LOGGING INDUSTRY RESEARCH ASSOCIATION
NEW ZEALAND

PROJECT REPORT

THE NEW ZEALAND LOGGING WORKER —A PROFILE

J. GASKIN, B. SMITH, P. WILSON.

Project Report
P.R. 44

New Zealand Logging Industry
Research Association (Inc.)
P.O. Box 147,
ROTORUA,
NEW ZEALAND.

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P.R. 44 1989

Prepared by:

John Gaskin,
New Zealand Logging Industry
Research Association (Inc.)

Barry Smith,
Forest Research Institute.

Peter Wilson,
Forest Research Institute.

FEBRUARY 1989

For information address the NZ Logging Industry Research Association (Inc), PO Box 147, Rotorua, New Zealand.

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SUMMARY

1. *The traditional method of recruiting to the industry through advertising in newspapers was seldom used. Most loggers got their first job through either a friend or a relative. This reliance upon "word of mouth" to recruit workers may restrict the employment base of the industry.*

2. *Half of those working in logging did so because of the attraction of working outdoors. Pay was cited as the main reason for working in the industry by only 14.5% of loggers.*

3. *The average fortnightly "take-home" pay of the loggers surveyed was $736. Individual pays ranged from $300 to $1500 per fortnight. While there was little variation in average take-home pay between the three regions surveyed, there was a relatively larger number of lower paid workers in Northland and the Otago/Southland regions.*

4. *Major regional differences were found in the method of paying loggers. Bay of Plenty loggers were less likely to be on a piece-rate or sub-contract system than their counterparts in Northland and Otago/Southland.*

5. *Despite the high accident rate experienced by the industry, there appeared to be a serious lack of follow-up to victims of logging accidents. Very few of the accident victims surveyed claimed to have been interviewed after the accident to try and ascertain the cause, and in no case was a recommendation made as to how the accident could be avoided in the future.*

6. *Most loggers recognised the benefits of using safety boots, hard hats and ear muffs in the course of their work. That the majority were also choosing to wear leg protection is particularly encouraging given the high incidence of leg injuries in the industry.*

7. *That three-quarters of the loggers interviewed suffered from some form of work-induced injury suggests that careful thought needs to be given to the implementation of ergonomically better techniques. The high incidence of back injuries needs urgent attention.*

8. *While the logging workers surveyed were found to be generally satisfied with their jobs, it was clear that promotional opportunities and pay were two areas giving concern.*

9. *In view of the high turnover rates experienced by the logging industry, it is worth noting that loggers who intended to leave the industry over the next five years were significantly more dissatisfied with their jobs than loggers who intended to remain.*

10. *The majority of the loggers surveyed had not undergone any formal instruction or skill recognition. Most loggers either learnt the skills themselves or were taught by more experienced workers.*

11. *The training and development of a more skilled and larger workforce will be prerequisite to any future growth in the industry. It must be of concern then that the majority of the loggers interviewed were unaware of the operations of the New Zealand Logging Industry Research Association (LIRA) and the Logging and Forest Industry Training Training Board (L&FITB).*

1. INTRODUCTION

Although logging is one of New Zealand's oldest industries little is known about the characteristics of its workforce. Mitchell (1971) noted **"On surveying the articles in Te Kura Ngahere from 1925 to 1936 and latterly in the N.Z. Journal of Forestry, I could find only four articles which had any bearing on forest labour:..."** The author further commented **"From this dearth of written information and comment, apart from the recent, timely editorial, one could well assume that, of the three elements of productivity, land, capital, and labour, the labour element in forest management to date has been of least consequence."**

The issue of The New Zealand Journal of Forestry from which the above quotations have been taken though did include other papers addressing the forestry workforce. Comments ranged from a discussion of motivation (Chavasse) and other aspects of labour in forestry (Fenton and Terlesk) to problems associated with the prolonged use of power saws (Tustin and Inglis).

More recently, numerous papers have addressed various aspects of logging labour - for example, turnover (Smith and Wilson, 1983; Liley, 1984; Gaskin, 1987; Bomford and Gaskin, 1988), absenteeism (Wilson et al 1988), accidents (Tempest and Horgan, 1978; Prebble, 1984; Gaskin, 1986, 1987, 1988) and predictions of future labour requirements (Levack, 1984; Johnson, 1984; Forestry Council, 1981). A recent census data based study by Crothers and MacPherson (1984) looked at selected demographic and social characteristics of both the forestry and logging workforces. Other studies have concentrated on the machinery/ production aspects of logging work (Fraser et al (1976), Liley (1985)). Both these studies noted average numbers of loggers per gang on a regional basis, but little else specific to the logging labour force was discussed. However, Fielder (1979) focused his analysis entirely on the logging industry using data from interviews with 125 loggers from 25 logging crews in the Bay of Plenty.

In summarizing the results he offered the following description of the logging labour workforce:

- The average age of loggers was 31 years. Most were married and lived in a small town.
- Most workers had between one and three years secondary schooling but less than one quarter had received any formal training in logging.
- Seventy percent felt that further training would improve their work.
- The average length of time in logging was slightly more than eight years, with the most common length of service being between three and five years.
- Factors that appeared to motivate loggers were an interest in the nature of the work, the physical environment, and the ability to set their own work pace.

While Fielder's research went some way towards profiling the characteristics of the logging workforce, it was confined to a survey of logging gangs in the Bay of Plenty.

Given that New Zealand has the potential to increase its annual

wood harvest from 10 to 20 million m^3, it is expected that at some stage in the near future the logging industry will need to plan for a substantial increase in the logging labour force. Thus the current lack of detailed knowledge about the workforce must be of concern.

One step in developing the much needed research in the human resource area was an undertaking by LIRA to carry out an extensive survey of the logging industry workforce, (Gaskin, 1986). The stated objectives of such a survey were:

(a) To gain base information about the logging labour force to assist in directing future ergonomic research.

(b) To help in predicting labour requirements and possible means of recruitment.

(c) To assist the training institutions determine potential training requirements.

Based on the above objectives The Logging Industry Workforce Survey was instigated in 1986 as a joint research project by the Social Science Research Group at the Forest Research Institute (FRI) and the Logging Industry Research Association (LIRA). The survey was designed to cover a sample of loggers from the Bay of Plenty and all loggers from Northland. It was later extended to include all loggers working in exotic logging in the Otago/Southland area.

The Bay of Plenty was selected as one area because of its long association with exotic logging, the size of the workforce employed (approximately half of the total exotic logging workforce), and the fact that two thirds of the exotic harvest (6 million m^3) is produced here.

Northland was chosen as a second area to be studied because of the major expansion expected in logging activity over the next 15 to 20 years. It is anticipated that the annual wood harvest will increase from the present 0.5 million m^3 to 1.8 million m^3 by 2004 - 2008 (Stewart et al, 1985).

The final region, Otago/Southland, was included because, like Northland, this area anticipates a major expansion by the turn of the century. Furthermore it was felt that its geographical isolation from the mainstream of exotic logging would provide an interesting comparison with the Bay of Plenty and Northland.

2. SURVEY DETAILS

Interviews with loggers working in the Bay of Plenty were started during April 1986 with the Otago/Southland area completed by March 1988. The Northland Survey was carried out between these dates. Interim results were published throughout the period and will be referred to within this report with the full list of papers included as Appendix 1.

2.1 SAMPLE SELECTION AND SIZE

The Bay of Plenty sample was drawn from a Register of logging gangs compiled by Liley (1985). In total, 37 gangs were surveyed resulting in a total sample size of 202 loggers. This sample size was sufficient to give an error margin on the responses of ±7%.

The Northland and Otago/Southland loggers were located with the assistance of the local Department of Labour Bush Inspector. Only "full time" logging gangs were included. The survey did not include any indigenous logging gangs in any of the three areas.

Because of the low level of exotic logging activity in Northland and Otago/Southland it was decided to survey the entire logging workforce in these areas. In all, 22 gangs from Northland and 21 gangs from Otago/Southland were surveyed involving interviews with 97 and 91 loggers, respectively. Thus in total, 390 interviews were carried out over the 3 regions amounting to approximately 15% of New Zealand's logging workforce.

The three areas were as follows:

- Bay of Plenty - as per the old NZFS Rotorua Conservancy boundaries and including loggers employed by all the major companies in the area.
- Northland - the area to the north of the Auckland Harbour bridge.
- Otago/Southland - the area to the south of Dunedin including that to the south of the Killmogg Hill.

2.2 INTERVIEW PROCEDURES

Interviews were carried out in the field by experienced LIRA staff members who were familiar with good interviewing techniques. To achieve minimum disruption to the gang's production, machine operators, wherever possible, were interviewed during workbreaks. The interviews took around 20 minutes to complete (a copy of the survey schedule is included as Appendix 2). Typically, the prime contractors took longer to interview as they also provided information relating to the gangs production and the machinery being used.

Only one logger refused to take part in the questionaire with a further two objecting to the question about pay. The interest in the project shown by the majority of those spoken to suggests that loggers were keen to use the interview as a chance to discuss their industry.

2.3 SAMPLE CHARACTERISTICS

A considerably smaller number of company logging gangs were surveyed compared to the earlier survey of Fielder. This reflects the trend away from company log-

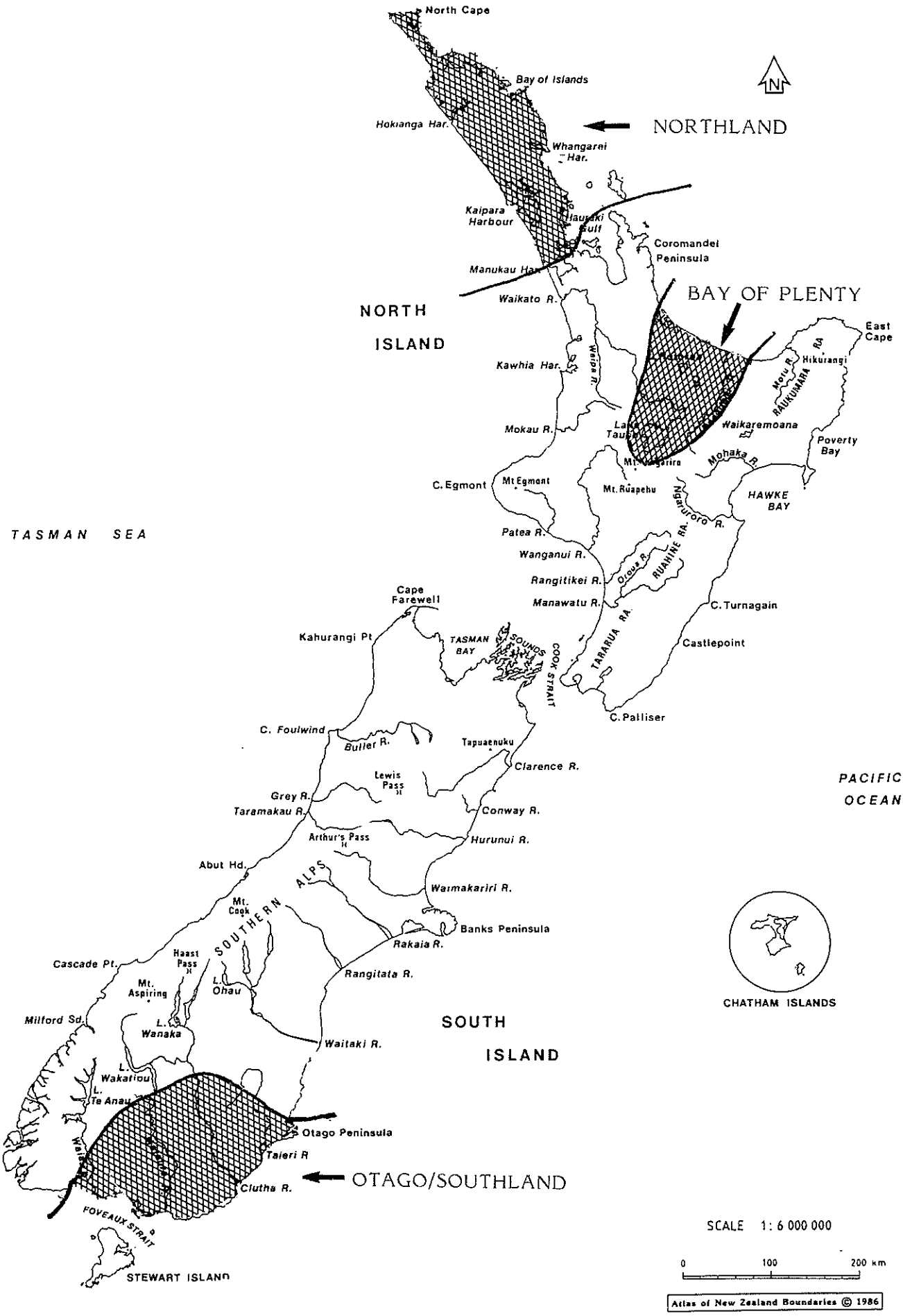


Figure 1 : Definition of Survey Areas

ging gangs to contract logging crews. Of the total of 80 gangs surveyed only seven were company employed. Table 1 gives the ratios of company to contract gangs and clearfelling to thinning gangs by region.

The average number of employees per gang was 4.9, ranging from a high of 5.6 for the Bay of Plenty to 4.7 for Northland and 4.6 for Otago/Southland. The distribution of the number of loggers per gang by area is illustrated in Figure 2.

TABLE 1 : COMPANY VERSUS CONTRACT AND THINNING VERSUS CLEARFELL

	Company	*Contract*	*Thinning*	*Clearfell*
Bay of Plenty	*4*	*33*	*20*	*17*
Northland	*1*	*21*	*6*	*16*
Otago/Southland	*2*	*19*	*1*	*20*
TOTAL	*7*	*73*	*27*	*53*

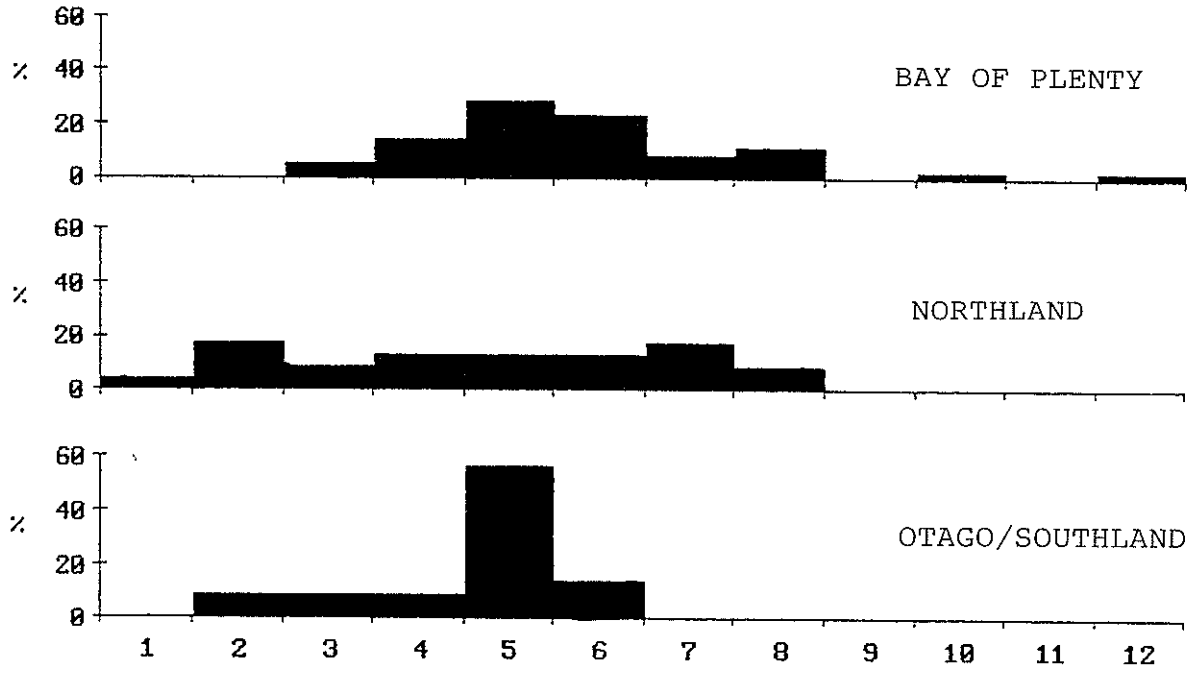


Figure 2 : Distribution of number in gang

3. FINDINGS

The results from the survey will be presented under the following sub-sections; general demographic characteristics; conditions of employment; recruitment and retention; training; accidents, safety equipment; occupational injuries; industry awareness; and job satisfaction.

3.1 GENERAL CHARACTERISTICS

Age

The average age of loggers interviewed was 31 years - the same as that found by Fielder in 1979. Both Otago/Southland and Northland Loggers had an average age of 31.7 years, while their Bay of Plenty counterparts were slightly younger at 29.5 years. Overall, the ages ranged from 15 years to 62 years.

Figure 3 shows the age distribution of loggers by region and as a total group.

Marital Status

A greater percentage of loggers in Northland and Otago/Southland were married (61% and 63% respectively) than in the Bay of Plenty (49%). Overall, the percentage of single loggers was 37%, married 55%, and "other" (for example in a defacto relationship) 8%.

Number of Dependants

Almost half of the loggers (48%) had no dependants, with 27% having either one or two. Table 2 gives the number of dependants by region showing differences between areas to be small.

Residential Location

Because there are a larger number of major urban centres and towns near to Bay of Plenty logging operations compared with Northland and Otago/Southland, a much smaller percentage of loggers in the Bay of Plenty lived in rural settings. This is shown in Table 3.

Housing

Nearly half of the loggers surveyed (49%) lived in their own house (with or without a mortgage); 38% lived in rental accommodation (including company housing). The remainder resided with parents or relatives.

Secondary School Education

Over half (56%) of those interviewed stated they had had between one and three years secondary schooling. A further 30% had three years or more. The highest school qualification attained was Higher School Certificate (2%), while 3% had University Entrance. Only 18% of the loggers questioned had School Certificate passes.

Tertiary Education

Very few loggers had had any further trade (or other) training after leaving school. Some 18.1% of the Northland workforce fell into this category along with 15.8% of those from the Bay of Plenty. Otago/Southland were best off in this regard with 29.7% of those spoken to having had such training.

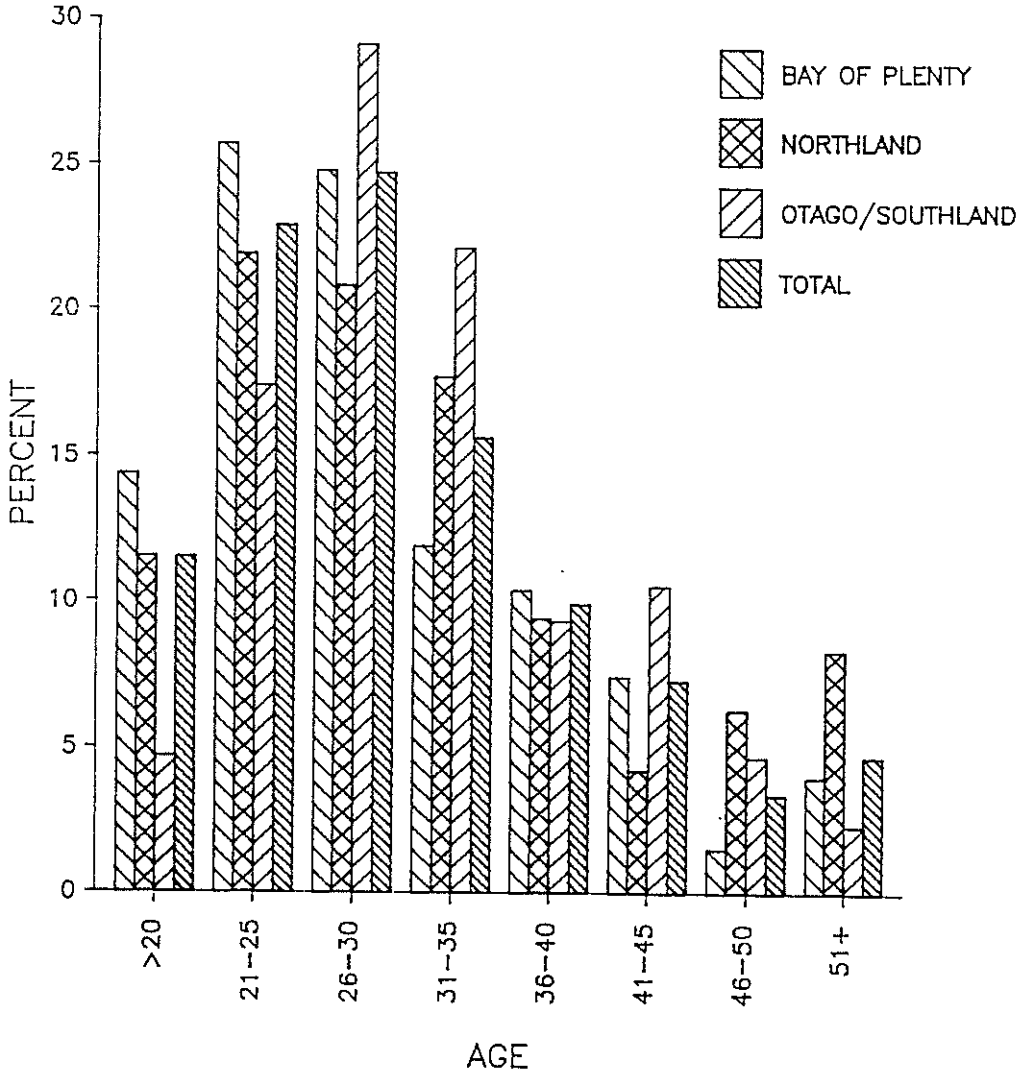


Figure 3 : Age Distribution of Loggers

TABLE 2 : NUMBER OF DEPENDANTS

Dependants	*BOP* %	*Northland* %	*Otago/ Southland* %	*Total* %
0	*48.5*	*46.5*	*50.5*	*48.4*
1	*9.4*	*9.3*	*6.6*	*8.7*
2	*18.3*	*21.6*	*15.4*	*18.4*
3	*12.9*	*14.4*	*16.5*	*14.1*
4	*6.9*	*3.1*	*7.7*	*6.2*
5	*1.5*	*3.1*	*2.2*	*2.1*
6	*2.0*	*1.0*	-	*1.3*
7	*0.5*	*1.0*	*1.1*	*0.8*
	100.0	*100.0*	*100.0*	*100.0*

TABLE 3 : LOGGERS PLACE OF RESIDENCE

Place Of Abode	*BOP*	*Northland*	*Otago/ Southland*	*Total*
Rural	*15%*	*40%*	*39%*	*27%*
Small Town	*29%*	*43%*	*54%*	*39%*
City	*56%*	*17%*	*7%*	*34%*

Time Worked in Logging

The average time spent working in logging was 6.9 years. Some regional differences were noted in that the average time in logging for the Bay of Plenty group was 8.1 years, followed by Otago/Southland region at 6.5 years, and Northland at 4.9 years.

The distribution of the time worked in logging is given in Table 4.

Time Worked in Present Gang

The average length of time loggers had been working for their current employer was 1.8 years. There were significant regional differences with the longest average period being 2 years for the Bay of Plenty but only 13 months for Otago/Southland. Northland loggers had on average been with their current employer for 1.8 years. This supports the findings of recent studies of labour turnover

TABLE 4 : TIME WORKED IN LOGGING

Time in Logging	*Total* %	*BOP* %	*Northland* %	*Otago/ Southland* %
Less than 12 months	*12.3*	*9.5*	*12.9*	*18.1*
1 year to less than 3 years	*14.2*	*12.8*	*22.0*	*9.2*
3 years to less than 5 years	*12.2*	*9.9*	*14.8*	*14.7*
5 years to less than 9 years	*25.9*	*30.7*	*20.9*	*20.5*
9 years or more	*35.2*	*37.1*	*29.4*	*37.5*
	100.0	*100.0*	*100.0*	*100.0*

which suggests that 50% or more of the logging workforce either change their employer or leave the industry each year.

The distribution of the time spent with the current employer is shown in Table 5.

In Fielder's (1979) study an average time in current gang of 2.7 years was observed. This is higher than the average length of service observed in the present study. Such a difference is probably attributable to the larger representation of company employees in Fielder's study.

Number of Gangs Worked In

To assess regional labour stability (turnover data collected to date by the logging industry has been limited to Bay of Plenty operations only), loggers were asked how many gangs they had worked in during their time in logging.

Analysis was made difficult by the presence of company gangs in the survey as these loggers, provided they had always worked for the same company, often considered themselves to have worked in one gang only.

The average number of gangs worked in was 2.6. Again regional differences were observed with the Bay of Plenty having a figure of 3.1, followed by 2.3 for Otago/Southland and only 2.0 for Northland. The maximum number of gangs that had been worked in was nine - by one logger in the Bay of Plenty.

3.2 CONDITIONS OF EMPLOYMENT

Questions relating to pay were not asked of the prime contractor.

Method and Frequency of Pay

The majority of loggers were paid wages once a fortnight. There were, however, significant regional differences in both the method and frequency of payment (Table 6).

The payment of weekly wages and the use of a piece-rate payment system were more common outside the Bay of Plenty.

TABLE 5 : TIME WORKED WITH CURRENT GANG

Time in Gang	*BOP* %	*Northland* %	*Otago/ Southland* %	*Total* %
Less than 12 months	*28.8*	*35.1*	*43.6*	*33.8*
1 year and less than 3 years	*33.3*	*26.8*	*20.0*	*28.7*
3 years and less than 5 years	*18.0*	*10.3*	*11.7*	*14.6*
5 and < 9 yrs	*12.4*	*14.4*	*10.6*	*12.5*
10 yrs and more	*7.5*	*13.4*	*14.1*	*10.4*
	100.0	*100.0*	*100.0*	*100.0*

TABLE 6 : METHOD AND FREQUENCY OF PAY

Area	Pay Method			Pay Frequency		
	Wages %	Piece %	Share %	Weekly %	Fort. %	Month %
Bay of Plenty	86.5	12.9	0.6	17.6	82.4	-
Northland	65.8	34.2	-	31.3	48.8	20.0
Otago/Southland	46.5	52.1	1.4	26.7	68.0	4.3
All areas combined	72.5	26.9	0.6	23.1	70.8	6.2

Income

Loggers were asked their take home pay per fortnight. The result was an estimate of net income. No attempt was made to separate tax free allowances (eg saw and clothing).

Average earnings varied little by region. Loggers in Northland earned the most with $750 per fortnight, while those in Otago/Southland and the Bay of Plenty took home $735 and $730 respectively. Overall, the average pay of the loggers surveyed was $736. The distribution of fortnightly take home pay can be seen in Figure 4. Individual income ranged from a low of $300 per fortnight to a high of $1500 per fortnight with both cases coming from Otago/Southland.

Adequacy of Pay

Those interviewed were also asked to rank their pay on a one to seven scale in terms of whether it was adequate to live on. Some regional differences were noted though the majority of loggers felt that their pay was adequate to live on. Satisfaction with pay is handled more fully in a later segment of this report.

Payment of Bonuses

Few loggers (26% over the three regions) were on a regular bonus system. This was usually tied to production. No differences in take home pay were found between payment systems.

Number Contributing to Household Income

Little regional difference was observed with respect to the number of loggers who lived in multiple income households. A quarter of those interviewed stated that another member of the family was earning, usually the logger's spouse.

Hours of Work

The average period spent "on the job" across the total sample was 8.5 hours. Northland and Otago/Southland loggers worked 8.9 hours per day, while their Bay of Plenty counterparts were almost an hour better off with a work day of 8.1 hours. The distribution of time on the job is illustrated in Figure 5.

Variation in the time spent at work ranged from a low of 6 hours

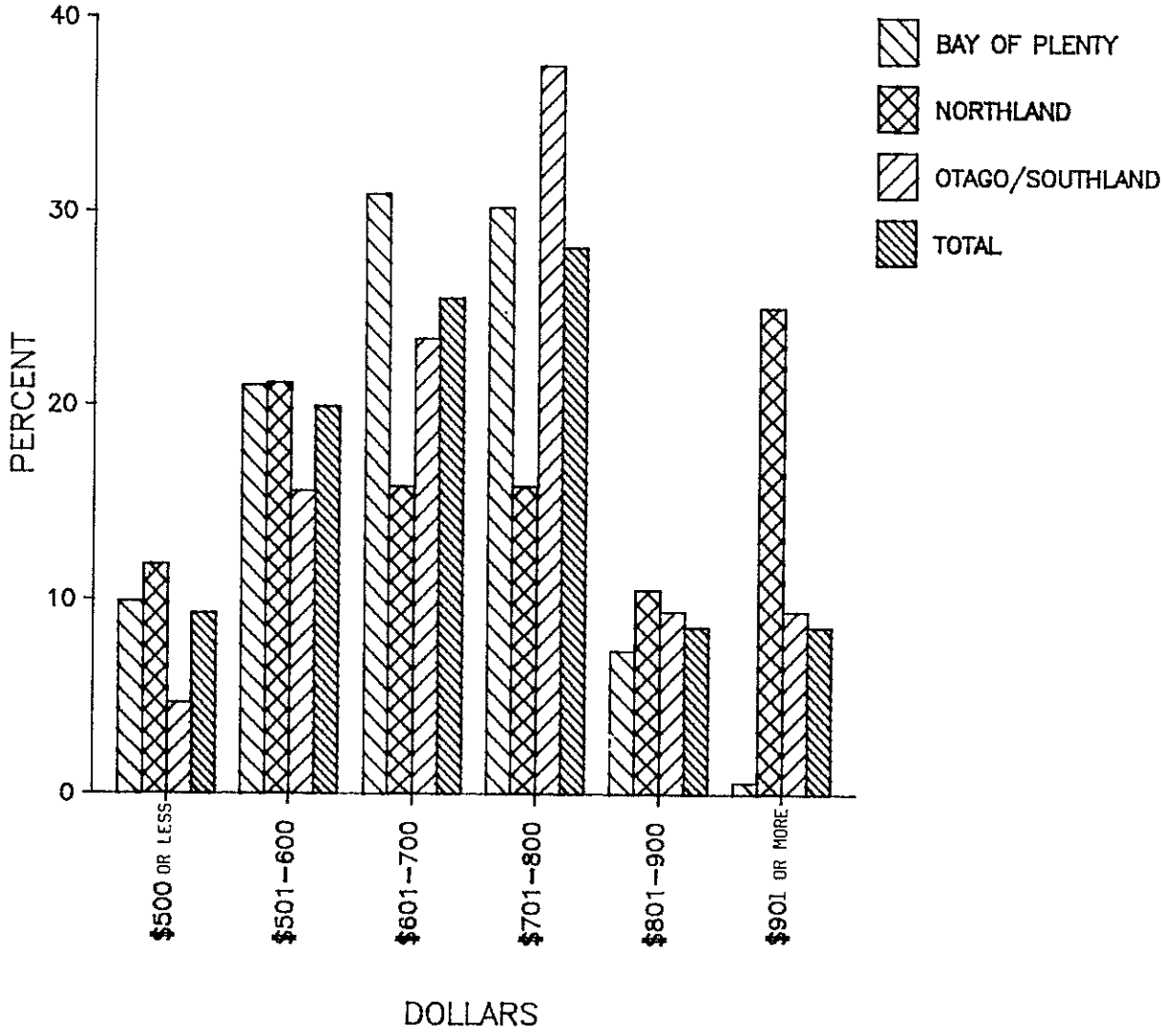


Figure 4 : Distribution of Fortnightly Pay

for a gang in Northland to a high of 12 hours for a gang in the Otago/Southland area.

Travel Time to Work

Travel time per day varied considerably between the three areas surveyed. This ranged from a low of six minutes for one logger in Otago/Southland, to a high of three hours for two loggers (one each from Northland and Otago/Southland). Variations in travel time were less in the Bay of Plenty (Figure 6). The average travel time across the three areas surveyed was 1.25 hours.

Major regional differences were evident with regard to the payment of travel time (Table 7). This reflects the fact that those paid on a piece rate system are not usually paid for their travel time.

Adding hours "on the job" and "travel time" suggests an average total work day of 9.75 hours.

Jobs Performed in Gang

Respondents were given a list of jobs normally associated with logging and asked which they had performed in their present gang. Fielder (1979) found that loggers had experience or skill in a wide range of jobs. The data from the present survey (Table 8) supports this finding.

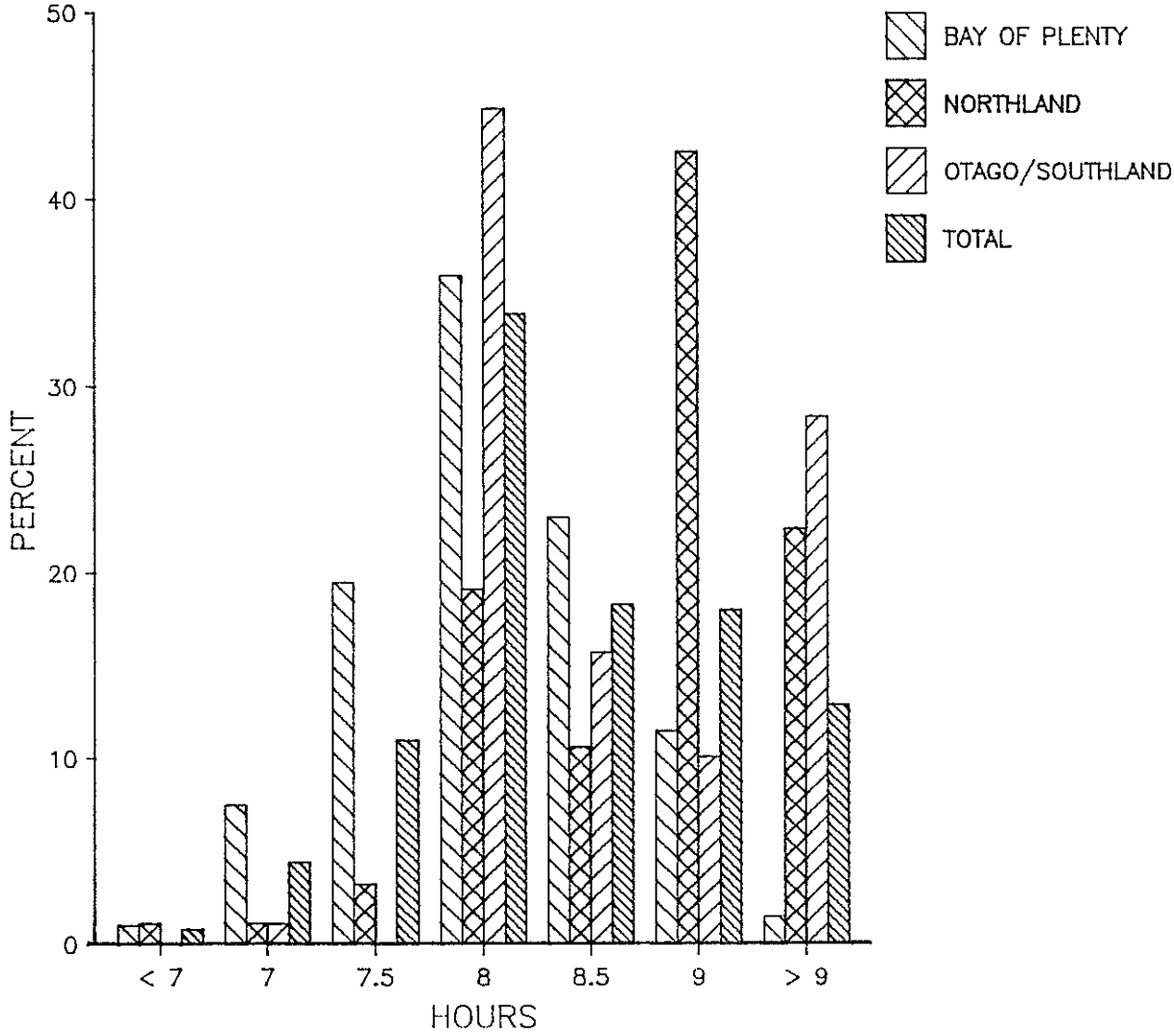


Figure 5 : Distribution of Hours Worked per Day

However, the low number of those who had operated a hauler or tractor is because so few of these units were encountered in the survey. There were only small regional differences in the frequency of the jobs performed with felling, trimming, breaking out and skid work being the jobs where most loggers had experience.

Normal Job

Felling and trimming together accounted for 37.2% of the normal jobs performed by respondents, followed by skidder and loader operation (combined) at 25.6%. Thirteen percent of the loggers interviewed were normally employed as skid workers.

Job Most Preferred

Felling and trimming were the jobs most preferred (40.5%). Machine operating (skidder, tractor, loader, or hauler) was deemed to be the "best" job by 26.5%. Some 7.2% of those questioned had no particular preference.

The reasons given for preferring one job over another were numerous. The three main responses however were: *"the job is challenging" (23.9%), "the job keeps you busy", or "the job is interesting" (21.5%) and "the job is easy" (11.6%).*

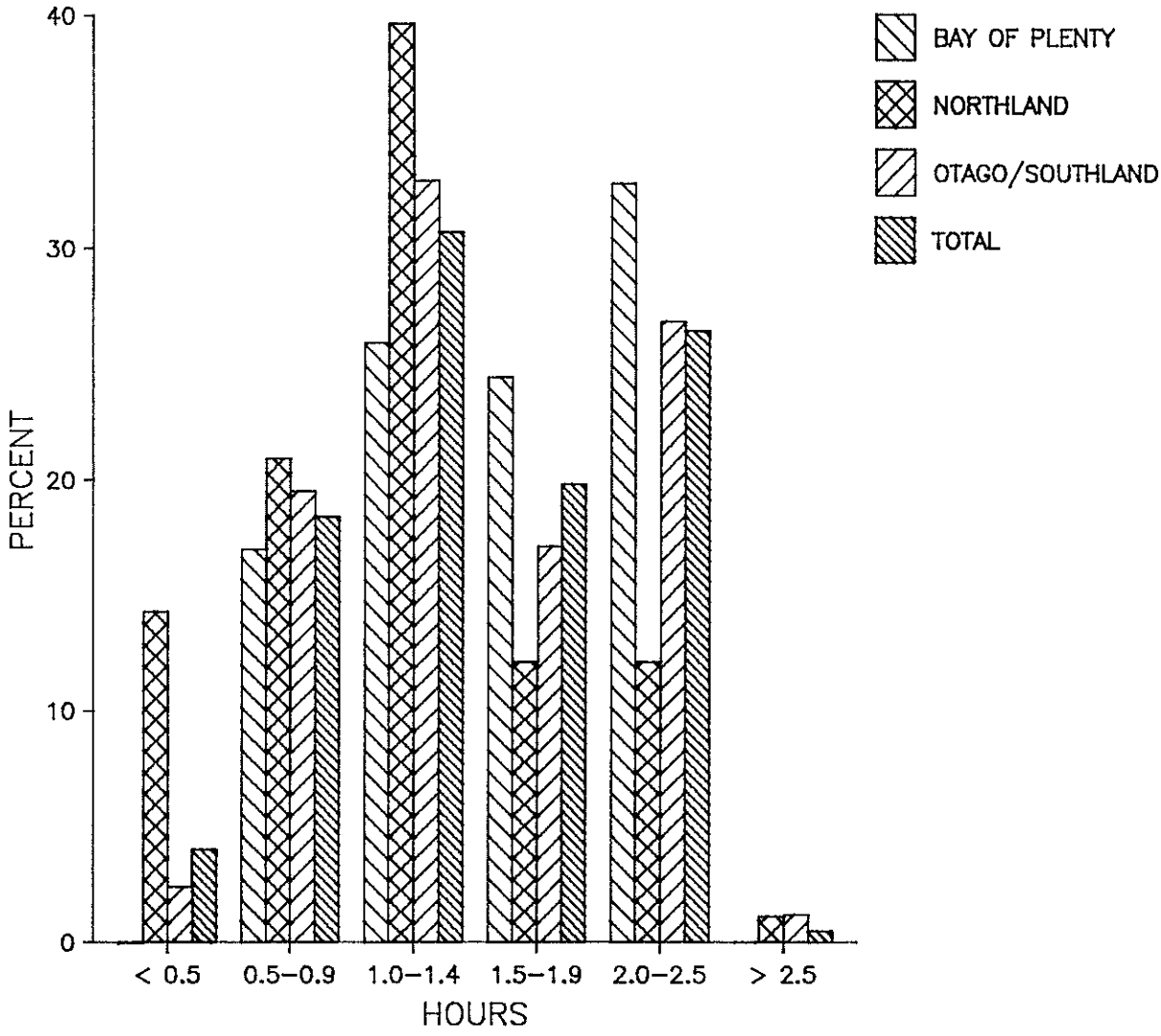


Figure 6 : Distribution of Travel Time

TABLE 7 : PAYMENT OF TRAVEL TIME

Travel Time Paid	*BOP* %	*Northland* %	*Otago/ Southland* %	*Total* %
Yes	*95.3*	*45.7*	*38.6*	*71.4*
No	*4.7*	*54.3*	*61.4*	*28.6*

TABLE 8 : JOBS PERFORMED IN GANG

Jobs Done	*BOP* %	*Northland* %	*Otago/ Southland* %	*Total* %
Felling	*85.6*	*82.5*	*87.9*	*85.4*
Trimming	*90.1*	*82.4*	*90.1*	*88.2*
Breaking Out	*75.7*	*76.3*	*79.1*	*76.7*
Skid Work	*79.2*	*80.4*	*90.1*	*82.1*
Skidder Op.	*53.0*	*50.5*	*62.6*	*54.6*
Tractor Op.	*19.3*	*36.1*	*27.5*	*25.4*
Loader Op.	*38.6*	*54.6*	*44.0*	*43.8*
Hauler Op.	*4.0*	*7.2*	*16.5*	*7.7*

Felling - the most preferred job in logging

3.3 RECRUITMENT AND RETENTION

Method of Recruitment

By far the most common method by which loggers got their first job in the bush (Table 9) was by being told of the opportunity by a friend or relative (73.8%). Few had used the traditional method of answering an advertisement in the newspaper. This suggests that either logging jobs are not advertised or that few people respond to advertisements.

Main Reason for Working in Logging

Enjoyment of the outdoor environment, and logging being the only job available, were the most frequently offered reasons for joining the industry. The latter suggests that if another job had been available this would have been taken in preference to working in logging. Pay was cited as a main reason for working in the industry by only 14.5% of loggers.

TABLE 9 : METHOD OF RECRUITMENT

Method	BOP %	Northland %	Otago/ Southland %	Total %
Answered Ad.	*10.4*	*7.4*	*8.1*	*9.2*
Told by Relative	*35.6*	*26.6*	*15.1*	*28.8*
Told by Friend	*40.6*	*45.7*	*54.7*	*45.0*
Asked for Job	*13.4*	*20.2*	*22.1*	*17.0*

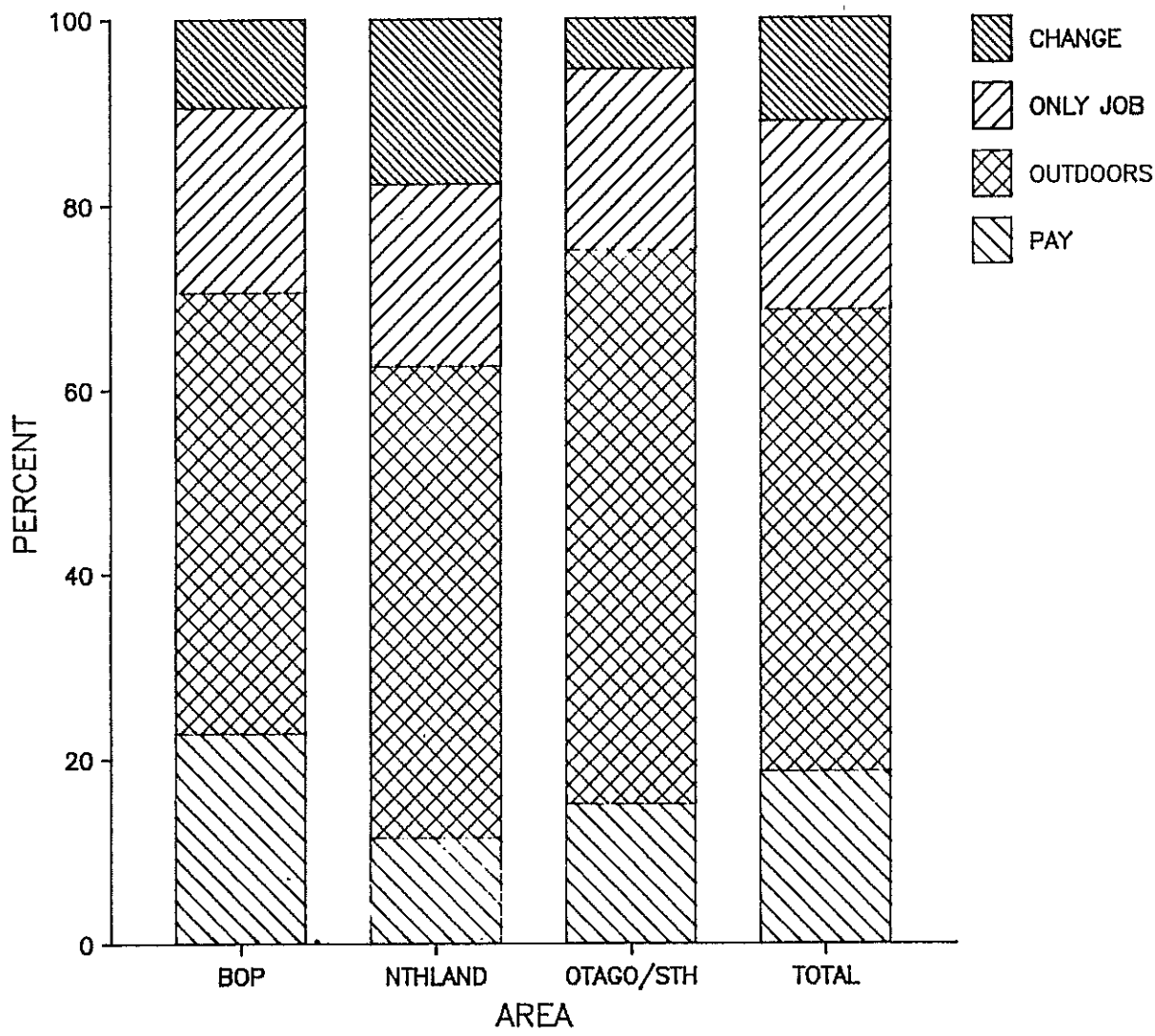


Figure 7 : Reasons for Working in Logging

Father's Employment

Respondents were asked whether their father had been employed in forestry, logging, or the rural sector to ascertain the extent to which loggers had followed their fathers' choice of occupation. It can be seen (Table 10) that almost two thirds of the logger's fathers had been employed in rural-based occupations including forestry and logging.

Only relatively minor regional variations existed with regard to the fathers' occupations, although it might have been expected that more of the Bay of Plenty loggers would have come from a logging background. Similarly more would have been expected to come from a rural background in Northland and Otago/Southland.

Respondent's First Job

However, wider regional variation was found when addressing the logger's first job on leaving school (Table 11). While there was a diversity of first jobs given by respondents, the data presented in Table 11 has, for ease of analysis, been grouped into the same four broad categories as that shown in Table 10.

It seems that fewer loggers in the Otago/Southland region started their working life in logging. However, there was evidence of more ex-woodsman trainees in this region (10%).

TABLE 10 : FATHER'S OCCUPATION

Occupation	*BOP* %	*Northland* %	*Otago/ Southland* %	*Total* %
Forestry	*5.5*	*8.3*	*8.1*	*6.8*
Logging	*34.3*	*25.0*	*22.1*	*29.1*
Rural Sector	*23.4*	*33.3*	*20.9*	*25.3*
None of Above	*36.8*	*33.3*	*48.8*	*38.6*

TABLE 11 : RESPONDENT'S FIRST JOB

First Job	*BOP* %	*Northland* %	*Otago/ Southland* %	*Total* %
Forestry	*9.0*	*1.0*	*19.0*	*9.0*
Logging	*20.8*	*11.5*	*4.8*	*14.9*
Rural Sector	*30.1*	*34.4*	*27.4*	*30.6*
None of Above	*40.1*	*53.1*	*48.8*	*45.5*

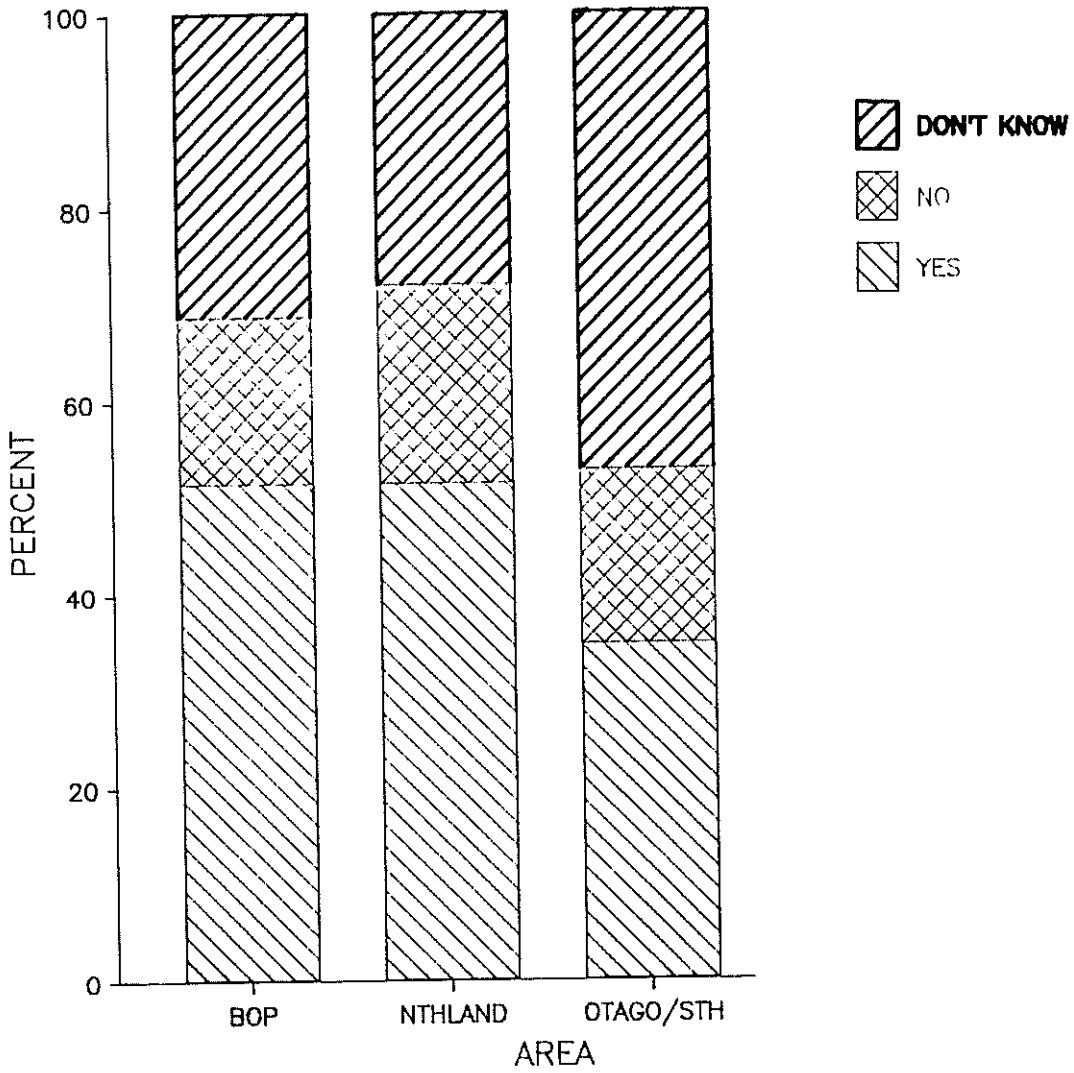


Figure 8 : Loggers Intentions about being in Logging in 5 Years Time

Respondent's Intentions About Future in Logging

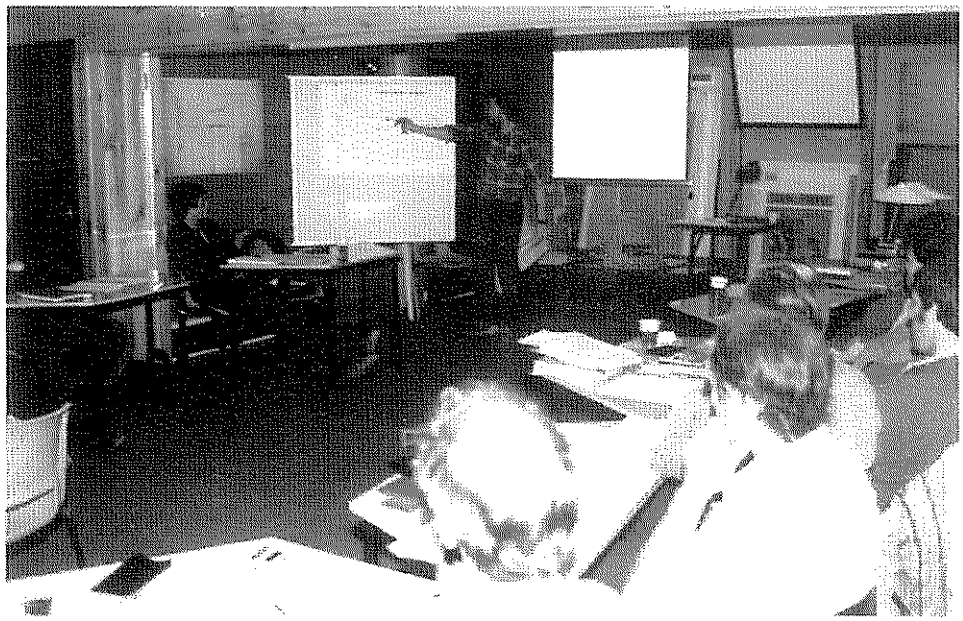
When asked whether they thought they would still be working in the industry in five years time, 186 (47.7%) of the 390 loggers interviewed stated they would, 71 (18.2%) stated they would not, and 133 (34.1%) were not sure. Figure 8 shows however, that more uncertainty exists amongst loggers in the Otago/Southland area. This feature could be attributable to the fact that the survey in this area occurred nine months after the N.Z. Forest Service (the major employer in the area) had been corporatised - a move which may have resulted in some anxiety about the future of the industry.

While less than a quarter of loggers in all three areas indicated that they would not be working in the industry in five years time, when coupled with the "don't knows" this suggests that about half of those surveyed are uncertain about their future in the logging industry.

3.4 TRAINING IN LOGGING SKILLS

Formal Training

When asked if they had received any formal training in logging only 29.2% claimed they had, although there were wide regional differences.



Classroom lecture during a cable logging course - few loggers had received such formal training

The Bay of Plenty, with the influence of major company training schemes showed the largest proportion of loggers with formal training (42.6%). This compared with 10.6% and 20.5% for loggers in Northland and Otago/Southland, respectively.

Informal Training

Those loggers who had not received formal training in logging were asked how they had learnt the job. About a half had learnt from a more experienced bushman (49.2%), with the remainder either being self taught (36.0%) or instructed by the boss or supervisor. Some regional variation is evident (Figure 9).

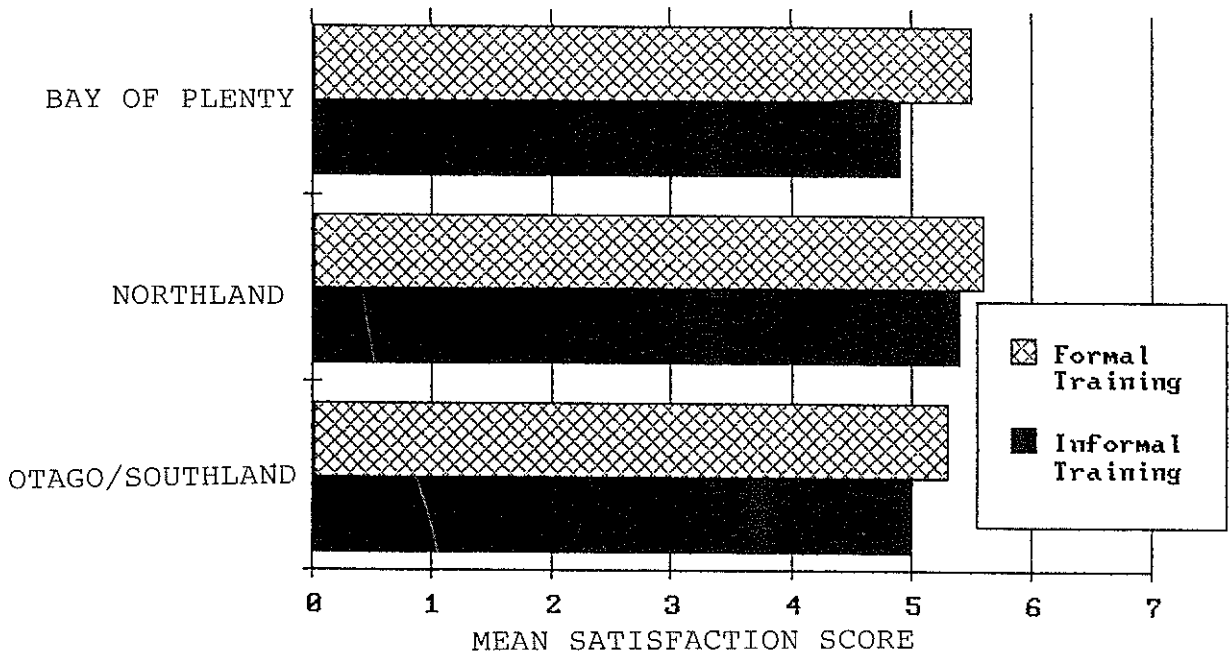


Figure 9 : Levels of Satisfaction with formal and informal training

It appears that the majority of those who had received some formal training were well satisfied with it. However, as shown in Figure 9, there was little difference between loggers satisfaction with formal training and the levels of satisfaction of those who received on-the-job training only.

Time Required to Learn Logging Jobs

Table 12 presents the loggers assessments of the time they thought it took to learn the eight principal logging jobs. Generally those surveyed regarded machine operating and felling to be the jobs requiring the most time to learn, although there was a tendency by Northland loggers to regard loader and hauler operating as less difficult to learn than their Bay of Plenty and Otago/Southland counterparts.

3.5 ACCIDENTS

The survey looked at two aspects of accidents. First, details were obtained on any accident the logger had suffered during the past five years which resulted in more than one day off work. Secondly, information was collected on the action taken by management in response to the accident. As the following analysis is based on the accident victim's recall over a five year period, some degree of caution is required in the interpretation of this data.

Accident Frequency

Table 13 shows the number of accidents that loggers had suffered during the preceding five years. The percentage of loggers who had suffered one or more accidents was highest in Northland (34%), dropping to 28% in the Bay of Plenty and 21% in Otago/Southland. In the Otago/Southland area only 4 loggers had suffered two accidents, with 3 reporting having had more than two.

Time Lost Due to Accidents

Information on the time lost due to accidents is summarised in Table 14 and shows that, on average, an accident leaves the victim off work for more than three working weeks.

Of the 150 accidents reported, 55 (38%) would not have come to the attention of the ACC as the time lost was five days or less. This suggests that data currently provided by the ACC seriously underestimates the magnitude of the problem by about a third.

TABLE 12 : LOGGERS ASSESSMENT OF TIME REQUIRED TO LEARN LOGGING JOBS (Months)

Job	*Bay of Plenty*	*Northland*	*Otago/ Southland*	*Total*
Felling	*8.1*	*6.6*	*6.7*	*7.5*
Trimming	*2.4*	*3.1*	*5.9*	*3.3*
Breaking Out	*3.7*	*3.0*	*5.4*	*4.0*
Skid Work	*2.9*	*3.7*	*5.2*	*3.6*
Skidder Op.	*7.7*	*8.5*	*8.0*	*7.9*
Tractor Op.	*8.5*	*8.2*	*7.3*	*8.2*
Loader Op.	*8.2*	*4.0*	*6.3*	*7.0*
Hauler Op.	*9.1*	*3.1*	*9.9*	*8.5*

TABLE 13 : NUMBERS OF ACCIDENTS IN LAST FIVE YEARS

Accident	BOP	Northland	Otago/ Southland	Total
1st	56	33	20	109
2nd	16	9	4	29
3rd	6	1	3	10
4th	2	-	-	2
Total	80	43	27	150

TABLE 14 : DAYS LOST THROUGH ACCIDENTS

Region	No. of Accidents	Total Days Lost	Est. Work Days Lost	Mean Work Days Lost/ Accident
Bay of Plenty	80	2136	1526	19.1
Northland	43	915	653	15.2
Otago/Southland	27	550	393	14.5
Total	150	3601	2572	17.1

In this survey, the lost time accident frequency rate was found to be considerably higher in Northland and the Bay of Plenty, where the number of accidents per one million hours worked were 42.4 and 41.6, respectively. The equivalent figure for Otago/Southland was 28.3. There appears to be no significant difference in accident severity (ie days lost/accident) between the regions.

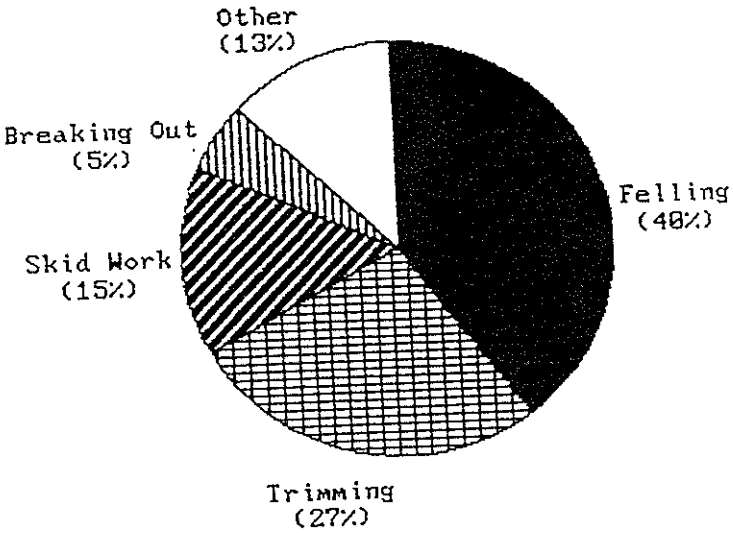


Figure 10: Job at Time of Accident

Jobs With Greatest Accident Risk

Analysis of the data relating to the job performed (Figure 10) at the time of accident found that over 80% of incidents occurred in three work areas - felling (40%), trimming (27%), and skid work (15%).

The parts of body most prone to injury were the legs, hands, and feet. The chainsaw was a key factor in 50% of accidents. These findings are consistent with those being reported through the Logging Industry Accident Reporting Scheme.

Discussion of Accident

Loggers who had suffered an accident were asked if anyone had discussed the event with them. The responses to this question were disturbing.

In only 29% of the 150 accidents that were reported did any follow-up occur. This was usually carried out by the foreman or supervisor.

This apparent lack of effort made to ascertain specific details pertaining to each case suggests there is little likelihood of the industry improving its understanding of the underlying causes of accidents and so being able to reduce accident frequency.

Recommendation to Avoid Accident Recurring

Perhaps an even more disturbing finding was the absence of appropriate recommendations aimed at preventing the accident happening again. The suggestion by some supervisors to simply "take more care" cannot be in any way considered helpful in improving the poor record of the industry with respect to safety. Indeed, one employer's solution was to fire the accident victim! These findings are a serious indictment on the industry and suggests that the logging industry views accidents as "a fact of life".

3.6 SAFETY EQUIPMENT

Within the survey loggers were questioned about what safety equipment they used, who supplied it, and, if they were not wearing an item, why this was so.

Safety Equipment Used

The most recent report on the use of safety equipment used by loggers was based on data collected from a limited sample in the Bay of Plenty in 1983 (Neumann and Gaskin, 1983). The authors noted that leg protection was worn by 43% of loggers, ear protection by 75% and eye protection by 21%.

Equivalent information from the present survey is presented in Figure 11.

An encouraging aspect of this information is the high percentage of loggers in the Bay of Plenty and Otago/Southland now wearing leg protection. The high number in the Bay of Plenty is a reflection of Company rulings regarding the use of such equipment. Leg protection has only been readily available throughout the country since 1983/84 and acceptance of this equipment has been achieved without legislation.

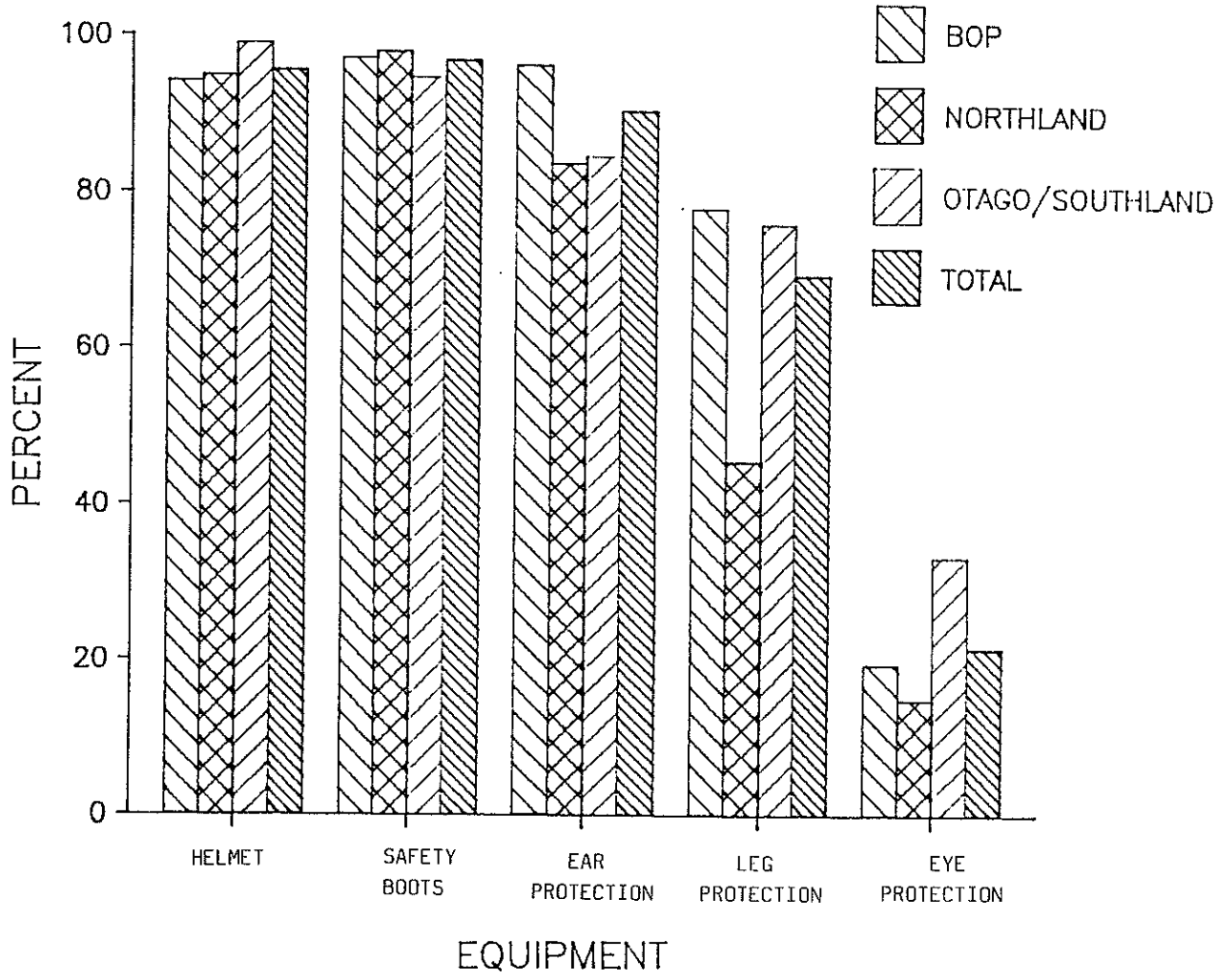


Figure 11 : Safety Equipment Used

While the use of ear protection also appears to be accepted practice, the use of visors by chainsaw operators to prevent eye injury is not as common.

Of the 390 loggers surveyed, only four were unaware that the safety equipment not presently being used was available.

Supply of Safety Equipment

Some regional differences were apparent in the source of supply of safety equipment. In the Bay of Plenty and Otago/Southland over half had their equipment supplied by the employer (Table 15) whereas in Northland, just over half the loggers provided their own with only about a third using employer provided gear.

Reason for not Wearing Safety Equipment

The reasons given by loggers for not wearing eye and leg protection related mainly to discomfort, although some loggers admitted not having tried these items.

TABLE 15 : SUPPLY OF SAFETY EQUIPMENT

Supplied by	*BOP* %	*Northland* %	*Otago/Sth.* %	*Total* %
Company/Boss	*63.6*	*35.6*	*56.8*	*55.2*
Self	*27.8*	*56.7*	*33.8*	*36.2*
Company/Boss/Self	*8.6*	*7.8*	*9.5*	*8.6*

3.7 OCCUPATIONAL INJURIES

The present survey marks the first detailed attempt to assess the extent of occupationally induced injuries within the logging industry. This was carried out using the loggers assessment of their health status. Accordingly, some degree of caution is advised in using this information.

Four distinct areas were considered; back problems, white finger, tendinitis, and hearing loss. Additionally, there was opportunity for those interviewed to record other disorders (such as eye irritation and problems in the lower legs) which were thought to have been caused through logging work.

With the exception of tendinitis, the four main areas selected have long been recognised as potential health hazards for loggers.

Numerous studies have addressed the link between prolonged chainsaw use and vibration induced white finger. The Safety Code for Bush Undertakings (1984) provides loggers with five simple methods of reducing the risk of white finger.

Back problems are almost inevitable for chainsaw operators in delimbing using currently accepted techniques. Bio-mechanical analysis of these methods (standing on top of the log to delimb) has shown the torque at the hip to be twice that associated with alternative techniques (Slappendel and Gaskin, 1988) which involve the operator walking alongside the log supporting the saw on the log or the thigh (LIRA and Swedfor, 1980).

Back problems are inevitable using a delimbing technique such as this

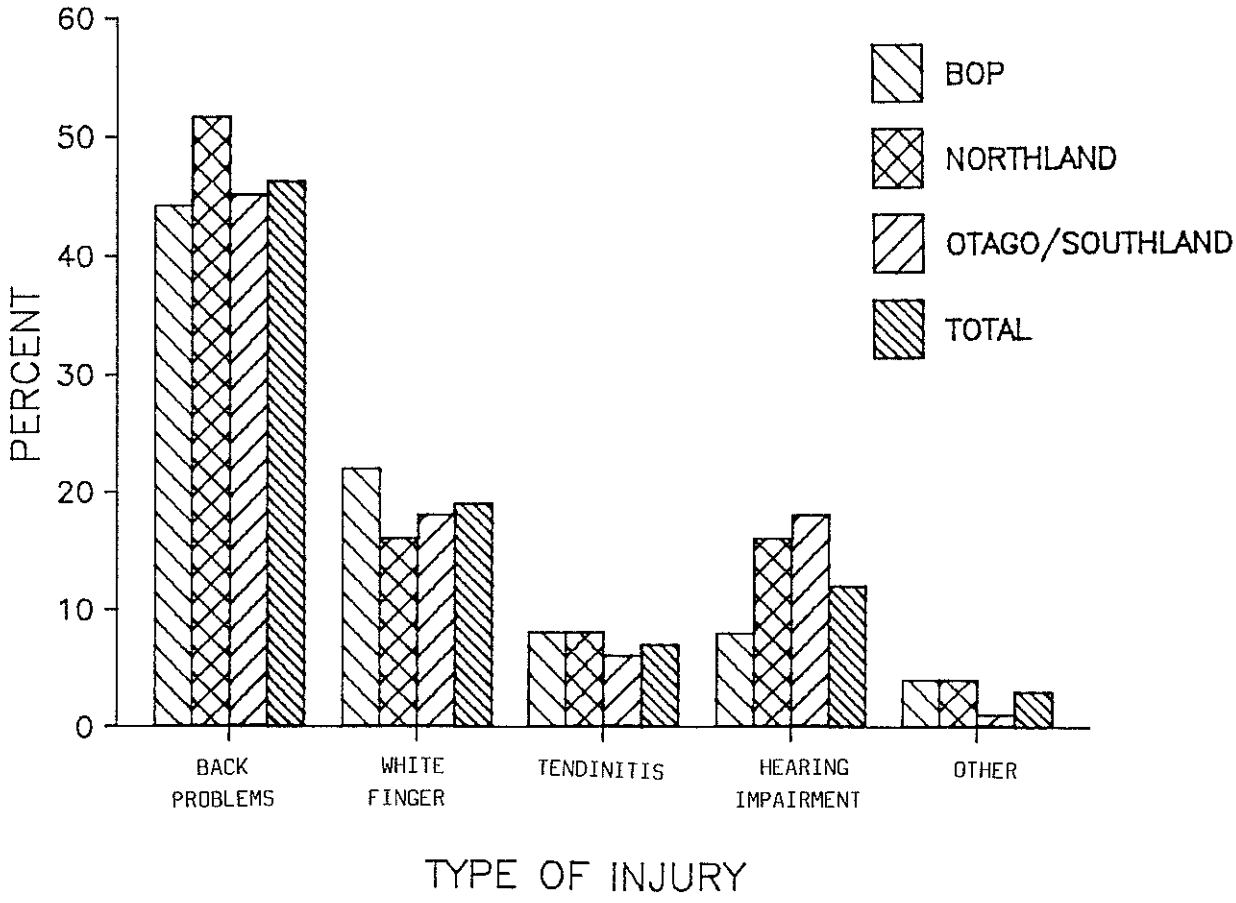


Figure 12 : Occupational Injuries

In order to reduce the incidence of hearing problems, the maximum recommended noise level where ear protection is not required, has been set at 85 dBA (Department of Labour, 1984). Most chainsaws, however, operate at noise levels of between 100 and 109 dBA under load (Douglass, 1987). This figure assumes a new saw, and noise levels will increase as the saw ages and the condition of the muffler deteriorates. Logging machinery creates noise levels of 90 to 100 dBA (Department of Labour, 1984). Hearing loss as a result of high noise levels is thus an ever present possibility in the logging environment in the absence of ear protection.

Figure 12 shows the percentage of respondents who suffer from an injury considered to be directly attributable to working in the bush.

The data show that nearly one logger in two suffers from back problems; one in five from white finger; and nearly one in twelve from tendinitis. More loggers in Northland and Otago/Southland suffer hearing impairment than in the Bay of Plenty. On average, 15% of loggers reported some loss of hearing. But it should be noted that only just over half of the loggers interviewed had had their hearing tested - most within the last two years (Table 16).

TABLE 16 : HEARING TESTED AND TIME SINCE LAST TEST

Region	Hearing Tested	Time Since Test: 2 yrs or less	3 to 4 years	5 yrs or more
Bay of Plenty	*51.2%*	*77.5%*	*9.2%*	*13.2%*
Northland	*51.0%*	*68.9%*	*6.7%*	*24.4%*
Otago/Southland	*63.3%*	*55.9%*	*7.0%*	*37.2%*
Total	*54.0%*	*70.4%*	*8.1%*	*21.5%*

3.8 INDUSTRY AWARENESS

This section of the questionaire looked at the methods (if any) used by the logger to keep abreast of what was happening in the industry. Questions addressed their knowledge of organisations set up to assist the industry such as LIRA and the Logging and Forest Industry Training Board (L&FITB), and whether they had seen what happened to the logs after they left on the truck. For example, whether visits to processing plants had been undertaken and whether they had had contact with the forest manager. Finally, loggers were asked what they thought was the best source of information about what was happening in the industry.

Awareness of LIRA

Only about half of those interviewed in the survey claimed to know anything about LIRA (Table 17). There was virtually no regional difference with the Bay of Plenty and Northland both recording 49.5% and Otago/Southland 46.7%. However, less than half had seen any LIRA publications: the Otago/Southland area had only 32.3% in this category. Fewer than half the loggers in the Bay of Plenty had met a LIRA staff member. The corresponding figure for the two areas further away from the organisation's base in Rotorua was much lower.

Little should be read into the last question "Is there a need for an organisation like LIRA" as it was LIRA staff members doing the interviewing. However, from the reponses to the questions on publications and staff contact, it would appear that, even in the Bay of Plenty, there are still more than half of the loggers in the industry that have had no more than minimal contact with the organisation. It should be noted that the response to the staff question by Otago/Southland loggers could have been influenced by an active LIRA presence in the area for three months prior to the survey being conducted.

Awareness of L&FITB

A similar set of questions was asked of respondents about their knowledge of the L&FITB. It appears that only a minority of those working in logging had any knowledge of the role of the L&FITB. The data collected is presented in Table 18.

TABLE 17. AWARENESS OF LIRA

Percentage Positive Response To Each Question By Area

Question	BOP	Northland	Otago/ Southland	Total
Know what LIRA Does?	49.5	49.5	46.7	48.8
Seen LIRA Publication	47.5	40.0	32.2	42.1
Met LIRA Staff (one)	43.6	28.0	28.7	36.4
Need for LIRA	72.3	85.7	97.6	79.3

TABLE 18. AWARENESS OF L&FITB

Percentage Positive Response To Each Question By Area

Question	BOP	Northland	Otago/ Southland	Total
Know what L&FITB Does?	24.8	21.3	34.4	26.2
Seen L&FITB Publication	9.9	8.5	16.5	11.1
Met L&FITB Staff (one)	10.9	19.1	27.8	16.9
Need for L&FITB	48.9	75.6	93.1	60.4

Surprisingly, the area furthest from the base of the L&FITB (Rotorua) - Otago/Southland, had the best knowledge of its activities. This could be a reflection of the very active co-ordinator employed by the Board in this area.

Clearly, the level of visibility of these two organisations could be much higher. If LIRA and the L&FITB wish to be more effective then it seems that much more time will need to be spent meeting with loggers in their own work environment.

Access to Popular Journals

Another way for loggers to maintain contact with the industry is through trade journals. One such publication, the N.Z. Forest Industries Journal, is published monthly. Respondents were questioned as to whether they had seen copies of this magazine and, if so, how often. Three-quarters of loggers in the Bay of Plenty had seen the magazine, but most only occasionally. Only a third of these saw it on a monthly basis. For the other two areas, half had seen the journal but, of that

half, only one in two had seen it on a monthly basis.

Typically, the contractor subscribed to the magazine and took copies to work for his employees to read during workbreaks.

Given the number that see this magazine and the fact that the LIRA newsletter is included in every second copy, the low positive response to the question about seeing LIRA publications seems surprising. It may be that the logger does not associate the newsletter as being anything other than a part of the magazine.

Visits to Processing Plants

More than three-quarters of those interviewed had visited a processing plant. The most common type of plant visited (Table 19) was a sawmill. The majority (69%) of loggers in Otago/Southland claimed that they visited a plant on a regular basis. While 38.5% of Northland loggers visited a mill regularly, only a low 14.3% of Bay of Plenty respondents claimed to make similar regular visits.

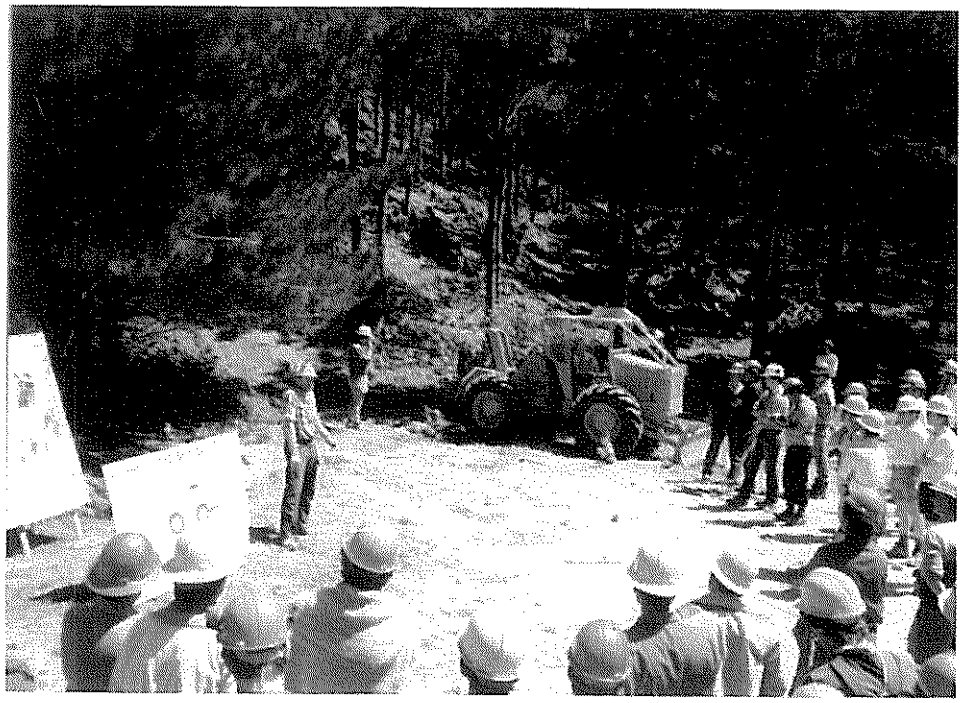
Of course, those working in the Bay of Plenty have access to a wider range of plants, and this is shown in the distribution of the types of plants visited. Loggers in Otago/Southland, on the other hand, have only limited access to plants other than sawmills.

Visits to Other Logging Operations

Two questions were asked in this section; whether they had visited other logging operations and, if so, whether or not these were in the same forest. Eighty-two percent of the Otago/Southland loggers had visited other logging operations compared with 66% from the Bay of Plenty and 63% from Northland.

Contact with Forest Manager

A considerably higher percentage (82.6%) of the Otago/Southland loggers had met the forest manager. Approximately two thirds of the loggers in the other two regions had had similar contact.



Although LIRA holds field demonstrations less than 50% of the sample had been to one

TABLE 19. TYPE OF PROCESSING PLANT VISITED

Type of Plant	BOP	Northland	Otago/Sth	Total
Pulpmill	15.8%	4.0%	1.4%	9.3%
Sawmill	15.1%	49.3%	78.4%	39.2%
Veneer Mill	1.3%	-	1.4%	1.0%
Particle Board Mill	1.3%	-	1.4%	1.0%
Pulp & Sawmill	32.9%	20.0%	12.2%	24.6%
All	31.6%	10.7%	4.1%	19.6%
Other Combinations	2.1%	16.0%	1.4%	5.3%

Best Source of Information About Logging

Loggers were presented with nine choices with regard to the best source of information about what was happening in the industry in their area (Table 20).

The method of information transfer that seems to be most favoured by those interviewed was "talking in the pub". The "forest manager" also appears to play some part in the passing on of information. This suggests that the more formal channels of communication are not favoured by the logging workforce.

TABLE 20. BEST SOURCE OF INFORMATION

Source	BOP %	Northland %	Otago/Sth %	Total %
Dept. of Labour	2.7	7.9	9.0	5.2
Union	3.8	1.3	4.5	3.4
Forest Manager	27.2	22.4	23.9	25.4
Machinery Sales	1.1	5.3	-	1.8
Talking in Pub	35.3	13.2	49.3	33.0
Formal Meetings	4.9	5.3	7.5	5.5
Company Newsletter	12.5	11.8	6.0	11.0
Informal Meeting	11.4	31.6	-	13.8
All the Above	1.1	1.3	-	0.9

Logging sports days is an example of an informal gathering well supported by loggers.

3.9 JOB SATISFACTION

A considerable amount of the research carried out by industrial and organisational psychologists has focused on the nature, causes and consequences of job satisfaction. This research has consistently shown that dissatisfied workers are more likely to be absent from their job, terminate their employment or be involved in industrial disputes. Other research into job satisfaction suggest that dissatisfied workers are also more likely to: have higher accident rates, be less productive, be more prone to physical and mental illness, be less satisfied with their life in general, and have a shorter life expectancy.

Many of these problems are clearly evident in the logging workforce in New Zealand, especially; absenteeism, turnover and high accident frequency. (A more detailed introduction to the issue of job satisfaction is to be found in Wilson et al, 1988).

Job satisfaction was measured using the Job Descriptive Index (JDI) developed by Smith, Kendall and Hulin (1969). The JDI is used internationally and is a widely regarded method of measuring job satisfaction. The JDI measures a worker's satisfaction with five facets of their job - the work itself, supervision, pay, promotional opportunities, and co-workers. Each facet is measured on either a 9 or 18 item scale consisting of short descriptive phrases about their job. The subjects respond to each item with a "yes", "no" or "unsure", depending on how well the item describes their work. Responses denoting satisfaction are given a score of three, reponses denoting dissatisfaction are given a score of zero, while unsure responses receive a score of one. The scoring of the unsure responses closer to the dissatisfied responses is based on the developers' discovery that dissatisfied repondents give more "unsure" responses.

TABLE 21: MEANS, RANGES AND INTERCORRELATIONS OF JDI SCALES

Facet	Mean	Range	Intercorrelations 1	2	3	4	5	6
1. Work	30.0	3-54	-					
2. Pay	28.0	0-54	.15	-				
3. Promotions	22.7	0-54	.29	.25	-			
4. On-Site Supervision	40.8	11-54	.24	.13	.25	-		
5. Off-Site Supervision	32.3	4-54	.11	.11	.08	.13	-	
6. Co-workers	40.7	8-54	.25	.12	.23	.31	.09	-

By summing the item scores for each scale, a single satisfaction score is obtained for each aspect of the job. For comparative purposes the scores on the 9-item scales (pay and promotions) are doubled, giving all the scales a common possible range of 0 to 54. A worker who is completely satisfied with a particular aspect of their job receives a score of 54, while one who is completely dissatisfied receives a score of 0.

Because most loggers recognise two supervisors - the gang boss or "on-site" supervisor and the Company or "off-site" supervisor - their satisfaction with both was measured.

Satisfaction with Various Aspects of the Job

Table 21 presents the mean, range and correlations between the six JDI scales. As this table shows, loggers expressed greatest satisfaction with their on-site supervisor and co-workers, with mean scores of 40.8 and 40.7 respectively. These were followed by satisfaction with their off-site supervisor (32.3), the work itself (30.0) and their pay (28.0). Least satisfaction was expressed with their perceived promotional opportunities (22.7).

The positive relationship between the six scales suggests that loggers who are satisfied with one aspect of their job, tend also to be satisfied with the others. However, the correlations were sufficiently low to suggest that the respondents were able to differentiate between these six facets of their job.

Closer analysis of the responses given to the various items contained on the JDI scales suggest that dissatisfaction with these five job facets is linked to:

- the physically demanding nature of the work;
- a discrepancy between the pay received by loggers and the pay they feel they deserve;
- the perception that promotional opportunities are limited and irregular;
- the feeling that the supervision style does not allow for worker involvement in decision-making; and
- differences in the mutual interests of co-workers.

Job Differences

No significant differences in the levels of job satisfaction were found between the eight main logging jobs; felling, trimming, breaking out, skid work, skidder operating, tractor operating, loader operating, and hauler operating. There was, however, a tendency for machine operators to be more satisfied with their off-site supervision.

An interesting finding amongst Bay of Plenty and Northland Loggers was that those loggers whose normal job involved both felling and trimming were less satisfied with their on-site supervisor, promotions, and co-workers than loggers who performed only one of these jobs.

Regional Differences

Figure 13 presents the means of the six JDI scales for each of the regions. The analysis reveals that while loggers in all three regions were typically most dissatisfied with their pay and promotional opportunities, Otago/Southland loggers were significantly more dissatisfied. In fact, nearly half (49%) of the Otago/Southland loggers can be categorised as "dissatisfied" (a JDI score of 17 or less) with their promotional opportunities, and 33% dissatisfied with their pay. This compares with a quarter of the Bay of Plenty and Northland loggers who were dissatisfied with each of these aspects.

The only other regional difference noted was with respect to the work itself where Northland loggers were found to be significantly more satisfied than Bay of Plenty loggers.

Employee Differences

Research findings have generally shown that employees differ in their values, needs and expectations of their job. While it is true that most employees will consider pay to be important, the importance attached to other facets of the job are often dependent upon the employees social situa-

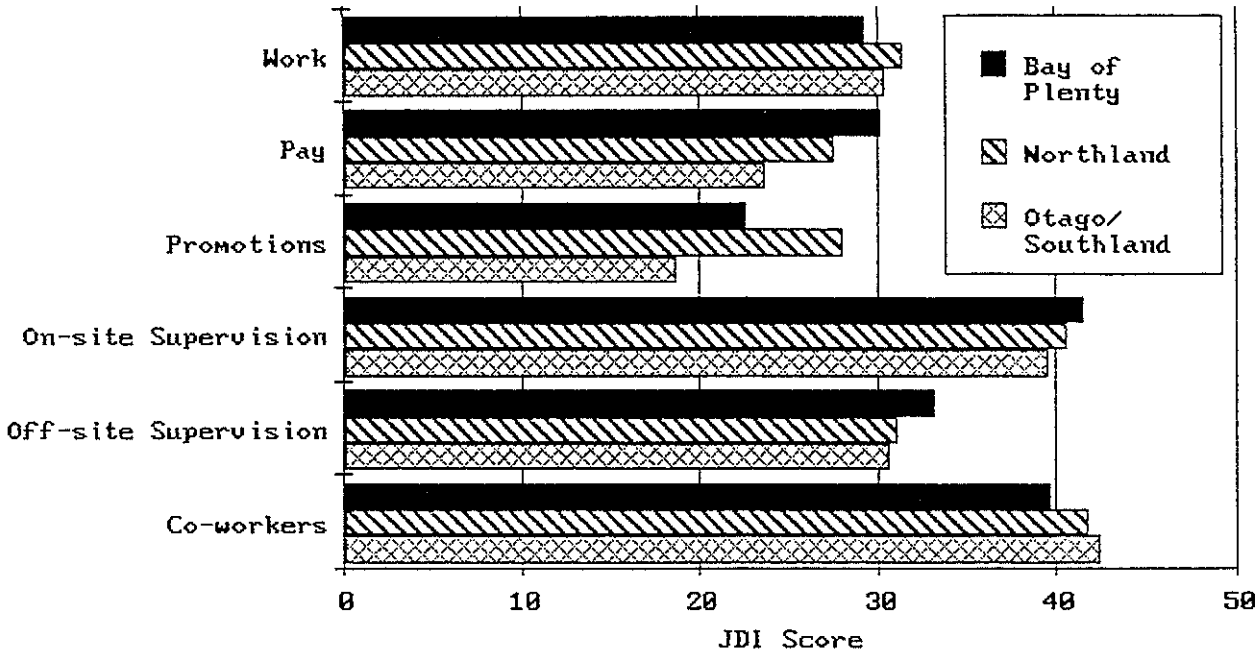


Figure 13 : Regional Job Satisfaction Scores

tion. For example, those with family responsibilities will often place higher value on job security, while educated employees will tend to be more concerned with a job's promotional opportunities and challenge.

Data collected from this Logging Workforce Survey covered a wide range of employee characteristics. Four of these have been selected (on the basis of previous research) for closer analysis.

(1) Length of Service

Most research shows that job satisfaction increases with length of service. The usual explanation is that longer-serving employees are more likely to have reached a satisfactory level of pay, cultivated positive co-worker relations, and gained status and seniority. Also, job expectations are likely to be more realistic as tenure increases, and research suggests that dissatisfaction is more likely to result when there is a large discrepancy between what an employee expects from a job and what it actually provides.

The Logging Workforce Survey data indicates that the time worked in the logging industry does not influence a logger's level of job satisfaction. However, analysis of the time worked in the present gang reveals that longer-serving crew members are more satisfied with their off-site supervisor and promotional opportunities than shorter-serving members.

The greater level of satisfaction with the off-site supervisor by longer-serving gang members can be considered a function of the respondent knowing this person better than those who have only been in the gang a short time.

(2) Age

Older workers have generally been found to exhibit greater job satisfaction than younger workers, particularly when comparisons are made between under 30 and over 30 year olds. Since age and length of service are clearly related, many of the explanations relevant to length of service also apply to age. Certainly, older employees are more likely to have settled on a job that is compatible with their needs.

This survey found, however, that age only played a minor part in explaining the level of job satisfaction. The only exception was that relating to the loggers satisfaction with their pay. Here, it was evident that younger loggers tended to be more satisfied than the older ones, possibly due to the younger loggers having fewer financial commitments.

(3) Marital Status and Family Responsibility

Most studies report no relationship between job satisfaction and marital status or the number of dependent children.

The present study also found no difference in job satisfaction on any of the JDI scales between married and single loggers. There was, however, a tendency for loggers with two or more children to be less satisfied than others with their promotional opportunities.

(4) Education

Research suggests that job satisfaction decreases with increasing education. The explanation usually offered is that better educated employees are less satisfied with routine jobs. Research in this area, however, is typically based on subjects with a wide range of educational levels drawn from a wide cross-section of occupations. It was expected that no differences would be evident in the present study where subjects are all employed in the same industry and share a similar educational background.

Data from the present study largely supports this view as dif-

ferences were only found with respect to the loggers satisfaction with their pay. Specifically, loggers with one year or less secondary schooling were more satisfied with their pay than loggers with two or more years of secondary schooling.

Relationship Between Job Satisfaction and Retention

As discussed in an earlier section of this report, respondents were asked if they would still be working in the logging industry in five years time. This section investigates whether there are differences in the level of job satisfaction between respondents whose stated intention was to leave the industry and those whose stated intention was to remain.

While it is accepted that one's intentions do not always result in actual behaviour, many researchers have noted a strong link between an employee's stated intention to leave a job and their subsequent turnover.

Figure 14 shows the mean scores for each of the six job satisfaction scales for loggers whose intention it was to remain in the industry and those whose intention it was to leave. The analysis reveals that loggers who intend to leave the industry over the next five years were significantly more dissatisfied with all the aspects of their job, except for their co-workers.

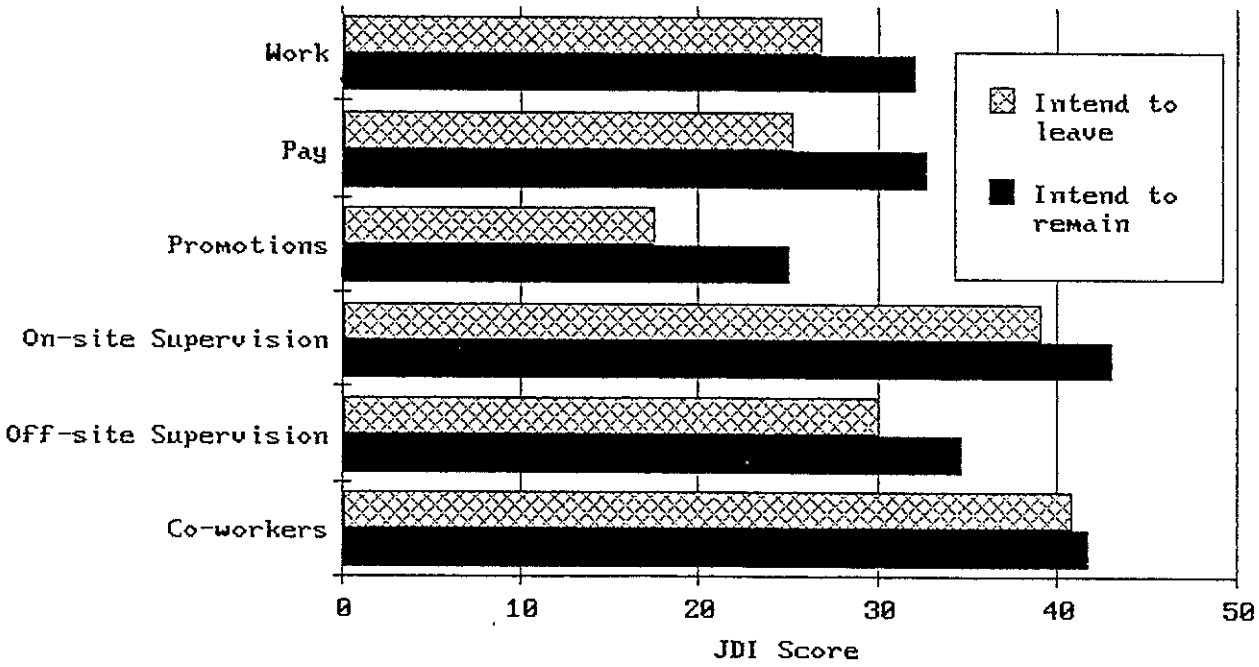


Figure 14 : Differences in satisfaction between those intending to stay and those intending to leave

4. DISCUSSION AND CONCLUSIONS

One of the objectives of the Logging Workforce Survey was to profile the "typical logger". After interviewing 390 loggers (approx. 15% of the total New Zealand workforce), it would appear that while the three areas surveyed were very different in terms of geographical setting, numbers employed, and volumes produced; the basic characteristics of those employed were remarkably similar.

The average age of those working in logging varied little between areas, being five to six years younger than that of the remainder of the male workforce. A person employed in logging will only spend between five and eight years in that occupation, during which time they will have worked in two or three different crews.

However, a major regional difference existed in the method of payment of loggers. While the majority of the Bay of Plenty loggers were paid wages (86%), the proportion paid on a piece-rate or sub-contract system was significantly higher in both Northland (39%) and Otago/ Southland (55%). This notwithstanding, the average fortnightly take home pay was remarkably similar for all three areas at between $730 and $750.

At some stage during the next twenty years, the annual harvest from New Zealand exotic forests is expected to increase from a current level of 10 million m^3 to nearer 20 million m^3. To achieve this expansion more people will have to be encouraged into the workforce. From a recruitment viewpoint, the findings of the survey are particularly important as they provide, for the first time, an idea as to the background of those working in the industry. Future recruitment programmes should bear this sort of information in mind. For example:

- Half of those working in logging do so because of the attraction of working outdoors.
- Thirty percent of those interviewed started their working career on a farm.
- A further 25% started working in either forestry or logging.
- The traditional method of recruiting through advertising in the newspaper is seldom used to employ loggers and the majority get their first job through personal contact.
- The majority (between 60 and 70%) felt that although there was ample opportunity for school leavers in the logging industry, there was a need to establish formal training for school leavers.

In its assessment of the value of training, the Review Committee on Education and Training in the Forestry Industry (Probine et al, 1987, p.30) comments that **"Training in logging and forestry skills is important because the success of the industry depends on the efficiency, and therefore the skill, of the people carrying out what are, largely, manual operations."** They go on to say that **"It is also important to have a well trained workforce because almost all of the operations carried out in the forest are potentially dangerous and, for the poorly trained, the operations are very dangerous."**

The results from this Logging Workforce Survey suggest that the

level of formal training within the industry is unsatisfactorily low in terms of the philosophy adopted by the Review Committee. However, it must be stressed that the data from the Survey does not indicate a clear relationship between formal training and accident rates. To establish the presence of any link between these two factors will require a more in-depth look at the logging environment than was taken in this study. On the other hand, it is quite obvious that, in order to effectively produce the larger workforce that would be needed to cope with the growth predicted for the sector, a training structure will be required that reaches a much higher proportion of those working in the industry than is presently the case.

Closely tied to this requirement will be the extent to which those working in the industry are aware of the operation of the training and research organisations directly concerned with logging. From the results obtained during the Survey it is evident that the level of awareness of the average logger in this respect is rather low. Whether this lack of visibility need be of concern to organisations like LIRA and the L&FITB depends upon how these agencies view their role and who they think the targets of their activity should be. Nonetheless, it would seem that any agency concerned with promoting improvements within the sector in areas like training and accident prevention could well establish a much higher profile with the workforce in general than that existing at present.

Loggers do avail themselves of other opportunities to pick up information about their own industry and the forestry sector at large. However, many of these opportunities involve informal contact which ties in closely with general features observed in respect to training. As far as planning for the future of the sector is concerned, decisions will need to be made in the training arena as to how reliant the industry wishes to be on the informal acquisition of work skills in logging as a means of preparing a workforce appropriate to an industry that has the potential for marked expansion.

Recognising the need for improved accident prevention and the role training may play in that, the Survey gave extensive coverage to finding out the current levels of accidents, the use of protective equipment, and for the first time in the logging industry, examined the extent of occupational injuries.

In respect to accidents, a most disturbing finding was the lack of follow-up with accident victims. Only 11% of these had had the accident discussed with them and no recommendation was made to avoid the accident happening again. Such a finding is a serious matter and highlights an area which requires urgent attention.

The accident severity rate calculated from data collected by the Survey was much lower than that reported in earlier studies. However, the present study found that nearly one-third of loggers surveyed had met with at least one accident during the past five years. Furthermore, the data did not support the traditional view that more experienced loggers are less likely to have accidents; indeed the Survey suggests the contrary.

Most loggers, though, have recognised the benefits of wearing protective legwear when using chainsaws. While such equipment does not prevent the accident happening, it most certainly reduces severity.

More than three-quarters of the loggers surveyed suffered some form of work-induced injury.This indicates that careful thought needs to be given to putting into practice ergonomically better techniques. This also has implications for recruitment. For example, if potential recruits al-

ready have back problems then there is little likelihood of the logging industry being a place of suitable employment for them.

A larger than expected number of machine operators suffered back injuries. Such injuries could be caused by repeated jumping on and off machines and long term exposure to whole-body vibration. The area of machine cab design is one that requires more detailed research in an attempt to reduce this problem.

Having identified the high accident and occupational injury risk faced by loggers, it is interesting to note that 91% of those surveyed thought the work was healthy. This finding most likely reflects the attitude that **outdoors work is healthy work.**

This Logging Workforce Survey, was also the first time a measure of loggers satisfaction with their work has been recorded. The study measured satisfaction with six aspects of the loggers job; the work itself; on-site supervision (the boss); off-site supervision (the company supervisor); pay; promotions; and co-workers.

The findings suggest that while loggers were generally satisfied with some of these job aspects, some characteristics of the job provided considerably more satisfaction than others. Greatest satisfaction was expressed with their on-site supervisor and co-workers (ie the "social aspects" of the work environment). These were followed by satisfaction with their off-site supervisor, the work itself, and pay. Least satisfaction was expressed with their promotional opportunities. Comparing this data with that provided by the Social Indicators Survey (1984) suggests logging workers are more dissatisfied with their pay and promotions than the remainder of the New Zealand male workforce. The present survey data also shows that job satisfaction within the logging industry is not related to the job performed.

Few differences were found in the relationships between job satisfaction and the individual differences of loggers studied. Where differences did occur, they were generally consistent with previous research and showed job satisfaction increasing with length of service and decreasing with education. Pay, however, was one area where the findings differed from other research in that younger loggers tended to be more satisfied with their pay than older ones. The present study also indicates that loggers with two or more dependant children are less satisfied with their promotional opportunities.

Like previous research, this study found that workers who were more satisfied with their job were less likely to have intentions of leaving than respondents who were not so satisfied. Specifically, those loggers whose stated intention was to leave the industry over the next five years were significantly more dissatisfied with all aspects measured except their co-workers.

Further analysis of the data from the Survey suggests that job dissatisfaction in the New Zealand logging industry is linked to:

- the physically demanding nature of the work;
- a discrepancy between the pay received by loggers and what they feel they deserve;
- the feeling that promotional opportunities are limited and irregular;
- the feeling that the supervision style does not allow for worker involvement in decision-making; and
- the differences in the interests of co-workers.

Finally, the role that good interpersonal relations play in providing an effective work environment should not be underestimated. For example, Cant and Woods (1968)

found the human relations aspects of management to be the single most important factor in determining the job satisfaction of New Zealand farm workers. While it is accepted that people may refrain from making negative responses in contexts where it is politic not to be critical (Bell and Weaver, 1987), the high levels of satisfaction expressed with the "social aspects" of job environment would appear to be an essential attribute in an industry where productive effectiveness is so dependant upon the concerted efforts of small work groups.

ACKNOWLEDGEMENTS

The authors acknowledge the co-operation of the loggers who took part in the survey, along with the contractors, gang foremen and companies for allowing the survey to be conducted.

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APPENDIX 1

Reports Published With Interim Results From The Logging Workforce Survey.

(a) 1986/7 Logging Workforce Survey (Preliminary Results From The Bay of Plenty) LIRA Report, Vol.12 No.2, 1987.

(b) The Logging Workforce in Northland (A Comparison with The Bay of Plenty) LIRA Report, Vol.12 No.12, 1987.

(c) Accidents, Safety and Occupational Injuries Within The Logging Industry (An Analysis of Data Collected in the 1986/87 Logging Workforce Survey) LIRA Report, Vol.13 No.2, 1988.

(d) Job Satisfaction Among New Zealand Logging Workers. LIRA Report, Vol.13 No.3, 1988.

(e) Otago/Southland Logging Workforce Survey (Preliminary Results) LIRA Report, Vol.13 No.14, 1988.

(f) Production and Capital Equipment in Logging (Supplementary Data From The Logging Workforce Surveys) LIRA Report, Vol.13 No.15, 1988.

(g) Training and Awareness in The Logging Industry. LIRA Report, Vol.13 No.16, 1988.

(h) Otago/Southland Logging Workforce Survey (Accidents, Safety, Occupational Injuries and Job Satisfaction) LIRA Report, Vol.13 No. 17, 1988.

APPENDIX 2

Questionnaire Used In Survey

LOGGING WORK FORCE SURVEY

(1) Age : in years.

(2) Marital Status : Single ☐
Married ☐
Other ☐

(3) Number of Dependants :

(4) Where do you live ? : Rural ☐
Small Town ☐
City ☐

(5) Housing : Own house , with mortgage ☐
w.out mortgage ☐
Rent house ☐
flat ☐
Company house ☐
flat ☐
Share house/flat w.others ☐

(6) Pay : Are you paid wages ? : Piece rate ? :

(7) How often do you get paid ? :Weekly Fortnight Monthly

(8) How much do you earn ? :

(9) Do you get paid a bonus ? : Yes No

(10) If 'yes' describe bonus system :

(11) How many people are contributing to your household income this week ? :

(12) What are your on job hours of work ? :

(13) How long do you travel each day ? :

(14) Is travel time paid ? :

(15) The pay is adequate to live on .

No strongly disagree			sometimes			yes strongly agree

Gang / Production Data. Page 2

(16) Is the gang : Company Contract
(17) Number of full time employees in gang :
(18) Continuity of work : Full Time Seasonal Other
(19) Type of operation : Thinning Clearfell
(20) Species : Age : Piece size
(21) Production : Daily Per annum
(22) End user of produce :Export Sawmill Pulp Chip
Partical board Veneer Other
(23) Machinery used : (1)Make: Model: Age:
(2)Make: Model: Age:
(3)Make: Model: Age:
(4)Make: Model: Age:
(24) What type of Gang transport is used ? :

Education / Training

(25) Length of time at school : 1 year
1 - 3 years
> 3 years

(26) School qualifications : None S.C. U.E. H.S.C.

(27) Post school education : Technical training Details

University Details

None : Other :

(28) Have you had any formal training in logging ? : yes no

(29) If 'yes' describe :

(30) If 'no' how did you learn the job(s) :More experienced bushman
:Boss or Supervisor
:Self Taught
:Other - comment

(31) If formal training was avaliable would it improve the chance of newcomers starting in logging ? : yes no

(32) Do you think logging offers opportunities for school leavers ? :
yes no

(33) If 'no' what could be done to improve that ? :

(34) I was satisfied with the training I got.

No strongly disagree						Yes strongly agree

Recruitment / Turnover — Page 3

(35) What was the main reason for you starting work in logging
: Pay
: Outdoor environment
: Only job available
: Other

(36) How did you get your first job in logging ? :
Answered an advertisment
Told by a relative
Told by a friend
other

(37) Was your father employed in forestry ? :
logging ? :
rural ? :
none of those ? :

(38) What was your first job after leaving school ? :

(39) How long have you worked in logging ? :

(40) How long have you worked in this gang ? :

(41) How many other gangs have you worked for ? : (Location)

(42) Why did you come and work for this gang ? :

(43) Do you think you will still be working in logging in 5 years time ? : Yes No Don't know

Accident Record

(44) Have you ever had an accident while employed in logging during the last 5 years that resulted in you having more than one day off work ? : Yes No

(45) If 'yes' to Q44 fill in the table .

	Accident No. 1	2	3	4
(45a) How long were you off work for in days ? :				
(45b) What were you doing at the time of the accident ? :				

(45c) Describe each accident you have recorded in the above table :

(46) Did anyone discuss the accident with you ? : yes no

(47) If 'yes' who ? :

(48) What was their recomendation to avoid the accident happening again ? :

(49) Have you ever suffered from ,

	yes	no
back problems ?		
white finger ?		
tendonitise		
other		

(50) Do you wear / use the following ? :

	yes	no
Helmet		
Ear muffs		
Visor		
Safety trou.		
Safety chaps		
Safety boots		
Other		

(51) Of those you are not wearing , did you know -

(a) they are avaliable ? : yes no

(b) where you can buy them ? : yes no

(52) If you are wearing all the above or part of the list of items , who supplies you with them ? :

(53) Why aren't you wearing them ? :

(54) Have you ever had your hearing tested ? : yes no

(55) If yes , how long ago was it and can you remember the result ? :

Awareness Page 5

(56) Do you know what LIRA does ? : yes no

(57) Do you see any of LIRA's publications ? : yes no

(58) Before now had you met any LIRA staff ? : yes no

(59) If 'yes' to question 56 , do you think there is a need for an organisation like LIRA ? : yes no

(60) Do you know what the L&FITB does ? : yes no

(61) Do you see any of the L&FITB's publications ? : yes no

(62) Have you met any of the L&FITB staff ? : yes no

(63) If yes to question 60 above ,do you think there is a need for an organisation like the L&FITB ? : yes no

(64) Do you see copies of any logging magazines ? : yes no

(65) If 'yes' , how often ? :

(66) Have you ever visited a processing plant ? : yes no

(67) Which ? :Pulp mill Sawmill Veneer mill Particle bd.

(68) How often ? :

(69) When ? :

(70) If answer was "no" , would you be interested in such a visit, during the week ? : ,or in your own time ? :

(71) Have you visited logging operations outside the ones in which you are / have been employed ? : yes no

(72) If 'yes' , was it : in the same forest ? : yes no

: in another forest ? : yes no

(73) Have you ever met the forest manager ? : yes no

(74) What do you see as the best source of information about what is happening in the logging industry ? :

Dept.Lab. Union For.Manager. Mach.Salesman Pub
Formal meetings Company newsletters

(75) Which of the following jobs of logging have you done in this gang (A), in previous gang (B), and in total time in logging (C).

Time			A	B	C	
How long would you say it takes to learn each of them . (in mths)		Felling				Of those jobs you have indicated how many of them would you say you are competent at?
		Trimming				
		Breaking out				
		Skid work				
		Skidder op.				
		Tractor op.				
		Loader op.				All , 75% , 50% ,
		Hauler op.				25% .
		Log truck op.				
		Mach. maint.				
		Gang boss				

(76) Which is your normal job ? :
(77) Which logging job do you like most ? :
(78) Why ? :