

**An Overview to  
Log Home Manufacturing in British Columbia**

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**by**

**Brad Stennes and Bill Wilson**

**Industry, Trade and Economics  
Canadian Forest Service  
Victoria, BC**

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## **An Overview to Log Home Manufacturing in British Columbia**

### **Introduction**

The expansion of secondary wood manufacturing is a priority for policy makers in many jurisdictions both within Canada and abroad. Increases in the value-added and employment per unit of increasingly scarce timber resources are the key reasons that governments are interested in expanding secondary wood activities. Log home production is a wood processing activity with recent success in BC and it is an option that possesses the attractive characteristics of being very labour intensive and adding value to timber harvested. Value is added through bidding up the price of suitable logs and having a high product selling price.

Log home manufacturing can be split into two main production styles; hand-crafted and machine profiled. Hand-crafted is the traditional, high-skilled method of production and is relatively more labour intensive. Logs are generally peeled, notched and fitted together using hand tools. The shell is often erected at the manufacturing site, the logs are numbered for reconstruction, then shipped to the final destination to be assembled and finished. Machine profiled log home production is a more capital intensive process where logs are run through a profiler resulting in very consistent logs in terms of size and shape (Westcoast CED, 1998). The final cost of machine-profiled log homes is generally lower due to savings in labour costs and the ability to use lower cost logs as raw material.

### **Log Home Sector in Montana**

Perhaps the most successful jurisdiction in log home manufacturing is in the state of Montana, and more specifically the Bitterroot Valley region of that State. The industry has achieved an average annual growth rate in sales value of 7% per year between 1976 and 1993 and has spawned a collection of firms in support industries (Braden et al, 1998). Both hand crafted and machine-profiled log home firms are operating in Montana's Bitterroot Valley. Montana is the major source of log home production in the US west, with approximately 60 companies (late 1990's), of which the highest concentration (approximately 40%) is located in the Bitterroot Valley. This compares to a total of only 35 companies in Montana a decade earlier (Keegan et al, 1991).

In Montana the preferred species for log home production is lodgepole pine, as it has a straight bole and little taper, although other species such as Douglas-fir and spruce are used to a lesser degree. Despite an estimated 40% price premium log home builders in Montana secured only 2% of sawtimber sized material (Keegan et al, 1991).

The Bitterroot log home sector has been characterized as one of a very limited number of successful wood product manufacturing clusters in the Western US (Braden et al, 1998). Manufacturing clusters are defined as groups of firms located in the same geographic region that have developed cooperative links. Clusters enable individual

firms to capture scale economies through the sharing of information, cooperative marketing and shared expertise in a region. For example, in the case of log home manufacturing, the development of specialized support industries such as chinking and finishing specialists, window and door manufacturers, design firms and a number of others have been major complements to the growth in log home manufacturing in the Bitterroot region.

### **Log Home Manufacturing in British Columbia**

The analysis related to log home manufacturing in BC is drawn from information compiled through a direct survey of BC secondary manufacturers (Wilson, Stennes and Wang, 1999). The data provided in this report is at a finer level of aggregation than that found in the main project report for that survey, where log home manufacturing is included within the engineered wood products business type (see Wilson, et al, 1999). Where appropriate comparisons are made to an earlier (1991) survey of secondary wood manufacturing in BC (FRDA, 1993). The sample size from both of these surveys and the population for 1997 are given in Table 1.

**Table 1 Sample and Population Sizes For Log Home Manufacturers in BC**

<b>Region</b>	<b>1991 Survey</b>		<b>1997 Survey</b>	
	<b>Sample</b>		<b>Population</b>	
	<b>Log Homes</b>		<b>Log Homes</b>	
Cariboo	3	7	8	
Kamloops	10	14	26	
Nelson	1	2	4	
Prince George	1	1	2	
Prince Rupert	0	1	2	
Vancouver	10	9	17	
<b>Total</b>	<b>25</b>	<b>34</b>	<b>59</b>	

The breakdown in Table 1 shows that, for 1997, the largest number of log home manufacturing firms are located in the Kamloops Region, representing 44% of the total. The Vancouver Region is the second most important with approximately 30% of the total for the province.

It is not possible to determine the population size for the 1991 survey because the information collected for that survey does not allow a separate identification of the log home manufacturers population. Thus, no inferences about population sales or employment can be made using the 1991 sample data. Comparisons are limited to sample statistics such as sample means of these characteristics. Estimates are made for the 1997 log home sector population. Sample totals and estimates of population sales and employment levels for 1997 are given in Table 2.

**Table 2 Sample Totals and Population Estimates For BC Log Home Manufacturer Sales and Employment, 1997**

<b>Log Homes</b>	
<b>Sales \$million</b>	
Sample Total	50.8
Population Estimate	85.2
<b>Employment</b>	
Sample Total	464
Population Estimate	672

Sample mean sales levels are \$1.6 million, and mean employment levels are 14 for log home manufacturers in BC. The distribution of sales into the various markets for the samples in both surveys are presented in Table 3

**Table 3 Sales by Market for BC Log Home Manufacturers**

<b>Market</b>	<b>1991</b>	<b>1997</b>
	%	
BC	22	31
Rest of Canada	5	6
US	10	28
Pacific Rim	61	30
Europe	2	5
Other	0	0

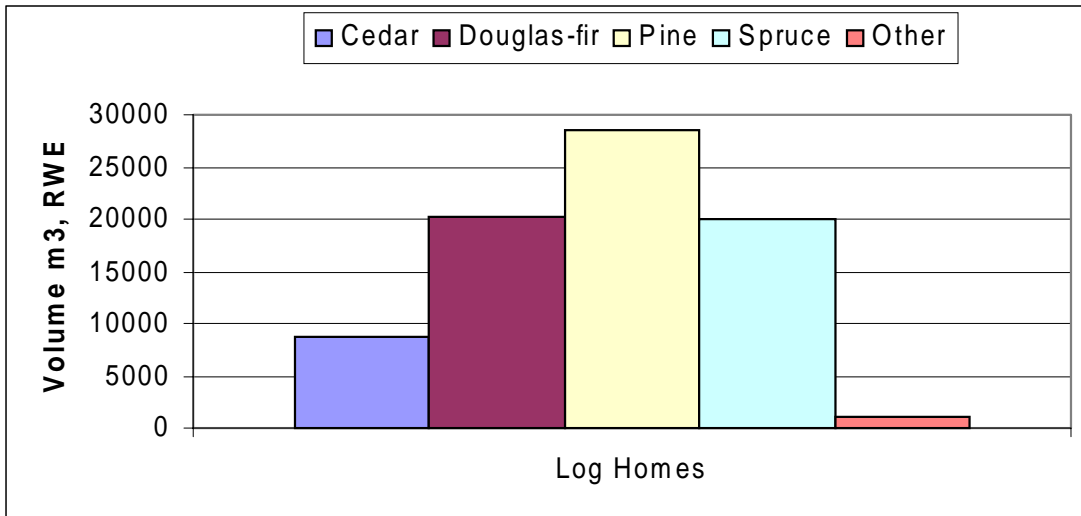
There are noticeable changes in the markets for log home manufacturers between 1991 and 1997. Sales for log home manufacturers were primarily to the Pacific Rim in 1991, with BC and the US markets much less important. In 1997, the proportion of sales was about equal in each of these three markets. Table 4 gives the species mix used by log home manufacturers.

**Table 4 Simple Average of Company Species Use Distribution For Log Home Manufacturers in BC**

<b>Market</b>	<b>1991</b>	<b>1997</b>
	%	
Spruce	31	33
Douglas-fir	25	35
Cedar	24	10
Pine	4	16
SPF	15	3
Other	2	3

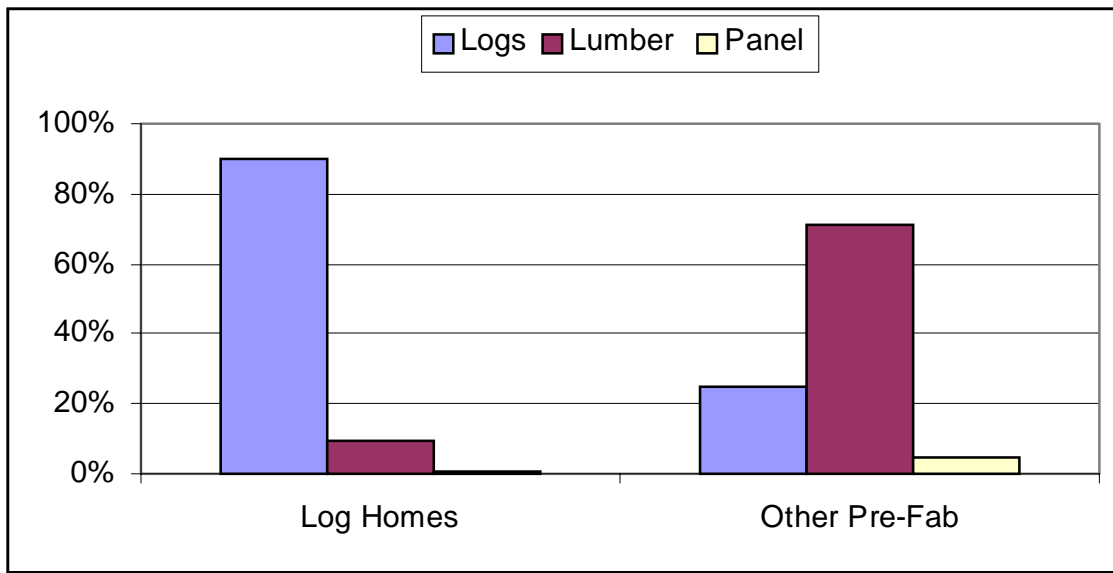
The average percentage of species used is similar between 1991 and 1997 for log home manufacturers. Spruce and Douglas-fir are the most commonly used species. Cedar use has declined while the use of pine has increased. The round wood equivalent

(RWE) volumes of species used by survey respondents (working sample) in the 1997 survey are shown in Figure 1.



**Figure 1 Volume, By Species, Used in BC Log Homes, 1997**

The total volume of raw materials used, on an RWE basis, is 79,000 m<sup>3</sup> for the working sample of log home manufacturers. When examining the species use for log home manufacturers on a total volume basis, rather than the simple company averages in Table 4, pine is the highest volume species used. The main reason is that the largest log home producer in the working sample used 100% lodgepole pine. The results in Table 4 indicate which species are important to the largest number of companies, regardless of scale. Figure 2 shows the proportion of different sources of raw material inputs (RWE) used by log home manufacturers and as a comparison, the source of raw materials for other building manufacturers.



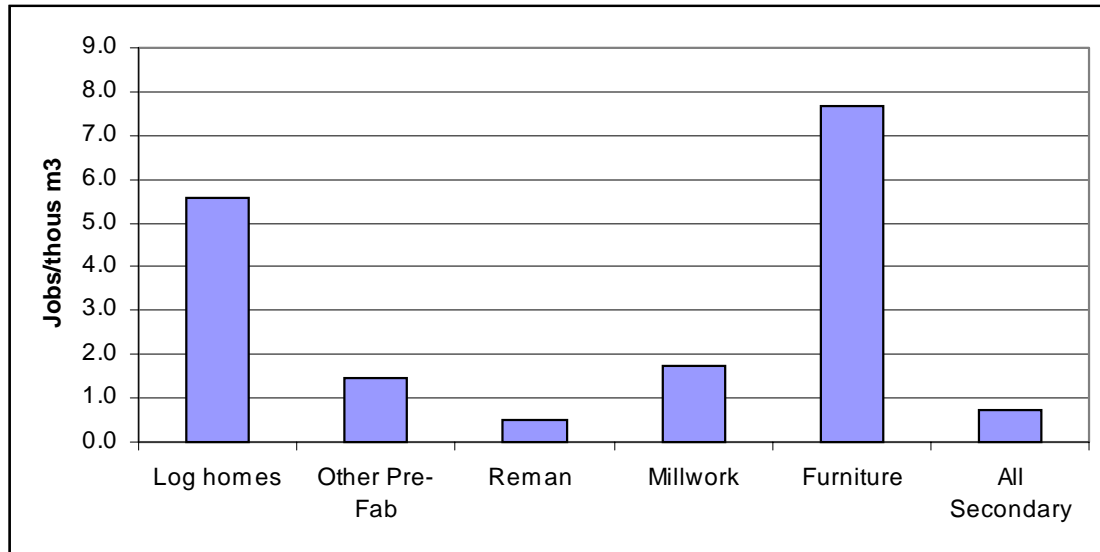
**Figure 2 Raw Material Type Used by Log Home and Other Pre-Fabricated Building Manufacturers, 1997**

The log home manufacturers utilize raw logs for 90% of their fibre requirements with the remaining 10%, lumber. Table 5 gives the sources of fibre supply for log home manufacturers.

**Table 5 Percentage of RWE Fibre Sources for Log Home Manufacturers**

Source	Log Homes
BC Market Sales	57%
SBFEP Sales	41%
Other Tenures	2%
Purchased Outside BC	0%

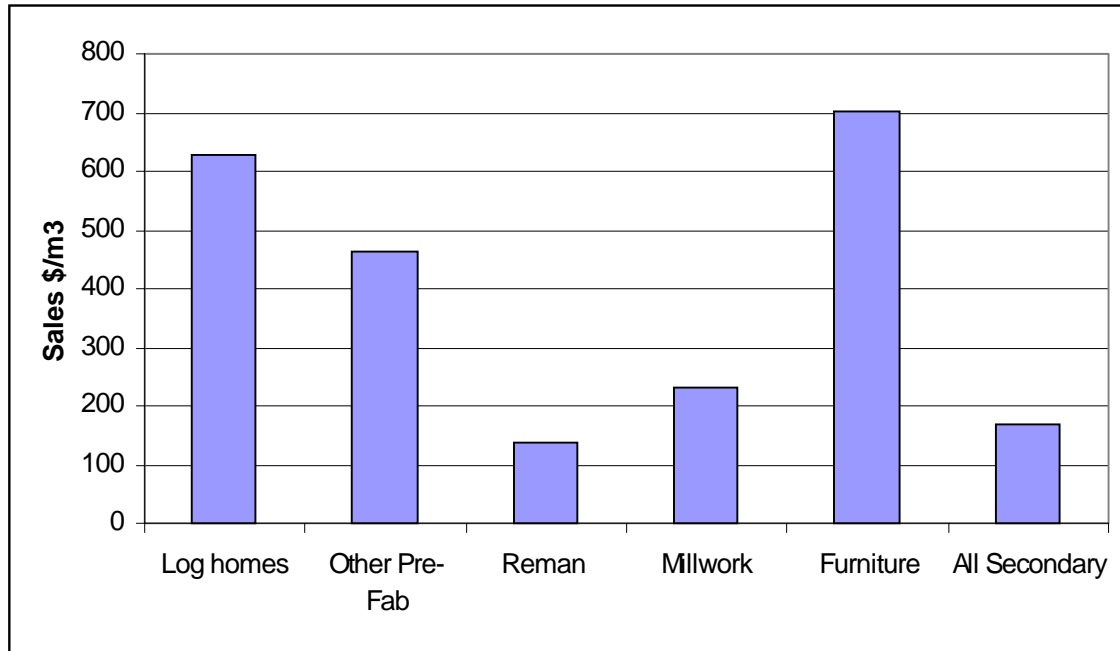
The fibre used in the manufacture of log homes is mostly purchased in BC log markets. Small Business Forest Enterprise Program (SBFEP) sales are nearly as important representing just over 40% of the fibre used. The labour intensity of log home manufacturing and other secondary manufacturing activities, as expressed by jobs/thousand m<sup>3</sup> RWE fibre input is given in Figure 3.



**Figure 3 Jobs/Thousand m<sup>3</sup> Round Wood Equivalent for Log Homes, Other Pre-Fab and Select Secondary Wood Manufacturing Activities in British Columbia**

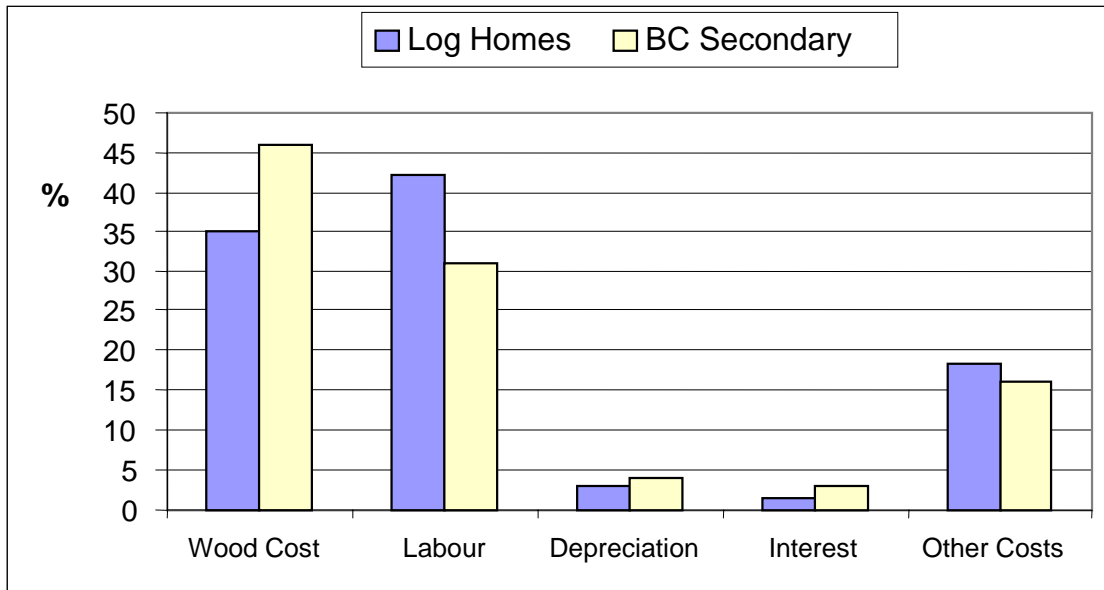
The results in Figure 3 show that the production of log homes is a labour intensive process when compared to other secondary wood processing activities (Wilson et al, 1999). In fact, when expressed in jobs per unit of fibre input, nearly as much labour goes into log home manufacture as furniture production. The manufacturing of buildings in the other structures category is less labour intensive than log home production, but is still higher than the overall average for all secondary wood manufacturing in BC. Figure 4 gives the sample estimates for sales per unit fibre input.





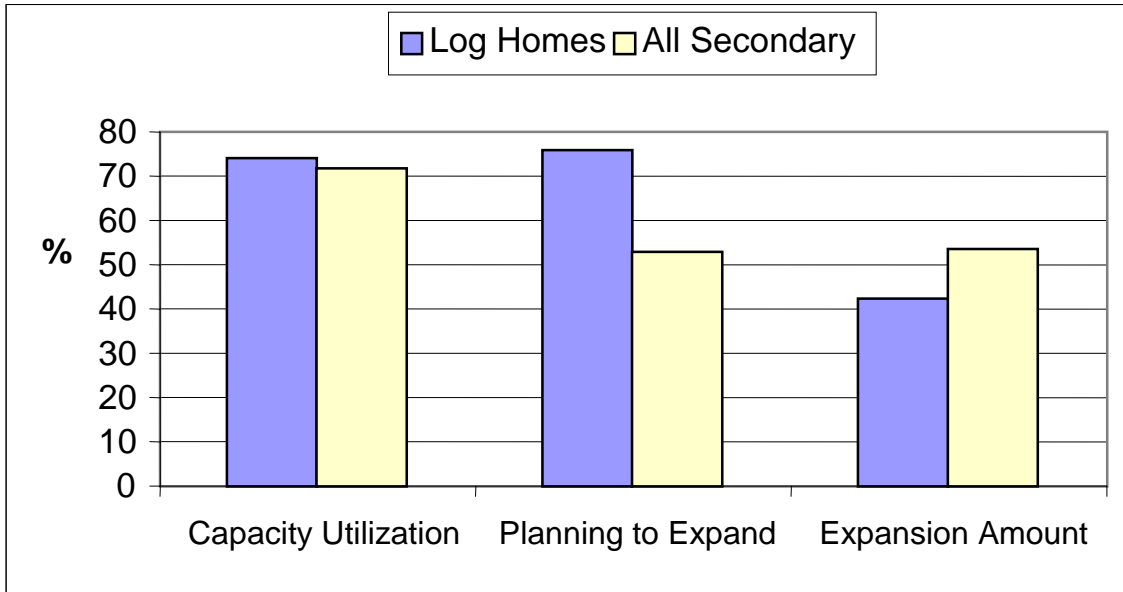
**Figure 4 Sales in  $\$/\text{m}^3$  Round Wood Equivalent for Log Homes, Other Pre-Fab and Select Secondary Wood Manufacturing Activities in British Columbia**

Again, the sales value/unit of RWE used is very high for log home manufacturing. In fact, it is nearly as high as the furniture manufacturing sector. Figure 5 shows the distribution of operating costs for these manufacturers, and the total for all secondary wood manufacturers in 1997.



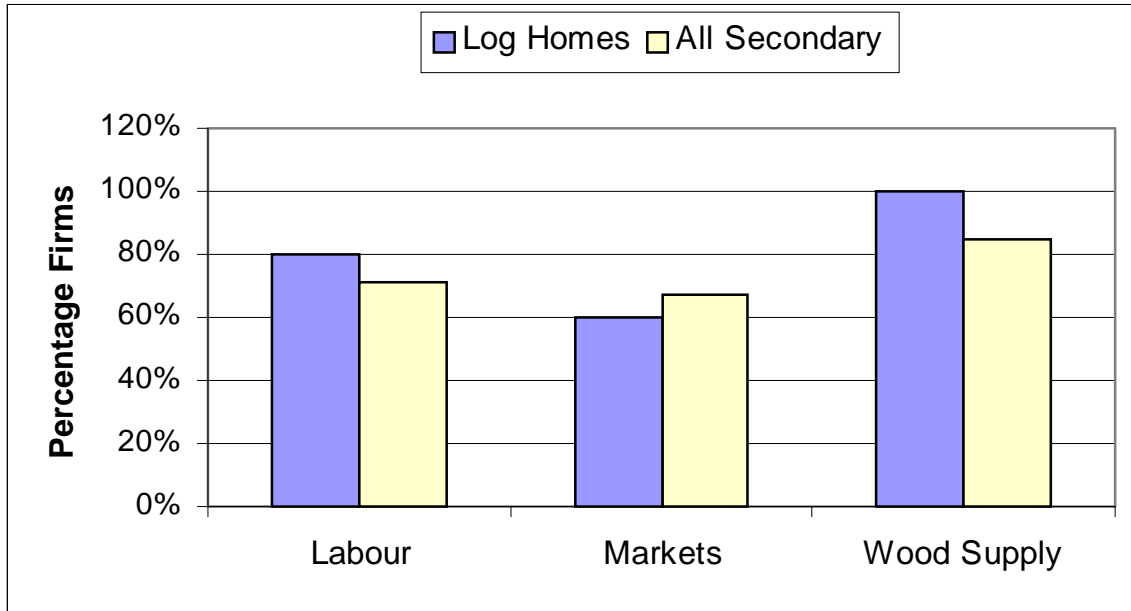
**Figure 5 Average Cost Distribution for Log Home and Other Pre-Made Structure Manufacturers in BC, 1997**

The most important component of operating costs for log home manufacturers is the cost of labour and benefits at 42 percent. This is followed by wood costs at 35%, other costs at 18% and the costs associated with capital stock (interest and depreciation) totaling 5 percent. Labour costs are more important for log home manufacturers than for secondary manufacturers as an industry. When the costs of all nine business types involved in secondary manufacturing are examined, labour and benefits accounts for 31% of operating costs, while wood costs are the most important at 46 percent (Wilson et al, 1999). Capacity utilization and expansion plans for the 1998-2000 period are summarized in Figure 6.



**Figure 6 Capacity Utilization and Expansion Plans for Log Home and All Secondary Wood Manufacturers in BC, 1997**

The results in Figure 6 indicate that capacity utilization is similar for log homes and the sample of all business types in secondary wood manufacturing. A larger proportion of log home manufacturers had expansion plans in the future, although the scale of expansion is lower than that planned for by the secondary manufacturing sector in total. The major constraints to expansion identified by responding log home companies are given in Figure 7.



**Figure 7 Constraints to Expansion for Log Home Builders and All BC Secondary Wood Manufacturers**

The constraints to expansion for log home manufacturers are different than those for all secondary wood manufacturing in BC. A higher percentage of firms identified labour and wood supply as a constraint while proportionally less firms saw markets as a problem for future expansion. Within the category of labour as a constraint the most commonly identifies problem is training and skills, which is indicated by 64% of log home builders. For those firms in which wood supply is a constraint to expansion, 72% identified volume as a problem and 52% identified price.

### Conclusions

In 1997 an estimated 59 log home manufacturers operated in BC. Industry sales totaled \$85 million and the sector generated 672 direct jobs. About 60% of the required log supply was bought via market log sales (57%) and much of the remainder (41%) was sourced through provincial government Small Business Forest Enterprise Program sales. The sector generates about 5.5 jobs per thousand cubic metres of timbers and \$650 in sales per cubic metre of timber used in manufacturing (both are estimated in round wood equivalents). The sector has successfully diversified shipments into three markets: BC, the Pacific Rim (mainly Japan) and the United States. The major constraints to additional expansion are wood supply and labour costs.

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