Economic Viability of Western Hemlock in the West Kootenays: Comparing Current & Potential Values

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Abstract

This study reviews the current and potential market for Western hemlock in the West Kootenay region of British Columbia. Currently, there is no true premium market for hemlock in the BC interior. By exploring the options available, both domestic, and through export, a theoretical "premium" market can be sought. Research data was collected at the Skattebo Educational Forest. As a typical Interior Cedar-Hemlock stand, this site provides an accurate and representative sample of a West Kootenay hemlock stand. The effect that the premium quality timber had on revenue is broken down and discussed. Further considerations such as export laws and regulations were also explored. The overall economic impact of the premium timber was not as significant as expected from a domestic market, but saw its largest profit increase coming from export to the United States. However, by adapting to potential market changes and utilizing all available options, increased revenue is still possible domestically as well.

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1. Introduction

This study compares current economic value of Western hemlock in the West Kootenays with its potential value in a more competitive market environment for its products. By manipulating the data that was collected, I have extrapolated the total revenue of a particular stand based on current and potential hemlock market prices. Currently in the interior forest industry, there is no market for premium hemlock. I will look at the potential impact a premium market would have on this stand for both domestic and export markets.

Western hemlock, despite its currently lacklustre place in the interior market, is used to make a variety of products in the global marketplace. These range from dimension lumber and timber frames, to finishing products such as mouldings and floors (Kalesnikoff, 2015). It is considered one of the most difficult species to bring to market, due to its complex drying process. Hemlock often needs to be kiln dried before export. If not dried properly, it easily loses its shape. Green (not dried) hemlock has some success in export markets, however it becomes weathered quite quickly. For this reason, its overseas demand is low in places such as Japan, who prefer clean, straight hemlock for their housing market. In China however, there is growing demand for green and lower quality hemlock, for use mainly in concrete form work.

The divide between coastal and interior hemlock markets is vast. On the coast, Western hemlock accounts for 60% of the total forest composition, and 42% of the total volume harvested annually (Edgington, 2004). Coastal markets can take advantage of the demand for hemlock in Asia-Pacific countries, offsetting the higher cost of harvest and kiln drying. Hemlock is generally marketed as hem-fir for lumber products. This is comprised of both hemlock and Balsam fir. Due to lower numbers in the interior, hemlock is sometimes marketed within the spruce-pine-fir (SPF) lumber category, which makes up 81% of harvest. However, hemlock itself makes up a very small overall percentage when included. Nonetheless, it is a leading species within the interior wetbelt. This presents a unique problem for hemlock in the region. Proximity generally dictates market. In contrast to the more diverse coastal markets, a majority of interior exports are still to the US (Edgington, 2004). In 2011, China became BC's largest overall softwood lumber importer, and the interior market is beginning to reflect this. However, aside from some exceptions, lower value species are generally uneconomical to export overseas, rather than to the US. This is especially true from the West Kootenays. Nonetheless, regional demand for hemlock is relatively low, and restrictive export laws often negate the higher price paid in the US.

Hemlock harvested in the West Kootenay region is generally sold for either pulp, or for a marginally higher price to Interfor's sawmill in Castlegar. Due to a distinct lack of competition, Interfor can afford to pay a lower price for these logs. Hemlock is often considered a nuisance species due to its low market value. High operational costs in the region can often lead to forest managers having difficulty meeting profitability goals in areas with a high hemlock composition.

Skattebo Educational Forest, which is where this study was conducted, is within the Interior Cedar-Hemlock zone within the West Kootenays. It is adjacent to the Kootenay River, about ten kilometers northeast of Castlegar. Being a typical "Kootenay Mix" stand, the forest contains a high number of merchantable species, including a large percentage of Western hemlock. This makes the stand a fairly representative site for the region. Using the revenues generated at Skattebo, this study will conclude the overall affect hemlock markets have within the West Kootenays, and explore various options for increased profitability, if possible.

2. Methods

The research block at Skattebo is situated on a west facing aspect. The terrain contains frequent slope breaks from mild, to very steep. This is due to its location on a series of ancient river bed terraces. The block had a total area of 14 hectares with a volume of roughly 500 m^3 per hectare. This resulted in an estimated total of 7000 m^3 of merchantable volume.

Data for this study was compiled during a field session in which fifteen timber cruise plots were established. They were spaced evenly enough to cover the entire study area. Within these samples, we conducted both an operational cruise plot as well as a product estimate of each tree. Equipment used included a Vertex, loggers tape, D-tape, and increment borer. A standard operational cruise was completed at each plot to the standards described in the BC Timber Cruising Manual. After completion, each tree was call graded, by dividing it into tens and assigning a product. The product grading criteria is outlined in *Table 1*.

Product data was entered into an Excel spreadsheet for each plot. This broke down the percentage by product (premium, sawlog, and pulp) for each tree; then converted it into a total percentage of the plot. This was done for all plots, which was then tallied for a total product by species. The next step was to multiply the total product percentages by the total volume, to find the volume of each product. This volume was then multiplied by the average value per cubic meter of each product, for a total product revenue of each species. The product prices per cubic meter are averages derived from a variety of sources, including local knowledge and the Vancouver Log Market.

Table 1: Product Grading Criteria

Species	Premium	Commodity	Low Grade
Fd	Straight logs 20 cm top, small knots	Sawlog - typical log to 10 cm top	Pulp - dead/dry or rotten w/ 50% firmwood
Cw	Cedar poles, 30 cm DBH at ground line, straight to 15 cm top, few defects	Sawlog - typical log to 10 cm top size	Post and Rail - 10 cm shell
Bg	Straight logs 20 cm top, small knots	Sawlog - typical log to 10 cm top	Pulp - dead/dry or rotten w/ 50% firmwood
Lw	Straight logs 20 cm top, small knots	Sawlog - typical log to 10 cm top size	Firewood - dead/dry or rotten
Pl	Straight logs 20 cm top, small knots	Sawlog - typical log to 10 cm top	Pulp - dead/dry or rotten w/ 50% firmwood
Sx	Straight logs 20 cm top, small knots	Sawlog - typical log to 10 cm top	Pulp - dead/dry or rotten w/ 50% firmwood
Bl	No premium log	Sawlog - typical log to 10 cm top	Pulp - dead/dry or rotten w/ 50% firmwood
Pw	Straight logs 20 cm top, small knots	Sawlog – typical log to 10 cm top	Pulp - dead/dry or rotten w/ 50% firmwood
Hw	Straight logs 20 cm top, small knots	Sawlog - typical log to 10cm top	Pulp - dead/dry or rotten w/ 50% firmwood

3. Results

The gross revenue generated by this block is $579,074. Western hemlock constitutes about 30% of the total composition, with a total value of $110,480 (*table 2*). A sizable portion is made up of Western redcedar, at 25%. This species is of very high value, and responsible for a majority of the profit at $256,115. Douglas fir, another high value species, is responsible for 19% of the block and a total revenue of $107,740. The remaining 25% is comprised of a mix of species including Lodgepole pine, Grand fir, Western white pine, and Paper birch. This represents a total of $104,589.

Table 2:Western Hemlock Revenue at Current Market Pricing

Product	Total %	Volume (m^3)	$/$m^3$	Total $
Sawlog	28%	1981.9	$ 55.00	$ 109,004
Pulp	1%	42.2	$ 35.00	$ 1,475
	30%	***2024.1***		***$ 110,480***

By incorporating a premium market price to the calculation, a total of 809 m^3 of hemlock will be valued at a higher price per cubic meter. This constitutes 12% of the total hemlock in the block. This adjustment increases the hemlock revenue to $122,626 (*Table 3*), thereby increasing the total block value to $591,221. As can be seen in *Table 4*, this additional market represents a total gross increase of 11%, or $12,147 of the hemlock value, or a 2% increase of total block value.

Table 3: Western Hemlock Revenue at Potential Market Pricing

Product	Total %	Volume (m^3)	$/$m^3$	Total $
Premium	12%	809.6	$ 70.00	$ 56,674
Sawlog	17%	1172.3	$ 55.00	$ 64,475
Pulp	1%	42.2	$ 35.00	$ 1,475
	30%	***2024.1***		***$ 122,626***

Table 4: Difference in Revenue

	Hemlock Revenue	Total Block Revenue
With Premium	$ 122,626	$ 591,221
Without Premium	$ 110,480	$ 579,074
Difference		***$ 12,147***

4. Discussion

The results show that with the inclusion of a premium market, the block's gross revenue increases by 11%, or $12,179. However, this block, although a typical ICH stand in the region, is merely a research sample, and some margin of error should be considered. With that in mind, it is worth considering further options to increase the revenue of stands containing premium quality hemlock.

4.1. Domestic Markets

Within the region, there are some potential options for increasing revenue. Occasionally, Atco Wood Products, a veneer mill located in Fruitvale has expressed interest in buying premium quality hemlock. Although they primarily process fir, spruce and larch, in the past they have purchased hemlock to use as peeler logs. The average rate paid for this high-grade hemlock is generally around $70/$m^3$. As stated, this is not a regular occurrence, and when it does happen, limited shipments are ordered. This is a viable option, especially for smaller scale operations with high quality hemlock being harvested. However, it is not a reliable long term strategy, and should not be depended on.

Premium hemlock is also sought after by some small-scale railway tie producers. They will pay a higher price for quality logs, but as with Atco, the shipments are limited. A savvy and well connected woods manager could make good use of these more limited options, and potentially stay on top of the market.

Innovation is bred through a competitive marketplace and high demand. Local operations are beginning to take advantage of demand for high quality, value-added products. As BC's forest industry is largely commodity based, many people are beginning to see the value in producing specialized products to meet more specific tastes. Hemlock is a preferred species for many specialty products such as flooring, mouldings, and doors. Finished products such as these necessitate higher prices, which can prove to be a lucrative business for small scale producers.

4.2. US Export Potential

With the higher US dollar, profitability of Canadian wood exports increases. Canada's weaker currency allows an advantage to which we can export our products at a higher exchange. Currently, the US Dollar sits at about $1.33 CAD. This exchange rate works in Canadian exporters favour, as they can sell for a higher price, making 33 cents on every dollar. With much of the West Kootenays bordering three US states, there is a significant export potential if interested buyers can be found. Some local land managers have been profitable hauling across the border. A local woodlot manager has been able to sell his hemlock to a sawmill in Moyie Springs, Idaho. In this case, the logs were sorted by species and product near Ymir, then scaled in a yard near Fruitvale. From there, they were reloaded on to trucks heading across the US border south of Creston. They were paying $70/$m^3$, which is equal to $93/$m^3$ through the current exchange, for high quality hemlock saw logs under 45 cm DBH.

It is worth noting that provincial regulations place restrictions on the species and grade of exports. Although premium grade hemlock is included in this, the lack of a premium market in the Interior essentially negates this. For this study, the higher price paid by American buyers can be a placeholder for the lack of a true premium market domestically.

With this option, quantity and quality are important. If the product does not meet a certain standard, the buyers will not pay the higher premium for it. Due to the high transportation costs, a significant quantity of premium logs need to be available for it to be a worthy investment. Another consideration is that importers will often pay a blended price for the wood, rather than a product based price. This can lead to premium logs being devalued if shipped alongside lower quality timber.

If we use the current exchange rate, we see a sizable increase of 33% or $18,620 over the gross premium hemlock revenue when limited to a domestic premium market (*Table 5*). This is a 15% increase over the total domestic hemlock revenue, and a 5.3% or $30,768 increase over the total block revenue without any premium market.

Table 5: Revenue Increase Through US Export

	Volume (m^3)	***$/m^3$***	***Revenue***	***% Increase over non-premium***
Domestic Premium Revenue	809.6	$70.00	$56,672	
US Export Premium Revenue	809.6	$93.00	$75,292	
Increase			***$18,620***	***+33%***
Domestic Hemlock Revenue (Without Premium)			$110,480	
Domestic Hemlock Revenue (Domestic Premium)			$122,626	*11%*
Total Hemlock Revenue (US Export Premium			$141,246	*15.1%*
Increase (No premium – Export)			***$30,766***	***+27.8%***
Total Block Revenue (No Premium)			$579,074	
Total Block Revenue (Domestic Premium)			$591,221	*2.1%*
Total Block Revenue (US Export Premium)			$609,842	*3.1%*
Increase (No premium – Export)			***$30,766***	***+5.3%***

4.3. Log Export Regulations

Another factor to consider is BC's log export restrictions. The Forest Act stipulates that any timber harvested from Crown land must be used or manufactured within BC, unless an export exemption is obtained (*Forest Act*, *1996*). By law, if a woodlands manager wants to export logs, a statement of intent must be made to all potential local buyers first. This can be very time consuming, and is subject to what Haley (2002) refers to as "blocking".

> *This takes place when a wood processor who does not "need" the logs being advertised nevertheless puts in a bid for them simply to prevent, or block, their export … When logs are advertised for export as "standing green", the bidder is unlikely to be required to take delivery at the bid price since, in most cases, in the absence of an export permit, the stand in question is simply not harvested. Under these circumstances, frivolous bids bear no consequences and are difficult to detect.* (Haley, 2002: 6)

This essentially gives them the opportunity to decide if they would like the logs for themselves. Would-be exporters may find themselves in a position where a locally based mill makes an offer, and the seller is obliged to let the logs go for a lower price than they otherwise could have through export.

4.4. Subsidies

In February of 2016, the BC government announced the formation of the Forest Enhancement Society of BC (FESBC). They allocated $85 million over a three to five year period to enhance environmental and resource stewardship of BC's forests. The society is involved in many aspects of forestry including mitigating wildfire, improving habitat, increasing fibre utilization and maximizing carbon sequestration. Another of their initiatives is the improvement of low value forests. If a forest manager was faced with a stand of decadent, low value hemlock, they could apply to the society to subsidise part of the cost, with the intent of planting a higher quality stand post harvest for future economic viability.

4.5. Further Considerations

It is worth noting the volume of waste fibre left behind on a block. Hemlock often requires significant bucking in the forest to manufacture logs for milling specifications. Between 10 and 50% of the total volume of a tree can sometimes be left behind. This can lower the overall value of the wood being harvested, and increase the operational costs for the contractor or licensee. Another consideration that affects hauling costs is the poor conversion rate of hemlock. Being a dense species, the increased weight per stem increases the overall cost of transportation. Hemlock is not valuable enough for buyers to cover the conversion cost, as is often the case with cedar logs.

5. Conclusion

The role of Western hemlock in the West Kootenays, both economically and ecologically, should not be understated. A successful woods manager understands this, and deals with it accordingly. It makes up a large percentage of the forest composition and one must not exhaust the options available to get the most revenue possible from it.

As this study has demonstrated, there are options available for those looking to extract more revenue from hemlock. US exports are a feasible option for the time being, and have proven to be the best for increasing revenue. However, with shifts in the political climate and protectionist trade attitudes becoming more prevalent, the competitive advantage may not be sustained.

With small-scale value added mills becoming more common, the future may be brighter for this species. These local operations are better suited to extract high value products from a log that may otherwise be used for basic dimension lumber or pulp. Diversification of the market will create a more competitive place in this region for the species, thereby leading to higher profits and greater incentive to harvest it.

Although a 2-5% increase may not seem very substantial, it can often make the difference between a profitable and non-profitable operation. By pursuing available options, higher profit is certainly possible. It is therefore up to forest managers to choose whether to take advantage of these available profits, or continue with the status quo.

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