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The New Zealand shearing industry - a
case study

**Primary Industry Council/Kellogg
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**The New Zealand Shearing Industry
- a case study**

Barry Pullin
November 2006

Abstract

An investigation into the labour force characteristics and their ramifications on a shearing business was completed at Pullin Shearing Limited - a shearing business based at Rolleston, Canterbury, New Zealand (43° 36' S, 172° 24' E, 46 m.a.s.l).

Pullin Shearing Limited (2005 / 2006 season) utilised 231 employees composed of 115 shearers and 116 woolhandlers and pressers. Work engagements occurred on 228 days completing 5,466 man days and 36,910 man hours.

Study objectives were to investigate the labour force characteristics defining significance in terms of days and hours worked, age demographics, work life stages, sector description and breakdowns, the business manpower strategies required and wider New Zealand shearing industry implications.

Three controlling factors influence the shearing business. One being demand - the farmers need for sheep to be shorn. Two – the availability and supply of labour to carry out the task. Three – the influence of weather, as sheep cannot be shorn wet. The balance between demand, labour supply and weather is also influenced by the labour forces skill and throughput efficiency.

This balance has a rhythm, a beat or *Takt*. Balance is achieved in delivery of service when the *takt* of farmer demand is met by the team *takt*, the shearers *takt* and the woolhandlers *takt*.

To maximise the resource of available labour supply a shearing business must follow closely a “just in time” philosophy.

Seasonal fluctuations and variances occur in the demand for shearing within a business and indeed the country regions. A pool of workers must be available to meet the high seasonal demands and this pool group must contain members of each life stage so that the

empowerment of knowledge and experience is passed from those mature workers to those in development.

Shearing businesses are dependant upon each other for this shared labour pool. A 1:1 ratio of shearers to woolhandlers and pressers exists. Give that the total demand for shearing in New Zealand is 64.28 million sheep (accounting for sheep shorn twice) in the year and the average 2006 productivity of a shearer is 20,000 shorn/year there is the need for 3210 shearers and 3210 woolhandlers and pressers to be in the labour pool. A total labour force of 6420 workers.

There are three sector worker groups.

1. Core – a stable group who account for a large percentage of the shearing business work.
2. Industry – mobile, skilled and flexible to meet seasonal demand. These are often overseas based workers and motivated, goal focused New Zealand shearers chasing the peak work demand.
3. Casual – availability is random, but highly valued by the shearing business.

There must be flexibility within the management structure to cope with all the variables but the primary strategy of a shearing business is to service the majority of demand from the core workers, meet seasonal variations from the industry labour supply and satisfy daily requirements from the casual labour segment.

Flexibility of employment exists and the casual “as and when required” nature defines the ability of the employee to accept or decline available work. Workers in the industry do not work long hours on a yearly basis but an average or above average income can be earned.

The average age of the New Zealand shearer is increasing but not at the same rate as is the average New Zealand worker. It is imperative for the productivity, efficiency and

sustainability of shearing that it continues to develop and utilise a young work force. In this process it is crucial that exit pathways be promoted so that opportunities for employment exist for the incoming development worker.

To capitalize upon shearing as a job the worker must have goals, focus and the knowledge that transferable skills from shearing enable a flexible exit strategy.

Shearing is a sound career option offering the opportunity to earn good money for minimal hours, the development of a valued skill base and the benefit of travel not only within New Zealand but the world.

Keywords: shearing, labour force, demographics, business manpower strategies

Table of Contents

1.	Introduction	1
2.	Literature Review.....	5
2.1	New Zealand Shearing Industry and Technology	5
2.2	The New Zealand Shearing Labour Force.....	8
	Problems in Planning.....	8
2.2.1	Define the Problem.....	8
2.2.2	Assess the Information	8
2.2.3	Demographics	9
2.2.4	Seasonality	10
2.3	Minimum Labour Requirements	10
2.4	How Many Sheep are to be shorn	12
2.5	The Core Workforce.....	13
2.6	The Need for Planning.....	13
2.7	Conclusion	14
3.	Case Study Pullin Shearing Limited	16
3.1	Pulling Shearing Limited	16
3.2	Pullin Shearing - Shearers, Woolhandlers and Pressers	18
4.	Results	19
4.1	Work Seasonality	19
4.2	Labour Force Demographics.....	21
4.2.1	Age.....	21
4.2.2	Hours/Service	23
4.2.2.1	Days	23
4.2.2.2	Hourage.....	24
4.2.3	Remuneration	26
4.3	Sector Building.....	27
4.4	Life stages	30

4.4.1	The Shearers Life Stage.....	30
4.4.2	The Woolhandlers Life Stage	33
4.5	Exits	36
5.	Discussion	39
5.1	A Shearing Business – controlling factors and the balancing act ..	39
5.2	Pullin Shearing Limited.....	46
5.2.1	Labour Force Impacts and Parameters.....	46
5.2.2	Labour Force Demographics – Life Stages and Exits.	51
5.2.3	Management Strategies	54
5.3	Industry Implications.....	55
5.3.1	Workforce demographics.....	55
5.3.2	Demand for shearing and workforce numbers	56
5.3.3	Sectors and life stages.....	60
5.3.4	Recruitment and retention.....	61
6.	Conclusion	63
	Glossary	65
	References	72
	Acknowledgements	74
	And now from the culture of shearing	75

List of Figures

Figure 2.1 New Zealand Shearing Labour Force Age Distribution (Percentage adjusted for commonality of age) (Source - Fuller 1967)	9
Figure 2.2 Agricultural Age Demographics 2004 (Source - Tectra 2004)	9
Figure 2.3 Annual Regional Workload Trends with relative workload assessment of light demand to heavy demand (Source -Tectra 2004).....	10
Figure 2.4 The New Zealand Sheep Flock Structure 1994-2004 (Source – The Economic Service, Statistics New Zealand).....	12
Figure 3.1 Pullin Shearing Sector Designators based on days worked in 2005-06.....	18
Figure 4.1 Pullin Shearing Seasonal Work Load 2005-2006 based on liable wages per month	19
Figure 4.2 Pullin Shearing Percentage of Peak Demand 2005-2006 – values at 1 where peak demand is highest at 100% for the year and relative values throughout the year	19
Figure 4.3 Pullin Shearing Three yearly work trend based on liable wages and monthly demand.....	20
Figure 4.4 Pullin Shearing 2005-2006 comparison of liable wages per month variation in comparison to average for previous 4 years.....	20
Figure 4.5 Pullin Shearing Age Demographics for Shearers and Woolhandlers 2005-2006	21
Figure 4.6 Pullin Shearing employees in sectors indicating number of days worked for the 2005-2006 period.....	23

Figure 4.7 Pullin Shearing employees in sectors indicating number of hours worked for the 2005-2006 period.....	25
Figure 4.8 Pullin Shearing's percentage of total liable wages per sector per month	26
Figure 4.9 Economic percentage variability for June, September and January for each sector	27
Figure 4.10 Pullin Shearing - Shearer Life Stage – ages and description	30
Figure 4.11 Pullin Shearing - Woolhandler Life Stage – years in the job and skill level level description	33
Figure 4.12 Pullin Shearing exit pathways 2002/03 and 2005/06 – detailing sector composition and total percentage loss	36
Figure 4.13 Pullin Shearing shearers exit pathways 2002/03 and 2005/06 – detailing sector composition and sector percentage loss.....	37
Figure 4.14 Pullin Shearing exit pathways to lifestyle stage	38
Figure 5.1 Controlling factors contributing to increased control by the contractor	39
Figure 5.2 Demand analysis for shearing service.....	40
Figure 5.3 Controlling factors of demand, weather and supply of labour and there influence on the X spot.....	42
Figure 5.4 Typical shearing shed layout and workstation placement.....	45
Figure 5.5 Pullin Shearing Percentage of Peak Demand 2005-2006 – values at 1 where peak demand is highest at 100% for the year and relative values throughout the year	46
Figure 5.6 Pullin Shearing proportion of workforce made up of core, industry and casual based on numbers of employees.....	47

Figure 5.7 Pullin Shearing proportion of days worked broken down into sectors – core, industry and casual	48
Figure 5.8 Labour force impact variation based on liable wages / sector.....	48
Figure 5.9 Pullin Shearing percentage of total liable wages per sector per month	49
Figure 5.10 Total employee numbers to liable wages yearly work trend per sector.....	49
Figure 5.11 Sector composition (percentages) in relation to number of employees, days worked and liable wages.....	50
Figure 5.12 Core Shearers and Woolhandlers monthly work history, based on liable wages per month clearly showing the peaks and troughs (entries and exits) variation that occurs through the year.....	51
Figure 5.13 Life stage to percentage loss per stage.....	53
Figure 5.14 Core sector shearers and life stage percentage.....	53
Figure 5.15 Pullin Shearing labour force composition – core, industry and casual based on liable wages and demand for shearing	54
Figure 5.16 Formula to determine shearers numbers required depending on sheep shorn and shearers productivity	57
Figure 5.17 Formula to determine total labour force required using shearers numbers and ratio of wool handlers to shearers.....	57

1. Introduction

The Shearing Industry is one of the largest employers in the New Zealand Agriculture sector. Employee numbers have never been accurately quantified but industry sources estimate up to 7,500 plus people work in the industry.

Shearing has always had a tough image but it is not always recognised as being a highly skilled occupation. It requires long hours of work in often harsh conditions. Shearing personnel pride themselves on their skill, physical stamina, self reliance and ability to “get the job done”.

This happens day in and day out in shearing sheds across the country.

It is only recently that real concerns have again been raised about labour shortages in the shearing industry. This is even more worrying considering the fall in sheep numbers from the peak of 70.3 million in 1983/84 to the present day 2005/06 level of 40.13 million.

Much research has been completed on the “easy” technological aspects of the industry

- Hand piece
- Upright shearing
- Wool press
- Ceramic cutters
- Shed design
- Wool characteristics
- Impact of shearing on twin survival

BUT ... little or no current research or data exists on the shearing labour force, the “*people*” of the industry.



Fuller (1967 and revised in 1974) says

“...little statistical analysis of the shearer labour force has been carried out in New Zealand. The analysis that has been done has been handicapped by both lack of data and the fact that available information has often been out of date”.

What was true then is even more so now. Data research by Lincoln University librarians have found no further studies on the work force characteristics, demographics and the people factors of the industry.

Shearing is a service industry. It services the needs of its clients in getting their sheep shorn.

It does this through its labour force – “its people doing their jobs”.

- People of different task specific-skills
Shearers, woolhandlers, pressers and classers
- People of different skill levels
‘learners’ through to the ‘gun’
- People of different ages and gender
From teenagers to retirement age, from boys to girls to men and women
- People of different ethnicity origin and many international and itinerant workers
such as *Pakeha, Maori, Australian, Swiss, English, Irish, South African and Dutch as examples*

All these people with all their different skills and all their different idiosyncrasies are organised together into shearing teams by shearing contractors/organizers.

To maximise efficiencies, these teams need to be carefully ordered, carefully chosen, self-contained working units.



Their function is the efficient removal, processing and packaging of wool from the sheep's back transforming it to a saleable commodity.

This labour force – these '*people*' are the shearing industries biggest **RESOURCE** and also the biggest **CONSTRAINT**.

Certain steps have been taken in researching the labour force in New Zealand: "The Shearer Labour force in New Zealand" (C Fuller (1967 and 9 revised 1974), Branford) and "Increasing the uptake of young people into shearing" (Tectra (2004)) **BUT** both of these studies are generic in nature and deal little with the coalface issues of the industry.

Researches face a challenging task when looking at an industry which has the following factors

1. the diverse range of people who work within the shearing industry.
2. the CASUAL "as and when required" nature of employment which effectively rules out permanent employment
3. the different employment models that operate within the industry – open shed and working for contractors.
4. the perception that working in shearing sheds is not a real job but "a filling in of time" therefore "I don't tell anyone I have been working in the sheds".

All of these, amongst other factors, make shearing a nightmare to the researcher.

However, for all that, it is not difficult to find people in all levels of New Zealand's social and business environment who have experienced the hard yards of the woolshed.

The purpose of this project is the detailed investigation and research into the labour force of one New Zealand shearing business.



The objectives are:

1. The identification of labour work history in terms of hourage and economic parameters.
2. The identification of the shearing business labour segments with regard to core / industry / casual parameters.
3. The economic and logistical significance of each sector to the business.
4. To define life/work stages of the labour force.
5. Discussion utilizing the four points above and the business manpower strategy required.
6. To promote discussion on the wider industry implications.



2. Literature Review

Little research has been undertaken on the labour force within the shearing industry of New Zealand. There have been only two studies undertaken.

1. Carol D Fuller, (1967) – “The Shearing Labour Force in New Zealand”, (revised ME Bamford (1974)).
2. Tectra (2004) – “Increasing the uptake of young people into shearing” – an internal report commissioned by Meat and Wool New Zealand, undertaken by the industries training provider. Tectra.

Other useful references were Meat and Wool New Zealand Economic Service, Statistics New Zealand and John Atkinson, “Manpower strategies for flexible organisation”, the University of Sussex (1984)

2.1 New Zealand Shearing Industry and Technology

Fuller (1967) “*Early farming practices meant the utilization of a sizeable population of itinerant labourers which was available for the “man power” of shearing, harvesting and other farm work in the late 19th and early 20th century*”.

Note was made of the supply of skilled shearers from Maori villages.

Shearing was solely by blades until the use of the machines from Australia gained wider acceptance in larger sheds about 1908.

Many of the larger sheds of twenty plus stands were reduced to ten or twelve machine stands.

It was the belief that with machines the process would be sped up.



Although this is true, the individual tally of the shearer did not advance until the method of shearing evolved. This was the forerunner of the New Zealand style of today. This style, developed and refined by the likes of Godfrey Bowen, involved the technique of holding the sheep with the shearers legs leaving arms free to part wool and guide the handpiece tool. Even today this is the hardest skill to learn but once mastered machine shearing is fast work.

The “gun shearers” of today tally out 400+ sheep per day, whereas the top blade guns struggle to full shear 180+ per day.

The change from blades to machine was the **technological revolution** of the Shearing Industry.

This further evolved with work on the tools of the trade, the “gear” – combs, cutters, hand pieces and grinders. The technology of today’s gear is far in advance of the early days. Aspects of bevel, side scallop, radius, gullets, comb width, thickness and even the durability of the steel, amongst others, have all been studied.

Even in 1967 Fuller states *“there has been no significant breakthrough for the last fifty years”* and *“it would appear that for some time to come, shearing will still be essentially a manual task, the speed and efficiency of which happens depends primarily on the engineering of hand piece, gear and the skill of the shearer.”*

That is even more so now. C. Minke, Heiniger New Zealand, pers. comm. (2006) agrees with the basics of the statement **40** years later and is evidenced by the following article from the Shearing magazine.



Time to stop wasting research money

Simon Tangney and Chris Minke of the Heiniger Company have been reflecting on latest discussions (mainly across the Tasman) about chemical shearing, robot shearers, and the millions of dollars spent investigating options other than the good old, hard working, back bending art of machine shearing. Their ponderings result in some pretty firm conclusions.

"Oh the steam is in the boiler, in the engine room below/While upon the board each boiler waits to hear the whistle blow..." (Jack Sorenson)

Over the past 50 years there have been many attempts and millions of dollars spent researching alternative methods of de-fleecing sheep.

Furthermore, many more millions of woolgrowers' dollars have been earmarked for this futile quest to continue for another 10 years at least.

To date however - in our view at Heiniger - none have been able to eradicate the shearer - the ultimate aim of all such ventures from robotic shearing to 'chemical shearing'.

While Heiniger is at the forefront of wool harvesting technology, our people have always had a healthy respect for the professional shearer, whose unique skill is held in high regard. Indeed, many of our best sales people have been drawn from the shearing fraternity.

Shearing is an industry that we are deeply proud to belong to. We can say without fear or favour that with all our product development work, we've never included a design to disperse with one of this country's last great iconic figures - the machine shearer. Frankly, we find it hard to fathom the perseverance of some entrepreneurial types bent on ridding shearers from the wool harvesting process altogether.

Our latest review of the various alternatives currently being developed reveals that traditional machine shearers are a highly efficient and professional body of people.



Heiniger's, Chris Minke - time to forget robots in favour of practical research.

Their remuneration represents a fraction of the fleece value and is highly competitive in terms of both cost and practical application. A common mistake made by many in the alternative de-fleecing camp is to overlook preparation time and manpower - both before and after the shearing process. Getting the wool off the body of a sheep is really quite straightforward. However, one fact that seems to fall on deaf ears is that shearing also involves mustering, penning, skirting, classing and pressing - all unavoidable costs borne by the grower, regardless of the de-fleecing process used.

To misunderstand this process or to underestimate the interaction between sheaters, shed hands, woolgrowers and their sheep could - perhaps understandably - lead to the incorrect conclusion that a cheaper, more efficient method can be readily found. But while many keep looking, nobody has found one yet!

At Heiniger, we genuinely believe that the best way to deliver value to shearers and woolgrowers is to continue developing new technologies that enhance the mechanisation process.

One example is Heiniger's new shearing cutter, The Xtreme, launched in New Zealand and Australia earlier this year. The Xtreme incorporates a new feature designed to eliminate what shearers often refer to as a mechanical lock-up while retaining a high level of cutting performance.

We believe this is the kind of innovation that is most valued by mainstream woolgrowers, not the niche opportunities being explored by the biochemical enthusiasts and various other radicals.

And now to complete the chorus to Jack Sorenson's chorus to *Call of the North*:

"... 'Cause the shearing is beginning and my heart is fancy free/And the friction wheels are spinning, yes the north is calling me!"



2.2 The New Zealand Shearing Labour Force

Problems in planning

With any issue you must first define the problem then assess the information before designing strategies to overcome it.

2.2.1 Define the Problem

Tectra (2004) *“an acute shortage of skilled staff, particularly shearers but also woolhandlers and pressers, is imminent”*.

“Shearer shortage” is the cry.

This has been perceived for a long time. In fact as far back as the 19th century. Fuller (1967) mentions the desperate shortage of shearers over the 1850 gold rush period and goes on to state a hundred years later *“in the early 1950’s a positive approach, in the form of a shearer training scheme, was made to solve the problem of increasing the shearer labour force to keep pace with the rapidly expanding sheep population”*.

2.2.2 Assess the Information

Fuller (1967) describes the problems in planning.

“Quantification of the existing and needed future shearer labour force in New Zealand presents problems due to gaps and definitional problems in official statistics.”

What was said then is even more so now. No-one officially (Statistics New Zealand, NZ Meat and Wool, Department of Labour) can accurately say how many people are in the shearing labour force or even how many sheep are to be shorn in a year in New Zealand per year.



2.2.3 Demographics

This report also raised concerns about “a progressively ageing population” of workers. Tectra (2004) and Fuller (1967) shows the comparisons of 2004 versus 1967.

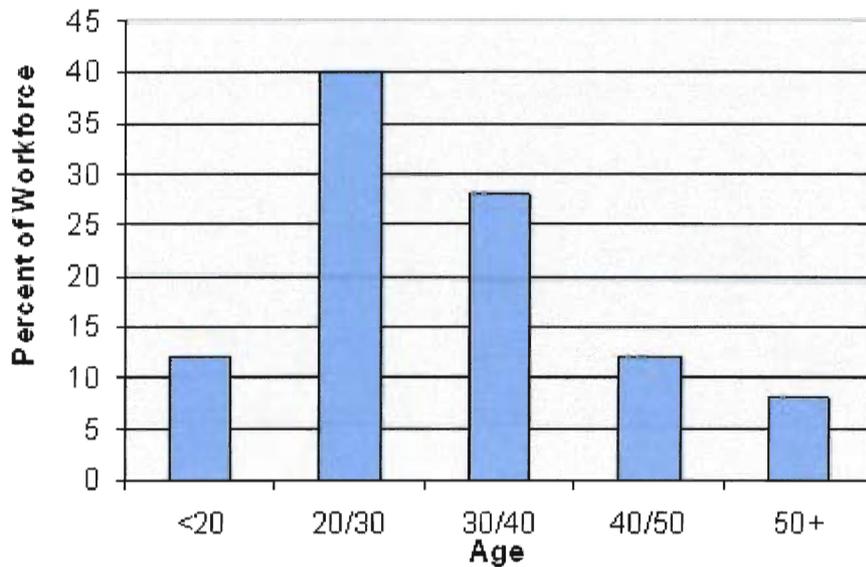


Figure 2.1 New Zealand Shearing Labour Force Age Distribution (Percentage adjusted for commonality of age) (Source - Fuller 1967)

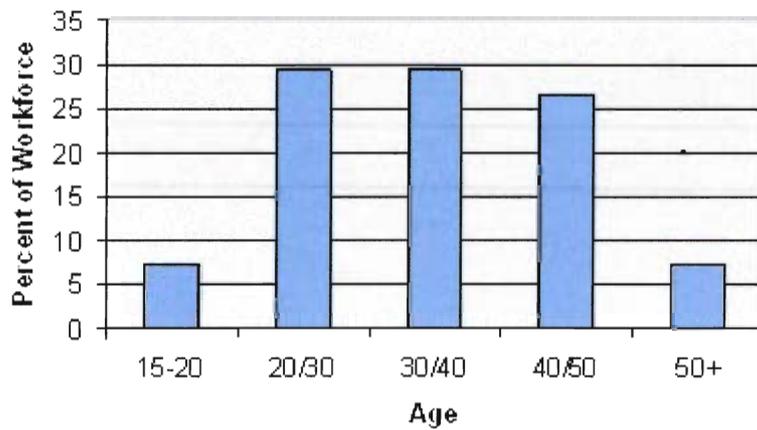


Figure 2.2 Agricultural Age Demographics 2004 (Source - Tectra 2004)



Although the Tectra study is not completely over the whole industry it shows comparable trends to Fuller (1967) some 37 years earlier. Fuller (1967) with age adjustments reveals a younger work force. The adjustments carried out were to enable commonality in comparison of age brackets of workers. Fuller's initial age bracket was 18-23. Using a straight lineal comparison a set percentage of the number of workers was allocated to each year.

2.2.4 Seasonality

The seasonal demand for shearing labour is evident from Tectra (2004) Seasonal Workload Study.



Figure 2.3 Annual Regional Workload Trends with relative workload assessment of light demand to heavy demand (Source -Tectra 2004)

There are two “quiet” periods. Autumn (February/April) and Spring (September/November).

2.3 Minimum Labour Requirements

Fuller (1967) outlined a very simple, but shearer only, formulae is also explained for minimum shearer labour force calculations.



“If it is assumed that no technological change in the shearing process, and no change in shearing practice in New Zealand will occur, in the absence of other data we can use the following formula to forecast minimum shearer labour force needs in the next 5 years”.

$$V_n = S_o(1 + r)^n sp$$

Where V_n = shearer labour force in year n

S_o = sheep population in base year

r = annual rate of increase in sheep population

s = ratio of sheep shorn to sheep (modal figure)

p = ratio of shearers to sheep shorn

If we let $S_o = 58.9$ million

$s = 1.2$

$p = 1/12,000$

(A modal sheep shorn to sheep ratio of 120:100)

The modal rate accounts for the sheep that are shorn more than once in the year.

Where $p = 1/12,000$ this figure allows for wet weather and delays and it is estimated that an average shearer can expect a minimum seasonal tally of 12,000 sheep.

In 1967 based on these figures a total of 5,890 shearers would be required to shear the nations flock.

Further investigation is necessary to account for the TOTAL labour force; shearers, woolhandlers and pressers and also the productivity changes of the modern shearer along with the current national shearing demand.



2.4 How Many Sheep are to be shorn?

The table shows the figures in each groups *but* does not detail what the demand for shearing is.

Questions of

- how many sheep are second shear (shorn twice in year)
- how many sheep are 8 months (shorn three times in two years)
- how many are shorn once
- how many works lambs are shorn twice before being killed at freezing works.

All these details need quantification.

The New Zealand National Flock

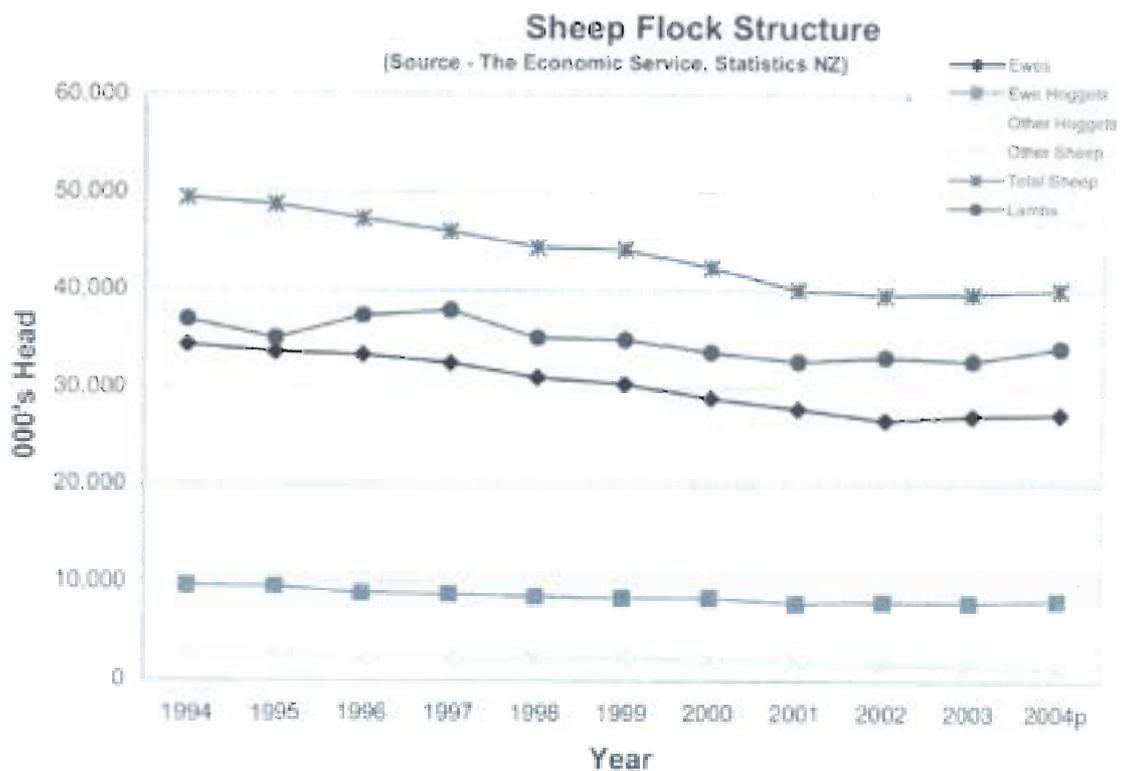


Figure 2.4 The New Zealand Sheep Flock Structure 1994-2004

(Source – The Economic Service, Statistics New Zealand)



2.5 The Core Workforce

Fuller (1967) described a “core” of shearers who with the ever-changing demands placed upon them would be able to service the needs of the industry.

No matter the pay rate or the training available, labour numbers may fall for an industry. Even in New Zealand shearing is a fairly unique occupation and not everyone is capable of becoming a shearer.

To continue shearing one must have the physical capability and also the ability to “chase the work” in other areas.

Atkinson (1984) discusses an increasing peripheral and therefore numerically flexible group of workers clustered about a numerically stable core group which will conduct the organisations key firm specific activities.

Atkinson identifies three kinds of organizational flexibility :

- Functional
- Numerical
- Financial

This is certainly true of shearing.

Since Fuller (1967) and Tectra (2004), the strongly seasonal workload profile has changed now. There is a growing trend of consistency of workload and the opportunity for the local or core shearer to work throughout the year.

Tectra (2004) “contractors endeavour to retain good staff by providing continuous work whenever possible”.

2.6 The Need for Planning

Back in 1967 Fuller said *“that plans must be laid well in advance to ensure that there are sufficient shearers to clip the wool crop in total, and that peak time demands can be met with a minimum of delay”*.

She also went on to say that market mechanisms alone (pay rates and employment rates) may be insufficient to attract people into shearing.



Inertia in shearing industry recruitment can come about by

1. The initial problem of learning the skill. It usually takes 2, 3 or 4 years to reach the required levels.
2. The seasonal nature of the work and the low wages.
3. The irregularity of earnings. It is not always relevant to what is shorn. The nature of the employment includes variables such as weather, skill level and the team requirements.
4. The migrant way of life. There is a need for mobility necessary from Fuller (1967) as the nature of work has changed.
5. The hard physical nature of the work. Shearers need to be physically fit to the job. Injury and lack of stamina can rule out people from the industry.
6. In a physical occupation like shearing, the early years of the shearing career are the best ones. This is as true today as it was in 1967. Lately the longevity of the shearers is being recognised as it being a career of choice. (P. Lyons, R. Davis, G. Redpath et al)

2.7 Conclusion

- Little detailed research has been undertaken on the Shearing Industry labour force.
- There is no magical technological revolution on the horizon in shearing.
- Shearing is a people business. It relies on people with physical skill sets to do the job. Shearing comprises not only shearers but wool handlers and pressers.
- Age demographics are changing as is the status and perception of shearing as a career.



- There is also little detailed knowledge the demand for shearing and how many sheep there are to be shorn each year in New Zealand.
- Shearing has a core of people and must have functional, numerical and financial flexibility to meet the work load seasonalities.
- New Zealand has an ageing workforce. Shearing must attract young people who have the physical attributes to undertake the work.
- A detailed study on the Shearing Industry labour force is well overdue.



3. Case Study Pullin Shearing Limited

3.1 Pullin Shearing Limited

Pullin Shearing Limited is a privately owned and operated shearing contracting company based in Rolleston, Canterbury (43° 36' S, 172° 24' E, 46 m.a.s.l). It comprises the two owners (husband and wife), 1 permanent part time office administrator and in the season 2005/06 231 shearers, woolhandlers and pressers employed on individual casual employment agreements (CEA).

This business is spread both geographically and by altitude to extend from Banks Peninsula across to the Main Divide, and from just north of Ashburton to North Canterbury. Work is performed in farmer's wool sheds spread over some 160 work sites.

Work is continuous throughout the year with peak demands at summer and pre-lamb. Availability of work is determined by the "need" for sheep to be shorn and variability of weather. Sheep can not be shorn when they are wet.

Numbers of staff employed vary on a day to day basis and on an "as and when required" basis.

There is also the component involved in service delivery regarding skill level, throughput, sheep size, wool preparation and processing that determines the "make up" of each team that goes out to that farmer each day.

Maximum team numbers peak in summer at 60+ per day with a stable demand of 15 to 20 people per day.



The principals of Pullin Shearing Limited have strong managerial ability and experience, having been involved in running a shearing business for some 20 years.

During this time, the business has evolved and grown from a small sole trader with two employees to the present day situation of 231 people per year.

Considerable industry experience, networking and involvement occurs through contact through the New Zealand Shearing Contractors Association. The principal of Pullin Shearing has been an executive member for six years, has held portfolios in Skills and Education, Health & Safety and is currently Industrial Chairperson.

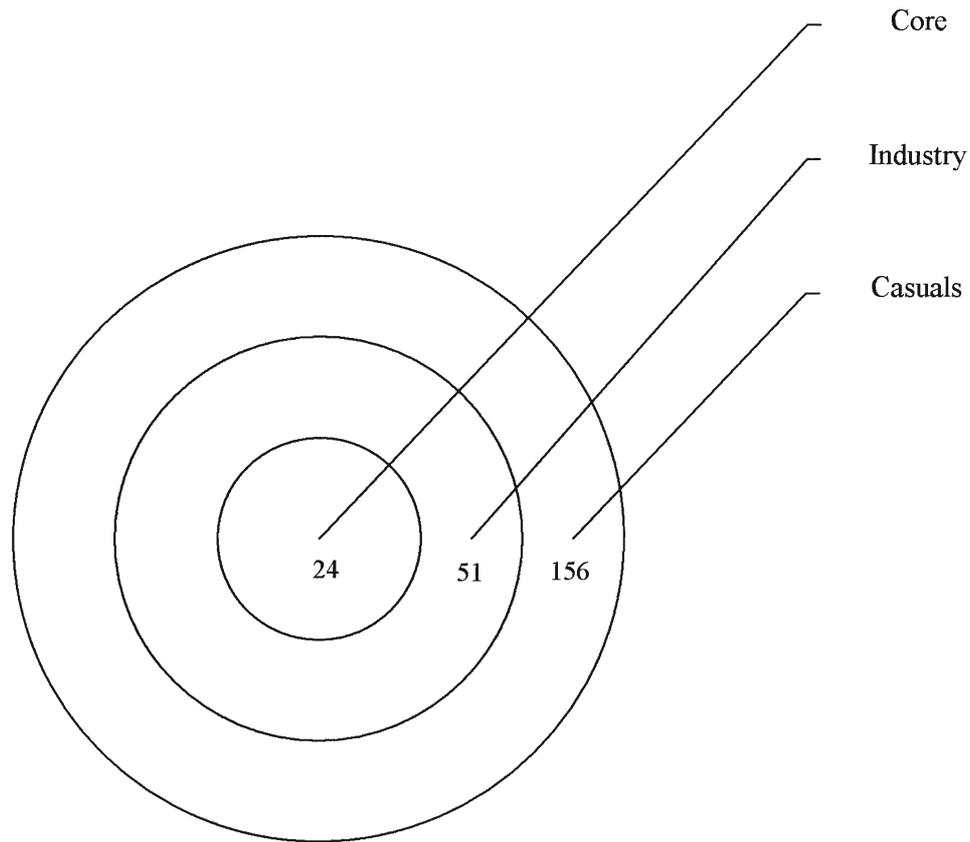
Pullin Shearing Limited over time has built up detailed records which can track an individual employee's work history in days worked, hourage, job function and productivity. This data base was available both manually and electronically and was used for statistical analysis.

The services of Lester Foulds (computer support services), office administrator, industry knowledge from both the principals of Pullin Shearing and other industry sources have been utilised and used to complete this study.



3.2 Pullin Shearing - Shearers, Woolhandlers and Pressers

Utilising Atkinson and Fullers preliminary work force sector designators the 231 shearers, woolhandlers and pressers employed during 2005/06 can be divided into three groups - Core, Industry and Casual. The breakdown of the workforce is detailed as follows.



Core = 70 days or more employment in 2005-2006

Industry = 16 days up to 70 days employment in 2005-2006

Casuals = less than 16 days employment in 2005-2006

Figure 3.1 Pullin Shearing Sector Designators based on days worked in 2005-06



4. Results

4.1 Work Seasonality

Workload seasonality is presented in the figure below.

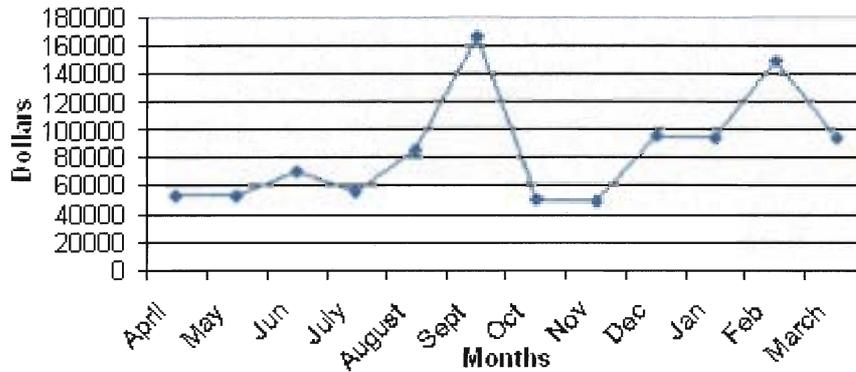


Figure 4.1 Pullin Shearing Seasonal Work Load 2005-2006 based on liable wages per month

The highest workload occurs in the pre-lamb period of September, followed closely by the summer main shear of February. Seasonal lows occur in April, May and October/November. These coincide with the autumn rams out and mating cycle and the October/November reluctance to shear ewes with lambs at foot. Taking the seasonal high of September as peak 100% work load demand, the following table results.

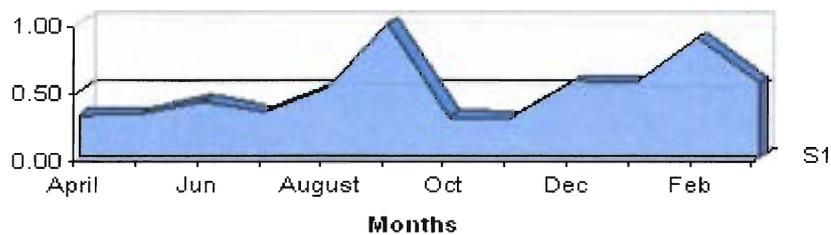


Figure 4.2 Pullin Shearing Percentage of Peak Demand 2005-2006 – values at 1 where peak demand is highest at 100% for the year and relative values throughout the year



Even at low demand periods, the lowest demands of April and May at 32% and November at 29%, still accounted for a sizeable amount of peak workload. July 2006 work load was lower than normal due to the wet weather experienced during that month, thus there was no work available to be done. The last three year seasonal trends can be evidenced by the following graph.

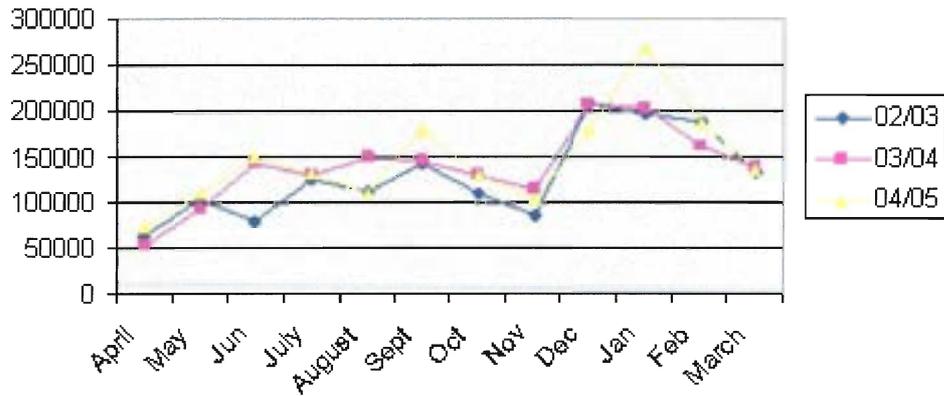


Figure 4.3 Pullin Shearing Three yearly work trend based on liable wages and monthly demand

A comparison of the three year average work trend and overlying the 05/06 work trend can be evidenced by the following graph.

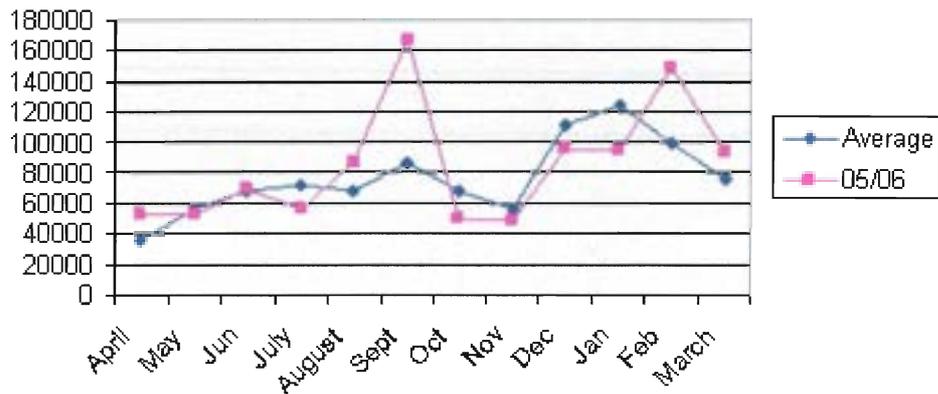


Figure 4.4 Pullin Shearing 2005-2006 comparisons of liable wages per month variation in comparison to average for previous 4 years



Not only is the business of Pullin Shearing at the mercy of variances of weather and availability of sheep, but it is also affected in its work trends by the changes in farming practices.

Pullin Shearing Limited is experiencing the rise in popularity of pre-lamb shearing with the on-farm benefits to the farmers of lamb survivability along with better wool quality. Summer peak demand is occurring later due to farmers reluctance to upset lamb growth with weaning and shearing. From all this there is continuity of work load throughout the year for staff.

4.2 Labour Force Demographics

4.2.1 Age

The labour force age demographics for shearers and woolhandlers can be demonstrated by the following graph.

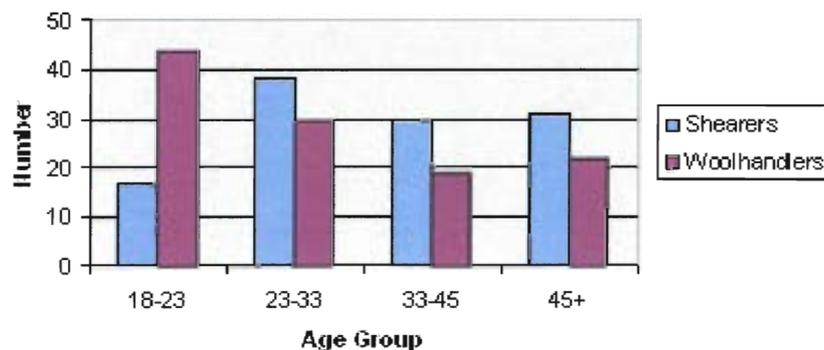


Figure 4.5 Pullin Shearing Age Demographics
for Shearers and Woolhandlers 2005-2006

Shearers

The average age of a shearer is 34 years. The largest group of shearers occurs in the 22-33 age bracket. These are the people who have tried shearing and chosen it as either a career or a short term occupation. Shearing has always traditionally been viewed as a young mans game. The fact that this largest group is within the



young mans years reinforces this. The two older age brackets of 33-45 and 45 plus years shows the longevity of the shearer and the view point that shearing is more of a long term career. The development shearer in the years of 18-23 makes up 14.6% of the total Pullin Shearing shearer population. Pullin Shearing in 2005/06 had one female shearer.

Woolhandlers

Woolhandlers show a distinct younger work force. The average age is 31. By far the greatest number of woolhandlers are in the 18-23 age bracket. Some 33% of woolhandlers are in this group. The second largest group is in the 23-33 age group. Woolhandling is definitely a young person's game. By far and large the greatest percentage of woolhandlers are female.

The large drop off of woolhandlers from the younger years to later years occurs as woolhandling is not viewed as a long term career choice. *The average length of time you can expect a woolhandler to spend in the industry is around five years.* Peter Lyons (2006) pers. com.

By combining the two sectors of shearers and woolhandlers, Pullin Shearing has a total industry average age of 34. This compares favourably with the agricultural sector average age of 43 (Department of Statistics, 2004) and Tectra (2004) 35 years, and Fuller (1967) 32 years of age. The age of all those people working in the shearing industry is getting older but Pullin Shearing has a younger than average work force. The average age of all New Zealand workers in 2004 was 40.

An interesting aspect of the demographic study showed an increase in number of shearers and woolhandlers in the 45+ age group who work for Pullin Shearing.

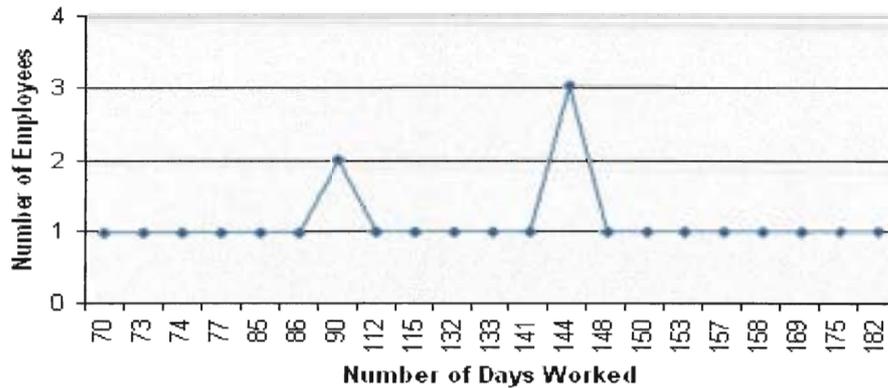


4.2.2 Hours/Service

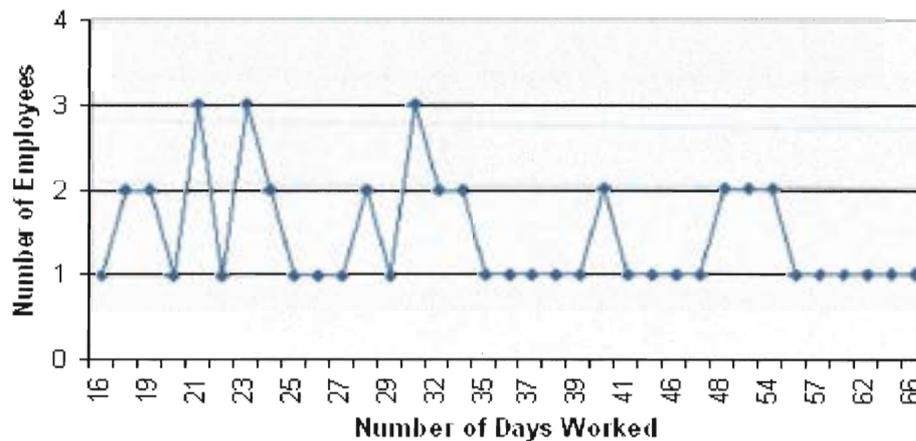
4.2.2.1 Days

Pullin Shearing completed work on 228 days of 2005/06. During this period 5,466 man days were worked, totalling some 36,910 hours in woolsheds. The number of days worked by individual employees is detailed by the following three graphs. These graphs were broken down into core, industry and casual components to allow efficient investigation and presentation of data.

Figure 4.6 Pullin Shearing employees in sectors indicating number of days worked for the 2005-2006 period

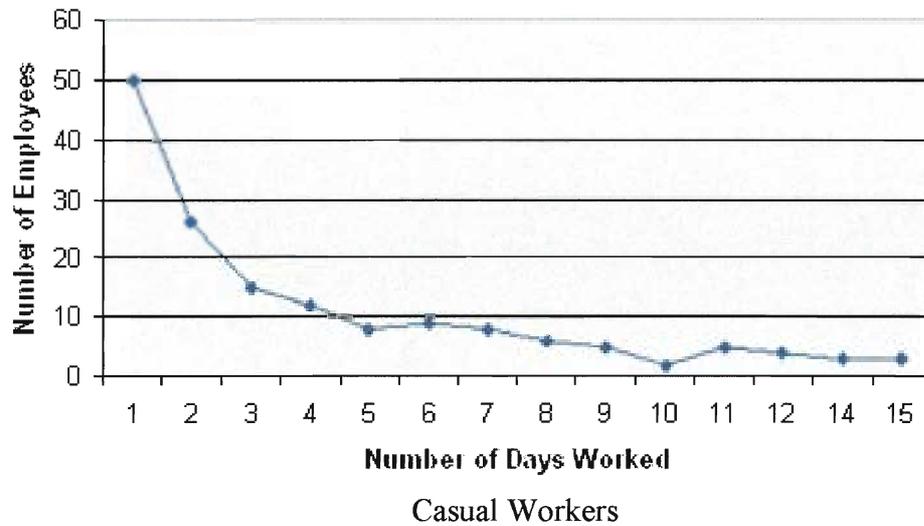


Core Workers



Industry Workers





The minimum number of days worked by an employee was one, up to a maximum of 182 with the average days per employee of 23.7.

In each sector the average days worked were:

Core	125
Industry	35.5
Casual	4.2

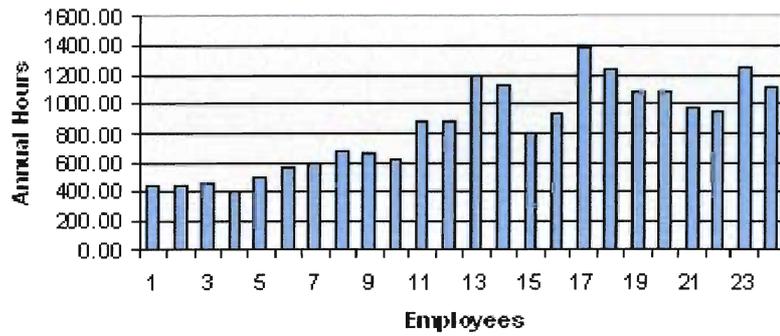
In the casual sector, there were **50** employees who only worked on **one day**.

4.2.2.2 Hourage

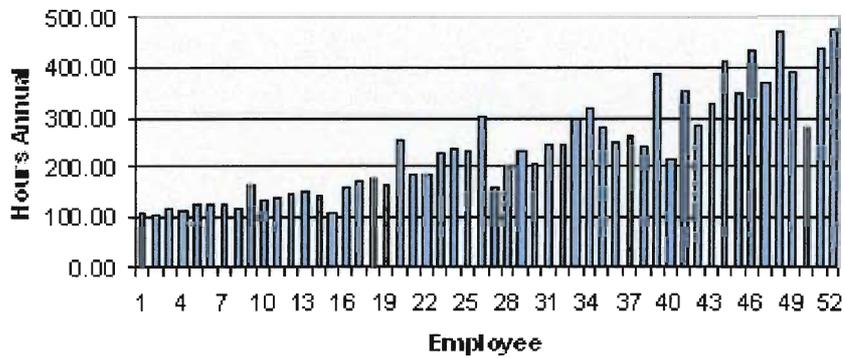
Utilising the sectors in 4.2.2 and 3.2, investigating the hours the individual employee completed for Pullin Shearing resulted in the following graphs and tables.



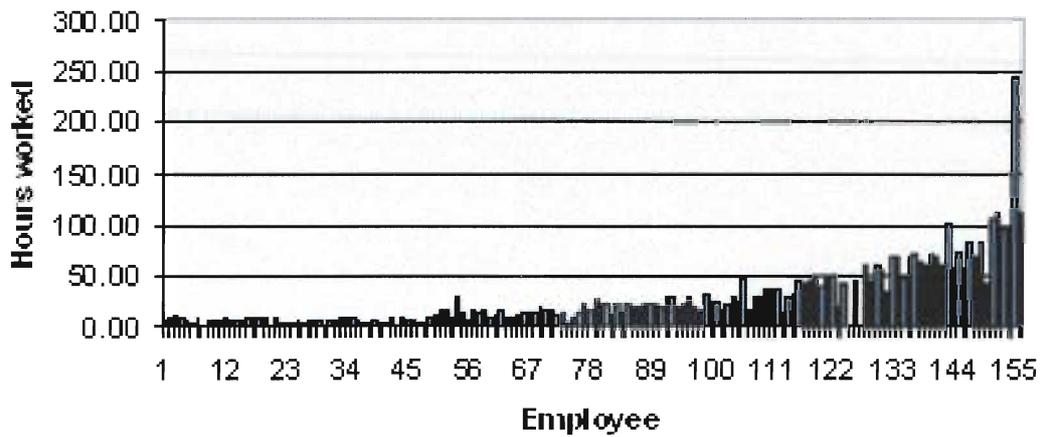
Figure 4.7 Pullin Shearing employees in sectors indicating number of hours worked for the 2005-2006 period



Core –hours worked



Industry – hours worked



Casuals – hours worked



4.2.3 Remuneration

The Shearing industry is based on a piece rate pay. A shearer, woolhandler and presser are paid for what they accomplish in the day. From a straight shearing prospective, every shearer is paid for every 100 sheep shorn. Their skill and throughput give their economic benefit. For woolhandlers and pressers, their piece rate is based on their hours and the skill level within that hourly rate. The industry comprises variability in the individual rate of pay per employee and their productivity obtained.

When studying the labour force of Pullin Shearing the economic impact of the employee must be considered and taken into account in the significance of that labour force to the business. Based on the three sectors of core, industry and casual, the following graphs track the economic impact in relation to liable wages.

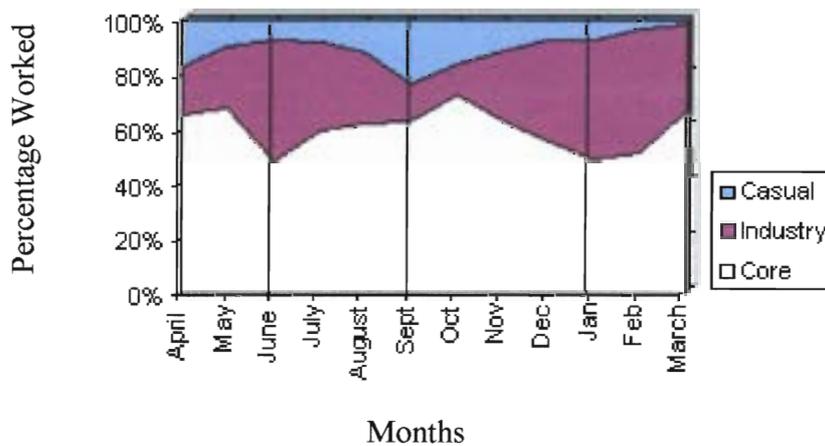


Figure 4.8 Pullin Shearing's percentage of total liable wages per sector per month

Taking any point in the year, the variation of economic value can be traced. The pie graphs illustrate that at any stage clearly all three groups are utilised by Pullin Shearing.



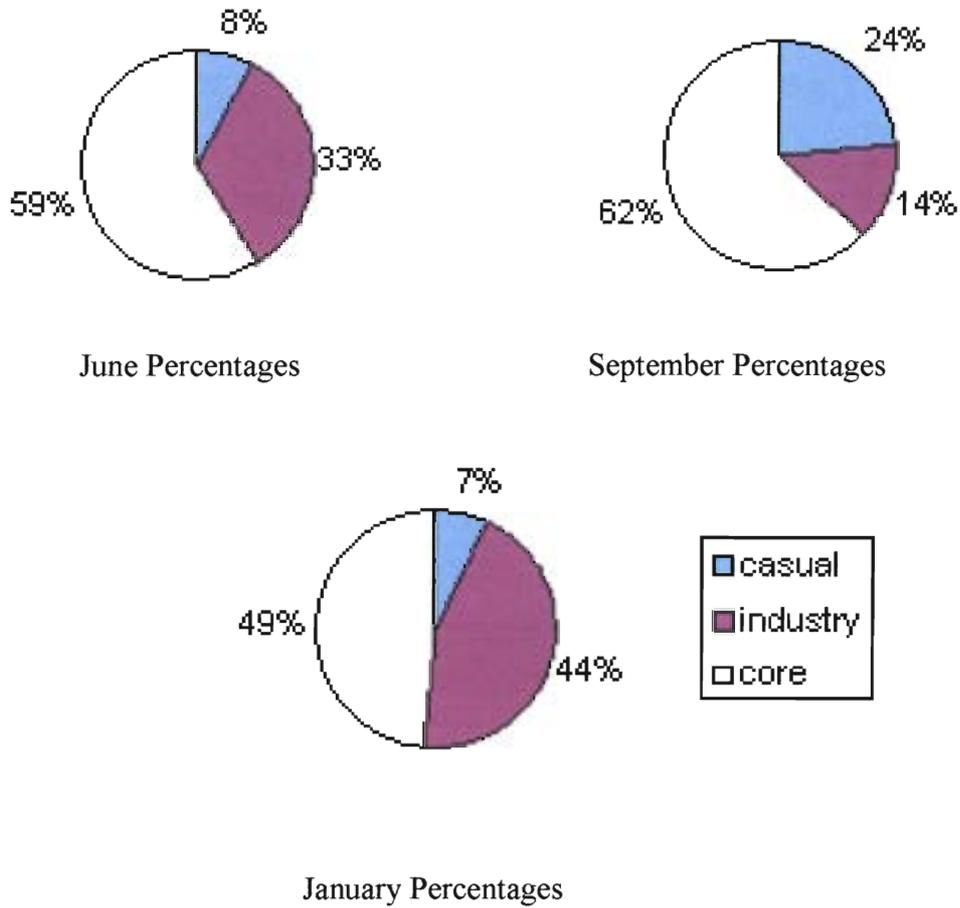


Figure 4.9 Economic percentage variability for June, September and January for each sector

4.3 Sector Building

The primary prerequisite for sector determination was work history in days worked.

Three levels were chosen -

- | | |
|-------------------|----------|
| >70 days worked | Core |
| 16-70 days worked | Industry |
| <15 days worked | Casual |



Further determining factors were assessed by Pullin Shearing Management.

Pullin Shearing Core (24)

Pullin Shearing Limited considers their core people to be staff who:

- Are available for work throughout the year
- Have stability
- Could have varying skill level
- Have worked for the business for 6 months continuously and 70+ days a year
- Generally have a good attitude
- Have good communication skills
- Show leadership potential
- Show professional development qualities ie are motivators and mentors
- Are reliable – in throughput and work ethic

Pullin Shearing Industry (51)

Their industry staff are those who:

- Are highly skilled in task specific jobs
- Their skill level is at a stage that they can mix into the team framework
- Transient enough to follow work
- Motivated
- Good work history
- Able to deliver to the contractors needs
- Good communication skills
- The right attitude and the ability to complete the job
- Available when they are in the location or when required to be there



Pullin Shearing Casual (156)

These staff are:

- Could have varying skill levels.
- Act as ‘fillers’
- Availability is random
- Work less than 15 days a year for Pullin Shearing
- Transient, often on their way through to somewhere else
- Other contractors core staff looking for extra days
- No longer working in the industry permanently but “still love the game”
- Second or third jobbers
- University students
- Older very experienced workers utilizing their skills and contacts to travel around the country
- New entrant having a go!



4.4 Life Stages

Analysis of the labour force resulted in the work life stages models presented below.

4.4.1 The Shearer Life Stage

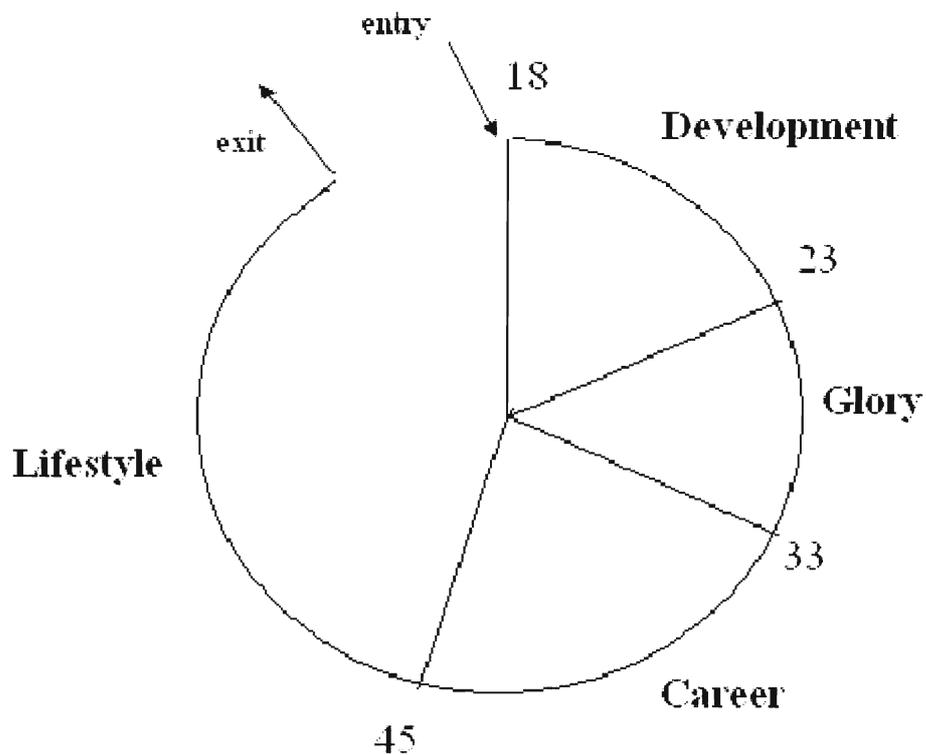


Figure 4.10 Pullin Shearing - Shearer Life Stage – ages and description

Age 18-23 – Development

This can be broken into two steps. The first step is as a raw beginner, as they interface within the woolshed environment and become comfortable with the roles and duties of their chosen work place. Tasks would be primarily in woolhandling and pressing. A gradual introduction would begin into the skill of holding a sheep and using the handpiece.



It is during this period that the choice is made – whether to continue with woolhandling and pressing or development on to shearing.

The next step is the “beginning of the shearing apprenticeship”, and involves the continued learning of the woolshed dynamics – its requirements of duties, including Health & Safety, fitness, language, workflow and the demands it puts upon people.

Skill sets of task-specific shearing are under development during which time the following will be achieved:

- The sequence to set emery papers
- Ability to grind combs and cutters efficiently and safely.
- Set up a handpiece with the correct lead and throw for the shear.
- Shear the sheep in the correct sequence, gaining proficiency
- Shear sheep cleanly, minimizing skin and second cuts.
- Select the right comb for the sheep to be shorn.
- Building a kit of gear and a sound understanding of the gear and its preparation.

Age 23-33 – Glory

The young shearers game. The best years of a shearers life.

When the learnt skill of shearing is defined, refined and mastered, combined with peak physical condition, the shearer will endeavour to set his personal best tally. These tallies should be set, extended and the boundaries broken on what the shearer can achieve. The shearer’s focus is narrow and relative to what happens within the day and even within the quarter hour. The shearer will be upwardly mobile, highly skilled and prepared to chase the work – not only within New Zealand but throughout the world.



Competition, not only within the workplace, but in the shearing competition scene helps the shearer's test themselves and further hone their skills.

They are the ambassadors and the face of New Zealand shearing throughout the world.

Age 33-45 – Career

The hard man phase. This shearer can still shear a tally, but the focus is extended from the tally today to what can be accomplished in the week, month or indeed the season. It is about maintaining output, balanced with the physical demands on the body of the shearer.

Often this is the family bread winner stage, where mobility is constrained to a limited time away from the home. The shearer's aim is to find an area which can give him continuity of work and income throughout the year, with the flexibility for other interests and commitments.

Age 45+ - Lifestyle

Those people who are in shearing for one of two reasons.

The first being that *they love the game* and the second that *they know no other*.

Retraining is generally not an option because shearing becomes the only way by which they can maintain the level of expenditure to which they have become accustomed. The life style of earning large amounts of money in short periods with a lot of time off is highly desirable. The mobility that can be found by following the work schedule not only within New Zealand but overseas is still an option and indeed an attraction. They have learnt to balance the demands of performance against the ability of the body to survive.



4.4.2 The Woolhandlers Life Stage

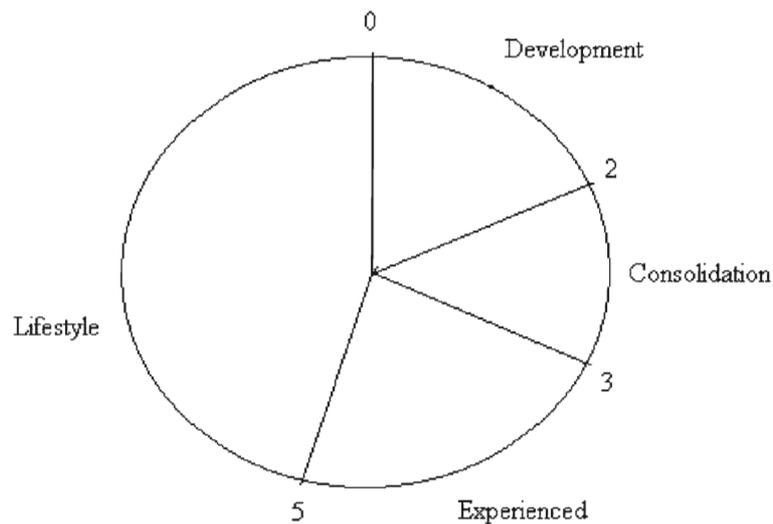


Figure 4.11 Pullin Shearing - Woolhandler Life Stage – years in the job and skill level description

The woolhandlers life stage can be broken down into a segmented period of five years or more. This is the average time taken to develop, consolidate, gain experience and utilise the career choice of woolhandling.

The occupation of woolhandling is not constrained by technology. It is the physical and mental development of the skill which enables a “remove to improve” philosophy. The wool preparation for quality assurance parameters of length, colour and contamination set the guidelines for all wool handling preparations.

The development and refinement of these skills occurs generally over a five year period. We have focused on this five year period in detailing the development of these skills. Woolhandling is attractive because of the relative high wage rates per hour, the flexibility and the commitment to the work and the ready reengagement of skilled experienced personnel by contractors.



Once the skill of woolhandling is mastered, the casual “as and when required” nature of employment in the shearing industry allows easy entry back into the industry even after a break.

It should be noted that a large percentage of wool handlers are female and often in a relationship with a shearer. They can offer the contractor the composite team. The variability and flexibility of woolhandling is exploited by young people wishing to travel within New Zealand, mothers, university students and people utilizing a second job.

Notwithstanding all of this, there still is a group within wool handling who see it as a career choice and continue with it because of the passion, commitment and enjoyment of working with wool.

Years 0-2 – Development

This can also be broken into two steps. The first step is the raw beginner as they interface within the woolshed environment and their subsequent development towards a woolhandling career. A gradual introduction would begin into the skill of handling the wool clip to the growers requirement. They will become familiar with the pattern of shearing and the sequence of the shed. They will develop the skills of using the ‘sweep’ and working ‘at the board’ initially and then mastering the ‘pick up and throw’ of the fleece.

Table work would follow with the main function being the identification and removal of wool faults and contamination. The productivity through put increases with experience and at all times the quality of the job is paramount.

The formal training and recognition of skills is through the NCEA Level 2 Certificate in Woolhandling (Junior) with woolhandlers who have a ready grasp



of the skill set, the right attitude and work experience progressing to obtain Level 3 (senior) qualifications.

An important aspect of the development of the woolhandler is the experienced gained by working with different breeds of sheep (cross bred to merino), different lengths of wool (lambs, second shear to full wool) and different levels of preparation requirement. Minimal removal of oddments in lambs in second shear, to table skirting on full wool (removing faults and contaminants) and onto the top level of wool preparation dealing with merino wool (spinners, top making short backs, flanks, double skirting).

It is during this period that the choice is usually made – as to whether to continue with woolhandling and pressing or development onto shearing.

Years 2-3 – Consolidation

This is when throughput, accuracy and the skills that allow a fleece to be processed on a table in less than 30 seconds are honed and defined. The woolhandler understands and appreciates the aspects of team work and communication, is able to coach and empower beginners into the industry, and is a valued member of any shearing team.

Years 3-5 – Experienced

The focus here is on woolhandler team management. The practical skill set should be well established and the woolhandler is confident in their job. Communication and all the intricacies of the working team should be related to, understood and helped where necessary by the experienced woolhandler.

Very often this experienced woolhandler will be competing in the woolhandling show circuit and be proud to show off their skills.



Years 5+ – Lifestyle

This woolhandler could be in one of two stages. Either a long term, full time career with pathways into wool classing and beyond, or two, having developed, obtained and demonstrated the best practical skills that a woolhandler can have, they are now using this to maintain the lifestyle they want.

4.5 Exits

In any population there is what's present, what's entering into it and what is leaving or exiting. The shearing labour force of Pullin Shearing is no different. We know who is there, we are unsure of who is entering in but we can track who has exited and the pathway these people have taken.

Exit numbers and pathways can be seen in the following figures. Data was sourced from not only the 2005/06 study year but also the 2002/03 three years previously. This was to allow an adequate sample population for analysis.

Shearers Life Stages	Total Number in each Stage 2002/03 and 2005/06	Number Exiting the industry/stage	Percentage Exiting as total of population
1 – Development	32	5	2.4%
2 – Glory	68	12	5.77%
3 – Career	54	19	9.13%
4 – Lifestyle	54	22	10.58%
Total	208	58	27.88%

Figure 4.12 Pullin Shearing exit pathways 2002/03 and 2005/06 – detailing sector composition and total percentage loss



The total shearer population for the two years was 208. Of this 58 exited, with a total loss of 27.88%. The following table occurs details the exit loss from each individual life stage section.

Shearers Life Stages	Total Number in each Stage 2002/03 and 2005/06	Number Exiting the industry/stage	Percentage Exiting industry/stage
1 – Development	32	5	15.63%
2 – Glory	68	12	17.65%
3 – Career	54	19	35.19%
4 – Lifestyle	54	22	40.74%

Figure 4.13 Pullin Shearing Shearers exit pathways 2002/03 and 2005/06
– detailing sector composition and sector percentage loss

From the entry into shearing the loss was small in comparison to the exit later in life. In Stage 1 (Development) a loss of 15.63% in comparison with Stage 4 (Lifestyle) with an exit loss of 40.74%

Exit pathways

Shearers left the industry for the following occupations –

- Farm work
- Apprenticeship
- Labouring
- Dairy Farm work
- Started their own business
- Freezing works
- Prison Officer
- Professional
- Truck Driving
- Deceased
- Miscellaneous or unknown



Exits in each life stage can be seen in the following table.

Occupation	Life Stage				Total
	1 Development	2 Glory	3 Career	4 Lifestyle	
Farm Work*	3	4	4	7	18
Apprenticeship	1				1
Labouring		2	3	3	8
Dairy Farm work*		2	3		5
Starting Own Business**			6	4	10
Freezing Works				1	1
Prison Officer				1	1
Professional	1	2	2	2	7
Truck Driver*		2			2
Deceased				2	2
Miscellaneous			1	2	3
Total	5	12	19	22	58

Figure 4.14 Pullin Shearing exit pathways to life stage

- * These exit pathways still have a close association with the agriculture as an industry sector (43% of total). Truck drivers went to rural cartage firms working on stock trucks.
- ** Starting own businesses included four businesses that are associated with servicing agriculture (sheep pregnancy scanning, fencing contractor, crutching trailer, machinery contractor). This adds an additional four to the total of exit pathways associated directly with agriculture – a grand total of 50% of exited shearers maintained their association with agriculture.

Woolhandlers

As woolhandlers have a random entry and exit into the industry, their exit pathway cannot be quantified in this study due to time constraints.



Weather

Very little can be done about the weather. It rains when it rains. Farmers can only help maximise the number of shearing days by holding stock “under cover” in woolsheds when it rains. (“Load em up”). However sheep have to eat so can only remain inside woolsheds for a limited time. This is especially so in late pregnancy where lack of nutrition could have adverse effects of sheep mortality.

Demand for Shearing

This is part of the analysis for the shearing business. The risk is “Can the business meet the demand for shearing”.

The analysis would be :

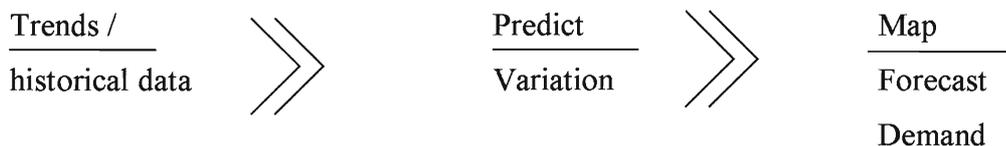


Figure 5.2 Demand analysis for shearing service

What sets the demand for shearing is the *farmer's need* “why is the sheep shorn”.

Many factors influence this and are shown in Figure 5.3.

Supply of Labour

Shearing is about people management and having the numbers and skill requirement of shearers, woolhandlers and pressers to do the job. Combined with this, the successful shearing business would maximise the effectiveness of its people by managing their emotional quotient. These are the factors outside their



task specific skill base. Consideration must be given to whether a team member demonstrates the attributes of:

- Being a team player
- Having leadership qualities
- Is reliable
- Has communication skills
- Is Health & Safety aware
- Has a positive attitude
- Is able to handle stress
- Is able to stay focused
- Is honest
- Is able to work under pressure
- Manages fatigue

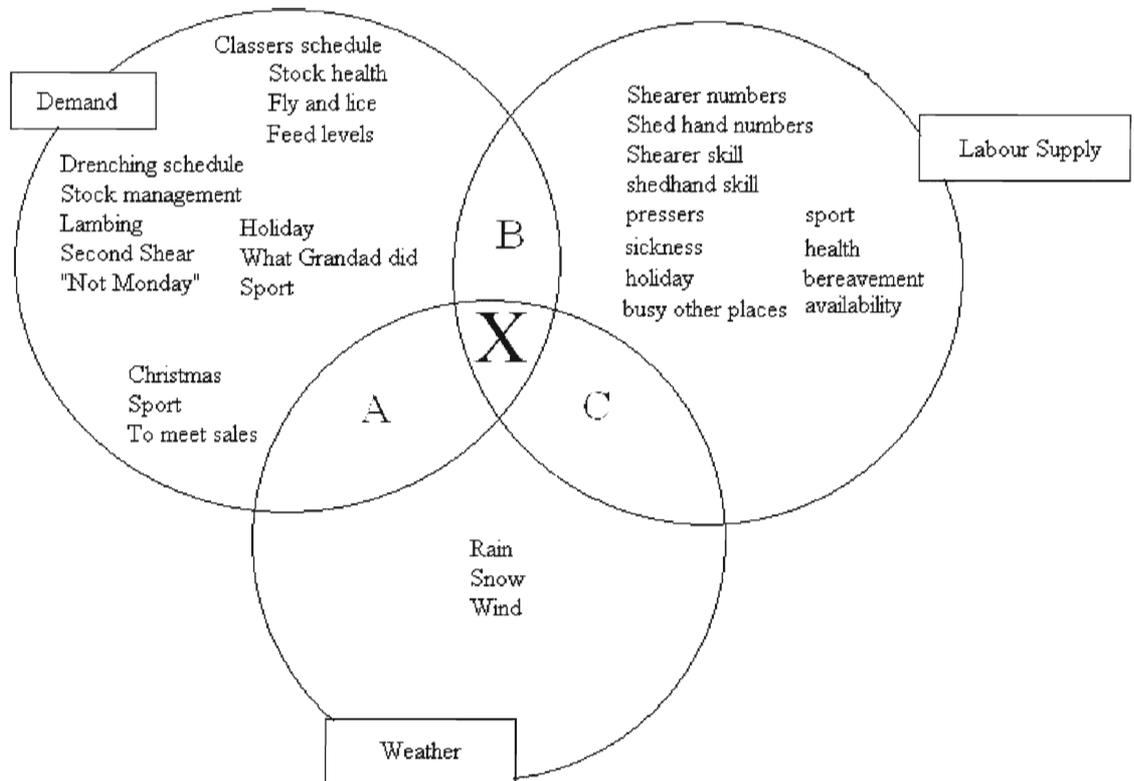
and whether they will get on with the other members of the proposed team

Also the stressors and complications of “outside of work contributors” must be monitored. These include personal relationships, sport commitments, financial stress, sickness, cultural and religious obligations, and the need to take a break or holiday from work.

All these factors must be considered in the labour supply because these people must be **motivated and available** on a particular given day.

The effects of demand, weather and supply of labour are shown in Figure 5.3.





- A** Have demand for shearing but sheep are wet.
- B** Labour supply not available but demand is there
- C** Labour supply available, dry sheep but no demand
- X** Demand for shearing is meet with available labour, and sheep are dry

Figure 5.3 Controlling factors of demand, weather and supply of labour and their influence on the X spot

Balancing Act, “the X Spot”

This balance between *shearing demand / labour demand / dry sheep* is also influenced by the shearing demand requirement of the labour forces skill and throughput efficiency.



Utilising the principals of *Takt* and line balancing the daily demand for shearing can be described.

Takt is the German word for beat and represents the rhythm of the process. *Takt* time is the desired rate of production in order to meet customer demand. To satisfy said demand, an outcome or unit should be accomplished every beat.

Takt is a key element in achieving the just in time philosophy and used to balance the line of supply and customer demand.

Takt maximizes the productivity of the process whilst focusing on the needs of the customer. It results in:

Customer deliver	=	right job, right time
Consistent quality	=	right skilled people
Employee safety	=	right pace, no rush
Improved efficiency	=	balance of shearing demand to shearing labour supply

The right person at the right job on the right day accomplishing the right task in the right way.

Takt is used when you are trying to understand the flow of work through a process and understand the bottlenecks.

Any production line works best when every area produces capacity equal to the daily demand.

In shearing this is true of the team workload but within that team each person has different production capacities. Therefore in shearing there are three *takts*. One of



the line balancing for the team to total farmer demand and the other two of the line balance of the people within the team structure.

For example

Takt 1. Team

840 Sheep to be shorn that day - an eight hour work day

$$840 \text{ sheep} \div 8 = 105 \text{ sheep per hour}$$

Takt 2. Shearers

Three stand shed (three shearers)

$$105 \text{ sheep/hour} \div 3 = 35 \text{ sheep per hour}$$

This could be made up of

- 1 shearer shearing 42 per hour

1 shearer shearing 36 per hour

1 shearer shearing 27 per hour

105 sheep per hour

Or an average of 35 sheep per hour per man

Takt 3. Woolhandlers

To efficiently process the 840 full wool fleece, labour demand is

1. Experienced wool handler capable of charge duties (A)
2. Two other woolhandlers (B) and (C) and one presser (D) to bale wool.
(B) on the board
(C) pick up and back to table



Work stations would be:

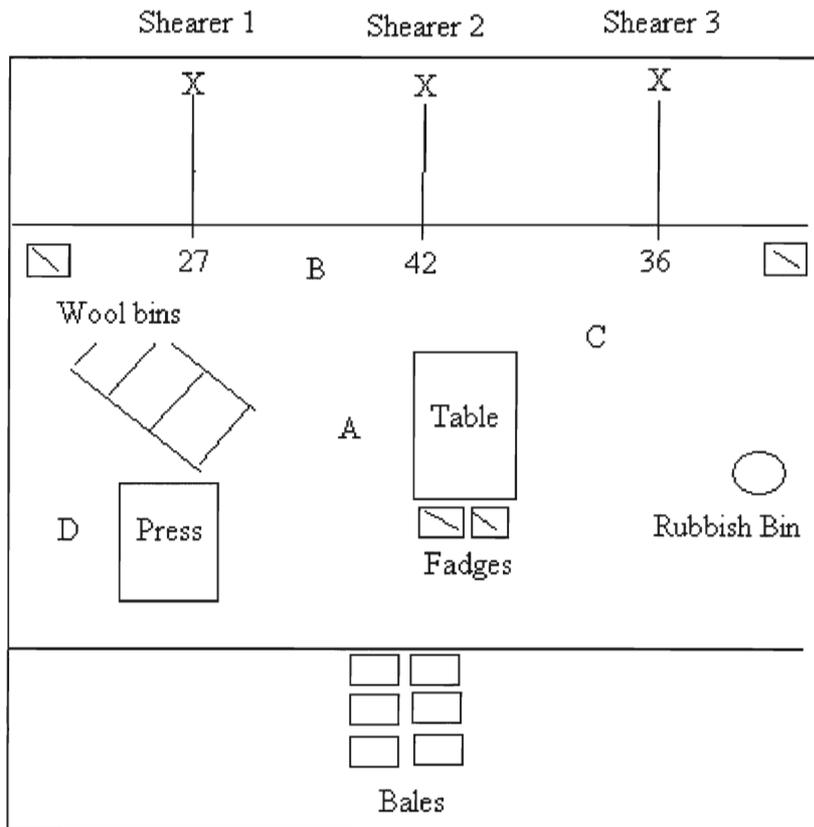


Figure 5.4 Typical shearing shed layout and workstation placement

The woolhandlers demand is 840 fleeces/8 hours or 105 fleeces per hour

Or

1 fleece every 0.57 minutes

Or

1 fleece every 34.3 seconds

The balance here is to have the necessary skills and throughput capacity of the Wool Handler team fraction to meet the demand of the shearers.



These are the line balancing equations that professional shearing businesses do every day.

Further variables occur in the ease of shearing. Some sheep shear faster than others. The best shearer in the world will not shear their best tally on the slowest shearing sheep. Influences are breed, sheep nutrition, facilities, and the number of sheep available to be shorn at that place in the day.

5.2 Pullin Shearing Limited 2005/2006

5.2.1 Labour Force Impacts and Parameters

As a business, Pullin Shearing had 150 clients with a total of 176 different work sites.

In the 2005-2006 period –

980,171 sheep were handled (shorn and crutched)

228 business days were worked

231 employees were employed

5,466 man days were worked

36,910 man hours were worked

Seasonal demand was:



Figure 5.5 Pullin Shearing Percentage of Peak Demand 2005-2006 – values at 1 where peak demand is highest at 100% for the year and relative values throughout the year



The Pullin Shearing labour supply consisted of

231 employees in total

115 shearers

116 woolhandlers

Ratio 1:1

The days worked varied from 1 day to 182 days

Average days worked was 23.7 days

The hours worked varied from 1.8 hours up to 1394 hours

The average number of hours/ day worked was 6.7 hours

Pullin Shearing sectors by numbers

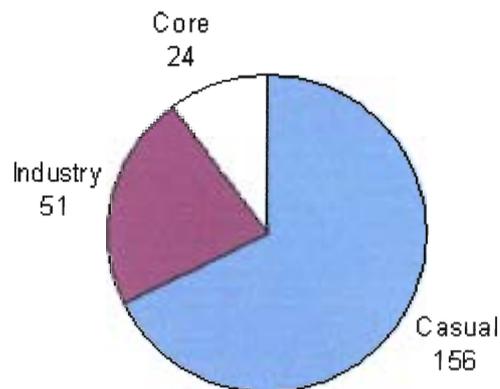


Figure 5.6 Pullin Shearing proportion of workforce made up of core, industry and casual based on numbers of employees



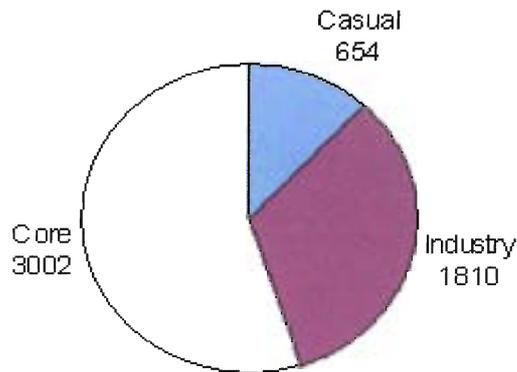


Figure 5.7 Pullin Shearing proportion of days worked broken down into sectors - core, industry and casual

At any given point throughout the year, Pullin Shearing utilises all three sectors of its available labour force to meet demand for shearing. This can be shown also by their sector economic contribution.

Pullin Shearing Sectors by Economic Value

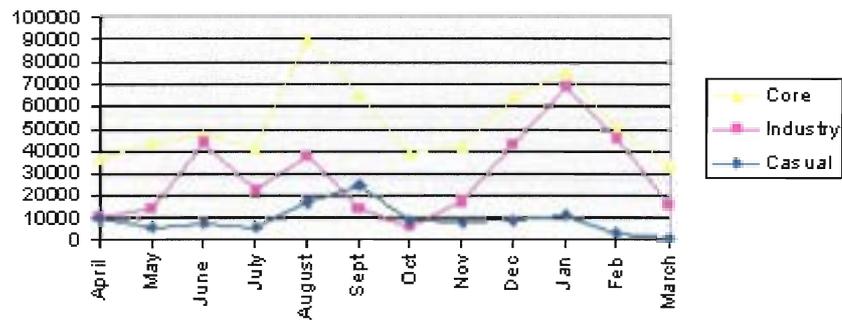


Figure 5.8 Labour force impact variation based on liable wages/sector



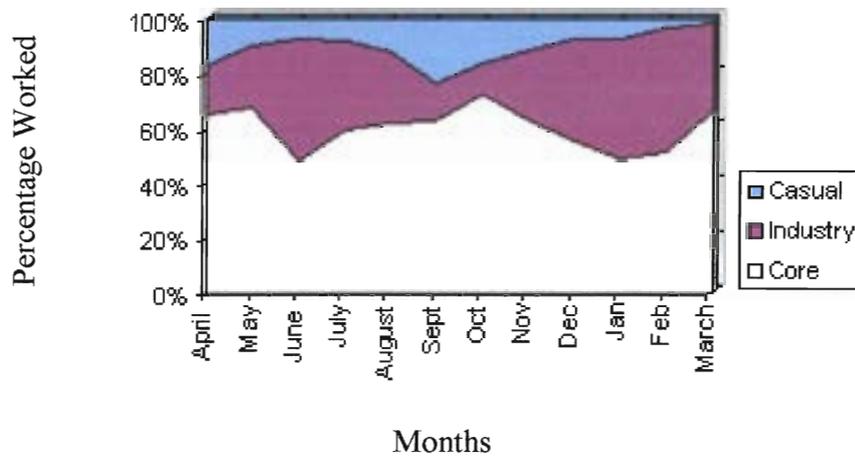


Figure 5.9 Pullin Shearing percentage of total liable wages per sector per month

Total year results are viewed in Figure 5.10.

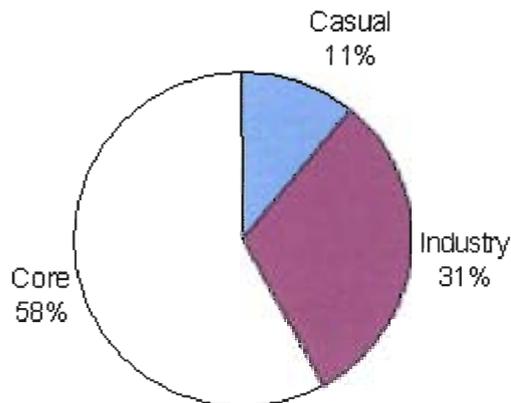


Figure 5.10 Total employee numbers to liable wages yearly work trend per sector

By combing sector breakdown by days worked to economic contribution, the core section of Pullin Shearing labour force (10%) accomplished 58% of the liable wages.



These figures can be viewed in table 5.10 below.

Sector	Percentage of workforce	Total Number	Percentage of liable wages
Core	10%	24	58%
Industry	22%	51	31%
Casual	68%	156	11%
	100%	231	

Figure 5.11 Sector composition (percentages) in relation to number of employees, days worked and liable wages

There is an inverse relationship in sectors between the number of employees/sector to days worked and value of wages earned.

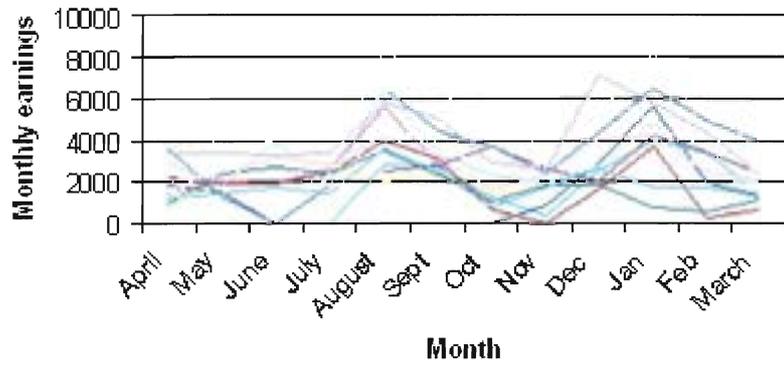
This is due to the “just in time” aspect for meeting demand for shearing and of the variable resource of labour supply.

Pullin Shearing has yearly trends in the demand for its service. Its labour supply must follow closely to that of a “just in time” philosophy.

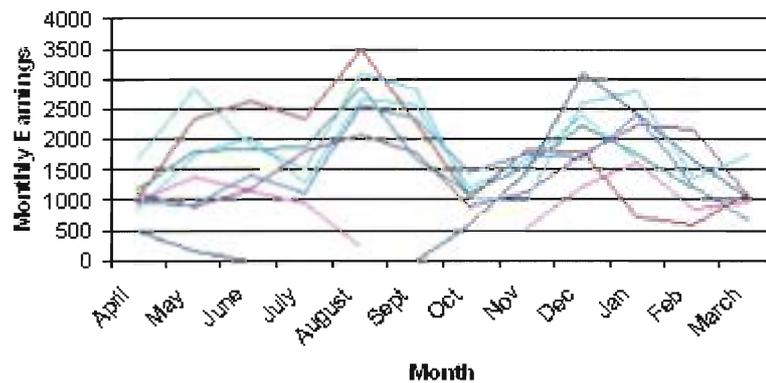
Pullin Shearing Core Sector Hourage

Further complications arise as core workers take annual leave or utilise the casual “*as and where required*” nature of employment. This can be seen in Figure 5.11.





Shearers



Woolhandlers

Figure 5.12 Core Shearers and Woolhandlers monthly work history, based on liable wages per month clearly showing the peaks and troughs (entries and exits) variation that occurs through the year

The clearly shows the flexibility the shearing affords its workers. Note, in the figure above, several woolhandlers break their employment with Pullin Shearing - one for high value classing work over the pre lamb period.

5.2.2 Labour Force Demographics – Life Stage and Exits

Pullin Shearing faces, as do all New Zealand businesses, an aging workforce. The average age of Pullin Shearing labour force is 34 years. This compares favourably



with the New Zealand Agriculture Sector (2004) at 43 years and the overall New Zealand average worker age of 40 years.

Shearing has traditionally been, and still is, a young mans game. It is based upon physically fit people who are geographically mobile. This was clearly evident in 1967 with Fullers study, somewhat spread with Tectra 2004 and the Pullin 2005/06 in depth study shows the aging workforce.

Combining the shearer life stage model described in section 4.4, the impact of shearing as a career is clear. Pullin Shearing shearers and woolhandlers have a more long term career philosophy.

However, with the total loss of 28% in the Pullin Shearing sample, is the entry of 15% giving a stable population?

Pullin Shearing must source some 13% of workers entering its workforce outside of the development stage. It does this through the mobility of the workforce both internally within New Zealand and utilizing overseas shearers.

The ratio of development employees to experienced staff is 1:6.5

This compares favourably with Tectra 2004 and puts Pullin Shearing as a more proactive contactor who takes on and develops their labour supply.

At this level it is likely, when allowances for seasonal variations in demand for shearing have been made, that sufficient staff will be available.

Taking the 32 shearers in development stage how many would be left in stage 4 is shown in table 5.13.



<i>Stage</i>		<i>Percentage</i>	<i>Loss</i>	<i>Total</i>
1 Development	32	15.6	5	27
2 Glory	27	17.6	5	22
3 Career	22	35.2	8	14
4 Lifestyle	14	40.7	6	8

Figure 5.13 Life stage to percentage loss per stage

8 shearers would retire from shearing having had their life career in the industry.

Pullin Shearing's retention rate from development to retirement is 25%.

The core sector breakdown is shown in figure 5.14

<i>Stage</i>	<i>Core</i>	<i>Shearers</i>	<i>Percentage</i>
1 Development	4	3	13
2 Glory	20	7	29
3 Career	18	8	33
4 Lifestyle	13	6	25

Figure 5.14 Core sector shearer and life stage percentage

Out of the 4 core shearers in Pullin Shearing development, 1 would retire as a Pullin Shearing core worker if they remained in Pullin Shearing employment throughout their career.

Given the known mobility of the work force, this event would be rare as shearers travel between contractors for experience and to broaden their skill base.



5.2.3 Management Strategies

Historical records show the variable demand for shearing. Yearly figures show trends but shearing operates on a daily basis. Historical data shows seasonal variance, management must use their current knowledge and future expectation to predict the demand for the shearing service. This demand cannot be accurately forecast and there must be flexibility in the management strategy to cope not only with the adverse effect of weather but the changing expectations of the client base.

Pullin Shearing has a 10% core of workers who satisfy 58% of the yearly work requirement. Variations between core, industry and casual are shown in Figure 5.15

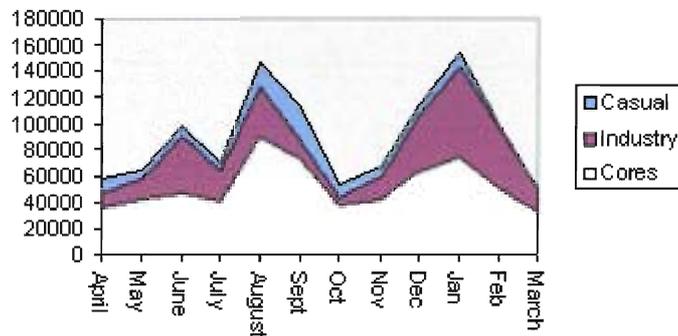


Figure 5.15 Pullin Shearing labour force composition – core, casual and industry based on liable wages and demand for shearing.

The pre lamb peak load for labour demand shows that core workers expand their availability to meet the demand for shearing with a minimal increase of industry workers and increasing amount of the casual segment. It must be noted that in this pre lamb period there is a great demand in the South Island for industry workers. The industry workers that are available for Pullin Shearing are usually the return of New Zealand shearers and woolhandlers from the northern hemisphere season of May, June and July, in comparison to the dedicated New Zealand shearer and wool handler that are following the peak season demand of available work.



The other period of interest is in the peak of summer where core workers, because of their continuity of work take a more traditional holiday to spend time with family and friends therefore they are not available for work. Industry workers are more available and the make up of these includes overseas shearers, the traveling New Zealand shearer returning back home for the post Christmas/summer period after their overseas sabbatical of the USA March/April, UK and Europe May/June/July and Australia August/September/October. These workers represent the true international mobility that shearing can give its workforce. Pullin Shearing actively recruits and develops links to these workers as these workers are in their glory or career stages of their work life stage.

The primary strategy involved is to service the majority of demand from the core workers, meet seasonal variations from the industry labour supply and satisfy daily requirements from the casual labour segment.

5.3 Industry Implications

5.3.1 Workforce demographics

All businesses in New Zealand face an aging work force, shearing as an industry is no different. It is imperative for the productivity, efficiency and sustainability of shearing that it develops and utilises a *young* work force. It must have workers from each life stage so that the empowerment of knowledge and experience is passed from the experienced worker to those in development. It is up to each and every individual shearing business, within their own structure, to maintain a young work force. It is too easy to rely on the experienced workers who can go out there and complete their tasks with no problems. The average age of the New Zealand worker in 2004 was 40 years old. The average age of a worker in the agriculture sector was 43 years old. Shearing must aim for an average age in the mid to low 30 years.



Tectra (2004) referred to an aging bulge of workers in 10 years time in 2014 of shearers in their 50+ year age bracket. Transposing Pullin Shearing data into the industry age pattern this will not happen. The increasing age of shearers results in an increasing exit percentage. For every four shearers in development only one of them will remain to retire from shearing at the end of their working life. This exit loss results in the opportunity for young people to enter the industry and follow through the life stage thus ensuring the average remains around 35 years.

Shearing is hard physical work and it is very true that those people in later years either chose to be there for its lifestyle benefits or have no other choice of employment which allows them the level of expenditure they have become accustomed to.

5.3.2 Demand for shearing and workforce numbers

The demand for shearing is driven solely on the reasons why a farmer wishes a sheep to be shorn then. In New Zealand, as in Figure 2.2.4, there is variability in demand per area across the country. Pullin Shearing study looked at the monthly demand in real time terms and how it responded in sourcing an available labour supply.

In utilizing Fullers formula for predicting shearer numbers, mention was made that the total labour supply had to include wool handlers and pressers. Pullin Shearing data and industry sources confirm that a 1:1 ratio exists in the number of wool handlers and pressers to shearers. Industry sources (Peter Lyons, Ron Davis et al) agree that the yearly productivity of a shearer in 2006, averages 20,000 sheep shorn per shearer. This shows the increase in productivity in comparison to Fuller (1967) of 12,000 brought about from the evolution of training from the Godfrey-Bowen days to the present day professionalism. Must credit for this must go to the industries training, which is currently provided by Tectra.



Fuller mentions that there has to be an available pool of people to meet the highs of seasonal demand. Pullin Shearing utilised 231 people in the study year to meet its demands. In looking at a yearly line balance for shearing demand, Pullin Shearing would utilise the labour supply according to the following formula.

$$SN = SS / SP$$

Where SN = Shearer numbers

SS = Sheep shorn

SP = Shearer productivity (numbers of sheep shorn per shearer)

Figure 5.16 Formula to determine shearer numbers required depending on sheep shorn and shearer productivity

$$TLF = SN \times (1+R)$$

TLF = Total Labour Force

SN = shearer number

R = ratio of wool handler / pressers to shearers

Figure 5.17 Formula to determine total labour force required using shearer numbers and ratio of wool handlers to shearers

$$772,506^* / 20,000 = 39 \text{ (rounded)}$$

* Sheep shorn equivalents

In a ratio R of 1 wool handler presser per shearer, this would give the total labour force requirement

$$39 \times 2 = 78 \text{ workers}$$



This shows the true variance of the shearing industry. If we could line balance the requirement of demand for shearing with available labour Pullin Shearing would only require 78 people in the year. It used 231. To relate this to the work history of the people in the business if we took the total number of hours worked in the year divided it by 78 and compared it to the sector breakdown of the hours worked as shown in Figure 4.3, the following would occur.

$$36,909 / 78 = 473.2$$

The minimum hours a core worker did for Pullin Shearing was 397, a maximum of 1394 and an average of 844.

For these 78 workers to be full time equivalents in Pullin Shearing, they would have to be present and available for work right throughout the year. In the shearing industry, with seasonal variations and demand and the transient nature of the work force, this does not happen. Pullin Shearing only had 24 people who were their core workers, the rest were comprised on industry and casual workers.

The industry implication of this is that a year line balance to even out demand and supply will not work. The balance between demand and supply occurs on a daily basis and shearing businesses will use what ever people they can to meet that demand.

Shearing workers will be one businesses core, another businesses industry employee and yet another businesses casual worker.

The demand for shearing in New Zealand

Seasonality of demand exists and was shown in Figure 2.2.4. We have shown through Pullin Shearing case study that yearly line balancing will not work for an



individual business because their requirements vary too much on a daily basis. Fuller (1976) shows a formula to work out total shearers numbers and total shearer numbers relative to the total demand for sheep to be shorn.

Updating this to 2006 -

$$V_n = S_o(1 + r)^n sp$$

Where $V_n =$ *shearer labour force in year n*

$S_o =$ *sheep population in base year*

$r =$ *annual rate of increase in sheep population*

$s =$ *ratio of sheep shorn to sheep (modal figure)*

$p =$ *ratio of shearers to sheep shorn*

Where $p = 1 : 20,000$ (one shearers yearly tally is 20,000 shears)

$s = 1 : 1.6$ (the rise in modal accounts for the increase in second shear, eight month shearing, lamb shearing and the shearing requirement for more mature lambs at the freezing works. This gives a total shearing demand in 2006 of 40.13 million X 1.6 = 64,208,000)

3210 shearers were required to shear the national flock.

The formula described in Figure 5.2.2.2 depicts the total labour force where $TLF = SN \times (1+R)$. The Total labour force required in 2006 was 6,620 workers.

On a yearly basis, this would give an adequate available labour pool to service the needs of farmers having their sheep shorn.



Note must be made that these are shearing only figures and do not equate for any crutching requirements.

5.3.3 Sectors and Life Stages

The sectors and life stages described in the Pullin Shearing case study have direct relationships to the industry. All shearing businesses have their core, industry and casual workers. All shearing businesses have their employees in different life stages. The ratio of development workers to the more experienced glory, career shearers and woolhandlers is crucial for the coaching and empowerment of young people in the industry.

Any one business in the shearing industry cannot stand on its own. There is interdependency between businesses due to the life stage of the shearers and the experience gained by the worker traveling between businesses and areas of the country. The shearing industry worker will travel between areas to maximise their work availability and in doing so increase their skill base and maintain their love of the game.

The average age of the industry worker is increasing, so is the average age of the New Zealand worker but the industry worker ages are not increasing at the same rate. Shearing is still a young person's occupation. They have to be young in body or young in heart to survive in an industry that is so physically demanding of its people.

For a full understanding of industry implications there is a need for a detailed study on a larger sample base of shearing businesses.



5.3.4 Recruitment and retention

Pullin Shearing data showed a 25% retention of those core workers in development who maintained a career in the industry, and exited through retirement.

The average number of days worked by an employee of Pullin Shearing was 23.7 with an average hourly rate of 6.7 hours per day. However 50 employees only worked one day. Those 50 workers who worked one day included those who were other peoples core and industry workers, the casual worker “giving it a go” and the genuine itinerant section of the industry who pick up a few days work on the way through to an area of high demand for shearing.

All these workers play an important role to enable the shearing business to meet its daily demand. The industry implication for retention is to ensure that enough people enter the development stage to maintain an available pool of workers that would make up the core, industry and casual employees.

The descriptions of exit pathways will allow workers choice in leaving the industry. They need to exit with a positive attitude and a positive bank balance. This is crucial in creating the opportunity for new development workers to enter the industry with a good job prospect. It is vital as a recruitment tool to sell the shearing industry as a place where you gain not only task specific skills but many other life skills that are valued by other industries.

Shearing is an industry where you do not have to work 2250 hours of the year to make the minimum wage. The negative aspect of having a “*casual*



and when required” nature of employment must be turned and sold as a positive.

That is -

Minimal hours required for maximum earning

The ability to have next Wednesday off

The ability to have high daily wages

The ability to travel not only in New Zealand but overseas

Need to be physically fit

Your occupation can become your sport

Work in a team environment

Goal focused



6. Conclusion

- Seasonal fluctuations and variance occur in shearing demand.
- There are three main controlling factors to shearing
 - the demand for the shearing service
 - supply and availability of labour
 - the influence of weather
- The balance between shearing demand, labour supply and weather is also influenced by the labour forces skill and throughput efficiency.
- To satisfy the farmers daily demand for shearing, there are three *takts* (or beats) to meet.
 - one of total team
 - one of the shearers
 - one of the wool handlers
- To maximise the resource of available labour supply a shearing business must follow closely a “just in time” philosophy.
- There must be flexibility within the management strategy to cope with all the variables.
- A pool of workers must be available to meet the high seasonal demands.
- This pool of workers must comprise people of different life stage and sector designations.
- It is crucial that it has workers for each life stage so that the empowerment of knowledge and experience is passed from those mature workers to those in development
- There are three sectors of workers in the shearing industry
 - Core workers are a stable group who account for a large percentage of the shearing businesses work
 - Industry workers have mobility, skills and flexibility to meet seasonal demand. These are often overseas based workers.
 - Casual workers are those whose availability is random but highly valued by the



shearing business to meet daily demand fluctuations

- The shearing businesses primary strategy is to service the majority of demand from the core workers, meet seasonal variations from the industry labour supply and satisfy daily requirements from the casual labour segment.
- A 1:1 ratio exists between the number of wool handlers and pressers to shearers.
- In 2006 the average shearers sheared 20,000 sheep.
- 3210 shearers were required to shear the national flock.
- 6420 workers were required in the total labour force to meet all farmer needs.
- Flexibility of employment exists and the casual “*as and when required*” nature defines the ability of the employee to accept or decline available work
- Workers in the shearing industry do not work long hours on a yearly basis
- An average or above average income can be earned for minimal hours
- The shearing work force is aging but not as fast as in the New Zealand total labour force.
- It is imperative for the productivity, efficiency and sustainability of shearing that it continues to develop and utilise a *young* work force.
- Exit pathways are crucial in creating the opportunity for development workers to enter the industry.
- Shearing businesses are dependant on each other due to the shared labour pool
- There is a need for a study on a larger sample base of shearing businesses to fully understand the shearers labour supply and the demands placed on it.

But most importantly

Shearing IS a sound career option.

It offers the opportunity to earn good money for minimal hours,
develop a valued skill base
and enable you to travel not only the country but the world.



Glossary

As and when required	When the demand for shearing is meet with available dry sheep there is the requirement for the shearer to work
At the board	A wool preparation term, where wool handlers duties occur around the shearers are working, either a raised or flat platform
Blades	Manual scissor type cutters used for shearing
Casual	Work is offered "as and when required"
Casual Employment Agreement	The employment agreement on which all shearers and woolhandlers should be engaged on in New Zealand. Details obligations, duties and responsibilities of all parties in the employment arrangement.
Ceramic cutters	Part of the cutter blade of the shearer hand piece made out of ceramic material (partially stabilised zirconia)
Classes	The charge wool preparation person who has responsibility for sorting wool into grades based on fineness and style.
Clip	The total wool produced by the farm or farms
Combs	Part of the shearing handpiece that guides the cutting blade into the wool.
Core	The stable worker who works for the business for more than 70 days of the year.
Cutters	The cutting blade of the shearing hand piece made of steel. Forms part of the scissor action between the cutter edge and the comb edge to enable the wool to be cut.
Emery paper	The abrasive cloth that is fixed to the round grinding disks that enable the cutter and comb edge to be sharpened.



Employment models	The method of engagement that a worker utilises. In New Zealand there are two - one is an employee employed directly by contractor. And two as an independent worker engaged directly by the farmer.
Ewe hoggets	A female sheep less than one year of age that is kept for replacement purposes in the ewe flock.
Ewes	Adult female sheep utilised for production of lamb and wool.
Ewes with lambs at foot	The practice of shearing before weaning where ewes and lambs are drafted, ewes shorn and the lambs put back with the ewes.
Exit	The pathway of leaving the industry.
Freezing works	Where the animals are slaughtered and processed for human consumption.
Gear and its preparation	The hand tools utilised by the shearer and wool handler in the removal of the wool from the sheep's back. The preparation of gear fine tunes the equipment to enable it to enter and cut the wool cleanly
Godfrey Bowen technique	The early development of the New Zealand shearing style.
Grind combs	To sharpen.
Grinders	The machine used to sharpening shearing combs and cutters on
Gun shearers	An outstanding shearer at the top of their field.
Handpiece	The primary hand tool that a shearer uses to shear sheep. The base piece of equipment of which combs and cutters are fixed to, to turn the round motion of the electric motor to the side ways scissor action necessary between a comb and cutter to cut wool.
Hoggets	Sheep less than one year of age, immature not yet an adult. Can be either female or male.



Holding a sheep	The technique that a shearer uses to hold and move the sheep in the shearing sequence utilising the shearers legs and body position.
Industry	The shearing industry
Kit of gear	The necessary tools of the trade, handpiece, combs, cutters, singlets, trousers etc that a shearer must acquire.
Lamb growth	The increase in live weight that a lamb experiences in its development. Live weight in kilos has a direct relationship to the dressed killing weight at slaughter.
Lamb survivability	The rate of live lambs to dead lambs through the critical late pregnancy to weaning period of a lambs development.
Lambs	Sheep from new born to one year of age.
Lead and throw	Lead is the amount of gap between the front edge of the cutter and leading edge of the comb. Throw is the maximum movement of the cutter over the comb to facilitate the scissor action.
Learners	A development worker in the industry who is learning the techniques necessary to accomplish the tasks.
Load em up	Where sheep are put under cover of the weather in a wool shed to maximise the amount of dry sheep that are available to shear.
Machines	The mechanisation of the blade hand tool shearing to the use of the mechanically driven handpiece.
Main shear	The traditional summer time shearing where all adult and young sheep are shorn.
Main summer shear	The traditional summer time shearing where all adult and young sheep are shorn.
Modal rate	The multiplication rate in comparison to base which accounts for where sheep are shorn more than once in a year.
Nations flock	The total number of sheep that are in New Zealand



NCEA Certificates	The formal NZQA registered qualification that is used in shearing and woolhandling. It is work place based with a compulsory technological requirement.
Not shorn when wet	Wet sheep - wet sheep cannot be shorn for two main reasons. The first being the quality assurance of the wool and the second being the health and safety implications on the shearers and wool handlers processing that clip.
On-farm	Within the farm boundaries.
Pick up and throw	The technique of setting, gathering, lifting and dispersal of the fleece which enables efficient skirting on the wool table.
Piece rate	The rate of pay that is based on the number of sheep shorn or hours worked.
Prelamb	The shearing of ewes prior to lambing traditionally done the six weeks period before lambing but now the focus is on shearing at the 90 day period post mating. This is done for 5 reasons - twin lamb survivability, wool quality, promote the mothering instinct to seek shelter, maximise lice control and influence cash flow.
Pressers	The wool handler responsible for compacting the wool into bales.
Remove to improve	A woolhandling technique where the philosophy is to remove unwanted characteristics in the fleece to ensure total maximum financial return.
Seasons	The period of work which is relative to that time of year ie December/January/February summer main shear season, July/August/September pre lamb season.
Second cuts	Short wool from cutting the wool twice
Second shear	The practice of shearing the sheep twice in the year
Shearers	The individual person who undertakes the shearing of the sheep.



Shearers focus	A technique used by the shearer to concentrate the mental and physical skill necessary to accomplish the task of shearing in a time period. A common shearing focus would be to set a target of 10 sheep per ¼ hour to comfortably shear 300 in a given day.
Shearing	The removal of wool from the sheep. Can also be used as a term to describe the whole process of the removal, processing and packaging of the fleece into bales.
Shearing Competition	An event where shearers and wool handlers compete against each other for prizes. Judging is based on time taken and the quality. They occur throughout New Zealand and are usually arranged into a series of competitions or circuits. IE South Island Shearer of the Year
Shearing Contractors	Individual businesses that organise and supply shearing teams to local farmers.
Shed design	The layout of a shearing shed to ensure the efficient and safe shearing of sheep from the beginning of the process through to the baling of the wool.
Shear sheep cleanly	A shearer must uniformly remove all wool from the sheep.
Sheep in the correct sequence	A shearing technique term used to describe the movement of both shearer and the sheep to allow the efficient placement of the shearing blows to optimize shearing the sheep cleanly.
Show scene	An event where shearers and wool handlers compete against each other for prizes. Judging is based on time taken and the quality. They occur throughout New Zealand and are usually arranged into a series of competitions or circuits. IE South Island Shearer of the Year
Skin cuts	The accidental removal of a sheep's skin in the process of shearing.
Stands	A shearing position on the shearing board. Each stand is equipped with overhead gear so the handpiece may be attached, a holding pen for the unshorn sheep and a "porthole" or exit for the shorn sheep to leave the shed.



Sweep	A specially designed flexible plastic head that is used by the wool handler to remove (pull out) the fleece from around the sheep once it has been shorn.
Table work	The physical processes of throwing the fleece onto what is traditionally a slated table, the pulling away of dirty and uneven edges and the sorting of the fleece by quality, length, colour, soundness and condition.
Takt	The German work for beat and represents the rhythm of the process. The desired rate of production in order to meet customer demand.
Tally/Tallies	The number of sheep shorn by a shearer. Tallies are ascertained by counting the sheep in the tally pens at the end of each run.
Under cover	Sheep held in woolshed facilities to keep them dry for shearing.
Upright shearing	A process designed to enable the shearer to shear the sheep while he is standing upright. No bending involved.
Weaning	Removing the lamb from its mother so grass becomes their primary food source.
Wool characteristics	Technical data on wool fibre length, tensile strength, micron, bulk (air flow measurement) all relevant to downstream processor requirements carpet, cloth manufacture.
Wool clip	The total wool produced by the farm or farms
Wool press	The machine used to compress wool into bales.
Wool quality	Technical data on wool fibre length, tensile strength, micron, bulk (air flow measurement) all relevant to downstream processor requirements. The better the quality the better the return for the farmer.



Woolhandlers	A member of the shearing team who handles the wool. This includes its removal from the shearing board, and the skirting (pulling away the dirty and uneven edges of the fleece to give a clean even appearance) and classing (sorting of the fleece by length, colour, quality, soundness and condition)
Woolshed	The farm building that is usually specifically designed and designated for the shearing of sheep.
Young mans game	Where the best years of a shearers working life are his early ones. He has mastered the techniques of shearing and combined with physical peak conditioning he sets his personal best tallies.

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Tectra Ltd, Wool Pressing Handbook, Shearing Handbook and Wool Harvesting
handbook

Wool Production Technologies Limited



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- To Lester Foulds of Computer Support Systems – without his technical knowledge and programming input, retrieving the required data would have been impossible. I promise you Lester I will not come up with another request.
- To Phillip and Hamish – sorry we couldn't go jet boating so much.
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- To my long suffering wife Trisha - I cannot thank you enough for the additional work load undertaken in running the business during the year. Without your support and dedication I could not have completed this.



And now from the culture of shearing.....

There twas "movements" at quarters
For word had passed around
The dreaded contractors sausages had been dug up from the ground.

In walked the shearers blood shot eyes and bodies shagged
And when their gaze did linger on the plates their mouths did openly sag.

For there resplendent in tomato sauce
Were two lovely sausages covered by an egg
A brown eyed cook bulging biceps at the sink
Turned and snarled
"Eat 'em you bastards I don't care if they stink".

One shearer – slightly braver than the rest
Stood up and cried
"Enough
We've had them boiled
We've had them fried
We've even had them bloody crucified
Without decent tucker upon our bellies
How the hell are we supposed to shear a tally?"

In walked the contractor with a sneaky grin
"My god" he thought
"These shearers are getting thin
This game of shearing is about give and take
From now on I think I'll feed em STEAK".

Barry Pullin

(February 1990)

