loop within the logging operation, and assisted in adjustment and refinement of the process.

While this study was completed in 2009-2010, the contractor continued to operate under this value recovery approach. The contractor acknowledges this change in operating focus has had a significant role in the company’s continued survival during the current industry downturn.

Figure 1. International Veneer buyer, explains multiple veneer grade options that can be produced from a given log and how log manufacturing affects marketability, of the final product.
Introduction

Since 2009, FPInnovations has been working with the Canadian Wood Fiber Center, the Ontario Ministry of Northern Development Mining and Forestry (MNDMF), the Ontario Ministry of Natural Resources, as well as local industry and forest stakeholders including a prominent local logging contractor, T. Fisher Logging Inc., to increase the revenue generated from the harvesting of tolerant hardwood forests in the Huntsville, Ontario region. This report summarizes this collaborative work and highlights the results from the 2009-2010 operating season.

Background

The logging contractor involved in this study produces approximately 90 000 m³ of roundwood furnish annually from the Huntsville, Ontario region. Hardwood sawlog material generally provides furnish for a local Huntsville sawmill, and is sold on a non-sorted, un-graded basis. Pulpwood grade material is delivered to a regional pulp mill or sold as firewood, depending on market conditions. The volume of veneer production historically has been so low that it would typically be marked and trucked in with the sawlogs, then separated once inside the sawmill yard. Veneer logs would then be slowly accumulated until sufficient volumes had been collected to warrant calling a veneer buyer, often resulting in downgrading due to stain in warmer weather. One local Ontario mill has been the main veneer buyer (when in operation), while another small Ontario facility and one Quebec plant have played minor purchasing roles in the past. Overall, this approach has led to sub-optimal value recovery from minimal production of veneer logs and the widespread perception that hardwood forests in the region were not a major source of high value logs.

Enhancing value recovery

Historical harvest records for the Westwind Sustainable Forest License indicate that this region yields a product mix of 65% pulp/fuel wood, 35% sawlogs, and negligible veneer volumes (Aubichon, 2009). However, previous studies conducted by FPInnovations (Hamilton, 2009) indicate that a higher veneer and sawlog recovery should be possible.
To verify this assumption, a value recovery enhancement program was established in 2009 in cooperation with the contractor and other project partners. First, we invited two international veneer buyers to assess a selection of locally produced potential veneer-quality logs. These buyers identified several new roundwood products and grades that local wood producers were unfamiliar with, and that local mills did not consume or value. A week-long training session was conducted by an international veneer buyer to train the log producers in the identification and bucking rules associated with these new products. It should be noted that while the formal training was completed during a one week period, international veneer buyers continued to provide guidance at each purchasing session, hence a process of continuing education was established for those staff responsible for log making. The contractor also guided his logging staff to refocus their orientation from “maximizing volume delivered to the mill”, to “maximizing value recovery from wood brought to roadside”. This orientation was driven from the ground up, with each member of the logging team being asked to consider ways of adding or protecting value as they carried out their daily tasks. In addition, the contractor obtained a “Manufacturing in Canada Exemption” permit that allowed the company to export certain grades of wood, which are not historically used within the region, to buyers outside Canada. While the export volume was restricted to 300 m³, the contractor was also required to maintain and, if possible, increase volume production of grades historically consumed by local mills, and to increase efforts to penetrate other Ontario markets.

The nine-month study to evaluate the success of this approach took place in 2009-2010, unfortunately during a period when the forest industry – and in particular the hardwood market sector – was declining and thus the contractor’s overall harvested volumes were down. It should be noted that no investment in additional equipment or infrastructure was required to conduct this trial, making this a very attractive initiative to other logging operations working in similar conditions.
Results

A total volume of 59,900 m³ of roundwood including 956 m³ of veneer, was produced during this maximizing value recovery trial.

Table 1 provides details of the contractor’s historical volume and value recovery, followed by the enhanced recovery rates obtained during the study, and normalized to a 90,000 m³ annual production rate for comparison purposes.

In Table 1, we used a standardized price set based on actual sawlog, pulp/firewood prices, except for veneer, where the average price (all markets/grades) obtained during the study year was used. As can be seen from Table 1, actual veneer production increased 16-fold. Likewise, sawlog recovery also increased from 35% to 48%, while pulp and fuelwood recovery decreased. Shifting volumes from lower grade to higher grade materials had a significant impact on the revenue per m³, increasing 10.2%, from $54.28 to $59.81.

Additionally, crown revenues increased by approximately $70,000 from this product upgrading. The enhanced high-value log sorting and value recognition effort can lead to increased production costs along the whole supply chain. These increases result from spending additional time while merchandizing individual stems, managing the larger number of product piles, slowing down the pace of some of the functions and the general care that the crews need to take when handling the material. Obviously, the additional value generated needs to more than offset these incremental costs, which were not measured during this particular study. However, any follow-up trials should attempt to document this important information.

Table 1. Volume and value for various grade recovery scenarios.

<table>
<thead>
<tr>
<th>Product</th>
<th>Historical Pre-2009</th>
<th>Enhanced value recovery 2009-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$/m³</td>
<td>Vol (m³)</td>
</tr>
<tr>
<td>Veneer</td>
<td>220</td>
<td>90</td>
</tr>
<tr>
<td>Sawlogs¹</td>
<td>72</td>
<td>31 500</td>
</tr>
<tr>
<td>Pulp²</td>
<td>43</td>
<td>36 000</td>
</tr>
<tr>
<td>Fuelwood²</td>
<td>43</td>
<td>24 410</td>
</tr>
<tr>
<td>Avg $/m³</td>
<td></td>
<td>90 000</td>
</tr>
</tbody>
</table>

1 Mass scaled not segregated by grade
2 Same grade, however represent different markets
Veneer markets

While this report references “veneer” as if it were a single product, it is important to note that veneer has many grades that command vastly different prices. In this study, we recorded actual sale prices ranging from a low of $96/m³ to a maximum of $1 700/m³, but published price lists show amounts in excess of $2 800/m³ (FOB landing) for some grades and species of figure wood (e.g. bird’s eye maple). An analysis of the grade/product range produced during this study indicates the key to value lies in ensuring that “the right log reaches the right buyer”. Figure 2 outlines the range of prices received from Ontario mills in comparison to prices received from mills in New Brunswick and Kentucky, USA. All prices are FOB Huntsville, Ontario.

Due to provincial regulations, local Ontario mills were given the first right of refusal, which limited the contractor’s access to the higher paying non-traditional markets, thus reducing potentially higher revenues. In this study, 81% of the veneer volume (770 m³) was purchased by Ontario mills, as can be seen in Figure 2. On several occasions, international buyers expressed interest in veneer that had not yet been viewed by Ontario buyers, offering premium prices over and above local offerings. However, despite the restrictions, significant gains were made in augmenting revenue, even with only 19% of the veneer volume exported outside of Ontario, representing less than 1% of total log and veneer volumes.

Figure 2. Veneer markets serviced during this study, with average, maximum and minimum price $/m³, obtained for all veneer grade products.
Figure 3 illustrates both historical and enhanced product recovery and its impact on overall revenue per tree. It is interesting to note that while veneer volume is low (1.6%), it accounts for a high (6%) percentage of revenue, or expressed as a volume-to-revenue ratio of 3.75. Within the New England/Southern Quebec hardwood regions, a volume-to-revenue ratio of 4 is considered normal for a value oriented operation, and is a reasonable target for the Huntsville region wood basket (Ryder, 2008). It is also interesting to note that at the beginning of this trial, the contractor had to actively seek out veneer buyers, but after just six months of operation, there were inquiries from potential buyers in many regions interested in bidding for the logs.

* Values used for this analysis: Pulp $43/m³, Sawlog $72/m³, Veneer $220/m³
Discussion

The following discussion is based on our experience with hardwood operations, but may be applicable to other forest conditions containing a wide range of potential product values.

This study demonstrated a 10% increase in overall harvest revenues at the contractor level, a significant increase in veneer delivered to local mills (770 m³ compared with a historical average of 90 m³), and an additional $70 000 in crown revenues. The local industrial network was not able to capture the entire potential revenue coming from the forest as demonstrated by the price ranges offered outside of the province, suggesting that exterior markets can play a significant role both in maximizing revenue, but also generating increased local supply. There is the possibility of increased operating costs associated with the sorting, transportation and marketing of these new products. This underlines the importance of extending this type of study to carefully assess the entire set of costs and values coming from the forest.

Implementation

In order to establish an enhanced value recovery program in an operation, one needs to follow the following principles:
- A clear management commitment to maximize product value, as opposed to maximizing volume production.
- Willingness to actively explore markets outside of historic supply zone.
- Provincial regulatory approval to export of any primary forest products not historically consumed or recognized in your region.
- Empower all employees involved in wood production with the responsibility to identify measures that will contribute to the overall goal of value maximization.
- Provide continuous feedback on success and failure to achieve enhanced value. Feedback loops promote continuous improvement.

Efforts to maximize roundwood values have positive impacts along the entire value chain, and foster the transformation of the local industry. The approach of value maximization generates more revenue at the local level, and can require less harvested volume for the same overall revenue.
References


Acknowledgment

This work has been made possible through the Transformative Technologies Program in Value Chain Optimization at FPInnovations, with funding from Natural Resources Canada. The author would like to thank Steve Deon of the Canadian Wood Fiber Center whom played a key role in the organization and implementation of this project. We would also like to extend our gratitude to the management and staff of T. Fisher Logging, Inc. for dedicating their time and expertise to this project.