

British Columbia Forest Industry Workforce Review

2006 to 2016



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Submitted to the

Logging Worker Training Needs Committee

April 2007

EXECUTIVE SUMMARY

The Logging Worker Training Needs Committee (LWTNC) was established in the fall of 2006. The committee was comprised of members from the Truck Loggers Association, the North West Loggers Association, the Interior Logging Association, the Central Interior Logging Association, employers, the United Steelworkers, and the BC Forest Safety Council. The purpose was to compile information and ideas that will help implement initiatives to address human resource needs in the forest sector.

A contract to conduct that assessment was awarded through a bid process to the Forest Engineering Research Institute of Canada (FERIC). Funding for the research was provided by the government of Canada and FERIC membership.

The project was accepted and undertaken as a needs assessment for logger training but as the project neared completion it became apparent that the work was also a needs assessment for loggers and equipment operators.

STUDY AND SURVEY PROCEDURES

Between October and December 2006, FERIC conducted two different surveys within the British Columbia forest industry. The first surveyed nine licensees, twenty-one contractors and 174 forest industry workers about recruitment, training, and worker retention. Licensees and contractors completed interviews with survey staff or returned surveys later, while worker survey forms in postage prepaid envelopes were distributed to all employees of cooperating contractors, and company logging crew employees of Western Forest Products and Island Timberlands. Worker survey returns were weighted towards the Coastal Region. About 48% of the worker responses came from the Coast, 16% from the North Interior, and 34% from the South Interior.

The second survey was completed by 28 licensee respondents, representing about 30.1 million m³ (roughly 36%) of the provincial annual allowable cut for 2006. This documented harvest systems and machines used in 2006. Using this base, a prediction model was built to estimate the number of logging workers stratified into nineteen job classifications.

FINDINGS AND CONCLUSIONS

The British Columbia forest industry experienced a labour force reduction over the past decade (1994 to 2005) of approximately 30%. Work force projections made through this study suggest that this declining trend will continue through 2016 but at a lower rate of 17%.

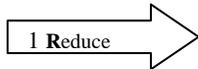
Although the predicted decline in logging equipment operators positions for the British Columbia forest sector should generate a surplus of skilled workers, the reality is that the sector will experience a labour deficit if changes are not implemented. Three factors contribute to this outcome.

1. **Workforce demographics.** A large segment of the work force (30% to 50% by region) is beyond the age of 50 and considering retirement. Also, as the number of available positions declined substantially over the last decade, very few young workers have either entered, or been retained in, the work force.
2. **Workforce retention.** The skilled workers currently working in the sector see a combination of high uncertainty for sustainable employment, an undesirable social life style (i.e., long work hours, remote work sites, hazardous environments, harsh weather conditions), and a relatively modest compensation package (wages and benefits), and weigh these against a strong demand for their skills elsewhere. The outcome of this comparison causes many skilled workers to change sectors.
3. **Workforce recruitment.** Young people entering the workforce today seldom consider a career in the forest sector because the public image of the work appears in conflict with environmental ideals, work locations are often remote requiring them to change life styles or cultures, and work schedules are frequently seasonal and somewhat erratic. As a consequence, new workers only enter the sector in desperation, or to improve their qualifications for other sectors.

RECOMMENDATIONS

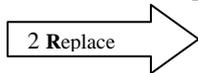
The old guard was drawn by wages. Perhaps the new wave will follow because of global warming and joysticks. Unconventional sources and solutions need to be examined.

Recommendations have been organized around three concepts of a Recovery Strategy loosely based on the basic-building-block-concepts of the primary school “three R’s.”



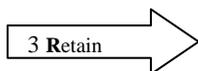
Reduce **R**etirements and **R**esignations.

- Make compensation and benefits packages¹ for contractors and employees competitive with similar work in other industries.
- Initiate discussions between licensees and contractors regarding plans, needs and expectations.
- Continue to improve the safety record.
- Work to reduce or eliminate shutdown periods, or schedule employee vacations during them.
- Retain workers past the age of 65 by offering creative job sharing arrangements.



Recruit and **R**etrain to **R**eplicate departed workers.

- Incorporate resolve motion control in new equipment. Resolve motion control cost was approximately \$60,000 in the 1990s and is now probably in the range of \$12,000 per unit.
- Target young people living in forest communities for future employment.
- The construction-equipment industry designs ergonomic machines that are easily learned and used by workers of all backgrounds and ages: harvesting equipment needs to be similarly designed.
- Consider joint licensee-contractor presentations on the benefits of working in the forest industry at large area high schools.
- Make conscious attempts to improve working relationships between licensees and contractors, aimed at reducing disputes and improving “image” at home and in communities.
- Change the work culture of the forest industry to attract unconventional labour sources, such as women and First Nations. Foreign nationals could possibly be retained on an indenturement program to ensure a minimum work period.
- Use pre-employment testing with simulators to identify candidates who have natural aptitudes and good hand-eye coordination.
- Encourage attendance at training schools and courses by government subsidy (apprenticeship?).
- Explore work/job sharing.
- Resurrect hiring hall placement agencies that will improve worker access to longer seasons and employer access to skilled workers.



Retain by **R**einforcing the positives.

- Take advantage of the global warming green movement to highlight the benefits of forest management and its positive influence on climate change.
- In conjunction with industry trade and professional associations, fund, prepare and distribute information sessions in high schools. Demonstrate the sophistication and comfort levels of modern forest equipment with simulators.
- Reinforce positive attributes of working in the forest – independence, the outdoors, the RENEWABILITY of the industry – and contrast against oilpatch.
- Encourage contractor cooperatives that can market harvesting services to multiple forest land holders and thereby extend equipment utilization and work seasons for employees.

¹ These should include pension, medical and dental insurance, and daily travel allowances.

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Licensees

Canadian Forest Products Ltd. – Houston Operations	West Fraser Mills Ltd.
Downie Timber Ltd	Western Forest Products Inc
Island Timberlands L.P	Weyerhaeuser Company Limited
Tembec Inc.	Winton Global Lumber Ltd.
TimberWest Forest Corp	

Contractors

Antler Creek Logging	Ed Smith Trucking Ltd.	Mike Hamilton Logging Ltd.
Arkel Contracting Ltd.	Far-Ko Contracting Ltd.	R.J.Schunter Contracting Ltd
Balcaen Consolidated Contracting Ltd.	Gulbranson Logging Ltd.	R. Spence Contracting Ltd
Bill Todd Ltd	Holbrook Dyson Logging Ltd.	Timber Baron Contracting Ltd.
Burns Lake Native Logging	Horovatin Enterprises Ltd	Val J Holdings
Canadian Air Crane Ltd.	Houlden Logging Ltd.	W.J. Vetter Contracting Ltd.
D.R. Holtom Ltd.	Lo-Bar Log Transport Co. Ltd.	Young's Mills (1980) Ltd

Logging Worker Training Needs Committee

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Suzanne Christensen		
	<i>Service Canada</i>	
	Rick Roberts	

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INTRODUCTION

The Logging Worker Training Needs Committee (LWTNC) was established in the fall of 2006. The committee was comprised of members from the Truck Loggers Association, the North West Loggers Association, the Interior Logging Association, the Central Interior Logging Association, employers, the United Steelworkers, and the BC Forest Safety Council. The purpose was to compile information and ideas that will help the Committee and the industry implement initiatives to address human resource needs in the forest sector, particularly in woodlands operations, or harvesting phases. The committee set as one of its first tasks the identification of specific skills relevant to forest harvesting.

A contract to conduct that assessment was awarded through a bid process to the Forest Engineering Research Institute of Canada (FERIC). Funding for the research was provided by the government of Canada and FERIC membership. This report documents the results of that research.

The results provide a comprehensive look at the current and forecasted needs for forest equipment operators, their skill requirements and training needs. It can be used to allocate training resources; to plan and establish training programs that will strengthen the existing work force; and to identify recruitment needs, changing technologies and skills requirements in the future to ensure a work force that is globally competitive.

This report will also provide justification for approaching governments for further assistance.

OBJECTIVES

The project focussed on six objectives.

- To describe and quantify labour and skills requirements for the current year (2006), 2011 and 2016 relative to anticipated provincial harvest volumes.
- To document the skills needed in the harvesting and forest management sector.
- To document training practices and resources available to meet skills development needs.
- To assess the potential for recruiting logging equipment operators and utilization of training resources by the industry over the next 5 years.
- To gauge the level of willingness on the part of industry and other potential users/funders to invest in training programs.
- To identify, in cooperation with the LWTNC recommendations and develop strategies for:
 - priorities for action to address skill shortages
 - training needs in the industry
 - recruitment and retention

STUDY PROCEDURES

Between October and December 2006, FERIC conducted two different surveys within the British Columbia forest industry. One was directed at training and recruitment, and the other at documenting data on harvest systems and machines used in 2006.

HARVEST SYSTEMS

This survey was conducted with FERIC's British Columbia forest company members. The data was used to estimate current and projected numbers of logging machine operators in British Columbia. A digital form was completed by 28 licensee respondents, representing about 30.1 million m³, or roughly 36% of the provincial annual allowable cut for 2006. Companies were asked to identify:

- their harvest volume for 2006 and if possible, expected volume for 2011 and 2016
- how current volume was distributed amongst harvesting systems
- the number of machines employed in each system for 2006

TRAINING SURVEY

Survey questions were prepared by FERIC and reviewed by the LWTNC. Their purpose was to ask licensees, contractors and forest industry workers about recruitment, training, and worker retention.

Nine licensees were selected by the committee and FERIC based on geographic distribution and size. Thirty-seven contractors were selected by the committee members representing the four associations (TLA, NW Loggers Associations, ILA and CILA). Although all initially agreed to participate, only 21 actually responded. A list of licensee and contractor respondents is in **Appendix 1**.

The original intention was to have FERIC's extension specialist (FORREX) conduct face-to-face interview surveys with licensees and contractors. This occurred in some cases, but most of the survey forms were left with licensees or contractors to be completed when the respondent had more time. Both surveys required respondents to access historical records and this was difficult to coordinate at the time of interview. Some contractor interviews were also lengthy (up to two hours) depending on the level of interest and who they chose to involve in the process, and many contractors were unable to provide that length of time in one sitting.

Worker surveys were conducted through anonymous mail in returns to FERIC. Survey forms in postage prepaid envelopes were distributed to all employees of all cooperating contractors, and to company logging crew employees of Western Forest Products and Island Timberlands. A total of 805 employee survey forms were distributed and 174 (21%) were returned completed to FERIC. About 48% of the employee responses came from the Coastal region, 16% from the North, and 34% from the South. The others did not identify their location.

CURRENT BASELINE SITUATION

PROVINCIAL HARVEST VOLUMES

Estimates concerning the number and type of workers needed for a task (and their training needs) can be influenced by many factors but the underlying question that must always be addressed is, "How much work needs to be done?" With respect to the forest and logging sectors, the amount of expected work is controlled by the amount of volume to harvest.

The British Columbia Ministry of Forests (BCMOF) released its first "State of the Forests" report in 2004 (**BCMOF 2004**). The document contained or referenced statistical information on six indicators of forest sustainability, including timber harvest.

For forest tenure management purposes the Province of British Columbia is divided into three regions – Coast, Northern Interior and Southern Interior (**Figure 1**). Each region has timber harvest volume allocated in Timber Supply Areas (TSA's) and Tree Farm Licenses (TFL's). The TFL's are scattered throughout the province in various Timber Sale Areas. Some TFL's (e.g., TFL#39) can be distributed across more than one TSA.

The Ministry's Forest Analysis and Inventory Branch documents annual allowable cut calculations for both tenures. Historical records date back to 1912 and future projections extend to 2050.

Figure 1 British Columbia Forest Regions
(illustrations from BCMOFR website)

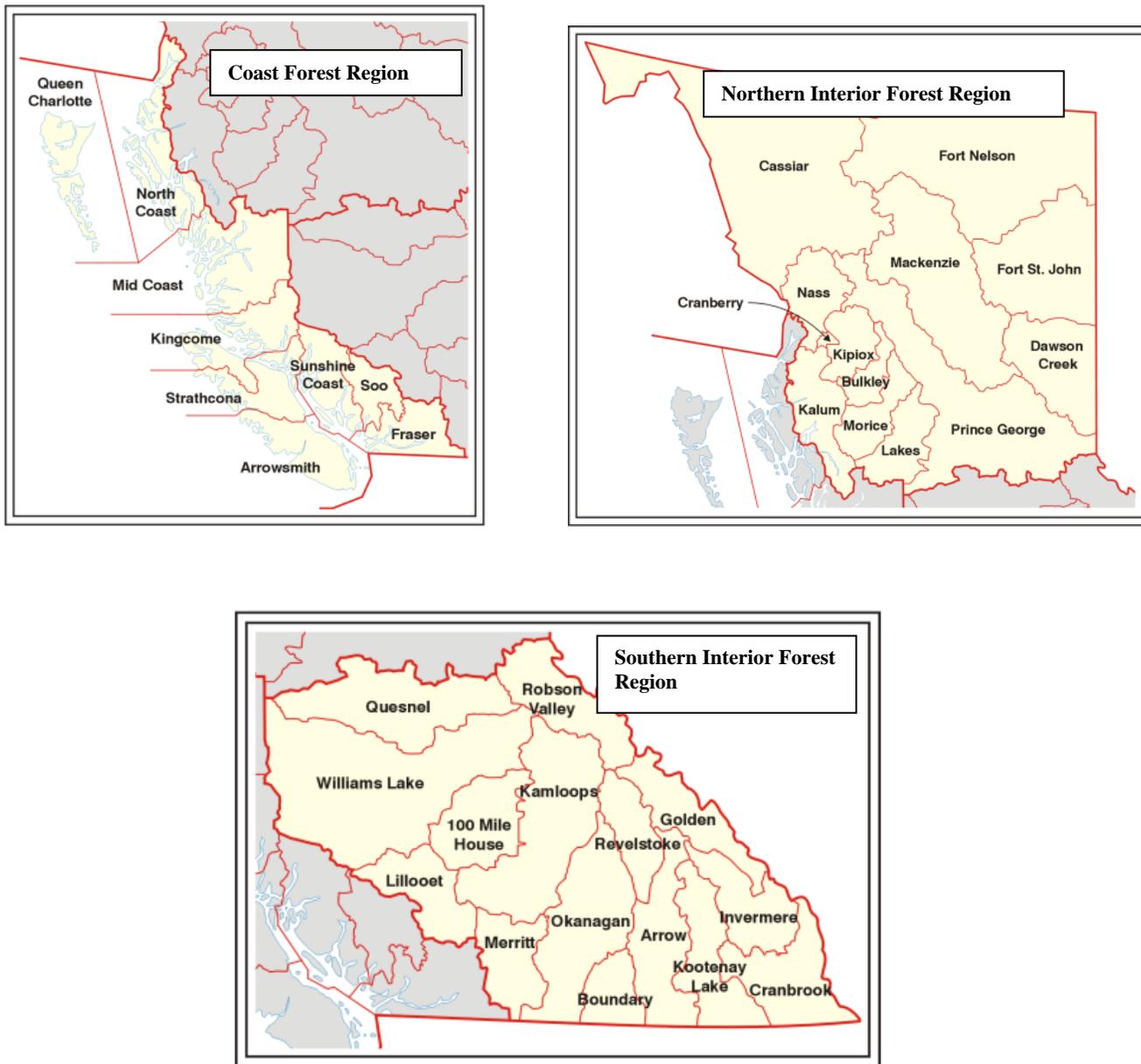


Figure 2 was extracted from the BCMOF’s “State of the Forests” report. The chart shows the total provincial timber harvest first exceeded 70 million m³ per year in the mid-1970’s, and has generally remained between 68-and 80 million m³ since then. The total harvest consists of volume from public tenure TSA’s and TFL’s, and from private land. It is difficult to predict volume from private land because owners may choose to harvest variable quantities (or choose not to harvest at all) but it is somewhat easier to predict volumes from public tenures because they are legislated and must occur within certain time frames.

Figure 2 Timber Harvest Volume in British Columbia

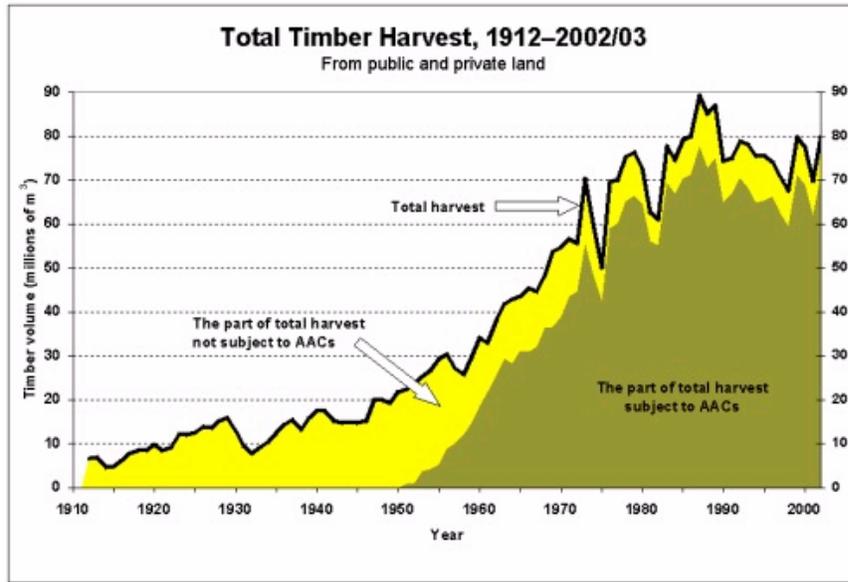


Table 1 shows the Annual Allowable Cut (AAC) from public tenures in British Columbia as of November 2006 (BCMOFR 2006a). The data is presented by region and is extracted from the full summarization contained in **Appendix 2**. The results exclude volume from private land.

The mountain pine beetle (MPB) infestation in British Columbia has had significant impact on communities and forest operations in the province, particularly in the Interior. Since 2001, the BCMOF has mandated temporary increases in the Annual Allowable Cut for beetle-related harvest in thirteen of the tenures in the Northern and Southern regions (**Appendix 2**). The increases, totalling nearly 10 million m³, are intended to mitigate the effect of beetle impact, and will stay in place until new AAC's are determined. A determination for new cut levels must take place within five years of the previous determination. The increases can be maintained or altered at the next determination.

Since 1995, the trend shows a generally increasing annual harvest, particularly since the AAC increase related to the pine beetle.

Table 1 Annual allowable cut by region – November 2006

Excludes volume from private land	Total AAC m ³
Coast forest region	17,845,193
Northern Interior forest region	35,254,001
Southern Interior forest region	30,418,711
Provincial total	83,517,905
Increase in above AAC related to pine beetle	9,893,971

Table 2 contains information on billed products, issued as a supplement to the Ministry's Annual Service Plan Report for 2005/2006 (BCMOFR 2006b). These data, showing an annual billed volume exceeding 90.5 million m³, represent the best estimates of the proportion of volume harvested from public and private provincial sources. FERIC utilized these numbers and distributions, combined with results from the survey of licensees, later in this report to calculate the number of harvesting operators in British Columbia.

Table 2 Annual volume of products billed in 2005/2006 by region and land status

	BC Crown all sources	Private, Federal, 1 st Nations	Province Total
	Volume billed, m ³		
Coast forest region	17,896,279	6,533,662	24,429,940
Northern Interior forest region	32,817,060	1,994,802	34,811,862
Southern Interior forest region	29,584,230	1,717,856	31,302,085
Provincial total	80,297,569	10,246,230	90,543,888

LABOUR FORCE EMPLOYMENT

Table 3 shows estimates of the provincial labour force for all industries and for the forestry & logging sector for the twelve year period ending in 2005 (BC Stats 2006a).

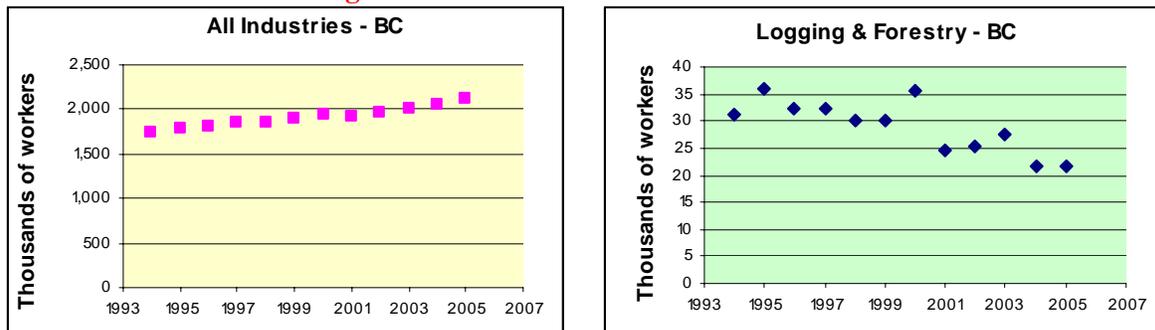
The data are shown graphically below in **Figure 3**. Although the BC workforce increased by more than 20%, the logging and forestry workforce decreased by 9500 people (about 30%) from 1994 to 2005. The logging sector data could be interpreted in two ways. The sector could be described as being consistently in decline except for some occasional short-term increases; but it might also be described as being relatively static within two different ranges, one ending in 2000, and a second lower range commencing after 2000. Nonetheless, there has been a 30% reduction in persons employed in the BC forest and logging sector from 1994 to 2005.

Table 3 British Columbia Employment Statistics¹

Year	All industries	Forestry & logging with support activities
	(thousands of persons)	
1994	1,743.20	31.1
1995	1,785.60	36.1
1996	1,816.40	32.3
1997	1,860.50	32.2
1998	1,858.40	30.2
1999	1,894.40	30.0
2000	1,931.30	35.5
2001	1,921.60	24.7
2002	1,965.00	25.3
2003	2,014.70	27.7
2004	2,062.70	21.5
2005	2,130.50	21.6

¹ Source: Statistics Canada's Labour Force Survey, Revised January 25 and March 20, 2006
Prepared by BC Stats March 20, 2006

Figure 3 British Columbia Workforce



Possible reasons for the smaller workforce include industry mergers resulting in net downsizings, and increased efficiencies resulting from both technological or system changes. Some production efficiencies may also have resulted from stimulus provided by the US countervail duties. Although duties were not imposed until 2002 (CNN 2002), hearings and publicity had been underway since 2000. That might explain the increased workforce in 2000, as the forest industry maximized production prior to the deadline.

In total between 1994 and 2005, the logging and forestry workforce decreased by about 30% while provincial harvest volumes increased from approximately 75.3 million m³ to 90.5 million m³.

NEEDED – A “RECOVERY STRATEGY”

The topic of training and training needs for loggers and forest workers is a complicated subject which evokes different interests amongst stakeholders. Those charged with training require information about the prospective number of trainees, because governments will be more receptive to funding activities that are clearly defined and in demand. Others are charged with a safety mandate, while still others represent groups of contractors or employers struggling with workforce and policy issues that may threaten their continued operation.

The workforce issues facing the forest industry are varied and complex but they can be described in a fairly simple statement. There are more attractive jobs elsewhere. The fundamental issues outlined below are critical and must be addressed before a training regime is implemented or it will only serve as a training vehicle for industries that draw from a similar labour pool.

A worker shortage is not a new problem. During the gold rush, ships arriving in San Francisco often lost their crews to gold rush excitement, leaving ships abandoned that could not be crewed for departure. That problem was really not resolved until the gold rush was over. WW II took many of the world's male worker population away from their jobs. Those stay-home jobs were filled by women.

There has been, and continues to be, a growing concern amongst stakeholders that the British Columbia forest industry also faces a serious and unparalleled worker shortage. The concern has developed over a period of years and culminates in the perception that many workers leave the industry and are not replaced, and that the remaining workforce is composed of older workers with practically no young ones. Forestry is particularly vulnerable to shortages since the skill sets required in logging and road building are also in demand in other sectors such as highway construction, utilities construction and maintenance, building construction and oil & gas.

A worker shortage may be relatively new to the forest industry, but other industries face similar problems. Every major industrial sector in BC, as well as many minor industries, currently face labour shortages. Vancouver television news reports in February 2007 reported a worker shortage in the South Interior was causing a manufacturer of body protection armour to move their factory to eastern Canada. The primary problem was the requirement to offer higher wages to attract workers, and the rates could not be maintained by the manufacturer.

Wages have been the primary motivator for workers to select jobs in the forest industry. Now, oil patch wages in Alberta and northeast British Columbia are currently the high interest area for workers. In addition, by taking advantage of higher prices for petroleum and natural gas, and using innovative technology, the oil patch has managed to transform its exploration program from primarily the winter period to year-round. The oil patch has successfully captured the role and position the forest industry

occupied between 15 and 30 years ago. Then, workers 'went logging' to make money. Now there are other, and more attractive, alternatives.

With respect to employment, the younger work force tends to view the forest industry with scepticism. Forestry is seen as low-tech, male dominated (perhaps even unfriendly to women), antiquated, low-paying, and a dirty, dangerous and dying industry that has poor job security seasonally and over the long term. The work is considered hard and requires shift work and long hours in unfavourable environmental and physical conditions. Today's young people have different expectations and priorities compared to those from previous generations. Living in communities close to their friends and attending social activities are more attractive to many young people than working in remote or semi-isolated locations for higher compensation. For these, wages are not adequate enticements away from other industrial sectors such as oil and gas or even some white-collar jobs where workers can live at home in town.

A national survey of high school students conducted by the Wood Manufacturing Council in 2006 ([WMC 2006](#)) clearly showed that students have little knowledge or understanding of the industry and related career opportunities. Student impressions were not positive. When asked if they might consider a career in the wood manufacturing industry, the majority of respondents said no, validating their choice with statements reflecting a belief in unsustainable forestry practices, manual labour, and other more attractive career options. These statements indicate a need for promotional / educational activities and materials targeted at young people.

A recent event highlights this concern. In February 2007, after more than 40 years of successful program delivery, the British Columbia Institute of Technology announced the suspension of their two primary forestry training programs due to lack of enrolment. The last graduates will be in the spring of 2008. Although suspension may not mean permanent termination, once teaching staff are dispersed, the effect may be the same.

Other concerns generate worries about long-term sustainability of the industry, towns and communities. Environmental impacts are regularly raised in discussions about careers in our sector. In addition, the perception of forestry as a sunset industry, combined with reports of mill closures and local discussion about the effects on communities of the pine beetle or the softwood lumber trade issues, cause unease in many families and give rise to the perception of an increasing exodus of people from forest-dependent communities. It may also decrease the likelihood of new entrants to the workforce relocating to these smaller towns.

The reality of this concern is evidenced by the changes in home assessments over the past years. Ilan Vertinsky, a Forest Economics and Policy Analyst with the University of British Columbia presented data on this topic at the 2006 Symposium on "Forest Tenure & Land Management in BC" hosted by the BC Forum on Forest Economics and Policy. He indicated that between 2002-2005 average assessments of home values in forest dependent communities increased by 2.3%, compared to an increase of 35.5% for the province as a whole ([Vertinsky 2006](#)). He emphasized that programs are needed to strengthen the more than forty-one forest dependant communities in British Columbia.

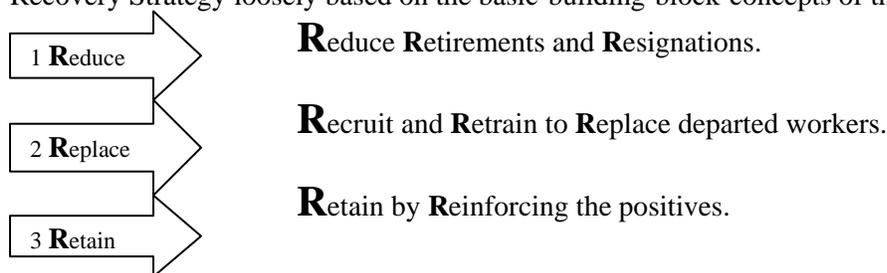
There are few if any entry level jobs in the sector today. Unskilled labour positions such as chokermen, buckermen, and swampers are no longer available in the industry. These unskilled positions provided an unofficial training program for the sector – a breaking-in ground – to prepare newcomers to the sector to operate the increasingly high-tech logging equipment. Today there are no such opportunities. The decreasing size of the overall forestry labour force and the continuing competitiveness to reduce costs requires remaining workers to develop increased skills, including the possibility of cross-training for multiple tasks.

The ways and means of combating these problems has been complicated by a pronounced shift in emphasis within the forest industry. The forest tenure holders effectively removed themselves as employers, and have transferred most activities to a contractor workforce. Logging contractors in British Columbia are dealing with a level of responsibility for planning, supervision and staffing situations that is unprecedented, and many are ill-prepared for those tasks. Few actually seem to want those duties.

The common thread amongst these interests is the concern over the health and continued well being of the forest industry in British Columbia. Those who work in the industry understand its importance to the provincial economy in general, and specifically to the many towns and communities throughout the province that rely on the forest. The many factors and concerns expressed by stakeholders, including committee members, licensees, contractors and employees, are related through their common desire for actions that will help resolve these issues.

Solving these issues is a priority to the sector as a whole, including forest management, harvesting and silviculture, as well through the value chain to finished wood products, and even to a broader range of industries related to the forest sector (e.g. trucking). There is a need to counter the poor image of the industry in order to improve the recruiting of new workers and the retention of skilled workers. With no collective effort on behalf of the sector to promote itself and its career potential, many of the myths and poor perceptions will be perpetuated.

The presentation format in the balance of this report has been organized around three concepts of a Recovery Strategy loosely based on the basic-building-block-concepts of the primary school “three R’s.”



The first and third strategies both deal with worker retention issues. The first should be directed at the existing workforce, primarily composed of the older experienced workers. The third strategy should be aimed at retaining the new replacement workers hopefully coming on-stream through strategy 2. The subjects that matter to each group are not mutually exclusive, in that what works with one group *may* work with the other, but each group should also be targeted separately.

This project does not address globalization of world markets. The effects of globalization may influence business decisions made in British Columbia, which may in turn result in impacts on the workforce, but that subject is beyond the boundaries of this work.

RESULTS

HARVEST SYSTEMS EQUIPMENT AND OPERATORS

There are at least two basic ways in which to organize the presentation of pertinent data. One is to present subjects (e.g. Provincial Volumes; Labour Force requirements) and then discuss 5-year periods. The other is the reverse, which is to group by 5-year periods and discuss subjects under those headings.

We used the latter procedure in this document. Our thinking was directed towards the end requirement for this work, which was not to make one prediction, but rather, several calculations about workforce size and composition.

OPERATOR PREDICTION MODEL – LICENSEE HARVESTING SYSTEMS 2006

Table 4 contains results from the Harvest Systems Survey for 2006. The twenty-eight licensee survey responses accounted for about 33% of billed provincial volume in 2006. Proportionate rates were 24 % in the Northern Interior, 45% in the South and 46% on the Coast.

The tabulation represents the first level of an Operator Prediction Model FERIC developed to estimate the number of logging machine operators. Survey responses were extrapolated to provincial totals based on the proportions of regional volumes. Subsequent levels for 2011 and 2016 are in Tables 5 and 6.

The model's calculation procedure is controlled by regional volume and is modified by several parameters:

- Anticipated volume distribution by harvest phase (from the licensee surveys)
- Operating days per year
- Production rates (m³/shift) by machine type

In operation, the model calculates the required number of shifts per year to harvest each phase based on the shift productivity, and divides that by the available days per year to determine the number of operator shifts.

The regional billed volumes for 2005/2006 were split into phases based on the reported survey distributions. The Coast was also divided into Crown tenures and private land so that calculations for number of operators reflected the distributions on private holdings.

The following example uses data from the Southern Interior section of the model to illustrate its basic operation. Using the estimates for total and phase distributions shown in **Table 4**, the model suggests that in 2006, there were about 339 feller buncher operators working in the Southern Interior. This assumes that 82% of the Southern Interior volume was handled by feller bunchers which produced, on average, 400 m³ per shift. That level of performance required 64,468 operating shifts. When that is related to the operating season of 190 days, that equates to 339 feller-buncher operators working for a single shift each day for 190 days.

Estimates for operating days per year and shift productivity came from various sources.

Coast Data were provided by the Truck Loggers Association (TLA). According to the Association, contractors of various sizes account for between 80% and 90% of volume harvested on the coast, encompassing the combination of Crown and Private tenures. The Association noted that approximately 3 million m³ of the Crown portion is harvested by major licensees, and that there is very little harvesting on Coastal private lands by licensee company crews. Many contractors are members of the TLA, and they were specifically surveyed by the TLA as part of this project. Those surveys generated data from different "size classes" of contractors for Crown and Private tenures, as well proportionate estimates of the amount of provincial volume handled by each class. For the purposes of this model, the TLA and FERIC agreed that a blended rate would represent the TLA productivity data, and those values were incorporated in this model for Coastal 2006.

Interior Estimates for operating days were averaged from licensee and contractor surveys, as well as from additional industry sources. Productivity estimates came from various sources including recent

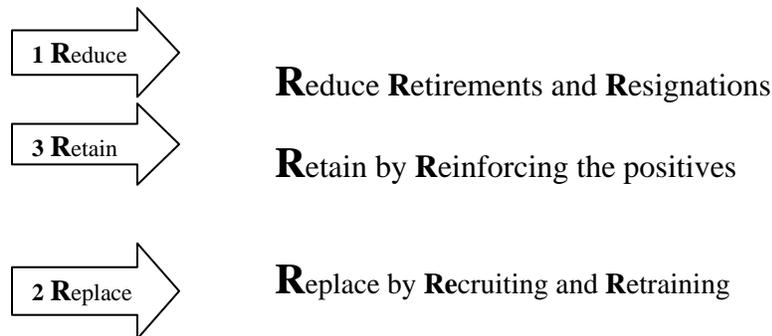
FERIC reports, information from staff files and projects, additional industry sources, and the surveys. The measure of ‘*shift productivity*’ is often considered a poor indicator of performance because it is influenced by many factors, but for calculating numbers of operators, it is actually a useful term. A ‘shift’ refers to an operating time frame for one individual. For this work, FERIC used estimates for Interior shift volumes that ought to be attainable, on average, during a 10-hour period. The distribution of trucks for different harvest systems was determined from in-house discussions at FERIC. Average load volumes were assumed to be 45 m³ in the Interior. Lesser volumes were allowed for self-load picker trucks. Trucks were calculated at three loads per day.

In summary for 2006, there was an expected province-wide need for a total of 9,884 harvesting operators.

Coast	24.4 million m ³	3,022 operators	8074 m ³ /operator
Southern Interior	31.1 million m ³	3,371 operators	9226 m ³ /operator
Northern Interior	34.8 million m ³	3,491 operators	9969 m ³ /operator

The apparent low productivity per operator on the Coast may be a result of the transition into a second-growth operating environment and the need for contractors to retain old-style equipment to deal with occasional old-growth harvesting requirements. This situation should improve as the benefits of increased mechanization become more available to coastal contractors.

Suggested strategies: concentrate immediately on implementing 1 and 3, followed by 2.



The second and third levels of the Prediction Model are for 2011 and 2016, in **Tables 5** and **6**. Each level allows changes for total volume, volume distribution between phases, operating days, and shift volumes. FERIC incorporated changes to many of these parameters based on realistic and probably conservative judgements and estimates.

The exception to this process was for the 2011 derivation of Coastal operating days and shift volumes. Those data are calculated values, half-way between the TLA blended averages for 2006, and FERIC’s estimated values for 2016. The 2016 Coastal values assume that in 10 years structural and other issues on the Coast can be reduced, and that producers can aim for, and hopefully attain, those targets.

Table 4 British Columbia Harvest Distribution – 2006

Operation Type	Coast Crown tenure					Coast Private land					Coast Total				
	Volume (m ³)					Volume (m ³)					Volume (m ³)				
	17,896,279					6,533,662					24,429,941				
No. operators / day															
% of volume	m ³ / shift	Required shifts / yr	Days / year	No. operators / day	% of volume	m ³ / shift	Required shifts / yr	Days / year	No. operators / day	% of volume	m ³ / shift	Required shifts / yr	Days / year	No. operators / day	
Falling Systems															
Hand Fallers	83%	101	146,759	150	978	34%	107	21,029	155	136					1114
Feller-Bunchers	15%	468	5,826	227	26	59%	431	8,964	235	38					64
Harvesters	2%	200	1,735	200	9	6%	225	1,867	200	9					18
Total	100%				1,013	100%				183					1,196
Yarding Systems															
Skidders	0%	378	0	169	0	17%	378	2,938	270	11					11
R.T. Forwarders	0%	250	0	169	0	0%	250	0	270	0					0
Excavator. Forwarders	26%	244	19,070	169	113	39%	233	10,936	198	55					168
Cable Yarders	54%	234	41,045	169	243	26%	213	7,975	180	44					287
Helicopters	14%	630	3,944	100	39	8%	700	747	100	7					47
Cherry-pick	7%	409	2,935	66	44	10%	404	1,617	114	14					59
Total	100%				440	100%				132					572
Processing Systems															
Hand buck	78%	495	28,135	150	188	34%	550	4,091	150	27					215
Delimb or Process	22%	344	11,540	300	38	66%	275	15,577	270	58					96
Delimb / bark / chip	0%	300	0	300	0	0%	300	0	300	0					0
Total	100%				226	100%				85					311
Loading Systems															
Cable Loaders	25%	350	12,783	140	91	10%	350	1,795	140	13					104
Hydraulic Loaders	75%	504	26,631	187	142	90%	464	12,727	208	61					204
F.E. Loaders	0%	400	0	187	0	0%	400	0	208	0					0
Total	100%				234	100%				74					308
Trucking Systems															
Long Log	100%	211	84,816	191	444	69%	151	29,856	210	142					586
Short Log	0%	156	0	191	0	28%	156	11,727	270	43					43
Picker Trucks	0%	128	0	191	0	3%	128	1,531	270	6					6
Chip Vans	0%	0	0	0	0	0%	0	0	0	0					0
Total	100%				444	100%				191					635
Regional totals:					2,356					665					3,022

Table 4 continued **British Columbia Harvest Distribution – 2006**

Operation Type	Southern Interior						Northern Interior				
	Volume (m ³) 31,302,086						Volume (m ³) 34,811,862				
	% of volume	M ³ / shift	Required shifts / yr	Days / year	No. operators / day	% of volume	m ³ / shift	Required shifts / yr	Days / year	No. operators / day	
Falling Systems											
Hand Fallers	8%	75	32,004	170	188	1%	75	3,853	140	28	
Feller-Bunchers	82%	400	64,468	190	339	99%	430	80,286	185	434	
Harvesters	10%	150	20,764	190	109	0%	150	0	185	0	
Total	100%				637	100%				461	
Yarding Systems											
Skidders	84%	350	75,488	190	397	78%	350	77,682	185	420	
R.T. Forwarders	7%	190	11,026	190	58	18%	240	26,654	185	144	
Excavator. Forwarders	0%	200	618	190	3	0%	200	834	185	5	
Cable Yarders	7%	135	16,078	190	85	3%	200	5,298	200	26	
Helicopters	2%	350	1,406	235	6	0%	400	0	225	0	
Cherry-pick	0%	150	0	100	0	0%	150	0	185	0	
Total	100%				549	100%				595	
Processing Systems											
Hand buck	6%	350	5,570	190	29	1%	400	737	185	4	
Delimb or Process	94%	250	117,411	190	618	99%	270	127,842	185	691	
Delimb / bark / chip	0%	240	0	235	0	0%	240	0	185	0	
Total	100%				647	100%				695	
Loading Systems											
Cable Loaders	0%	500	0	190	0	0%	500	0	185	0	
Hydraulic Loaders	87%	550	49,686	190	262	100%	550	63,294	185	342	
F.E. Loaders	13%	400	9,937	190	52	0%	400	0	185	0	
Total	100%				314	100%				342	
Trucking Systems											
Long Log	63%	135	146,076	190	769	62%	135	159,877	185	864	
Short Log	33%	135	76,516	190	403	35%	135	90,253	185	488	
Picker Trucks	4%	125	10,017	190	53	3%	125	8,355	185	45	
Chip Vans											
Total	100%				1,224	100%				1,397	
Regional totals					3,371					3,491	
Provincial totals	million m ³	90,544		operators	9,884						

BRITISH COLUMBIA HARVEST SYSTEMS PROJECTION – 2011

By 2011, licensees projected that harvest levels would undergo a net decrease compared to 2006. Based on their proportionate responses, the total annual harvest was estimated to be 87.421 million m³, or 95.7% of the 2006 total. Coastal licensees estimated a level of 91.6%, while Southern Interior licensees estimated 89.8% and Northern Interior licensees predicted a small increase of about 4%.

Projections for 2011 are shown in **Table 5**. The model incorporates the changes for regional volume as well as any changes to volume distribution by phase, number of operating days or production rates, and recalculates the required number of operators. The next step is the application of a new factor to represent a measure of attrition. Attrition estimates for both 2011 and 2016 are shown at the bottom of this page.

The final calculation shows the net increase or loss of operators compared to the total at the end of the previous 5-year period. As an example, in 2011 for the Southern Interior, the model suggests that 24 additional feller-buncher operators, 2 fewer harvester operators and 11 fewer handfallers, will be needed than in 2006. These changes result from less total harvest volume, the proportion of volume felled by each method, and attrition.

COMMENTS

By 2011, there is an expected province-wide need for a total of 9,257 harvesting operators, an amount that is 627 less than required in 2006. However, the anticipated attrition rates identified below account for losses that are greater than that difference, so there is actually a requirement for 1,795 “new” operator positions.

Coast

- Reduction of cable loaders and increase of hydraulic loaders.
- To remain competitive, expect an increase in the pace of mechanization. This trend is allowed by the fibre basket.
- Expect increased ground-based harvesting and decreased cable harvesting, and more productive excavator forwarding because of excavators with house-levelling capability.

Interior regions

- South - expect less use of front-end loaders because of fewer and smaller landings.
- North and South – expect little change in processing productivity – gains resulting from technology improvements will likely be offset by poorer wood quality.

Suggested strategies on which to concentrate prior to 2011:



Replace by Recruiting and Retraining

Attrition The key points in the chart below are that, by 2016, a cumulative total of 31% of workers are expected to retire in the Interior and 52% on the Coast. The *non-retirement* allowance (movement within or departure from sector) of 6% must then be added to each *retirement* allowance to account for the estimate of total workforce attrition. The derivations of these rates are shown on page 29 of this report.

		2006	2011 year end		2016 year end	
Retirement attrition allowance		Workforce start %	% attrition	Workforce balance - %	% attrition	Workforce balance - %
	Interior	100	13	87	21	69
	Coast	100	31	69	30	48
Non-retirement additional allowance			6%		6%	

Table 5

British Columbia Harvest Systems Projection – 2011

Operation Type	Coast Crown tenures							Coast Private land							Coast Total							
	Volume (million m ³)							Volume (million m ³)							Volume (million m ³)							
	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri ⁿ n rate	New opers	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri ⁿ n rate	New opers	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri ⁿ n rate	New opers	
Falling Systems																						
Hand Fallers	55%	91	104,620	160	654	37%	37	30%	94	18,620	163	114	37%	29					768	37%	66	
Feller-Bunchers	40%	544	12,728	231	55	37%	39	65%	526	7,210	235	31	37%	7					86	37%	46	
Harvesters	5%	238	3,637	218	17	37%	11	5%	250	1,167	218	5	37%	-1					22	37%	11	
Total	100%				726		88	100%				150		35					876		123	
Yarding Systems																						
Skidders	17%	364	8,084	160	51	37%	51	9%	364	1,443	210	7	37%	0					57	37%	51	
R.T. Forwarders	1%	250	692	185	4	37%	4	5%	250	1,167	235	5	37%	5					9	37%	9	
Excavator. Forwarders	40%	247	28,032	185	152	37%	80	42%	242	10,125	199	51	37%	16					202	37%	97	
Cable Yarders	24%	227	18,301	175	105	37%	-48	26%	217	6,990	180	39	37%	11					143	37%	-38	
Helicopters	8%	665	2,082	150	14	37%	-11	8%	700	667	150	4	37%	0					18	37%	-11	
Cherry-pick	10%	409	4,232	33	128	37%	100	10%	404	1,444	57	25	37%	16					154	37%	117	
Total	100%				453		176	100%				131		48					584		224	
Processing Systems																						
Hand buck	30%	323	16,077	165	97	37%	-21	28%	350	4,667	165	28	37%	11					126	37%	-10	
Delimb or Process	66%	302	37,830	268	141	37%	117	68%	255	15,558	252	62	37%	25					203	37%	142	
Delimb / bark / chip	4%	350	1,978	268	7	37%	7	4%	350	667	268	2	37%	2					10	37%	10	
Total	100%				246		104	100%				93		39					338		143	
Loading Systems																						
Cable Loaders	10%	425	4,073	150	27	37%	-30	7%	425	961	150	6	37%	-2					34	37%	-32	
Hydraulic Loaders	87%	527	28,576	194	147	37%	58	93%	507	10,702	204	52	37%	14					200	37%	71	
F.E. Loaders	3%	400	1,298	150	9	37%	9	0%	400	0	179	0	37%	0					9	37%	9	
Total	100%				183		36	100%				59		12					242		48	
Trucking Systems																						
Long Log	65%	176	63,929	213	300	37%	20	65%	147	25,797	213	121	37%	32					421	37%	52	
Short Log	28%	151	32,098	213	151	37%	151	28%	151	10,818	213	51	37%	23					201	37%	174	
Picker Trucks	3%	127	4,089	213	19	37%	19	3%	127	1,378	213	6	37%	3					26	37%	22	
Chip Vans	4%	400	1,731	235	7	37%	7	4%	400	583	235	2	37%	2					10	37%	10	
Total	100%				477		198	100%				181		60					658		258	
Regional totals					2,085		600					614		195					2,698		795	

Table 5 continued

British Columbia Harvest Systems Projection – 2011

Operation Type	Southern Interior							Northern Interior						
	Volume (million m ³)							Volume (million m ³)						
	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri' n rate	New opers	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri' n rate	New opers
	28,094							36,183						
Falling Systems														
Hand Fallers	6%	70	24,081	170	142	19%	-11	1%	75	4,824	140	34	19%	12
Feller-Bunchers	84%	415	56,865	190	299	19%	24	99%	440	81,412	185	440	19%	89
Harvesters	10%	170	16,526	190	87	19%	-2	0%	150	0	185	0	19%	0
Total	100%				528		12	100%				475		101
Yarding Systems														
Skidders	71%	350	56,991	190	300	19%	-22	80%	350	82,704	185	447	19%	107
R.T. Forwarders	15%	190	22,180	190	117	19%	70	15%	240	22,614	185	122	19%	6
Excavator. Forwarders	5%	200	7,024	190	37	19%	34	2%	200	3,618	185	20	19%	16
Cable Yarders	7%	135	14,567	235	62	19%	-7	2%	200	3,618	225	16	19%	-5
Helicopters	2%	350	1,605	100	16	19%	11	1%	350	1,034	100	10	19%	10
Cherry-pick	0%						0	0%						0
Total	100%				532		87	100%				615		133
Processing Systems														
Hand buck	5%	350	4,013	190	21	19%	-3	1%	400	905	185	5	19%	2
Delimb or Process	90%	260	97,249	190	512	19%	11	94%	270	125,971	185	681	19%	121
Delimb / bark / chip	5%	240	5,853	235	25	19%	25	5%	240	7,538	225	34	19%	34
Total	100%				558		34	100%				719		156
Loading Systems														
Cable Loaders	0%	500	0	190	0	19%	0	0%	500	0	185	0	19%	0
Hydraulic Loaders	90%	550	45,972	190	242	19%	30	100%	550	65,787	185	356	19%	78
F.E. Loaders	10%	400	7,024	190	37	19%	-5	0%	400	0	185	0	19%	0
Total	100%				279		25	100%				356		78
Trucking Systems														
Long Log	58%	135	120,701	190	635	19%	13	55%	135	147,412	185	797	19%	97
Short Log	33%	135	68,675	190	361	19%	35	35%	135	93,808	185	507	19%	112
Picker Trucks	4%	125	8,990	190	47	19%	5	5%	125	14,473	185	78	19%	42
Chip Vans	5%	240	5,853	190	31	19%	31	5%	240	7,538	185	41	19%	41
Total	100%				1,075		83	100%				1,423		291
Regional totals					2,971		240					3,588		760
Provincial total	million m ³	87,421			9,257		1,795							

BRITISH COLUMBIA HARVEST SYSTEMS PROJECTION – 2016

Licensees predicted harvest levels would be lower than in 2011 (**Table 6**). Based on their proportionate responses, the total annual harvest was estimated to be 81.406 million m³, or 93.8% of the 2011 total. Coastal licensees estimated a level of 97.7%, while Southern Interior licensees estimated 88.3% and Northern Interior licensees estimated 95.6%.

Between 2011 and 2016:

Coast

- Rate of coastal mechanization expected to increase.
- Further reduction of cable loaders.
- Coast may look to Interior as labour source.

Interior regions

- Significant shift to recovery of dead pine stands, using in-woods or satellite chipping techniques for recovery of biomass.
- Expect increase in harvesters and decrease in feller bunchers as operations move to more selective harvesting and away from clearcuts with feller bunchers.

By 2016, there is an expected province-wide need for a total of 8,232 harvesting operators, an amount that is 1,025 less than required in 2011. However, the anticipated attrition rates account for losses that are greater than that difference, so there is actually a requirement for 1,822 “new” operator positions.

Suggested strategies to employ prior to 2016

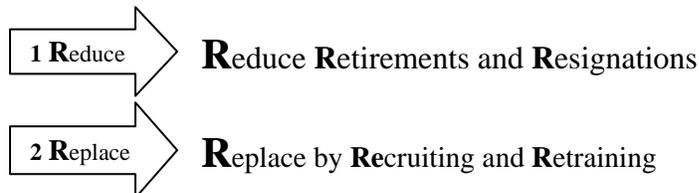


Table 6

British Columbia Harvest Systems Projection – 2016

Operation Type	Coast Crown tenures							Coast Private land							Coast Total						
	Volume (million m ³) 16,144							Volume (million m ³) 5,831							Volume (million m ³) 21,975						
	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri ⁿ / n rate	New opers	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri ⁿ / n rate	New opers	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri ⁿ / n rate	New opers
Falling Systems																					
Hand Fallers	30%	80	60,541	170	356	36%	-62	25%	80	18,221	170	107	36%	34					463	36%	-28
Feller-Bunchers	65%	620	16,925	235	72	36%	37	70%	620	6,583	235	28	36%	8					100	36%	45
Harvesters	5%	275	2,935	235	12	36%	2	5%	275	1,060	235	5	36%	1					17	36%	3
Total	100%				441		-24	100%				140		44					580		20
Yarding Systems																					
Skidders	17%	350	7,841	150	52	36%	20	17%	350	2,832	150	19	36%	14					71	36%	34
R.T. Forwarders	10%	250	6,458	200	32	36%	30	10%	250	2,332	200	12	36%	8					44	36%	38
Excavator. Forwarders	45%	250	29,060	200	145	36%	48	45%	250	10,495	200	52	36%	20					198	36%	68
Cable Yarders	20%	220	14,677	180	82	36%	15	20%	220	5,301	180	29	36%	5					111	36%	19
Helicopters	8%	700	1,845	200	9.2	36%	0	8%	700	666	200	3.3	36%	0					13	36%	1
Cherry-pick																					
Total	100%				321		113	100%				116		48					436		161
Processing Systems																					
Hand buck	26%	150	27,983	180	155	36%	93	26%	150	10,107	180	56	36%	38					212	36%	131
Delimb or Process	70%	260	43,465	235	185	36%	95	70%	260	15,698	235	67	36%	27					252	36%	122
Delimb / bark / chip	4%	400	1,614	235	7	36%	2	4%	400	583	235	2	36%	1					9	36%	3
Total	100%				347		190	100%				125		66					473		256
Loading Systems																					
Cable Loaders	5%	500	1,614	160	10	36%	-7	5%	500	583	160	4	36%	0					14	36%	-8
Hydraulic Loaders	93%	550	27,298	200	136	36%	42	95%	550	10,071	200	50	36%	17					187	36%	59
F.E. Loaders	2%	400	807	150	5	36%	0	0%	400	0	150	0	36%	0					5	36%	0
Total	100%				152	30%	35	100%				54		16					206		51
Trucking Systems																					
Long Log	65%	140	74,955	235	319	36%	127	65%	140	27,071	235	115	36%	38					434	36%	165
Short Log	28%	145	31,175	235	133	36%	36	28%	145	11,259	235	48	36%	15					181	36%	52
Picker Trucks	3%	125	3,875	235	16	36%	4	3%	125	1,399	235	6	36%	2					22	36%	6
Chip vans	4%	400	1,614	235	7	36%	7	4%	400	583	235	2	36%	2					9	36%	9
Total	100%				475		174	100%				172		57					647		232
Regional total					1,735		488					606		231					2,342		720

Table 6 continued

British Columbia Harvest Systems Projection – 2016

Operation Type	Southern Interior							Northern Interior						
	Volume (million m ³)							Volume (million m ³)						
	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri' n rate	New opers	% of volume	m ³ / shift	Shifts / yr	Days / yr	# oper. / day	Attri' n rate	New opers
Falling Systems														
Hand Fallers	6%	70	21,256	170	125	27%	22	1%	75	4,618	140	33	27%	8
Feller-Bunchers	79%	430	45,559	190	240	27%	21	92%	450	70,806	185	383	27%	61
Harvesters	15%	180	20,665	190	109	27%	45	7%	180	13,468	185	73	27%	73
Total	100%				474		88	100%				489		142
Yarding Systems														
Skidders	64%	360	44,086	190	232	27%	13	81%	360	77,925	185	421	27%	95
R.T. Forwarders	20%	200	24,798	190	131	27%	45	12%	240	17,317	185	94	27%	4
Excavator. Forwarders	7%	200	8,679	190	46	27%	19	3%	200	5,195	185	28	27%	14
Cable Yarders	7%	135	12,858	235	55	27%	9	3%	200	5,195	200	26	27%	14
Helicopters	2%	350	1,417	235	6	27%	-6	1%	350	990	225	4	27%	-3
Cherry-pick														
Total	100%				469		81	100%				573		124
Processing Systems														
Hand buck	5%	350	3,543	190	19	27%	3	1%	400	866	185	5	27%	1
Delimb or Process	85%	260	81,071	190	427	27%	53	89%	270	114,161	185	617	27%	120
Delimb / bark / chip	10%	260	9,538	235	41	27%	22	10%	260	13,320	225	59	27%	35
Total	100%				486		79	100%				681		156
Loading Systems														
Cable Loaders	0%	500	0	190	0	27%	0	0%	500	0	185	0	27%	0
Hydraulic Loaders	90%	550	40,579	190	214	27%	37	98%	550	61,710	185	334	27%	74
F.E. Loaders	10%	400	6,200	190	33	27%	6	2%	400	1,732	185	9	27%	9
Total	100%				246		43	100%				343		83
Trucking Systems														
Long Log	56%	140	99,193	190	522	27%	58	56%	140	138,533	185	749	27%	167
Short Log	30%	145	51,307	190	270	27%	6	30%	145	71,655	185	387	27%	17
Picker Trucks	4%	125	7,935	190	42	27%	7	4%	125	11,083	185	60	27%	3
Chip vans	10%	260	9,538	235	41	27%	18	10%	260	13,320	225	59	27%	29
Total	100%				874		90	100%				1,255		217
Regional totals					2,549		380					3,341		722
Provincial total		million m ³	81.406		8,232		1,822							

ROAD CONSTRUCTION EQUIPMENT AND OPERATORS

Table 7 shows estimates for number of operators for road construction equipment. The estimation process for road construction phases is similar to that for harvest machines. Licensee respondents first provided counts for the number of pieces of road construction equipment that were used to develop and access the reported volumes. Those responses were then extrapolated to provincial totals based on the proportions of the survey volume to the regional total. For instance, licensees in the Southern Interior reported 57 road graders. The Southern Interior survey volume represented about 43% of the regional volume, so that equates to 131 graders for the Southern Interior.

Table 7 Estimated number of road construction operators

	RoadConstruction Machines	Coast	S. Interior	N. Interior	Prov. Total
2006 90.54 million m ³	Crawler tractors	67	191	166	425
	Road graders	84	131	187	402
	Rock drills	103	20	8	132
	Excavators	199	187	212	597
	Front-end loaders	12	9	29	50
	Gravel / rock trucks	155	104	191	450
	Other	6	12	50	67
	Total	626	654	843	2124
2011 87.42 million m ³	Crawler tractors	62	172	173	406
	Road graders	77	118	194	389
	Rock drills	94	18	9	121
	Excavators	182	168	220	570
	Front-end loaders	11	8	30	49
	Gravel / rock trucks	142	93	199	434
	Other	5	10	52	68
	Total	574	587	877	2037
2016 81.40 million m ³	Crawler tractors	60	152	165	377
	Road graders	75	104	186	365
	Rock drills	92	16	8	117
	Excavators	178	148	211	537
	Front-end loaders	11	7	29	47
	Gravel / rock trucks	139	82	190	412
	Other	5	9	50	64
	Total	561	518	839	1918

In 2006, there were an estimated 2124 operators of road construction equipment working in the forest industry throughout the province of British Columbia. The total is expected to decline by about 100 during the next five year period and by an additional 100 by 2016. The expected reduction resulted from anticipated declines in annual harvest volume.

- Road construction technology is unlikely to change as much as harvest phase technology. There may be some marginal improvements in productivity but these will be incremental.
- There is an increasing trend towards excavator construction in the Interior. That is likely to continue and may alter the mix of machines shown here..
- Road building contractors may work for the forest industry, the oil and gas sector, or in highways construction.

MODEL RESULTS – DISCUSSION

The model estimates the number of full time operator positions needed to produce the volume from operational phases. The model does not address issues which may surround part-time or part-year scheduling.

Current prices for new equipment (\$350,000 to \$800,000) dictate that owners strive towards maximizing annual operating days and shift production. Low annual scheduling and low production directly affect harvest cost. Those issues may indirectly impact on training and worker performance if a replacement worker is ill-trained or ill-equipped to do the task. It was not part of this initial survey to make a determination about part-time workers. Such a pool may have different interests and training needs than the workers who responded in this survey.

Using the assumptions shown in the model, there is a predicted reduction from 9,884 to 8,232 net logging equipment operator positions between 2006 and 2016 – in other words, 1,652 fewer workers are projected to be needed, in total, to fill the required work phases. The decrease represents a reduction of about 17%. The forest industry workforce has been declining in British Columbia since 1994. Applying the 17% reduction from the model to the 2005 provincial estimate of 21,600 forestry workers suggests that, by 2016, there will be less than 18,000 workers classed as ‘forestry & logging with support’.

The workforce numbers calculated by the model do not suggest that additional net operator positions are needed in the province. The model examined 19 key industry job categories as a surrogate for forest industry employment levels. Employment levels are sensitive to annual harvest volume, annual operating days and phase productivity, before allowing estimation for attrition loss.

The retirement attrition values used in this document are based on the surveys from this project. Those values, when combined with an allowance for non-retirement employee movement, indicate a continuing need for replacement operators to fill vacated positions. Using the numbers identified in the model indicates a need for approximately 1,800 replacement operators in 2011 and about the same number in 2016.

Future reality may be different than these estimates. If attrition is less than shown, then fewer replacement operators will be needed.

The North and central Interior already have high mechanization, and there is not likely to be great evolution in systems mechanization. However, individual machine phases could become mechanically or electronically more complex.

Southern Interior operations have become as mechanized as they are likely to become within this time frame.

The Coast still has potential for further mechanization, particularly as forest operations shift to second growth, and mechanization is a key component in any strategy directed toward revitalizing the sector.

FACTORS INFLUENCING THE WORKFORCE

The Operator Prediction Model provides an estimate of how many total workers are needed to do phase tasks, and the assumptions predicted a decrease of net logging operator positions by 2016.

If all else stayed the same, a conclusion might be that few *new* workers are needed, because if everyone involved sorted themselves out properly, employee departures might possibly be balanced by redistribution within the workforce. That would probably mean that relatively small amounts of in-house or on-the-job training would suffice to adequately address the training needs of redistributed staff. This scenario pre-supposes a reasonably stable workforce whose employees have high levels of satisfaction with their job and their industry. Workers might leave a job (by promotion, for example) but would tend to stay in the industry.

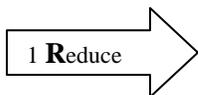
Instead, several factors influence forest industry workers' decisions to remain in or leave the industry. The Training Surveys were intended to solicit information on training needs, but also on attitudes of respondents representing Licensees, Contractors and Employees. The surveys accomplished that and results are presented below and in **Appendix 4**.

Purely descriptive information is in the Appendix, while opinions or training specifics are in the following report sections. If extensive, some results may be summarized in the report body and presented more fully in the Appendix.

RETIREMENT / DEMOGRAPHICS

The word “attrition” has many meanings. When applied to personnel staffing, it usually is understood to mean the shrinking of a work force because of retirement or resignation. An expanded definition is:

- Retire
- Move up (within the sector – internal job changes e.g. young handfaller moves to machine)
- Move out (for good)



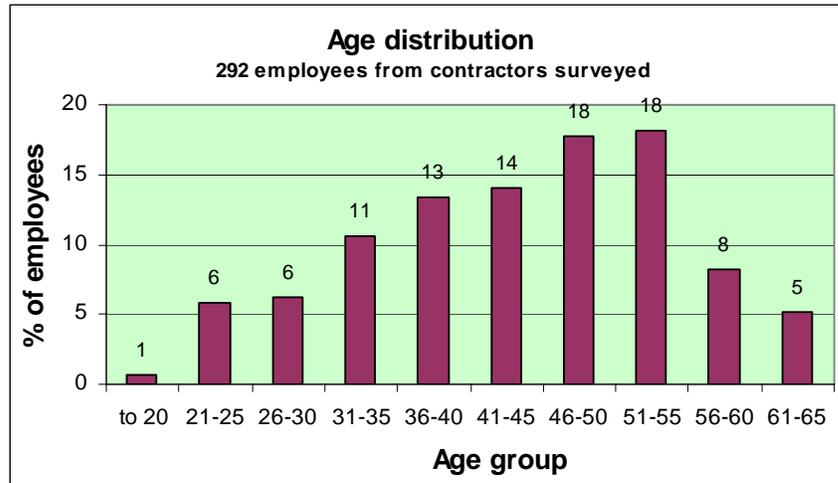
Reduce Retirements and Resignations

New additional workers are always required in an expanding workforce, and predictive numbers can be related to expansion plans. Predictions may be harder to make when the workforce is static or in decline, particularly if workers feel a “negativity culture” towards their industry, employer or job. Concerns about long-term stability, for example, may prove to be strong motivators to retire as soon as possible, or to choose a different industry that pays more money.

The aging population of baby-boomers touches all industries, including the forest and logging sectors. Surveys normally show a wave or bulge representing the population born between 1945 and 1955. (In some media the upper range occasionally includes 1960.) In 2006, the 10-year range represented workers between 51 and 61 years of age.

This study collected age distribution information during the employee survey and from available contractor records of employees. FERIC used the contractor-supplied data to construct the chart in **Figure 4**. Although the contractors in the survey had more than the 292 employees shown, age information was not easily obtainable for the remainder. FERIC did not use age information from the employee surveys because there were fewer responses from employees and because those employees were already part of contractor's responses.

Figure 4 Employee age distributions – all regions

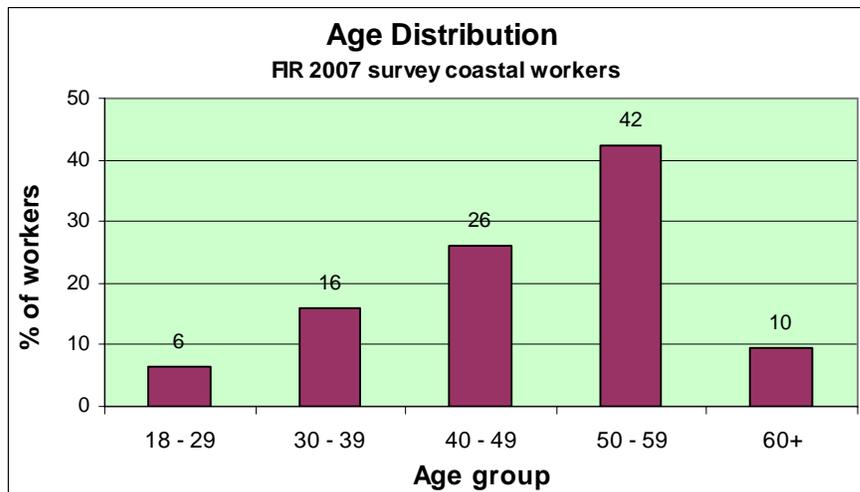


Contractors were selected by their associations for inclusion in the survey based on location distribution, size, history and stability, with the intention of soliciting a cross-section of contractor opinions. Although not a random process for *contractor* inclusion, FERIC considers the distribution of their workforce to be an acceptable approximation for use in this report. The 292 employees represent about 3% of the estimated operator workforce in British Columbia in 2006.

The graph clearly shows the bulge for baby-boomers, and it also very clearly shows that there were few workers (only 13%) under 30 years of age. These results are very similar to data reported by Industry and Trade Division of Natural Resources Canada (Huq 2007). Although in slightly different age categories, those results showed that 14% of employees in forestry and logging across Canada were 30 years old or younger.

Additionally, Forest Industrial Relations reports demographic data but only for coastal BC (FIR 2007). A summation based on their results is in **Figure 5**. The FIR data tends to show larger proportions of older employees and is likely explained by the large unionized workforce on the coast, relative to the other regions of the province. As the industry shrinks, older employees migrate to the remaining jobs while younger workers are laid off.

Figure 5 Age distribution – coastal workers



The demographics data from all sources show two distinct trends.

- A large block of older employees is getting closer to retirement.
- Few young people are entering the industry.

Attrition calculation

The data from these charts were used to calculate the attrition rates used earlier in **Tables 5 and 6** (starting on page 20). *Retirement* attrition is assumed to be at age 60, and an additional estimated *non-retirement* allowance accounts for operators rotating between jobs in the industry, or departing for other industries. **Table 8** below illustrates the logic and summarizes the values.

Figure 4 was used to calculate rates for the Interior.

- 2016 – Cumulative total of 31% of workers expected to retire (sum of oldest three age groups).
- 2011 – 13% of the workforce expected to retire (sum of oldest two age groups).

The attrition rate for 2011 is therefore 13%, and for 2016 the rate must be 21% in order to generate the required cumulative total.

Similarly, the FIR data from **Figure 5** was used to calculate rates for the Coast.

- 2016 – Cumulative total of 52% of workers expected to retire (sum of oldest two age groups).
- 2011 – 31% of the workforce expected to retire by 2011 (all of the oldest group and one-half of the second-oldest group)

The Coastal attrition rate for 2011 is therefore 31%, and for year 2016 the rate must be 30% in order to generate the required cumulative total.

The *non-retirement* allowance of 6% must be added to each *retirement* allowance to account for the estimate of *total workforce attrition*.

Table 8 Attrition Calculations for 2011 and 2016

		2006	2011 year end		2016 year end	
Retirement Attrition Calculation		Workforce start %	% attrition	Workforce balance - %	% attrition	Workforce balance - %
	Interior	100	13	87	21	69
	Coast	100	31	69	30	48
Non-retirement additional allowance			6%		6%	

ATTITUDES AND OPINIONS

Although the age distribution of the population can not be altered, the point in time at which workers choose to retire or depart can be influenced. This requires an understanding of the factors that contribute to satisfaction levels, which correspondingly influence attitudes, opinions and beliefs.

Questions on all Training Surveys dealt with opinions about the forest industry. Licensees, contractors and employees were asked to explain whether or not they would recommend work in the forest industry to a relative or friend.

Would you recommend the forest industry?

The question was asked at the end of each survey after respondents had answered the other questions. Contractors had replied about staffing, turnover, hiring and training process, personnel policies, and skill sets. Licensees had determined in-house and out-source training, and future requirements. Employees had responded about their background, satisfaction levels, reasons for making various choices, and their

skill sets and training. In short, respondents answered the question after having spent time thinking about why the subject had some importance, particularly to them.

Tables 9, 10 and 11 contain summaries of their responses. The employee and contractor groups were very pessimistic about industry viability as a continued, long-term employer. Sixty percent of employees and 65% of contractors would not recommend their industry. Among the nine licensees, there were two definite “no’s” and a 3rd probable. The remaining six licensees said “yes, they would recommend the industry” but half of those responses were given on the expectation of capitalizing on anticipated labour shortages – they gave a positive slant to a gloomy situation. If those three replies are counted as pessimistic views of the industry, the licensee “no” response rate rises to 66%, also in the same range as the other groups. Even if they are not counted differently, the gloomy connotation remains.

Table 9 Employee Responses – Employee survey question 17

“No” responses			“Yes” responses		
Reasons	Number of		Reasons	Number of	
	Comments	Replies		Comments	Replies
Poor wages	29		Good wages	14	
Hours too long	26		Other	11	
No future	26		Like outdoors	5	
Lack of stability	24		Competitive benefits	5	
Other	19		Enjoy the work	4	
Less timber or fibre base	10	92	Make good living with right company	2	35
Unsafe working conditions	6		Freedom to work on your own	1	
Poor benefits	3		Opportunities because of retirees	1	
No advancement	2				
Training	2				
Total	147		Total	43	
No. of surveys that had no comments			No. of surveys that had no comments		
			28		
Total ” No” replies			Total “Yes” replies		
			63		
Number of replies “maybe yes or maybe no”			4		
Number of replies with no answer given			4		
Total respondents in survey			174		

Table 10 Contractor Responses – Contractor survey question 21

“No” responses			“Yes” responses		
Reasons	Number of		Reasons	Number of	
	Comments	Replies		Comments	Replies
Industry uncertain /unstable	9		Would like to keep family business running	1	
Poor pay or no profit	3		It’s more technically-oriented work	1	
Too much stress	1		Like outdoors	1	
High costs and no markets	1	13	Good wages	1	6
Too cyclical	1		With caution, to expand to other fields	1	
WCB is a problem	1		If they like the work and the long hours	1	
Licensees don’t assist contractors enough	1				
Total	17		Total	6	
No. of surveys that had no comments			No. of surveys that had no comments		
			1		
Total ” No” replies			Total “Yes” replies		
			7		
Number of replies “maybe yes or maybe no”			1		
Number of replies with no answer given			0		
Total respondents in survey			21		

Table 11 Licensee Responses – Licensee survey question 8

Yes	There is going to be a shortage of skilled forestry workers in the next few years. Should use the Scandinavian training model, to get a professional forest worker.
	Recommend young people getting trained in mechanized part of the industry
	I believe there will be a shortage of skilled workers in the very near future.
	Although the industry experiences global economic fluctuations, steady work in a good working environment is available.
	Long term varied work
No	I have in the past and they didn't like it, but I have enjoyed my career with it's ups and downs
	Long hours and exposure to the elements. Not a full year of employment. Questionable future given the uncertainty of "life after beetle."
	Pay does not match work conditions. Too much red tape. Seasonal constraints can affect work year.
	No comments

Surveys from other organizations

Alberta Forest Products Association

In 2005, the Alberta Forest Products Association (AFPA) released the results of a study of forestry graduates from Alberta colleges and universities (AFPA 2005). Their study indicated that the Province of Alberta had approximately 1000 foresters and forest technicians. About 580 were between the ages of 30 and 55 years, and a further 45 were older than 55. The study estimated that the majority of workers were over the age of 45 and that 1/3 of the professionally trained forestry workforce would retire within 5 to 10 years.

Concurrently, enrolment at Northern Alberta Institute of Technology (NAIT) dropped from about 80 to 30 students between 1994 and 2002, and University of Alberta (U of A) enrolment dropped from about 175 to 95 students. Decreasing enrolment in forestry based programs resulted in the closure of GP Regional College. Other institutions faced challenges in maintaining programs.

The AFPA surveyed both forestry and non-forestry students to determine factors that influenced forestry enrolment.

Among forestry students, the findings showed:

- 65% of students currently enrolled in forestry programs were from forestry based communities.
- 75% of these students had previous experience in the forest products industry.
- The vast majority (92.5%) were satisfied with their career path.

When asked why students were not enrolling in forestry programs, the top 5 reasons were:

1. Lack of understanding of forestry as a career.
2. Media coverage that depicted industry as being in trouble (a sunset industry sector with little or no growth).
3. Forestry was perceived as being environmentally unfriendly.
4. Career opportunities in other areas were seen as being more lucrative.
5. Individuals were not prepared to move to smaller or northern centers to pursue their careers.

ABCFP 2006 membership survey

The Association of British Columbia Forest Professionals (ABCFP) released the results of their 2006 membership survey conducted during the summer of 2006 (ABCFP 2006). Over 1000 members took part in the survey, which resulted in a response rate of 20%. One of their questions was “Assuming you have children, would you recommend they pursue a career in forestry?”

Sixty percent of the people who responded said they would not encourage their children to pursue a career in forestry. The three most common reasons were:

- Long-term instability.
- Pay is too low.
- Lack of employment opportunities and job mobility.

Respondents gave additional reasons for discouraging their children from pursuing a career in forestry.

- Forestry is a poorly understood and respected profession.
- Forest sector is in decline.
- Lack of environmental stewardship in forest management.
- Bureaucracy is eroding and taking the enjoyment out of the practice of forestry.
- Poor lifestyle including: being forced to live in remote areas, not enough work in the outdoors and poor working conditions.
- Children have already made another career choice.
- Too much risk and liability.
- Children's perception is that forestry is not a progressive industry.

Forty percent of respondents said they would encourage their children to pursue careers in forestry. The three most common reasons were:

- Forestry is an interesting, challenging and dynamic profession.
- There will be many career opportunities to explore because of the competitive advantage of BC's forest sector, agro forestry, the aging workforce, the lack of students entering post-secondary forestry programs and the current shortage of people working in the profession.
- The lifestyle and work-life balance offered by the profession.

EMPLOYEE SURVEY RESULTS

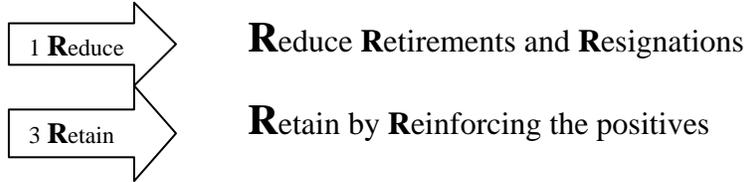
The fore-going opinion responses about working in the forest industry were positioned as the lead presentation about attitudes because they encapsulate clearly "what everybody already knows." They represent what people think and believe and capture the essence of discussions heard increasingly frequently in the province.

The results from the rest of the surveys from this project are presented below and in the Training Section of this report. Discussions of some of the observations from the tables above are presented at those times. (For instance, the topic of wages received positive and negative critique from employees and contractors.) The surveys need to be interpreted and used in the context of the generally dissatisfied attitudes in which they were provided.

Each set of results is linked to at least one of the Recovery Concepts. The hope is to stimulate discussions about how problems might be remedied and converted into solutions.

In the balance of this report, questions are identified by the number and type of survey from which they originated. EQ 4, CQ 4, and LQ 4 all refer to question number 4, but respectively from Employee, Contractor or Licensee surveys. Many of the illustrations portray a graphic representing an 'Importance Value', which is a relative ranking measure showing how closely the average response value for an answer (factor) approached the maximum possible value. The maximum was usually 3 because most questions could be ranked for 4 possible answers (values of 0, 1, 2, 3.) The number of ranks is shown with each question. Answers or factors with an average value greater than the mid-point represent a majority feeling.

The presentations immediately following summarize survey questions targeting *interest in industry, job or employer* (EQ 4, 5, 6), *satisfaction levels* (EQ 8), and *reason for choosing this job* (EQ 9). Two additional questions dealt with changing employment (*primary reasons* – EQ 14 and *drawbacks* – EQ 16). All the above questions are related to Concept 1, and portions of the latter two may also apply to Concept 3.



INTEREST IN THE INDUSTRY

Figure 6 shows how employees responded when asked why they had been interested in the industry. In the category of *wages* the average response value for ‘all respondents’ was 2.2, meaning that most of the 174 operators ranked *wages* as ‘very important’. *Wages* was clearly the primary motivator amongst responding operators for selecting the forest industry as an employer.

EQ 4 What interested you about the logging industry? 171 responses - 3 did not identify their location

Choice of factors		Analysis rank	
Family business	Attractive work environment	V = Very important	Value 3
Friend or relative	Coincided with other seasonal work	S = Somewhat important	Value 2
Independence	Potential for advancement	L = Little importance	Value 1
Only work available	Good wages	N = Not a factor	Value 0
Good benefits			

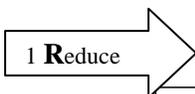
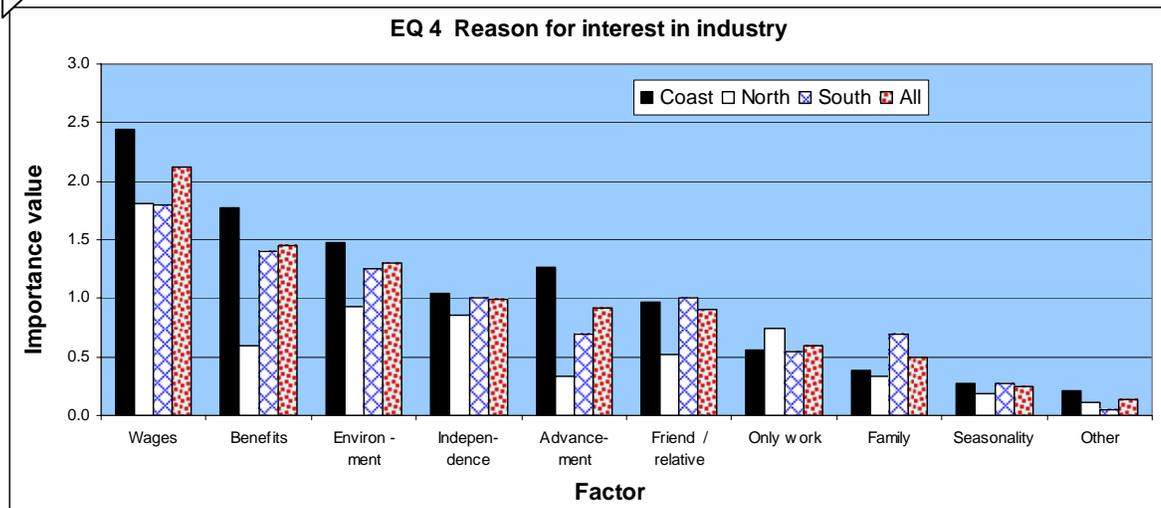


Figure 6 Reasons for interest in industry



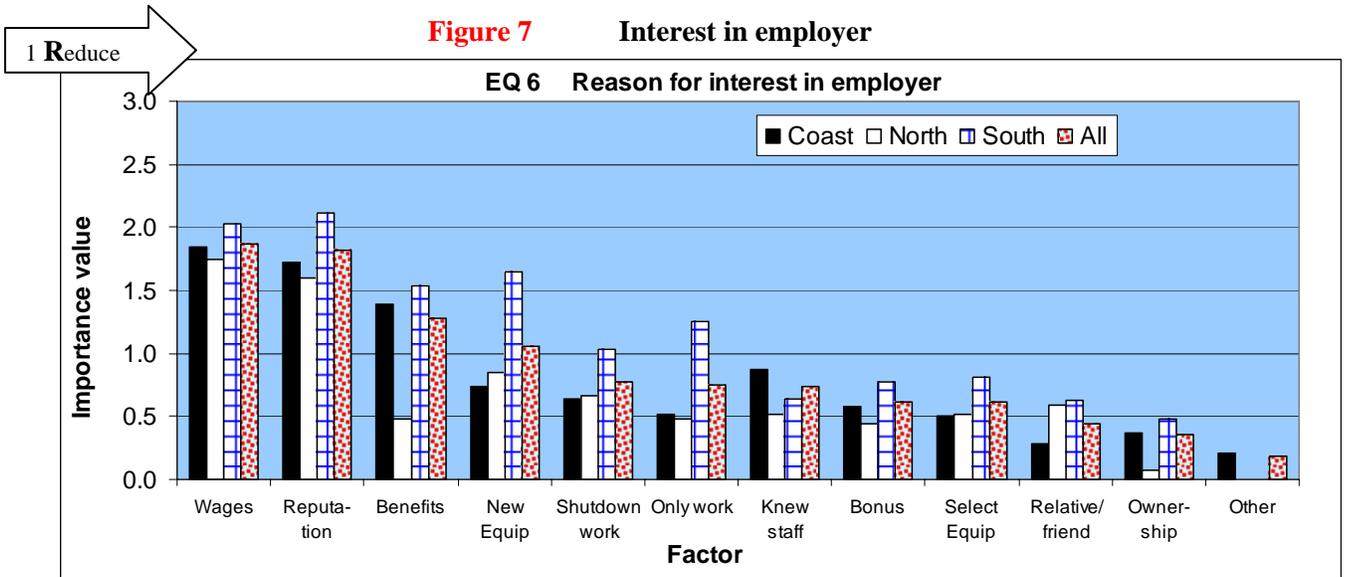
FACTORS FOR CHOOSING THIS EMPLOYER

Figure 7 illustrates factors important in choosing the particular employer. Again, on average over all regions, *wages* was the most important consideration for selecting a particular employer, but *contractor reputation* had almost an equal rating. In the South, *competitive benefits* and *new equipment* were also important influences (>1.5 average value).

EQ 6 What interested you about this employer?

171 responses - 3 did not identify their location

Choice of factors		Analysis rank	
Only work available	I knew some of the employees Pays quality and / or production bonus Provides other work during shutdown Involves operator in machine selection Encourages workers to take ownership in operations	V = Very important	Value 3
Long-term good reputation		S = Somewhat important	Value 2
Competitive wages		L = Little importance	Value 1
Competitive benefits		N = Not a factor	Value 0
Is relative or friend			
Has new equipment			
Other			



FACTORS FOR CHOOSING THIS JOB

Again, *wages* was the most important criteria in choosing the specific job but *work environment*, *benefits*, and *employer reputation* were also rated highly (**Figure 8**).

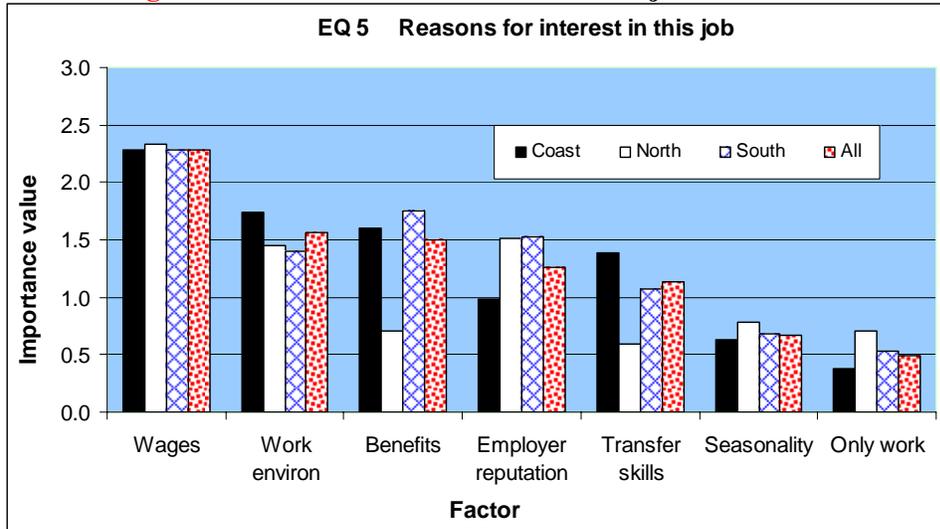
EQ 5 What interested you about this job?

171 responses - 3 did not identify their location.

Choice of factors		Analysis rank	
Good wages	Reputation of contractor or company	V = Very important	Value 3
Work environment		S = Somewhat important	Value 2
Good benefits	Potential to learn new skills that can transfer to other work	L = Little importance	Value 1
Only work available		N = Not a factor	Value 0
Seasonality of work			



Figure 8 Reasons for interest in this job



A later question in the survey returned to the reasons for selecting the particular employment. However, unlike EQ 5 above, EQ 9 below is probably not specifically tied to the respondent's particular occupation. Instead, respondents likely answered the following question based on a merged view of industry/employer/occupation.

EQ 9 *Did you have other job prospects, but still chose this job? Which factors helped you decide?*

Choice of factors			Analysis rank	
Wages	Boss	New equipment	V = Very important	Value 3
Location	Relative/friend	Working hours	S = Somewhat important	Value 2
Benefits	This company	Safety record	L = Little importance	Value 1
Opportunities for advancement	Work environment		N = Not a factor	Value 0

There were 174 respondents in total. 3 did not identify their region and I gave no answers to this question. Of the remaining 170, a total of 45 (26%) Answered "No", meaning they accepted this job because they had no other prospects. The remaining 125 workers answered "Yes"; they accepted this job even though they had other prospects. The reasons provided by those workers are shown in the graph below.

Figure 9 illustrates the range of replies. The seven factors with the highest ratings are shown along with the averaged response value for the four lowest-ranking factors. The four factors that were not considered to be strong motivators were *relative/friend*, *this company*, *new equipment*, and *opportunities for advancement*.

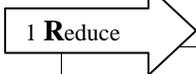
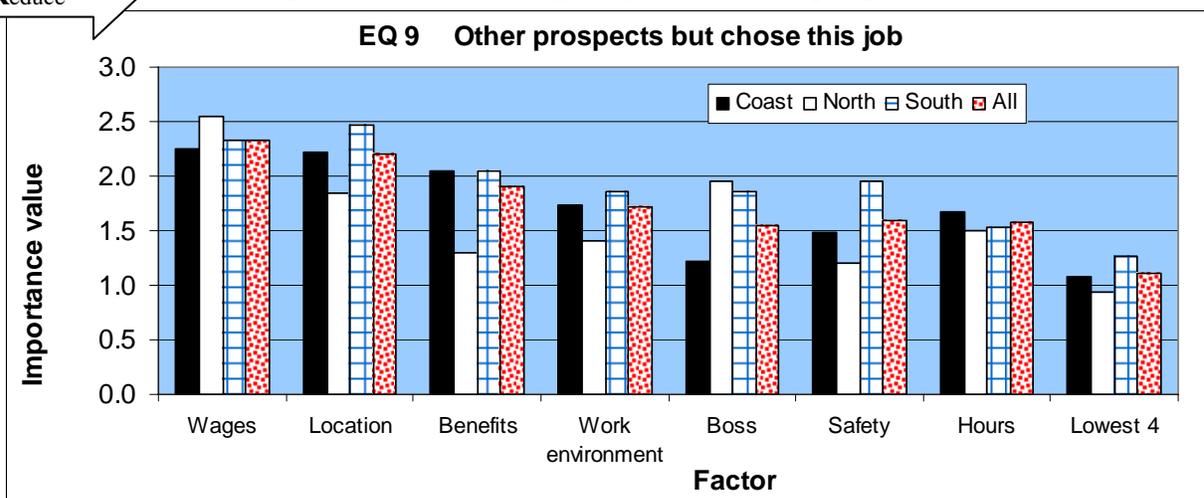


Figure 9 Choosing this job over other prospects



SATISFACTION WITH INDUSTRY, JOB AND EMPLOYER

EQ 8 asked *How satisfied are you with –? a) The logging industry; b) This job; c) This employer - : Very Satisfied Satisfied Not very satisfied.* The answers are illustrated in the charts in **Figure 10**.

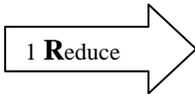
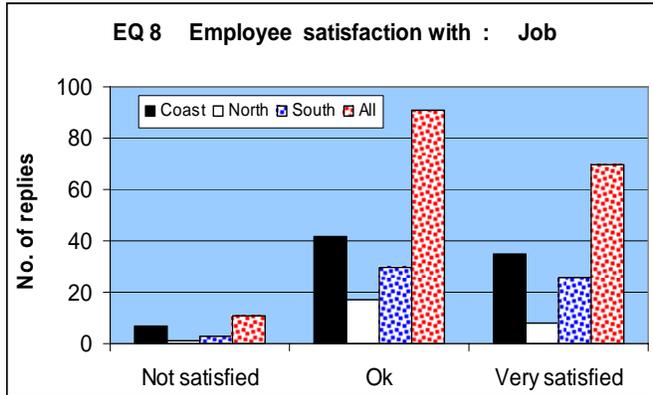
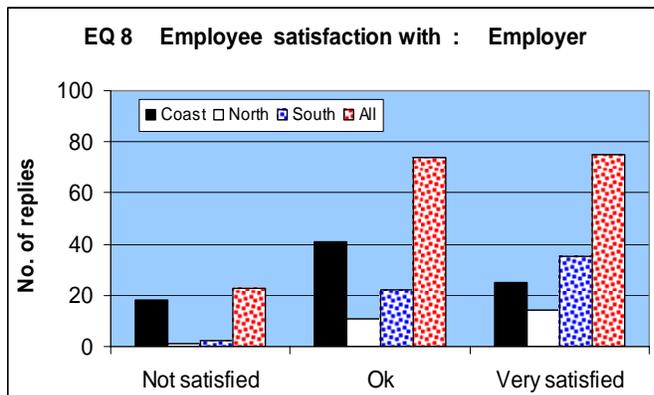


Figure 10 Employee satisfaction level



171 responses - 3 did not identify their location



These answers are interesting compared to the later answer in EQ 17 about recommending the industry to relatives or friends. Here, there was a noteworthy group that was not happy with the industry, but employees generally were fairly satisfied with their job and particular employer. The ‘not’ proportion was 72 replies, or about 40% of respondents. By the end of the survey questions, the dissatisfied count had risen to 103 or nearly 60%. There could be various reasons for this but one strong possibility is that employees increasingly recognized sources of dissatisfaction as they thought more about their employment. This suggests the following conclusion. Many workers appear to consider their long-term future at risk even though they are satisfied with their job and employer.

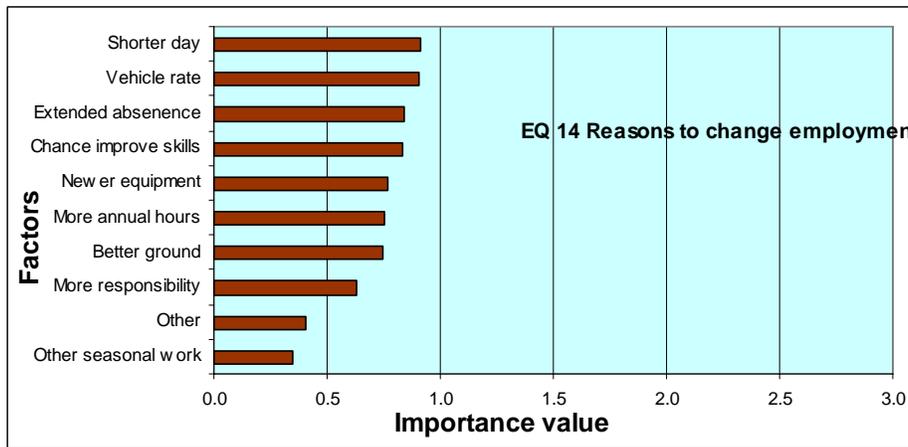
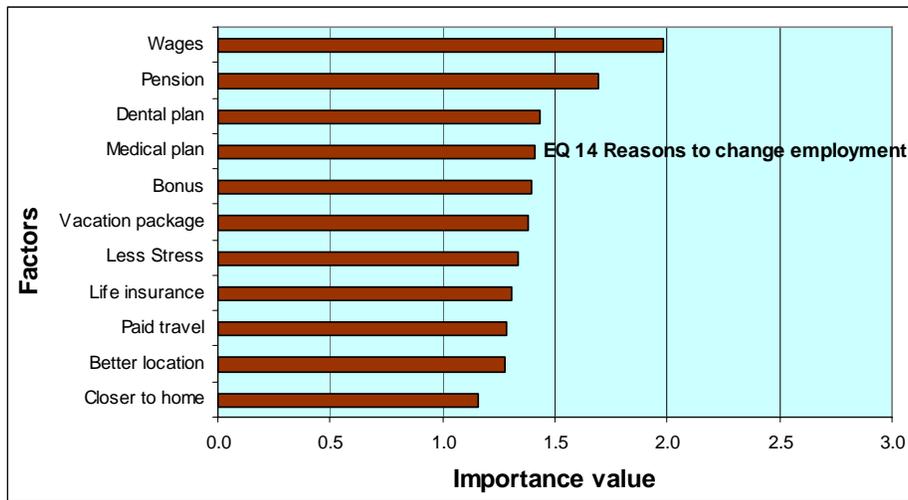
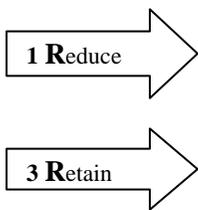
PRIMARY REASONS TO CHANGE EMPLOYMENT

Respondents' replies about changing employment are illustrated in **Figure 11**.

EQ 14 *What would be the primary reasons that would cause you to change employment?* 174 responses

Factors				
Better match to other seasonal work	Better wages	Better benefits, such as		
Better terrain and timber	Better location	Pension	Life insurance	
More opportunity to improve skills	Closer to home base	Medical coverage	Production/quality bonus	
Shorter time portal to portal	Newer equipment	Dental coverage	Extended absence	
Increased annual hours	Less stress	Vacation package	Vehicle allowance	
More responsibility		Other benefits ?	Paid travel to home base	
Rank	V = Very important	Value 3	L = Little importance	Value 1
	S = Somewhat important	Value 2	N = Not a factor	Value 0

Figure 11 Reasons to change employment



The primary inducement that might cause workers to change jobs was better wages, followed by five consecutive topics related to better benefits. The most important benefit was considered to be a pension, which is not unusual for this age group. The related topics of *better location* and *closer to home* did not show more strongly than their mid-level rankings. That is surprising because remoteness and travel time are frequently cited in casual conversations as *disincentives* in the industry. A possible reason may be because of the wording of the survey question, where all items relating to benefits were grouped

sequentially. There were indications that some employees treated the whole group with very similar answers. If the subject of ‘benefits’ is considered as the next-most important topic after *wages*, then sequentially *stress* and *location* follow next. It would probably have been better to ask about the relative importance of various benefits in a subsequent question.

WAGES AND HOURS OF WORK

Wages have been shown to be the single largest factor in attracting workers to the industry, employer and job, and they are the largest stated inducement to leaving the current employer. **Table 12** illustrates the hourly wages, work site hours and paid travel reported by 132 responding employees. There were 42 other respondents that did not provide the requested information. Similar pertinent information was extracted from the contractor’s responses on staffing levels, so these topics could be examined over a larger group. All of the Employee results are accounted for within Contractor record systems. The two numeric values of 47 in the South region happen to have the same total, but they are not the identical group of workers.

There is a higher proportion of handfallers in the contractors record sets for the Coast than for the employees who replied in the Employee Surveys, and this greater weighting explains the lower work site hours and higher hourly wage from the contractor data.

Staffing lists from South region contractors also included some service and support staff with hourly rates between \$12 and \$15 per hour. The South region Employees Survey grouping includes only logging workers. That grouping shows a higher hourly wage.

Table 12 Wages and hours of work reported in surveys

Employee survey		No. of replies	Region	Days/week	Work site, hours	Average wage \$/hr	% of respondents with no paid travel	Avg travel hours when paid
3 Retain		64	Coast	5.30	9.63	31.84	55	1.28
		21	North	5.10	11.3	25.77	43	1.17
		47	South	5.06	10.5	25.27	45	1.11
Contractor records								
		116	Coast		8.56	37.42		
		86	North		10.0	26.25		No data
		47	South		10.5	22.92		

Wage rates are for straight time before overtime or bonus. Although they may seem high when compared to wages for many urban workers, they are not very high compared to other sectors within and outside of British Columbia. Forest workers are further influenced by annualized ‘losses’ because their work year is rarely more than 9 months and is frequently much less. Wage differentials that no longer favor forestry are one of the underlying dissatisfactions amongst forest workers. Some comparisons are shown below.

- The average hourly wage for 2006 in the manufacturing sector in the Red Deer Region of Alberta was \$19.24. That region has been identified by Alberta Economic Developments as one of the hottest economic corridors in Canada and is expected to generate 9,300 jobs between 2005 and 2010 ([Red Deer Prospects 2006](#)).
- A TD Bank Special Report ([TD Economics 2006](#)) identifies an hourly median wage of \$25.50 for 2006 Q2 for Alberta’s Rainmaker sector, a TD classification referring to the combined industries of Forestry, Fishing, Mining & Gas.
- Log haul wages in Alberta are reported between \$25 and \$30 per hour, but the oil-patch pays \$35 to \$40 ([CanWest 2006](#)).

- As of October 2006, the mining sector in British Columbia has very competitive wages (United Steelworkers 2006). For example, a mid-level Dozer-Grader F.E.L. Operator II is a Wage Grade 7 with an hourly wage of \$27.53.

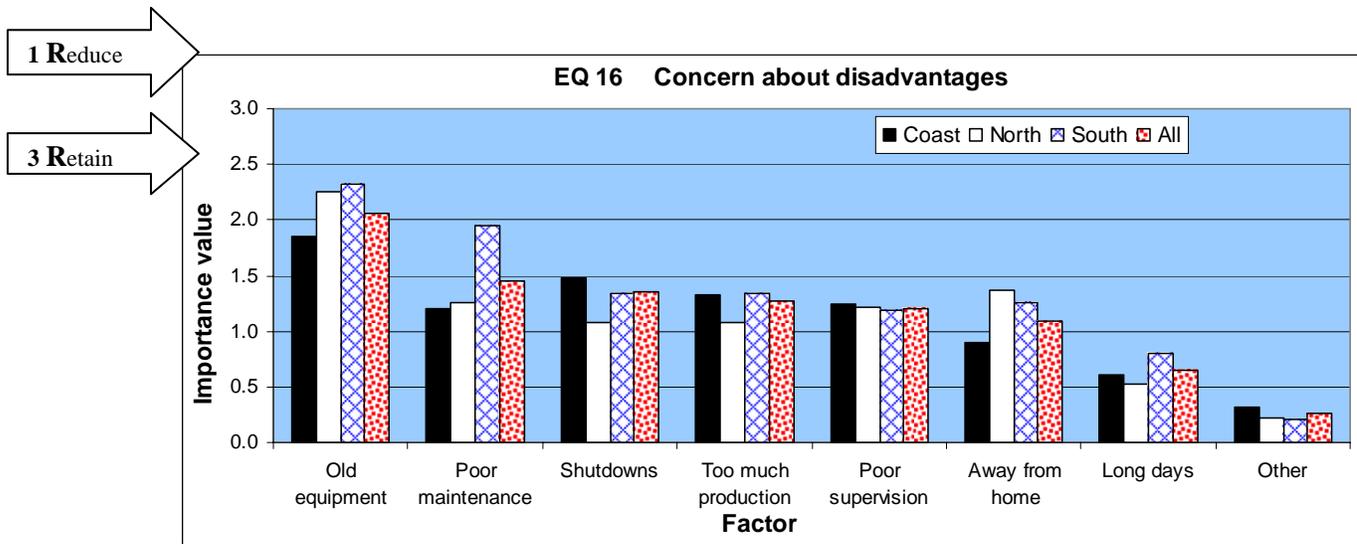
DISADVANTAGES WITH JOB

The primary stated job disadvantage was concern that machines were too old. A maintainability issue was pronounced in the South region (Figure 12). Issues surrounding *unplanned shutdowns* and *too much production emphasis* had similar ratings but were both ranked as less important than *maintainability*.

EQ 16 How concerned are you about the following disadvantages or drawbacks to your job / career? 171 usable responses

Choice of factors		Analysis rank	
Old equipment	Unplanned shutdowns for indefinite periods Too much production emphasis Lack of supervision Poor equipment maintenance	V = Very important	Value 3
Away from home base		S = Somewhat important	Value 2
Long days		L = Little importance	Value 1
		N = Not a factor	Value 0

Figure 12 Concerns about job disadvantages



CONTRACTOR SURVEY RESULTS

CONTRACTOR EXPANSION PLANS

CQ 5 and 6 asked respondents if they were expecting to expand their workforce in the next 5-and 10 year period. A summary of their answers is in **Table 13** and the complete presentation is in **Appendix 4**.

By 2011, about half of the twenty-one contractors surveyed expected to expand. One contractor recognized a need for skidder operators and another required drivers, while all remaining expansion plans needed operators in all phases. One contractor estimated a 40% increase in staffing. The others were unable to estimate numbers.

Expansion estimates over the 10-year period were less clear. Only five contractors seemed certain of expansion. They expected to need a wide range of employees, and some believed they could find the required workers from within the area workforce.

Table 13 Contractor expected expansion plans

Period	Replies	
	No.	Type
5-year plan	9	No
	2	Maybe
	10	Yes
10-year plan	10	No
	6	Maybe
	5	Yes

CRITICAL SHORTAGE OF SKILLED WORKERS?

CQ 7 is summarized in **Table 14** and presented in detail in **Appendix 4**. Contractors were asked to explain whether or not they were currently experiencing a critical shortage of skilled workers. About 40% of contractors surveyed indicated they had a shortage.

Table 14 Contractor summary of critical shortage of workers

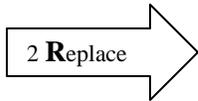
Yes	9 replies
No	12 replies

CQ 8 asked for a prediction about whether any labour shortages might improve or worsen. The results are shown in **Table 15** and presented in detail in **Appendix 4**. About 70% of contractors surveyed expected the labour situation to worsen.

Table 15 Contractor expectations about a labour shortage

Worsen	15 replies
Improve	5 replies
Unknown	1 reply

RECRUITING WORKERS



Recruit and **R**etrain to **R**eplace departed workers.

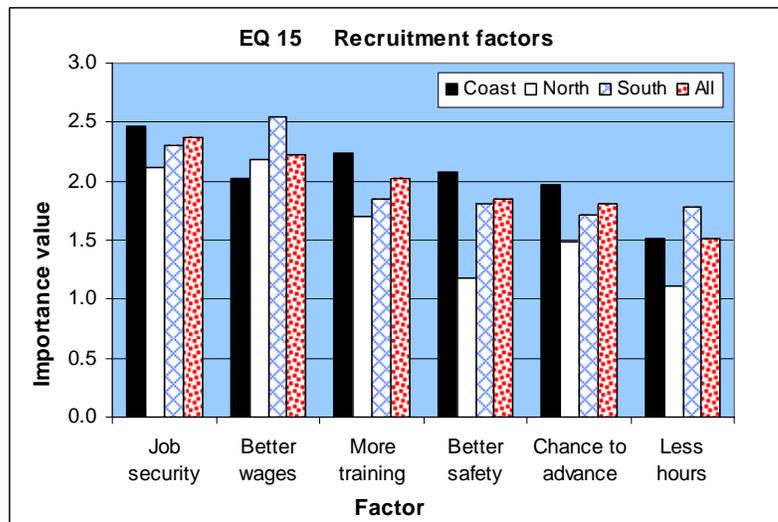
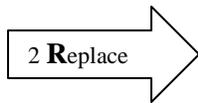
EMPLOYEE PERSPECTIVE

EQ 15 generated one of the more complete response sets in the survey (**Figure 13**). There were fewer non-responses within this question than with most others. Employees ranked *job security* and *better wages* as the two most important factors of six topics they felt would help influence new recruits. All six factors, however, were ranked strongly. The interpretation is that increases in each of the topics would help attract new workers.

EQ 15 *The following factors may play a role in helping recruit new workers to the forest industry. How important do you think they are in helping influence a new recruit?*

Choice of factors		Analysis rank	
Better job security	Decreased time portal to portal	V = Very important	Value 3
More opportunity	Improved safety	S = Somewhat important	Value 2
Higher wages	Sufficient training provided by employer	L = Little importance	Value 1
		N = Not a factor	Value 0

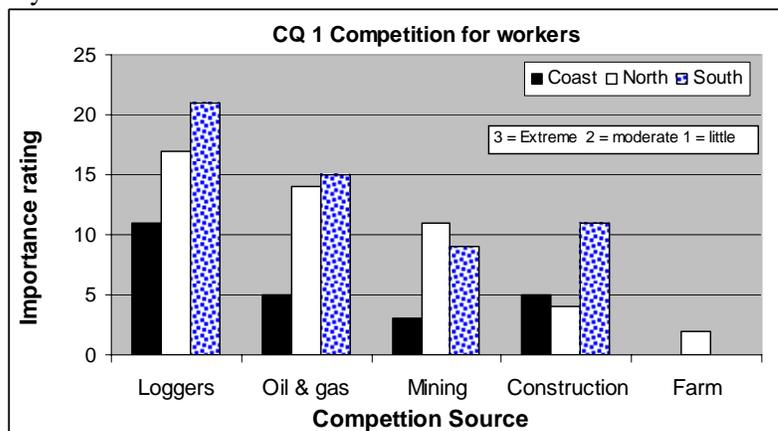
Figure 13 Recruitment factors



CONTRACTOR PERSPECTIVE

CQ 1 asked about the source of competition for workers, and whether the competition was considered extreme, moderate or little. Their answers were coded numerically and summed (**Figure 14**). In all three regions, contractors considered the most important source of competition for workers was from other loggers, followed by the oil and gas industry.

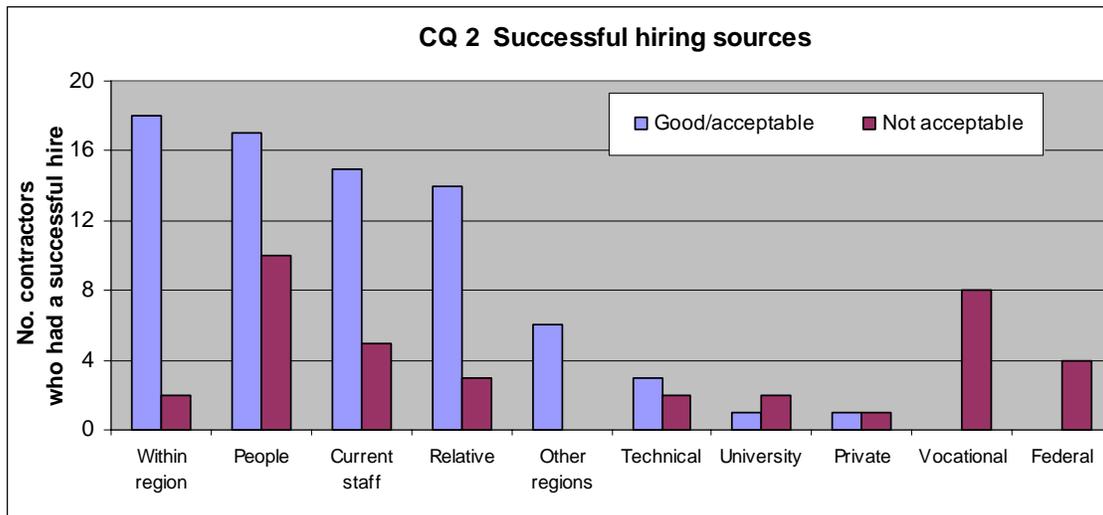
Figure 14
Source of competition for workers



The source of contractor workers is shown in **Figure 15**. Contractors were asked to explain how they found workers over the past 2 years and to rate the quality of new hires. Some contractors also identified how many workers came through each source, but many simply identified whether a source was successfully used or not. The count reflects only that a source was used or tried. For example, the first bar means that acceptable or good employees were found within the region by 18 contractors over two years. The source may have provided more than one employee.

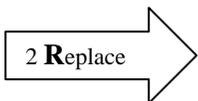
The most successful source for new workers was from other contractors or companies *within the same region*, but this was closely followed by the category of *people looking for work*. Generally schools and placement agencies were viewed as poor sources of acceptable workers.

Figure 15 Successful hiring sources



CQ 3 asked if employees were now, or had been in the past, located from amongst unconventional sources (minorities, gender, foreign countries) and whether these had been successful sources. **Table 16** summarizes the responses. Contractors in this survey have been very hesitant about sourcing workers from unconventional sources, such as females or 1st Nations, but the reports are generally positive from those that have.

Table 16 Unconventional sources of employees



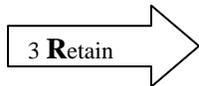
Females		Comments
No	Yes	
20	1	yes -long term & well-adapted
1 st Nations		Comments
18	3	

CQ 4 asked if there were other sources of potential workers they might suggest. Eleven respondents had no comments. Recruitment suggestions from the remaining ten contractors are shown below.

- Functional and proven training program that can qualify employees.
- Any that qualifies for job.

- Federal government centre, private centre, university.
- Only if qualified.
- Would consider foreigners under right conditions.
- Eastern provinces.
- Construction sector.
- Have advertised on radio.
- Young kids out of school, if we could make it attractive for the younger generation somehow.
- Any who are known for honesty, responsibility, and qualifications.

RETAINING WORKERS



Retain by **R**einforcing the positives

ATTRITION REASONS AMONGST CONTRACTOR EMPLOYEES

CQ 9 asked about turnover by job type. The full set of responses is in **Appendix 4**, and a summary is below in **Table 17**. Contractors noted that some employee departures were mutually agreed on.

Table 17 Summary of employee departures - 21 contractors

	2005			2006		
	Retire	Quit	<i>total</i>	Retire	Quit	<i>total</i>
		5	79	84	8	104
No. of contractors reporting attrition	18			19		
No. of contractors with no attrition	3			2		

The ratio of departures to retirements was 16:1 in 2005 and 13:1 in 2006 amongst the contractors who were surveyed. Two contractors reported no departures during that period but all others experienced attrition. Total attrition increased from 84 departures in 2005 to 112 in 2006. The totals are surprising and disturbing.

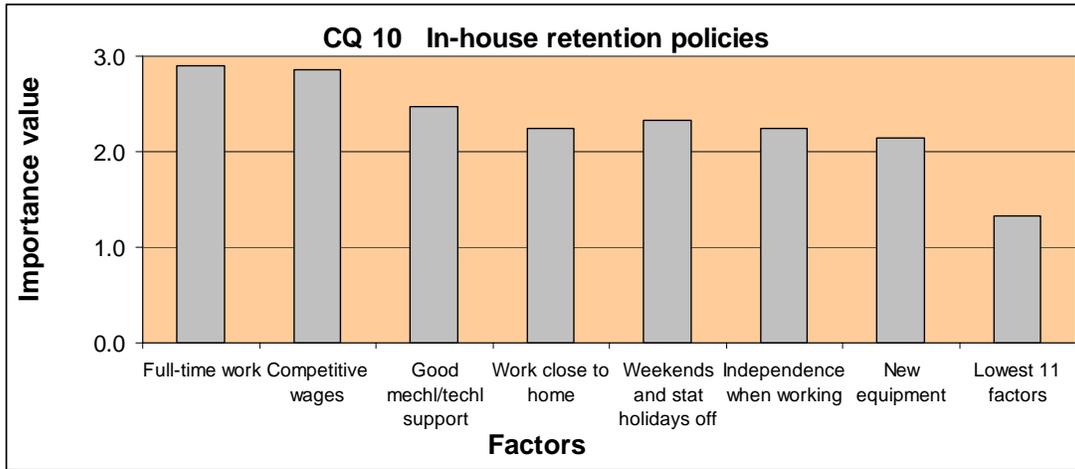
CONTRACTOR RETENTION POLICIES

Two questions were directed at soliciting suggestions regarding worker retention. CQ 10 asked contractors to identify policies they were currently using to help influence retention, and the next question asked contractors to rate the importance of various factors in helping the industry retain employees. The charts in **Figure 16** summarize both queries.

CQ 10 *What policies do you have that helps retain your workforce? Please rate their importance.*

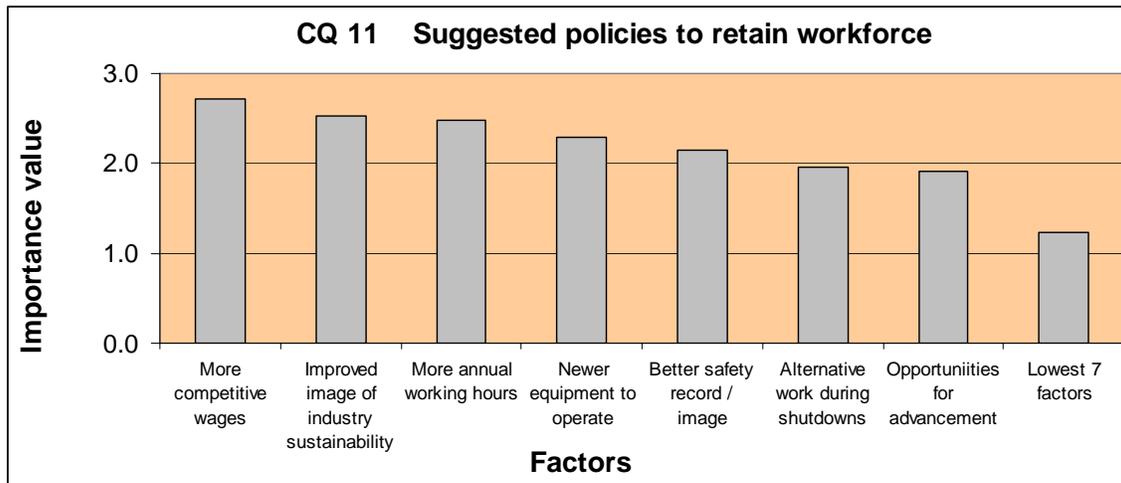
Full-time regular work	Bonus (seasonal or quality)
Competitive wages	Extended absence/vacation
Mechanical/technical support when needed	Paid travel to home base
Work close to home base	Vehicle allowance
Weekends and stat holidays off work	Residence/living allowance
Independence when working	< 10 hrs portal-to-portal
New equipment	< 12 hrs portal-to-portal
	Short season but extended hours
	Seasonal work
	Operators influence equipment purchase
	Potential to advance

Figure 16 Current and suggested retention policies



CQ 11 What do you think will help forest companies and contractors retain employees? Please rate their importance

More competitive wages	Improved benefits, such as: - - - Less daily working hours More attractive shift hours Greater control over job performance
Improved image of industry sustainability	
More annual working hours	
Newer equipment to operate	
Better safety record / image	
Alternative work during shut-downs	
Opportunities for advancement	



In view of the attrition rates reported by these contactors in the last section, the policies employed by the contractor group generally do not succeed in retaining their workers. Contractors were not queried about their understanding of the reasons for departure. Future assessments could possibly be made of departing employees through an exit interview process.

SKILLS AND TRAINING REQUIREMENTS

HOW SKILLS ARE ACQUIRED

Employee perspective

The employees surveyed reported that the technical skills for operator jobs have primarily been learned on the job (**Table 18**) from another operator (86 responses) or from their boss (41 responses). These were followed closely by operators who felt they learned by watching experienced workers (36 responses) or learned in isolation by themselves (34 responses). Training courses accounted for 33 responses. Approximately one-half of those were from mechanics or truck drivers.

Interestingly, more than 70% of the employees considered themselves fairly or highly experienced when they began their current job. This might mean a high degree of skill transferability between jobs, but it might also mean that respondents simply did not correctly remember their initial skill level. (Many indicated they had been in the same job for more than 20 years.)

Table 18. How Skills are Acquired – Employee Responses

Position	Experience level when beginning current job					Very Helpful / Somewhat Helpful Methods									
	Experienced				No data	Other operator	Training program	From boss	Equip. distributor	Prof. trainer	Former tech training	Videos	Other training	None by myself	None watched others
	Novice	Partly	Fairly	Highly											
Aircraft Maintenance	1					1	1	1			1			1	1
Boomman	1		1			2								1	1
Bucker				1	1			1							1
Bulldozer				1		1									
Cable Hook Tender			1	1		1	1	1	1	1				1	1
Cable Log Loader		2		1		1									
Cable yarder-Swing				4		4		1	1						
Cable yarder -Tower				1											
Camp Maintenance				1		1	1								
DLS Bucker				1									1		
DLS Bucker/grader				1		1									1
DLS Chargehand	1														
Equipment Handyman		1				1	1								
Excavator Operator			2	3		4		1						1	1
Feller Buncher Operator		1	2	3		3	1	2	2		2			1	1
Foreman / Supervisor			1	4		1		2			1			1	3
Forester				1											
Forwarder Operator						1								1	
Handfaller			4	2		3	1	1	1	3	1	1			1
Harvester Operator		1				1			1					1	
Heli Mechanic		2	1	1		3	2		1	1	1	1	1	1	2
Heli Pilot				2		2	1	1							
Hydraulic log loader	1	4	3	10		8	1	3	1					5	3
Landing Bucker				5		2	1	2							1
Landing Man		1				1	1	1				1			
Log Stacker				3		1									
Log Truck Driver	10	7	9	11		20	8	8	2	1	1	1		7	10
Mechanic			4	9	2	2	6	2	1	2	7	2		3	1
Processor Operator	4	5	5	11		13	5	9	5	2	1			4	3
Quality Control	1	1	1			1					1				
Quality Control Scaler	1					1		1							
Rock/Drill Blast			1			1									
Scaler				1		1	1	1		1	1			1	
Scaler/Grader			1	1		2	1	1		1	1			1	
Skidder			4	4		2		2	1	1				1	3
Driver & Hyd.Log Loader			1	1							1			2	1
Welder			1								1			1	1
All Jobs	20	25	42	84	3	86	33	41	17	13	21	6	2	34	36

Contractor perspective

Contractors were asked how they dealt with training their employees. Their responses in **Table 19** are loosely grouped in four broad categories. About half the contractors conducted in-house training, about 25% did not train or did not respond, and the remainder had some interest in a trainer or formal program.

- In-house / on-the-job 10 responses
- Interest in trainer or facilitator 3 responses
- Formal training program/institution 2 responses
- Don't train / no answer 6 responses

Table 19 How contractors provide training

CQ 12 How do you intend to invest in training?	
Reply No.	Comments
1	Have safety training program
2	Have one apprentice heavy duty mechanic
3	All pertinent courses
4	Dollar wise, I don't. EMS training, 1 st aid courses
6	Willing to train young workers, provide 1st aid, fire fighting, WHMIS, spill management, faller train etc. We pay to take the courses and pay for some certificate improvements, equipment attachment training courses and maintenance courses.
8	We train on the job if we find competent people
21	Always train in house
15	Hiring junior personnel to train on the job
10	Will only train people who show a keen interest to learn; otherwise it is cheaper to park the equipment. Training is one-on-one.
18	Train as much as I can by giving a guy a chance on another machine when we are far enough ahead. Or, if he is really eager he can go on weekends and practice. They get schooled in 1st aid, EMS, fire fighting, safety conferences, and safety plan.
9	Continue to provide training to each employee during breakup. Bring in a facilitator for a group of employees and train specific to their job description.
12	We currently train, but in future will try to tie in to someone who does it professionally. Looking at Fox.
16	Work closer with operator when training and send to Waratah training course during downtimes and breakup
13	I have trained operators and fallers in the past. I would support a functional training organization by providing field training sites.
14	Apprentices. Advancement from within when possible.
19	We do not train.
17	Can't. Unaffordable in current market.
7	Haven't made plans
5, 11, 20	No answers

Contractors were also queried about the process used to implement On-The-Job Training. The full summation is in **Appendix 4 – CQ 14**. In summary form, seventeen contractors described various forms of one-on-one training sessions, usually with the supervisor or owner.

Contractors were asked if they could think of ways to improve the training process. Their answers are shown in **Table 20** and are also loosely grouped in four broad categories.

- Government assistance / cost incentives / rebates 4 responses
- Formalized training schools 4 responses
- Pre-employment testing 1 response
- No suggestions / prefer in-house 12 responses

Table 20 **Ways to improve the training process**

CQ 13 <i>Can you suggest ways to improve the training process?</i>	
Reply No.	
2 4 13	Government should offer discounted training for forestry Forestry-assisted programs. Job training for buckermen e.g. how to grade wood. Being able to bring in starting employees at a lower starting wage.
9	More training opportunities, cost benefits to encourage contractors, and certification rebate incentives.
6 10 14	Training schools could have new employees achieve 60% production before starting Learn some skills at a training school (especially processors) so contractor equipment isn't damaged and production losses are reduced. Don't want to train workers on the job because some will leave for other jobs after we invested in their training. 3 rd party training facilities - Malaspina College
15	Send employees to technical training courses
12	Identify whether the trainee has the aptitude for the job before investing in training.
8	Prefer to train on the job for steep slope applications
3	My guys don't like any of them
1,5,7,11,16,17 18, 19,20,21	10 respondents had no suggestions

WHAT SKILLS ARE REQUIRED?

Employee perspective

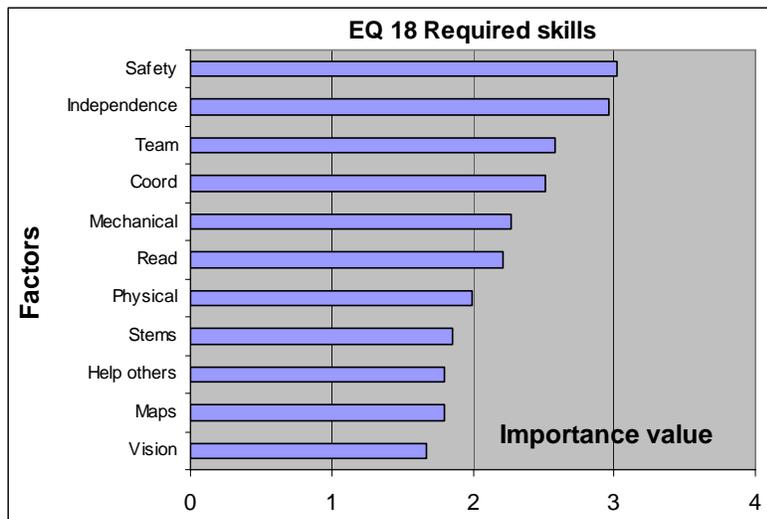
EQ 18 *What are the skill and aptitudes required for this job. Prioritize the top 3 if possible.*

Choice of factors	
Ability to work safely	Good physical condition
Ability to work independently	Ability to recognize & interpret stem characteristics
Ability to work as a team	Ability to change patterns to improve downstream operations
Good hand-eye coordination	Ability to interpret maps & prescriptions
Mechanical skills	Good night vision
Ability to read	
Analysis Rank	R = Required (must have) Value 4 S = Somewhat important Value 2 N = Not a factor Value 0
	V = Very important Value 3 L = Little importance Value 1

This question had an additional analysis rank because employees were asked to define if the factor was 'Required' (**Figure 17**). The maximum importance rating for responses to this question was 4. Unfortunately, the prioritizing process was erratic and that aspect of this question is inconclusive.

Employees surveyed believed it was important to work safely as part of a team without needing close supervision. To do this, they needed good hand-eye coordination, mechanical training and reading skills.

Figure 17 Required skills – operator perspective

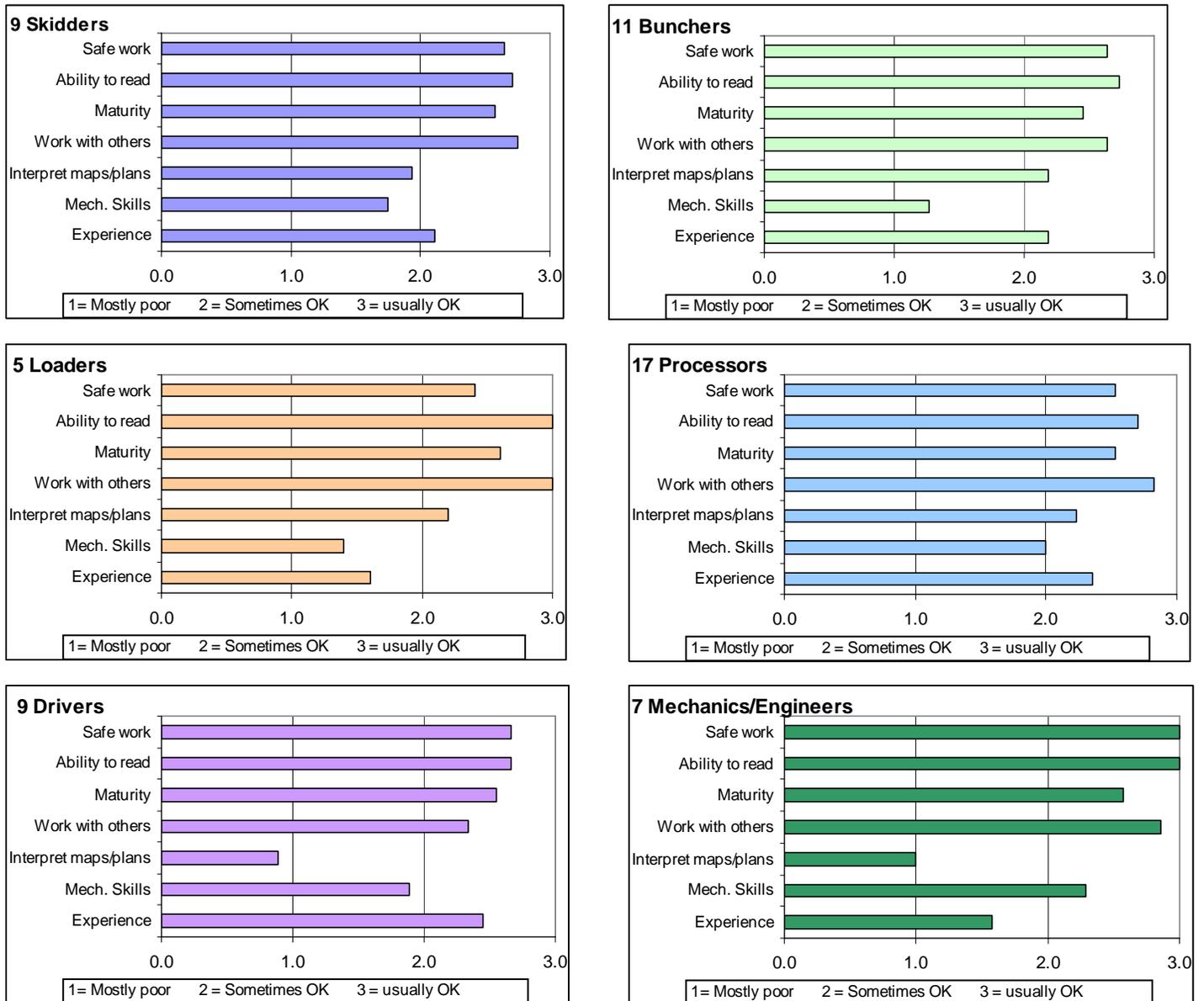


Contractor perspective

Requirements for new hires

The contractor group was asked to rank the skills and aptitudes of new hires. There was no time period defined and some contractors recalled new hires dating back several years. Occupations other than those shown below in **Figure 18** were identified but have not been graphed because the occupations had less than three new hires. All occupations are listed numerically in tabular form in **Appendix 4, CQ 15**.

Figure 18 Contractor assessment of skills & aptitudes of new hires



After the subject of safety, the next three categories are social and interactive skills or aptitudes (*ability to read, maturity, and work with others*). Contractors rated new hires better in all four of those categories

than they did for the technical skills in the remaining three groups (*interpret maps/plans, mechanical skills, and experience*).

The charts illustrate a similar trend for all occupations except for that of ‘drivers,’ where *experience* approaches the levels of the social skills. That is probably because there is a larger pool of trained drivers from which to acquire new staff, compared to the pool available for other occupations.

Contractors in this survey generally appear to have hired new employees who are strong in social skills and relatively weak in the technical skills. This is in line with contractor assertions that they prefer to do on-the-job training.

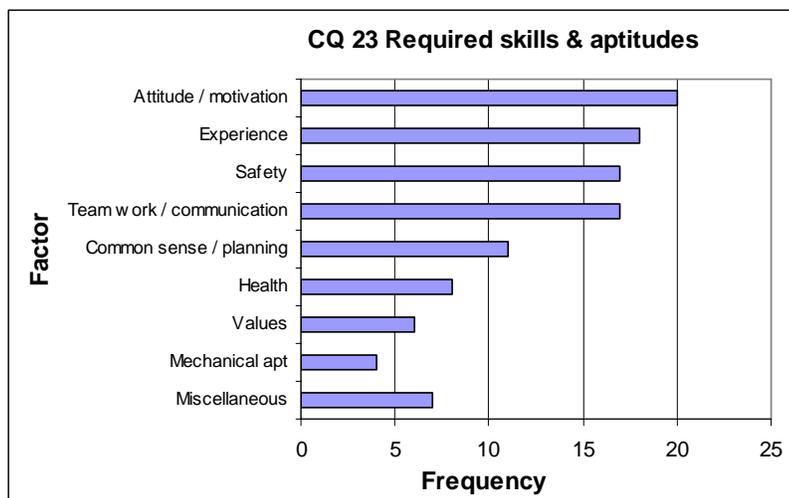
Requirements for long-term safe & productive workers

The twenty-one contractors responded to **CQ 23** by identifying 108 criteria they considered as important skills and aptitudes necessary for long-term safe and productive work. Their responses are summarized in the groupings shown in **Figure 19**. The chart shows a frequency count of how many comments or criteria were related to each aptitude group.

Examples of specific comments are shown below.

- Attitude and motivation – hard work, self-motivated, eager to work.
- Experience – prior experience, skills, bush smarts, natural ability, dexterity, hand-eye coordination
- Safety – strong safety awareness, 1st aid, high regard for safe work
- Team work – ability to work in a team, takes directions, willing to cooperate, team player, gets along with others
- Common sense – common sense, work independently, intelligent, good thinker, good reasoning
- Health – substance-free abuse, no drugs, no alcohol
- Values – loyalty, honesty, dependable, mature.

Figure 19 Desirable skills & aptitudes for safe & productive work



The topics of *experience, common sense / planning* and *mechanical aptitude* cover technical skills while the others relate to social and interactive skills or values. The contractors in this survey appear to believe that over the long-term, non-technical skills and aptitudes probably have a higher importance to an employer than the technical aspects of an occupation.

ON-THE-JOB-TRAINING

Employee perspective

EQ 13 asked *Do you think you need additional training? Please mark the reasons that apply.* The employees in this survey were about equally divided in their thoughts about the need for additional training (**Table 21**). Those who responded with *yes* (49%) marked 161 entries amongst the possible five reasons. The most frequent explanation was *to be more effective in my current job*.

Table 21 Requirement for additional training – employee perspective

	Respondents	
	No.	%
No	89	51
Yes	85	49
<i>Reasons among 'yes' responses</i>	<i>161</i>	<i>100 %</i>
<i>To be more effective in my current job</i>	<i>38</i>	<i>24</i>
<i>To work more safely</i>	<i>34</i>	<i>21</i>
<i>To meet corporate certification requirements</i>	<i>33</i>	<i>20</i>
<i>To get experience for a different job</i>	<i>30</i>	<i>19</i>
<i>To improve performance of downstream operations</i>	<i>26</i>	<i>16</i>

EQ 12 queried the source of upcoming training for 2007 by asking employees to respond to the following statements.

My employer will provide training or I will take a course on my own.

Either to improve the skill set for this position or provide a new skill set for a different position.

Of the surveyed employees, about 28% expected to receive employer-sponsored training in 2007 primarily directed at improving their job (**Table 22**).

Table 22 Expected source of training

	No. of respondents	% of all respondents
Source of training		
Employer will provide training	49	28
Take my own course	11	6
No. of operators who marked both	11	6
Reason for training		
To improve this job	40	23
For different job	10	6
For both	8	5

Total respondents in survey = 174

Contractor perspective

Training for supervisors

CQ 16 asked about training provided for supervisors. Contractor comments are in **Table 23**. About half the contractors provided some form of supervisory training, with about half of them using informal in-house sessions while the remainder provided a range of more formal courses.

Table 23 Contractor training of supervisors

Yes responses (10)	1-day supervisor course from WCB. Currently looking into which courses are needed to become a "Safe Company" through the audit process.
	Varies. New & evolving regs require training in bullbucker course.
	Formal and informal
	Safety procedures, map interpretation, leadership training, accounting skills.
	As much in-house training as required
	No comments
	Instructions, manuals. Personal one-on-one training.
	WCB supervisors course given to one person
	One-on-one training with owner
	1. Skillpath seminar training (new supervisor/managers). 2. BC Continuing Studies (danger tree assessing). 3. EMS standards
No responses (11)	Supervisors selected on basis of experience, attitude, and aptitude
	My son and I supervise. The most senior employee takes over if we are not there.
	Can't seem to trust anyone anymore. We do it ourselves.
	Don't have supervisors
	7 replies had no comments

Contractor training plans 2007

CQ 19 enquired about training expectations for 2007 by asking how many workers were expected to be trained for different topics. Three of the twenty-one contractors had no training plans for 2007. Of the remaining 18, eleven contractors had rotational procedures to train half the staff every two years, mostly for WHMIS and 1st Aid. The numbers in **Table 24** represent the 2007 portions.

Table 24 Contractor training plans for 2007

Training subject	No. contractors planning to train	Total employees to train
Safety	18	392
First aid	18	250
Fire fighting	18	416
WHMIS	17	260
Spill containment / recovery	18	308
Blasting	3	9
Falling certification	7	14
Other certification	2	11

Training cost for contractors

CQ 17 enquired about the annual cost of training. The answers are shown in **Table 25**. It is clear that there is an understanding that training has a cost in terms of equipment damage and lower production, but the affect on overall cost is not simple to determine. Estimates are varied and range to \$500,000. A common assumption seems to be between \$30,000 and \$60,000 resulting from increased repair and lost performance.

Table 25 Estimated annual cost of training new hires

Bunchers/Harvesters	\$75,000-\$100,000	\$300,000	\$40,000	\$50,000-\$60,000	
	Tried but let go when costs for breakage on machine reached \$40,000 and trainee still did not understand.				
Cat operator	\$10,000				
Hoe excavator	\$20,000		200 hrs @ 50% of \$150 = \$15,000		
Handfaller	\$75,000 to \$100,000		\$10,000		
Foreman	\$90,000				
Labourers	\$3,000				
Loader	\$125,000				
Mechanic	\$100,000				
Pilot	\$500,000				
Processors	\$50,000	\$20,000	\$5,000	\$375,000	\$40,000
	\$100,000 limited production first year. \$10,000 - \$15,000 annually for maintenance. Production loss extra.				
Skidder	\$60,000	\$40,000 limited production 1 st 6 months.		\$20,000	\$20,000 - \$30,000
Truck driver	\$20,000	\$20,000 for unnecessary abuse & poor maintenance.			\$10,000 - \$15,000
Yarder operator	\$30,000		\$60,000		
Overview comments	Do not train new – train in house.				
	Minimal. There's always a probationary period, but just until they realize how our company operates.				
	All new hires were experienced operators. Minor training for them to learn company policies and new mill specs. Cost of training was very little because changes are always occurring anyways.				
	Lost production, expensive repairs on equipment.				
	\$50,000 overall. Hard to estimate.				

Duration of training

CQ 18 asked how long it took before new hires with no previous experience reached an acceptable productivity level, and what they meant by 'acceptable'. **Table 26** shows the responses. Contractors provided information for many, but not all, of their employee occupations and appeared to try and provide their best judgement about an "average" for that occupation in their conditions.

In the opinion of the contractors in this survey, most new hires reached an acceptable performance level between 12 and 24 months after start. Not all contractors provided estimates. The measures of performance were quite varied in range and type, and included volume per hour, volume per day and loads per day.

The occupation for loader operators is a good illustration. Seven contractors provided information – 6 gave estimates of time to attain experience, and 3 contractors provided the three different productivity

levels shown. Others gave no estimates or supplied descriptions like “to get to 75% level” or “Industry Average”. The average is shown for similar answer styles. The purpose of this information is to aid in understanding contractor estimates for training time. These data are not appropriate for use in logging cost estimation.

Table 26 Estimated duration for new hires to reach acceptable productivity

Training time			
Occupation	No .of contractors who replied	Months to reach acceptable performance	Volume estimates m³ and loads
Boom crew	1	6	-
Bucker	1	6	-
Buncher/harvester	11	13	40 / hr // 550 / day
Cat operator	2	9	300 / day
Excavators	5	13	200-300 / day
Foreman	1	24	16 loads
Forwarder	1	12	Industry average
Front-end loader	1	6	-
Handfaller	2	12	80 / day
Hooktender	2	15	-
Loader operator	7	15.5	120 / hr // 900 / day // 16 loads
Engineers	2	30	-
Mechanic	1	60	-
Pilot	1	12	-
Processor/delimiter	10	14	34 / hr
Project manager	1	24	-
Quality control	1	3	-
Skidder	7	8	49 / hr
Truck driver	5	12	Meets cycle times
Yarder operator	2	24	34 / hr / 600 /day

Indenturement

CQ 22 asked for opinions about the possibility of trainee indenturement for their circumstances, and if so, how that might work. Six of the surveyed contractors (about 25% of the respondents) are willing to further examine the concept of indenturement. The remainder, however, are sceptical or would be unwilling to participate in such a program (**Table 27**).

Table 27 Feasibility for an indenturement program

Maybe responses (3)	<ul style="list-style-type: none"> - Might work - Depends on timing and company effort for the level of return - If you can see something in them that looks like they might have a chance of making it work. Most people want full money right away - they don't seem to want to do it bad enough to suffer at all. There are a few good kids still out there but are hard to find. I don't mind training people. I do it all the time with my crew.
Yes responses (6)	<ul style="list-style-type: none"> - In return for job training - In return for experience - Did this in-house - In return for job training & lower wages. Provided there are no drug or alcohol dependencies, I would spend the money to train him or her. - As an apprenticeship program in return for on the job training - If someone wanted to work for free (or reduced wage) to learn and if they showed they were sincere and could do the job, then they would be hired full time when production levels were acceptable.
No responses (12)	<ul style="list-style-type: none"> - Don't think it would work. Could be challenged legally. - Government has created new programs (tickets) which we are required to pay for – these courses should be free for inexperienced workers - Preferably not - Would not work - It's too easy to find jobs now, so I would be suspect of their abilities if they were willing to work for free. - An inexperienced man would slow down the whole chain of production - hence too costly. - 6 contractors gave no comments

Licensee perspective

The training data from licensees was incomplete, partly because of a poorly-worded question that did not clearly state which company staff should be included, and partly because of bookkeeping differences within coastal licensees after various transfers or amalgamations. The data in **Table 28** are believed to contain a consistently-reported estimate of numbers of people trained over a 3-year period, and the associated estimate of the costs to do so. Costs of training contractor harvesting crews differ both in amount and in method. At some licensees, contractors are solely responsible for training, while other licensees have forms of cost sharing.

There are no obvious trends, except that licensees have funded training each year. Replies from the surveys indicate they will continue to do so, particularly in response to regulatory changes or needs assessments.

Table 28 Estimates of personnel trained and training cost

	2005		2006		2007	
	No. people	\$	No. people	\$	No. people	\$
Licensee harvesting personnel	77	193,200	77	189,600	77	196,600
Contractor harvesting crews	695	117,000	792	66,960	595	64,200
Total	772	310,200	869	256,560	672	260,800
Cost per person trained, \$	402		295		388	

TRAINING CLASSIFICATION SYSTEMS, PROGRAMS & FACILITIES

WORKER OCCUPATIONAL CLASSIFICATION – NOC/ESPORT

National Occupational Classification is a system of classifying jobs by occupation and skill level. It is prepared and maintained by Human Resources Development Canada and is of interest to this project because it is used by many agencies, and because a linkage exists between it and a skills assessment program also developed by the federal government. The program is called Essential Skills Portfolio (ESPORT) and it is an ongoing process developed as a means for clients (user individuals) to self-assess their skills and compare them against skills required in different occupations. Clients are unemployed or under-employed individuals and are referred to in program literature as Learners.

A search within the NOC in October 2006 for occupational listings returned the following results:

<i>Forestry</i>	5 occupations	<i>Driver</i>	4 occupations
<i>Operator</i>	55 occupations	<i>Logging</i>	3 occupations

An additional classification of interest is *Drillers and Blasters*. Of all the listings, the groups shown in **Table 29** encompass the forestry and logging occupations pertinent to this project. One occupation that was not found within the NOC was that of *Bridge/Culvert Builder*.

Table 29 Forestry and logging occupations in the National Occupational Classification

NOC group code & name	Logging machine operator or occupation task in survey	ESPORT available?
7411 Truck Drivers	Articulated rock truck Logging truck	Yes
7421 Heavy Equipment Operators	Bulldozer Excavator Road grader	Yes
8421 Chainsaw and Skidder Operators	Skidder – track or rubber tired Fallers	Yes
8616 Logging and Forestry Labourers	Choker setter Forestry or logging labourer Swamper	Yes
8241 Logging Machinery Operators	Feller buncher Harvester Processor Forwarder Cable yarder tower Cable yarder swing Cable rigging slinger Hydraulic log loader Cable log loader Front-end loader	No
7372 Drillers and Blasters	Rock drill – tank or rubber Blaster	No
8211 Supervisors, Logging and Forestry	Cable hook tender Logging contractor Production supervisor, logging	No
Not found	Bridge/culvert builder	No

ESPORT describes jobs by classifying tasks within a framework of essential skill categories. “Essential skills” is defined by Human Resources and Skills Development Canada (HRSDC) as enabling skills that people use to carry out a wide variety of everyday life and work tasks. They are not the technical skills required by particular occupations, but rather the skills applied in all occupations (HRSDC 2006). The information is collected by the Government of Canada as part of ongoing research that examines skills people use at work.

As of Fall 2006, about 180 profiles have been developed from 3000 interviews across Canada. The classifications include the items in the list below. Within each classification, tasks are identified and ranked on a numerical complexity scale usually composed of 4 or 5 gradations.

- Reading text
- Document use
- Writing
- Numeracy
- Oral communication
- Thinking skills
 - Problem solving
 - Decision making
 - Critical thinking
 - Job task planning
 - Use of memory
 - Finding information
- Working with others
- Computer use
- Continuous learning

SKILL SETS MISSING FROM ESPORT

The NOC/ESPORT systems are neither complete nor infallible. The job of *bridge and culvert builder* could not be located through keyword searches within the NOC system, and the ESPORT skills list for *Logging and Forestry Labourers* contains numerous task descriptions for other industries (farming, mining, oil and gas, aquaculture). It is not clear whether these are errors or attempts at cross-referencing.

Table 29 showed NOC occupation groups for which ESPORT skill sets have not been completed. They are *Supervisors, Drillers and Blasters*, and *Logging Machinery Operators*. Together these groups account for 15 distinct logging occupations pertinent to this survey. Many of those are in the important *Logging Machinery Operator* group. The NOC document for *Logging Machinery Operator* contained nearly 70 separate identifiers for machine operators. Many are name variations for the same job. FERIC divided the occupations into five phase-related topics, from which smaller subsets can be generated that have more commonality for technical training purposes. **Appendix 3** shows the occupations grouped in the five phases.

Despite these limitations, FERIC nonetheless suggests to the LWTNC that the federal NOC/ESPORT systems be adopted by those preparing training programs, or seeking funding for training. These systems have undergone extensive development and are in use and ought to be enhanced with specific technical skills determined from these surveys, as well as information from existing training establishments.

CANADIAN AND EUROPEAN PROGRAMS

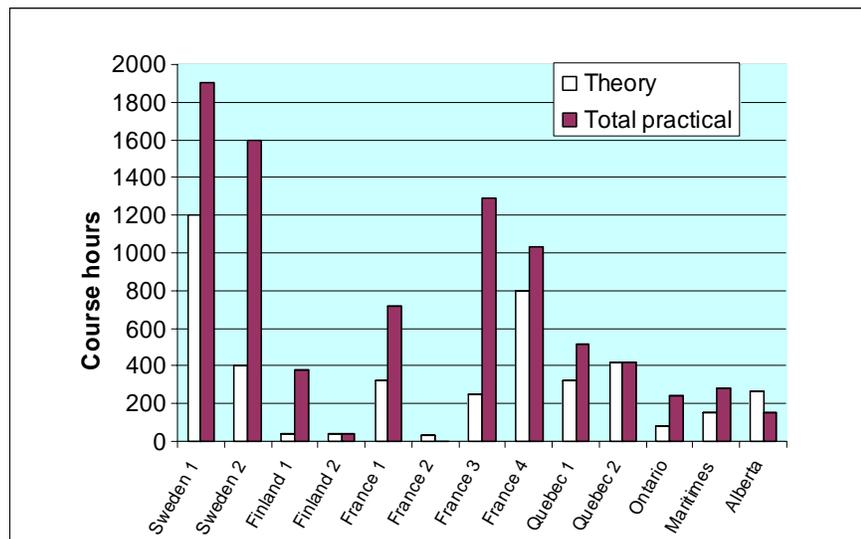
A recent study conducted by Collège Boréal in Kapuskasing, Ontario identified formalized Canadian and European training programs (Vallières and Gingras, 2006). Their intent was to evaluate training program funding formulas so the Collège could adapt strategies for making training available to more Ontarians. The Collège study approached 13 training institutions in six different countries, and received replies from nine locations in four countries (Sweden, Finland, France, and Canada).

Selected results from their report appendices are summarized and presented below.

TYPE AND DURATION OF TRAINING

Figure 20 compares program duration and the ratio of practical to theory hours. Except for Ontario and France 3, all responding training facilities indicated that harvester and forwarder operators were trained for cut-to-length operations.

Figure 20 Theory and practical training hours for machine operator courses



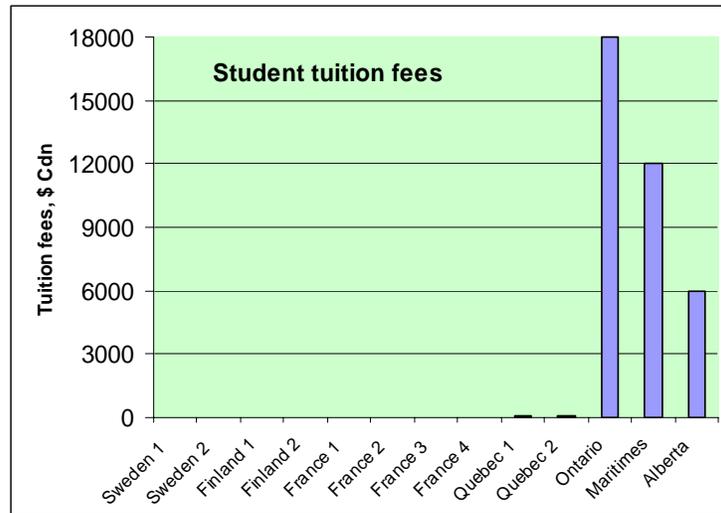
Operators for cut-to length harvesters and forwarders are trained at Swedish 1 and 2, Finland 1 and 2, France 1 and 2, Quebec 1 and 2, and the Maritimes. France 3 and 4 train operators for skidders, forwarders, farm tractors, feller bunchers, and delimiters. Ontario targets operators for feller-bunchers, grapple skidders and declaimers. Alberta uses simulators to train operators for feller bunchers, harvesters, and forwarders.

FUNDING

The Collège study reported capital funding was almost entirely from government departments responsible for education and training. In Europe these tended to be federal or regional district governments. In Canada, the provincial governments in Alberta, Ontario and Quebec provided capital funding, while in the Maritimes there was a federal/private industry split (40/60%).

Operational funding of training programs is very different between Europe and Canada. In Europe, 100% of operational funding was provided by governments, private industry and income from timber cutting. In Canada, student tuition fees (**Figure 21**) contributed much or most of the operational budget, particularly in the Maritimes, Ontario and Alberta. Provincial funding through accredited training institutions is not available in BC.

Figure 21 Student tuition fees



The Quebec schools require small tuition fees of \$50 and \$100 respectively

ANNUAL GRADUATES

Table 30 lists annual number of graduates from the courses. With only a few exceptions, training institutions graduated between 20 and 30 students per year. Placement rates for responding institutions were usually 60 % or more, except for Sweden. In Canada, the combined number of annual graduates from the five training establishments ranged between 104 and 126 students.

In the fall 2006 FERIC contacted sources in Australia and New Zealand concerning training courses but did not receive any replies.

Table 30 Annual graduates

	No. of students / course	Course frequency / year	Graduates / year	Graduate placement, %
Sweden 1	26	1	26	15
Sweden 2	16	1	16	40
Finland 1	8-10	2	16-20	75
Finland 2		on demand ¹		no data
France 1	5-7, 3-4 ²	3	24-33	60
France 2	6	4	24	no data
France 3	20	permanent on going	20	80
France 4	5	permanent on going	5	no data
Quebec 1	16	2	32	70-90
Quebec 2	10-12	3	30-36	70-90
Ontario	8	2	16	70
Maritimes	12-18	on demand	12-18	90
Alberta	12	2	24	80

¹ Finland 2 offers short customized courses on demand. Courses are usually to Russian companies who buy machines. Some courses have been provided to South American companies.

² France1 trains 5 -7 operators in felling and 3-4 in forwarding.

WESTERN CANADA

WOODLAND OPERATIONS LEARNING FOUNDATION

The Woodland Operations Learning Foundation (WOLF) is a non-profit corporation established by forest and education stakeholders in 2001. Their offices are based out of Northern Lakes College (NLC) in Slave Lake, AB.

WOLF offers a variety of training courses on topics of continuing interest in the forest community, such as water crossings, forest health, spill response, log quality, equipment maintenance, and logging technician. WOLF also has simulators to train operators on a harvester, processor, forwarder, feller buncher and delimber. Simulators consist of complex, sophisticated units that closely match the actual machine (Timberjack Harvester and Forwarder), 3-D units (Denharco DH and DM delimiters) and personal computer based units (Simlog).

The simulators have been used for pre-employment assessments, training for employment projects, and as part of the curriculum of certificate forest equipment operator training courses. Certificate courses are offered by NLC in Alberta (WEOP - Woodland Equipment Operator Program) and College of New Caledonia (CNC) in British Columbia (FEOP - Forest Equipment Operator Program). Malaspina University College (see below) will offer a similar program early in 2007.

Since inception, 231 students have trained on the simulators for a total of 4136 hours, and includes training given by WOLF, NLC, and CNC ([WOLF 2007](#)). WOLF also reported the employment status of graduates from the courses. NLC had 5 students in their certificate program in 2003/2004, and 3 in 2004/2005. Four graduates responded to an employment survey taken up to nine months after graduation and all indicated they were employed in related work. The CNC program has had 50 students since it began in 2005. 80% of the students graduated and all graduates were employed in related fields. Tuition fees for the certificate courses ranged from \$6,000 to \$10,500 depending on the college and the specifics of the course offerings.

MALASPINA UNIVERSITY COLLEGE

Malaspina University College is located in Nanaimo, BC. Through their Natural Resources Extension Program, they offer a variety of forestry-related training courses, including environmental monitoring, environmental management systems, GPS applications for forestry and riparian area regulations, fire suppression, and new faller training. The courses may be given in Nanaimo or at satellite campuses.

The college is proposing a new course offering called Forest Harvesting Equipment Operator for February 2007 ([Malaspina 2007](#)). Details include:

- 16-week certification program totalling 503 hours
- Provide skills for feller buncher and processor equipment
- Developed through an advisory committee from industry and college faculty
- Students will train with the WOLF simulators and a purchased SIMLOG station.
- Course includes 40 hours with the simulator and 160 hours of practicum placement.
- Tuition fees are \$11,500.

DISCUSSION

ROLE FOR TRAINING FACILITIES

Assuming there is a defined need for a training process, then the continuing challenges become implementation and funding. Those issues control all program activities and help to define and select the student training clientele through the tuition fee structure.

The current practice in western Canada is to develop and present training modules locally in regional schools. Students train in basic concepts by using a simulator, and this is usually followed by a practicum at a local harvest operation. The concept of regional training allows programs to be developed, or transported, fairly quickly when there is a defined need. This appears to be the most sensible training model for the forest industry and should be encouraged. This could potentially be expanded as adult or continuing education offered out of high schools, and if that could next be added to high school curriculum, that would allow the industry to be much more effectively portrayed to the younger, next generation workforce. In addition, the high school curriculum offers further opportunity to introduce Grade 12 students to operator training basics such as forest safety and equipment maintenance in conjunction with overviews of harvest systems and machinery performance.

ROLE FOR FOREST INDUSTRY, TRUCKING AND PROFESSIONAL ASSOCIATIONS

- As mechanization increases, there will likely be a need for better human/machine interfaces – less complicated or awkward controls.
- Safety aspects/concerns are addressed as machines get smarter (e.g. remote operation). Work with and encourage manufacturers.
- Provide simulators at all trade shows – when not at shows, proactively approach schools. Somebody buy a set specifically for this. YES – it costs money. Work with WOLF.
- Promote resolve motion control with manufacturers – in parallel with simulator push.
- Combat “sunset industry” viewpoint in local media. Strongly advocate re-forestation as a positive.
- Promote the high-tech nature of advanced equipment as a positive. For example, with manufacturers, promote the possibilities of “heads up displays” projected on windscreens to show operator current “high score” in various topics, such as production, safety achievement, etc. Monitoring technology can support this also (e.g., the Talkie Tooter, or truck on-board computers that monitor truck fuel use, gear shifting and travel speeds).

ROLE FOR FEDERAL AND PROVINCIAL GOVERNMENT

- Remove policies that work against year-round forest and mill operations.
- Consider ways to re-float BCIT forestry (both technologist and more importantly technician programs).
- Provide training allowances for contractors - incentives, offsets.
- Consider training allowances for young workers to cover tuition fees when training is needed. Also, the student loan program is well-understood by governments, and the programs can motivate students to try for a more promising career.
- Consider apprenticeship.
- Promote benefit and wage cost-sharing programs that allow new employees to work as swampers with minimal influence on overall costs.

ROLE FOR COMMUNITY DEVELOPMENT

- In every school district, challenge attitudes that are not pro-forestry and actively combat those that are anti-forestry.
- Encourage community forests.

ROLE FOR LICENSEES AND CONTRACTORS

- Combat the philosophy of “cut out then cut out”.
- Mergers may reduce support from communities so forest companies should engage in local PR in many ways – sport teams for example – but in all ways that help sponsor and promote the community, particularly if management or business skills can be utilized. Be visibly active – put it in the budget and allow staff time.
- Retain functioning retired machines as training machines. They could be set up in bone yards, with the cabs re-arranged for 2 people, and used as weekend or after school opportunities for potential new recruits. This would allow companies to determine new worker aptitude without sacrificing productivity, safety or machine health. It would also compliment training simulators such as those at WOLF.
- Logging is perceived as dangerous because it is dangerous. Continue with all safety programs and attempt to significantly reduce injuries.
- Lengthen harvest season as much as possible. Search for innovative ways to provide alternative work – crews contracted out in off season to highways, municipalities, parks branches, agricultural work? Maybe establish industry liaisons with various ministries. What is important is job stability/security, and total income.
- Work at altering stereotype image that work is always tough and physically demanding – sponsor concepts like *heated/air conditioned cab*, *ease of operation*, and *high-end music systems*.
- The industry must attract a new workforce. Promote positive images of logging operator work: team work, independent decision making, personal responsibility, working in a green industry.
- It is critical to address the demographics, and get more of a balance across age classes. Discussions about succession planning may stimulate events. If there is more of a balance, and there are available workers, the training issue may take care of itself, because contractors would likely be happy to continue with the success they have had with on-the-job training.

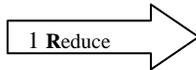
OPPORTUNITIES FOR EMPLOYING PREVIOUSLY UNDERUTILIZED POPULATIONS

- Women – some camps are not set up for females.
- 1st Nations - encourage start up of band-sponsored and controlled programs. Recognize cultural issues associated with 1st Nations communities – such as work days and work hours.
- Consider foreign workers – but beware of risks of “ghettoizing” the cheap labour group in small communities.

RECOMMENDATIONS

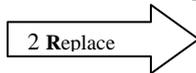
The old guard was drawn by wages. Perhaps the new wave will follow because of global warming and joysticks. Unconventional sources and solutions need to be examined.

Recommendations have been organized around three concepts of a Recovery Strategy loosely based on the basic-building-block-concepts of the primary school “three R’s.”



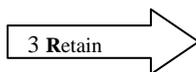
Reduce **R**etirements and **R**esignations.

- Make compensation and benefits packages² for contractors and employees competitive with similar work in other industries.
- Initiate discussions between licensees and contractors regarding plans, needs and expectations.
- Continue to improve the safety record.
- Work to reduce or eliminate shutdown periods, or schedule employee vacations during them.
- Retain workers past the age of 65 by offering creative job sharing arrangements.



Recruit and **R**etrain to **R**eplace departed workers.

- Incorporate resolve motion control in new equipment. Resolve motion control cost was approximately \$60,000 in the 1990s and is now probably in the range of \$12,000 per unit.
- Target young people living in forest communities for future employment.
- The construction-equipment industry designs ergonomic machines that are easily learned and used by workers of all backgrounds and ages: harvesting equipment needs to be similarly designed.
- Consider joint licensee-contractor presentations on the benefits of working in the forest industry at large area high schools.
- Make conscious attempts to improve working relationships between licensees and contractors, aimed at reducing disputes and improving “image” at home and in communities.
- Change the work culture of the forest industry to attract unconventional labour sources, such as women and First Nations. Foreign nationals could possibly be retained on an indenturement program to ensure a minimum work period.
- Use pre-employment testing with simulators to identify candidates who have natural aptitudes and good hand-eye coordination.
- Encourage attendance at training schools and courses by government subsidy (apprenticeship?).
- Explore work/job sharing.
- Resurrect hiring hall placement agencies that will improve worker access to longer seasons and employer access to skilled workers.



Retain by **R**einforcing the positives.

- Take advantage of the global warming green movement to highlight the benefits of forest management and its positive influence on climate change.
- In conjunction with industry trade and professional associations, fund, prepare and distribute information sessions in high schools. Demonstrate the sophistication and comfort levels of modern forest equipment with simulators.
- Reinforce positive attributes of working in the forest – independence, the outdoors, the RENEWABILITY of the industry – and contrast against oilpatch.
- Encourage contractor cooperatives that can market harvesting services to multiple forest land holders and thereby extend equipment utilization and work seasons for employees.

² These should include pension, medical and dental insurance, and daily travel allowances.

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APPENDIX 1 SURVEY RESPONDENTS

Coast Region	Northern Interior Region	Southern Interior Region
Licensees		
Western Forest Products Port McNeill	Canfor Houston	Weyerhaeuser Kamloops
Timber West Campbell River	Sinclair Group (Winton Global) Prince George	Tembec Cranbrook
Island Timberlands Parksville		Downie Timber Revelstoke
		West Fraser Quesnel
Contractors		
Antler Creek Logging Canadian Air Crane Ltd. Holbrook Dyson Logging Ltd. Mike Hamilton Logging Ltd.	Burns Lake Native Logging D.R. Holtom Ltd. Far-Ko Contracting Ltd. Gulbranson Logging Ltd. Houlden Logging Ltd. Lo-Bar Log Transport Co. Ltd. Timber Baron Contracting Ltd. Young's Mills (1980) Ltd.	Arkel Contracting Ltd. Balcaen Consolidated Contracting Ltd. Bill Todd Ltd Ed Smith Trucking Ltd. Horovatin Enterprises Ltd. R.J. Schunter Contracting Ltd. R. Spence Contracting Ltd. W.J. Vetter Contracting Ltd. Val J Holdings

APPENDIX 2 PROVINCIAL TENURE 2006

Coast Forest Region

	#	Name	Effective Date	AAC total m ³ /year	Total AAC in region, m ³
Timber Sale Areas	38	Arrowsmith	Apr 2004	418,769	17,845,193
	30	Fraser	Aug 2004	1,270,000	
	33	Kingcome	Sep 2006	1,232,000	
	19	Mid Coast	Sep 2006	768,000	
	21	North Coast	Sep 2006	435,624	
	25	Queen Charlotte	July 2006	255,000	
	31	Soo	Mar 2004	503,000	
	37	Strathcona	Sep 2006	1,193,000	
	39	Sunshine Coast	June 2004	1,143,000	
Tree Farm Licenses	6	Western Forest Products Inc.	Sep 2001	1,490,000	
	10	International Forest Products Ltd.	Sep 2001	170,950	
	19	WFP Western Lumber Ltd.	Aug 2001	978,000	
	25	Western Forest Products Inc.	Sep 2006	683,000	
	26	The Corporation of the District of Mission	May 2006	45,000	
	37	Western Forest Products Ltd.	Oct 2006	1,068,000	
	38	Northwest Squamish Forestry Limited Partnership	Aug 1998	263,000	
	39	Western Forest Products Inc.	Sep 2006	3,254,000	
	43	Scott Paper Limited	May 2003	39,900	
	44	Western Forest Products Inc.	Dec 2005	1,327,000	
	45	International Forest Products Ltd.	Sep 2006	220,000	
	46	Teal Cedar Products Ltd.	Jun 2004	498,000	
	47	TFL Forest Ltd.	Sep 2006	780,000	
	54	International Forest Products Ltd.	Jan 2000	75,750	
57	Iisaak Forest Resources Ltd. Area based 381 ha/yr	Jan 2005	123,800		

Northern Interior Forest Region

	#	Name	Effective Date	AAC total m ³ /year	Total AAC in region, m ³
Timber Sale Areas	3	Bulkley	Aug 2005	882,000	35,254,001
	4	Cassiar	Jan 2002	305,000	
	42	Cranberry	Nov 2002	110,000	
	41	Dawson Creek	May 2003	1,860,000	
	8	Fort Nelson	Sep 2001	1,625,000	
	40	Fort St. John	Mar 2003	2,115,000	
	10	Kalum	Jul 2003	436,884	
	12	Kispiox	Jan 2003	977,000	
	14	Lakes	Oct 2004	3,162,000	
	16	Mackenzie	Jun 2004	3,050,000	
	20	Morice	Oct 2002	1,961,117	
	43	Nass	Aug 2002	865,000	
	24	Prince George	Oct 2004	14,944,000	
Tree Farm Licenses	1	Coast Tsimshian Resources Limited Partnership	May 2000	611,000	
	30	Canadian Forest Products Ltd.	July 2003	330,000	
	41	West Fraser Mills Ltd.	Nov 2003	400,000	
	42	Tanizul Timber Ltd.	Aug 2001	160,000	
	48	Canadian Forest Products Ltd	Sep 2001	580,000	
	53	Dunkley Lumber Ltd.	Oct 2005	880,000	

Southern Interior Forest Region

	#	Name	Effective Date	AAC total m ³ /year	Total AAC in region, m ³
Timber Sale Areas	23	100 Mile House	Sep 2006	2,000,000	30,418,711
	1	Arrow	Jul 2005	550,000	
	2	Boundary	Jan 2002	700,000	
	5	Cranbrook	Nov 2005	974,000	
	7	Golden	Jun 2004	485,000	
	9	Invermere	Nov 2005	598,570	
	11	Kamloops	Jan 2004	4,352,770	
	13	Kootenay Lake	Jan 2002	681,300	
	15	Lillooet	Jan 2002	635,900	
	18	Merritt	Jul 2005	2,814,171	
	22	Okanagan	Jan 2006	3,375,000	
	26	Quesnel	Oct 2004	5,280,000	
	27	Revelstoke	Sep 2005	230,000	
	17	Robson Valley	Aug 2006	536,000	
29	Williams Lake	Jan 2003	3,768,400		
Tree Farm Licenses	3	Springer Creek Forest Products Ltd.	Aug 2002	80,000	
	5	West Fraser Mills Ltd.	Jan 2003	300,000	
	8	Pope & Talbot Ltd.	Dec 2002	175,000	
	14	Tembec Industries Inc.	July 2005	160,000	
	18	Canadian Forest Products Ltd.	Mar 2006	290,000	
	23	Pope & Talbot Ltd.	Oct 2002	680,000	
	33	Federated Co-operatives Ltd.	Dec 2005	21,000	
	35	Weyerhaeuser Company Limited	July 2006	391,600	
	49	Tolko Industries Ltd.	Dec 2005	580,000	
	52	West Fraser Mills Ltd.	Jan 2003	570,000	
	55	Louisiana – Pacific Canada Ltd.	Apr 2001	90,000	
56	Revelstoke Community Forest Corporation	Dec 2005	100,000		

Tenure Alterations Directly Related to Mountain Pine Beetle

Tenure	Date	Old m ³	New m ³	Increase m3	MPB-related reasons for altering AAC
Lakes TSA	Oct 2004	2,962,000	3,162,000	200,000	- To salvage timber killed by the current and projected MPB epidemic. - For forest management strategy in response to the mountain pine beetle epidemic. - Mitigate MPB. - To address the mountain pine beetle epidemic and other forest health concerns. - To support an effective forest management strategy in response to the MPB epidemic. - Various reasons including MPB.
Prince George TSA	Oct 2004	12,244,000	14,944,000	2,700,000	
TFL 42	Aug 2001	120,000	160,000	40,000	
TFL 53	Oct 2005	500,000	880,000	380,000	
100 Mile House TSA	Sep 2006	1,334,000	2,000,000	666,000	
Kamloops TSA	Jan 2004	2,682,770	4,352,770	1,670,000	
Merritt TSA	July 2005	1,838,750	2,814,171	975,421	
Okanagan TSA	Jan 2006	2,655,000	3,375,000	720,000	
Quesnel TSA	Oct 2004	3,248,000	5,280,000	2,032,000	
TFL 5	Jan 2003	122,800	300,000	177,200	
TFL 18	Mar 2006	177,650	290,000	112,350	
TFL 49	Dec 2005	380,000	580,000	200,000	
TFL 52	Jan 2003	549,000	570,000	21,000	
Total				9,893,971	

APPENDIX 3 SUGGESTED OPERATOR GROUPS FOR ESPORT

YARDING

cable yarding operator
cable yarding system operator
Grapple operator – logging
Grapple yarder operator - logging
linehorse operator
operator, cable yarding system
operator, grapple yarder - logging
operator, linehorse
operator, steel spar
Rigging slinger
steel spar operator
yarder operator
yarding engineer – logging

LOADING

loader operator – logging
loader, logging truck
log loader operator
log loading machine operator
logging truck loader
operator, log loader
operator, log loading machine
operator, grapple loader - logging
operator, picker truck
picker truck operator
crane and claw operator – logging
operator, crane and claw – logging
logging crane operator
operator, logging crane

CHIPPING

chipping machine operator
chipping machine operator – logging
Mobile chipper operator - logging
Mobile whole tree chipper – logging
operator, chipping machine – logging
operator, mobile chipper - logging

SLASHING

operator, slasher – logging
operator, slasher sawyer - logging
slasher operator – logging
slasher saw operator - logging
slasher sawyer operator - logging
slasher loader operator
slasher-brusher

FELLING / SKIDDING / PROCESSING

operator, logging machinery
logging machinery operator
feller buncher operator
operator, feller buncher
tree harvester operator
operator, mechanical harvester – logging
mechanical harvester operator – logging
mechanical harvester and forwarder operator
feller delimeter operator
feller forwarder operator
tree-length harvester operator
delimeter and buncher operator
delimeter operator
operator, delimeter
shortwood harvester operator
operator, pulpwood harvester
operator, shortwood harvester
pulpwood harvester operator
log process operator
log processor operator
mechanical tree processor operator – logging
operator, tree processor – logging
tree processor operator – logging
operator, mechanical tree processor – logging
mechanical tree processor and loader operator
bunk skidder operator
forwarder operator – logging
operator, forwarder – logging
treelength forwarder operator

APPENDIX 4 EXPANDED SURVEY RESULTS

EMPLOYEES

EQ 2 : PRIMARY OCCUPATION

Number of employee survey responses by occupation and region

Occupation	Coast	North Interior	South Interior	Did not provide
Aircraft Maintenance	1			
Boomman	2			
Bucker	1			
Bulldozer			1	
Cable Hook Tender	1		1	
Cable Log Loader	3			
Cable yarder-Swing	4			
Cable yarder –Tower			1	
Camp Maintenance		1		
DLS Bucker	1			
DLS Bucker/grader	1			
DLS Chargehand	1			
Equipment Handyman	1			
Excavator Operator	3		2	
Feller Buncher Operator		2	4	
Foreman / Supervisor	2	1	1	1
Forester		1		
Forwarder Operator	2	1		
Handfaller	6			
Harvester Operator	1			
Heli Mechanic	4			
Heli Pilot	2			
Hydraulic log loader	9	2	5	
Landing Bucker	4			1
Landing Man	1			
Log Stacker	3			
Log Truck Driver	13	7	17	
Mechanic	10	3	1	1
Processor Operator		8	17	
Quality Control	3			
Quality Control Scaler	1			
Rock/Drill Blast	1			
Scaler	1			
Scaler/Grader	2			
Skidder	1	1	6	
Truck Driver & Hydraulic Log Loader			2	
Welder			1	
Totals	85	27	59	3
	174			

EQ 3 : EDUCATIONAL BACKGROUND

Region	Total		Post - Secondary		High school					
					Graduated		Completed Grade 9 -11		Completed less than Grade 9	
	#	%	#	%	#	%	#	%	#	%
Coast	83	48	30	36	29	35	18	22	6	7
Northern Interior	27	16	7	26	8	30	9	33	3	11
Southern Interior	59	34	9	15	26	44	21	36	3	5
No data	5	3	1	20	1	20	1	20	0	0
All Locations	174	100	47	27	64	37	49	28	12	7

- Two respondents did not identify their education level and three did not identify their location.
- The minimum level of education for 111 or (69.4%) of the 172 employees responding to this question was high school graduation.
- Post-Secondary includes University, College and Technical School

CONTRACTORS

CQ 5 & 6 : WORKFORCE EXPANSION

Are you expecting to expand your workforce in the next 5-and 10 year period? How? Describe positions and expected source.

Period	Replies		Explanation
	No.	Type	
5-year plan	9	No	
	2	Maybe	We will do some training ourselves. We work locally and will get a lot of applications. We'll be looking for all jobs, as our current workforce is predominantly 50+ and will retire. May have to double shift. May increase processing capacity. Will find employees from contractors going out of business.
	10	Yes	Road construction crew - whatever source we can find. All phases - need positions in stump to dump logging including high lead. Operators from other companies. About 40% - engineering & machine ops. Buckermen, fallers, yarder ops, hooktender. Loggers and haulers. Probably find within area workforce. Depends on mills future plan. But others lose contract - will hire their exiting employees. Longer hauls need more drivers. Source?? - can't find drivers. Become a bit larger, depending on forest industry. 1 or 2 skidder ops. I will retire.
10-year plan	10	No	
	6	Maybe	Same as for 5 yr - We will do some training ourselves ... We'll be looking for all jobs, as our current workforce is predominantly 50+ and will retire. Too far to plan for. Can't predict -- too far -- may be no trees left in 10 yr. Will be up to my successor. Possibly into oil & gas exploration. Need equipment operators.
	5	Yes	Operators from other companies. Buckermen, fallers, yarder ops, hooktender Both loggers and haulers. Probably find within area workforce. Longer hauls need more drivers. Source - can't find drivers. I would like to expand but how, with the worker shortage?

CQ7 & 8 : CRITICAL SHORTAGES

CQ 7 Do you currently have a critical shortage of skilled workers? Please explain why.

Yes 9 replies	<ul style="list-style-type: none"> - Qualified hourly equipment ops and logging truck drivers (3 operators). - Can use 2 more good processor ops - mostly stokers. - It is hard to find highly skilled people for steep slope work. - HD mechanic -1; Excavator op - 1; Driller/blaster - 1. - We inventory to keep logging & retain workers. - Work is contract so people are laid off and go to other jobs. When work starts up, need drivers and ops. - Need 2 drivers, 2 machine ops. - Need 2 processor ops. Truck drivers hard to find. - Need 1 hoe, 1 skidder.
No 12 replies 2 replies with no comments	<ul style="list-style-type: none"> - We can offer town work, which most employees find appealing. - Bringing in junior pilots and apprentice engineers that will advance. Maintaining employee positions through slow periods. - Logging is slowing down and becoming more technical so need fewer employees. - Provide benefits, paid fairly. We have long-term employees. Looking at maintaining or reducing company size. - I cross-train my employees so if an important operator quits, I have someone to take over. They don't start the job totally green. It is easier to find a skidder operator than a buncher or danglehead operator. - Our crew helps us find good workers. - Have accessed pool of First Nations in area. - Be a good employer. - Treat employees fair & with respect. Lots of family involved with business

CQ 8 Are you expecting a shortage to improve or worsen?

Worsen 15 replies	<ul style="list-style-type: none"> - Our ability to provide a full year of work with enough annual salary is becoming increasingly difficult because of the state of the coastal industry. Other industries that need the same skill sets have more ability to pay (oil & gas, construction). - Fewer people entering workforce leads to increasing shortages of trainable workers. - No training in industry, and competition from other industries. - No comments. - Oil & gas and port expansions take our operators. - Pay shortage. Working conditions. Competition with inside jobs with better pay. Consistent work not available. - Due to expanded mining / oil / gas exploration. - There is a limited Number of viable First Nations working due to lack of experience and work commitment. - Fewer people want camp jobs. - No comments. - No trained op. Hard to train ie safety liability - It appears that due to the aging workforce and the lack of interest in the younger work force, there will probably be a shortage (poor hours and wages). - Baby boomers retiring. Young workers being offered big \$\$ to go north. - Older employees retire and lack of skilled younger workers to bridge the gap. - Operators are getting harder to find. Young people don't want the long hours and travel time. A lot of young people don't want to work at all.
Improve 5 replies	<ul style="list-style-type: none"> - Shouldn't be a problem. - Employees from mill closures in north should come south looking for jobs. - More technology = less employees. - I'm new to area and I expect my crew to become more stable as we settle in. - No comments.
Unknown 1 reply	<ul style="list-style-type: none"> - If oil patch slows down, some workers may become available. If mills keep giving raises to union workers and not to loggers, then more loggers will want to work in mills.

CQ 9 : TURNOVER BY JOB TYPE

Contractor No	Job / Occupation	2005		2006		Total departures
		Retire	Quit	Retire	Quit	
2	loader op			1		10
	hoe operator		2		1	
	buckerman		2		2	
	cat operator		1		1	
3	no explanation		2		1	3
4	truck driver		1			4
	buckerman				2	
	hoe operator				1	
5	Buncher		2		1	17
	processor				3	
	loader op				1	
	truck driver		4		6	
6	road builder cat				1	4
	excavator road builder	1				
	truck driver				1	
	truck driver				1	
8	truck driver		1		1	5
	delimber operator			2		
	yarder operator		1			
9	Foreman				1	5
	truck driver				1	
	truck driver			1		
	Buncher Skidder		1		1	
10	truck driver	1				3
	processor		1			
	loader op				1	
11	Buncher		2		1	37
	Skidder		1		1	
	processor		3		2	
	loader op		2	1		
	Drivers		8		10	
	hoe operator		2		2	
	cat operator		1		1	
12	truck driver		1		1	3
	mechanic					
	loader op				1	
13	handfallers		5		26	47
	buncher operators		8		3	
	harvester operators		4		1	
14	HD mechanic		2	1		25
	gravel truck driver		1			
	driller blaster		2			
	excavator operator		3			
	hook tender		1		2	
	log truck driver		5		4	
	second loader		1			
	apprentice HD mechanic		1			
	tireman				1	
	chaser				1	

15	engineers pilots quality control		1	1	4 2	8
16	buncher processor	1			3	4
17	yarder operator truck driver buckerman	1 1	1	1	2	6
18	dangle head				1	1
19	hooktender/chokermen		4		3	7
20	bunchers butt'n'top hand faller		2		1 2 1	6
21	buncher				1	1
	TOTALS	5	79	8	104	196

CQ 14 : ON-THE-JOB-TRAINING

Briefly describe how you implement on-the-job training

17 contractors provided answers, 4 did not

- Reply 1 Go over machine on day shift; checklist in safety box; evaluated by owner and other workers (very important).
- Reply 2 We have 90% operators that have to be experienced.
- Reply 3 One on one.
- Reply 6 Hands on training - e.g. truck drivers, processor operators. Dealer training on attachments etc e.g. processors. Feller bunchers, truck drivers do a pre-work train with written instructions. Safety training yearly.
- Reply 7 Supervisor holding trainee's hand.
- Reply 8 Close one-on-one supervision.
- Reply 9 Field orientation of safety, equipment, environmental management systems, and hands-on experience with senior qualified staff.
- Reply 10 During breaks or slow times, operators will try new equipment with the proficient operator watching.
- Reply 11 Trainee spends time with supervisor, and a few shifts with experienced workers.
- Reply 12 We put the trainee with an experienced operator initially and then make sure they get the simplest job available to start, and have an experienced person close by to observe.
- Reply 13 Varies with experience. Start as mechanics helper to learn machine manipulation. When ready, move to small trees on flat terrain, gradually increasing size and slope. Trainer spends 100% of time, usually for 1 week, followed by sporadic visits.
- Reply 14 Training wage - probation period - suitability to job.
- Reply 15 Assign junior personnel to work directly with senior employees under constant supervision.
- Reply 16 When I see operators struggling, I sit with them for a few hours.
- Reply 18 Give new hires the safety program and talk to them about our company policy and what we expect of them. Have them watch our operators and then put them to work with an experienced person. Check continually and tell them what they are doing wrong or right. You can soon tell if they will make it or not.
- Reply 19 The foreman runs through what our company expects of them. The rest they will know already.
- Reply 21 Experienced operators given opportunity on other equipment if desired.

CQ 15 : WHAT IS MISSING FROM THE SKILL SETS OF NEW HIRES?

Contractor assessment of skills and aptitudes of new hires.

The table shows the number of occupations listed by the contractors. The numeric values are the averaged responses when contractors ranked the skill sets as:

- 1 = mostly poor
- 2 = sometimes OK
- 3 = usually OK

	Skidders	Bunchers	Loaders	Processors	Drivers	Mechanics / engineers	
No of occupations	9	11	5	17	9	7	1 each of
Safe work practices	2.65	2.64	2.40	2.53	2.67	3.00	Forwarder Co-pilot Quality control Driller Cook
Ability to read	2.71	2.73	3.00	2.71	2.67	3.00	
Maturity	2.58	2.45	2.60	2.53	2.56	2.57	
Ability to work with others	2.75	2.64	3.00	2.82	2.33	2.86	
Ability to interpret maps / prescriptions	1.94	2.18	2.20	2.24	0.89	1.00	
Mechanical skills	1.75	1.27	1.40	2.00	1.89	2.29	
Practical experience	2.11	2.18	1.60	2.35	2.44	1.57	

	Grapple yarder	Hook - tender	Chaser	Cat operator	Excavator	Buckerman	
No of occupations	3	3	2	2	2	2	3
Safe work practices	3.00	3.00	2.50	2.00	3.00	3.00	No description
Ability to read	3.00	3.00	3.00	3.00	2.50	1.00	
Maturity	3.00	2.33	2.50	2.50	3.00	3.00	
Ability to work with others	3.00	3.00	3.00	3.00	2.50	3.00	
Ability to interpret maps / prescriptions	3.00	3.00	1.50	2.00	2.50	1.00	
Mechanical skills	2.67	1.00	1.00	1.50	2.50	2.50	
Practical experience	3.00	2.67	1.50	2.00	2.00	3.00	