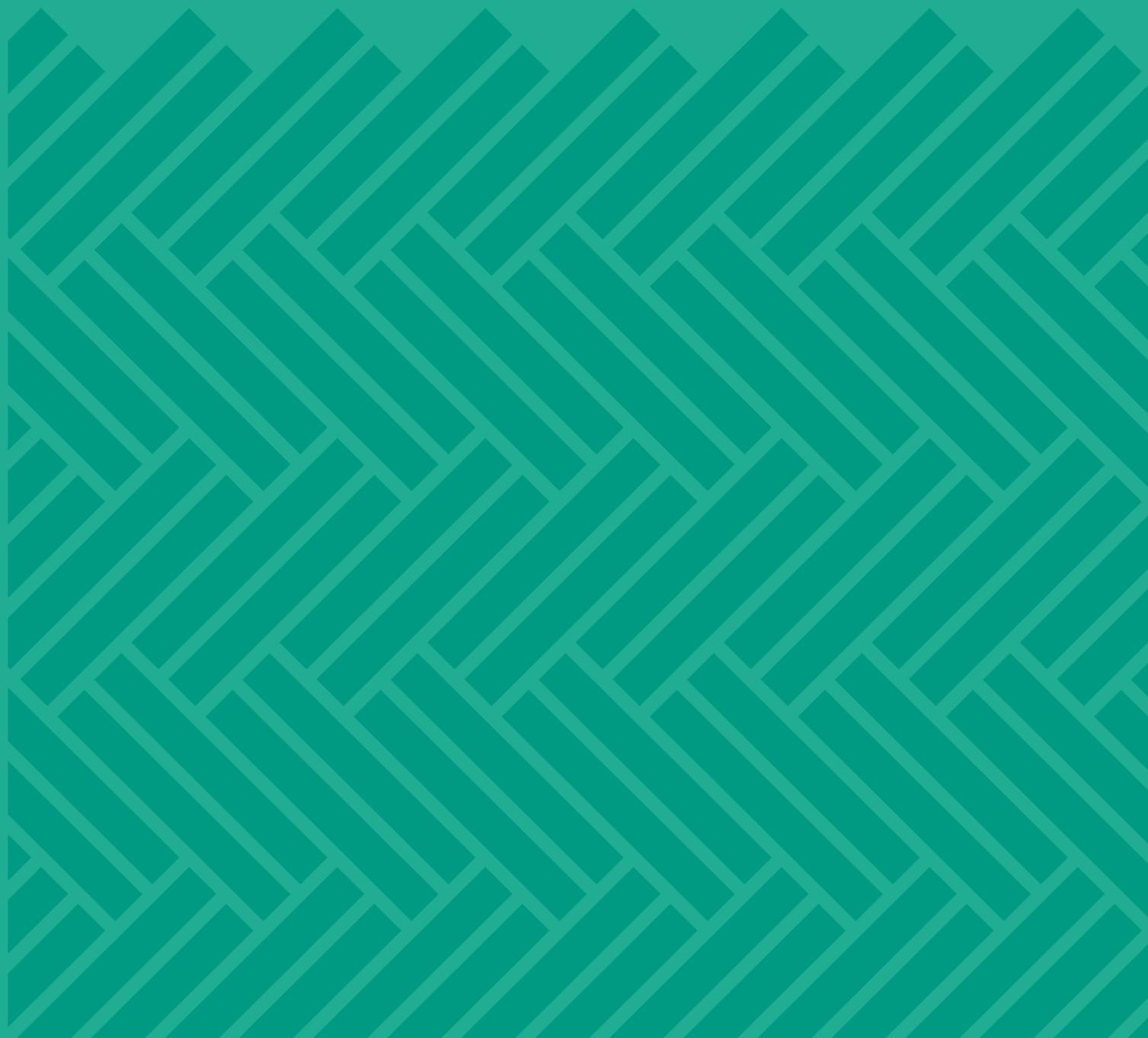


“Healthy on the outside, sick on the inside”

WORK-RELATED HEALTH IN FORESTRY

MARCH 2017



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EXECUTIVE SUMMARY

Forestry is one of WorkSafe's four priority sectors due to the high incidence of serious injuries and fatalities in the sector. The WorkSafe Forestry programme has been running since 2010 and is currently in the development phase of its future work programme.

To inform the next phase of the programme, the project team requested research to understand what was happening in the sector, both with respect to changes in practice and behaviour and fatality and injury outcomes. The quantitative component of the research involved an analysis of ACC claims data, WorkSafe Swift data and the Health and Safety Attitudes and Behaviours Survey (Nielsen). The qualitative component of this research involved face to face interviews and focus groups and explored the views of corporates, contractors, and workers (crews) in the forestry sector.

The research focussed on the following areas of interest:

- > small- and medium-scale forestry
- > work-related health¹
- > silviculture
- > worker engagement, participation and representation
- > training.

This report focuses on health and safety in the sector and highlights the key work related health issues in forestry and what the sector itself considers to be important or the focus of attention. Health outcomes for workers in forestry are shaped by a complex range of exposures including: exposures related to the work environment generated by

the industry itself including the machinery, tools and chemicals; the conditions that are produced by these exposures (eg noise, airborne particulates and industry product – timber). The exposures occur within a natural environment which in itself contributes to exposures relevant to health outcomes (eg weather, ultra violet radiation, soil, plants, and insects).

How the worker experiences exposures is shaped by a range of contextual factors, including external factors such as market prices and legislation; employer specific factors (eg the pace of work, provision of Personal Protective Equipment); to task specific factors (eg repetition, worker control). And finally, health outcomes from these exposures can range from immediate to delayed and in duration from acute to chronic.

Mechanisation can assist with improved injury and fatality outcomes. However, there are also a range of occupational health issues associated with full mechanisation. Internationally it has been documented that increased mechanisation and the work activity associated with it places different physical, mental and psychosocial demands on the worker.

Non-work factors can exacerbate and or ameliorate work-related stress and affect health outcomes. A range of lifestyle factors can also have the potential to buffer health effects for example: good nutrition, physical fitness and exercise, smoking cessation and stress management.

¹ Occupational health (injury and disease).

Forestry workers are exposed to a range of hazards, including: chemical and dusts; physical hazards (excessive noise, vibration, extremes of temperature and pressure, falling objects); biomechanical hazards (heavy lifting, repetitive awkward or forceful movements that results in musculoskeletal disorders for example carpal tunnel syndrome (CTS) and lower back pain); biological hazards (zoonotic infections); psychosocial stressors (high stress work environments resulting from excessive work demands on workers, long working hours, low control by workers as well as stress related insecure employment; stress at home and its impact on work).

The quantitative data showed that there had been improvements in the severe injury rates in forestry and a decline in fatalities since 2013. The improvements in severe injury rates have been occurring since 2010, meaning improvements may be part of a larger trend in the industry, including increased mechanisation and less 'men' on the ground.

The qualitative findings reveal that workers, both supervisors and crew are aware of the causes of severe injury, and some interviewed had experienced crush injuries from rolling logs. All were aware that felling and breaking out were high risk activities. Most had known somebody who had died at work in the sector. Some still had ongoing pain and restricted movement from injury sustained while at work.

Workers spoke of weather conditions impacting on their working day, with poor weather (rain, snow) being impacting on the pace of work and causing fatigue. Workers spoke of long days, early starts and late finishes and the impact this had on them and their families.

Drugs and alcohol were addressed by both crew and supervisors. All agreed that it was a significant health and safety issue, but most focussed on the safety aspects and did not note the health impacts of drug and alcohol

dependency. Monitoring for drug and alcohol consumption was common place and most believed that the culture of drugs in the industry and while at work was changing because of monitoring activity. A number of contractors observed that monitoring for drug and alcohol was easier than addressing other issues and that there were a range of societal influences that impact on the health and safety of workers.

Healthy on the outside and sick on the inside was a dominant theme when the health of workers was addressed. Some owner/contractors did health monitoring and all noted that many of the men had a range of health conditions (early onset diabetes, high blood pressure, cardiovascular disease) and even young men who looked fit on the outside had very poor lung capacity (primarily an outcome of cigarette smoking).

There were a range of psychosocial issues around the imposition and implications of rules. The imposition of rules sometimes interfered with the culture of the crew and established hierarchies, rules were circumvented and challenged in these instances. There was also a clear perception that those that make the rules have no idea about their working lives and the reality of harvesting in forestry. They also thought that there were clear differences in who made the rules and who had to follow them, with they being the latter and the former doing what they like. There were a wide range of psychosocial issues all of which can be said to impact on health and safety outcomes. All of these issues related to the relationship between their home and community life and how this impacted on their ability to focus or be safe at work. These issues were raised by owners, contractors and crew.

All of the crew had musculoskeletal issues, most with lower back complaints and some with bad knees. There was an awareness of the importance of hydration amongst workers, and owners, contractors were more likely to address the importance of nutrition and the need for adequate rest.

Many of the crew members had a range of co-morbidities while also working in a high risk sector. Occupational health must be understood in its societal and historical context; occupational health disparities mirror health disparities in New Zealand society. For workers in forestry, they go to work with a range of health conditions that are at least in part determined by their place in New Zealand society and they go home from work with conditions that are directly related to their occupation.

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01/

INTRODUCTION

IN THIS SECTION:

- 1.1 Background
- 1.2 Introduction
- 1.3 Method
- 1.4 Occupational health in forestry

1.1 BACKGROUND

Forestry is one of WorkSafe's four priority sectors due to the high incidence of serious injuries and fatalities in this sector. The WorkSafe Forestry programme has been running since 2010 and is currently in the development phase of its future work programme.

To inform the next phase of the programme, the project team requested research to understand what was happening in the sector, both with respect to changes in practice and behaviour and fatality and injury outcomes. The research explored the point of view of corporates, contractors, and workers (crews) in the forestry sector. The qualitative component of this research sought to understand perspectives of those in the sector, what they think has changed and needs to change and what they anticipate will be health and safety issues in the future.

This research focussed on the following areas of interest:

- > small-scale forestry
- > work-related health
- > silviculture
- > worker engagement, participation and representation
- > training.

These areas have been addressed in separate reports, however, it should be noted that all of the topic areas are ultimately inter-related and there are overlapping themes across the topic areas.

The insights from the Forestry sector research have relevance for WorkSafe's three other focus sectors (Agriculture, Construction and Manufacturing) and its fifth national programme (the Canterbury Rebuild), as well as wider initiatives such as the *Reducing Harm in New Zealand Workplaces* Action Plan, *Maruiti 2025*, and the *Healthy Work* Strategic Plan.

1.2 INTRODUCTION

The forestry sector experienced a high number of deaths in 2013 with 10 workers killed while at work. Following this, industry commissioned an Independent Forestry Safety Review.² The government's response to the review laid out the actions its view on the four key focus areas: Strengthening Forestry Leadership, Strengthening Regulatory Standards, Strengthening Enforcement, and Strengthening the Workforce.³ The response highlighted the need for industry and government to work together to bring about the change required to have an impact on the rates of fatalities and severe injuries in the sector. The following issues were identified by WorkSafe's submission to the Independent Review as underlying the industry's safety performance:

- > the supply chain
- > undervaluing safety
- > competency deficits
- > poor safety culture, and;
- > insufficient investment in forest harvesting infrastructure.

² For more information, see: www.mbie.govt.nz/info-services/employment-skills/workplace-health-and-safety-reform/document-and-image-library/independent-forestry-safety-review/independent-forestry-safety-review.pdf

³ For more information, see: www.mbie.govt.nz/info-services/employment-skills/workplace-health-and-safety-reform/document-and-image-library/independent-forestry-safety-review/initial-government-response.pdf

1.3 METHOD

The research employed a mixed method approach. This involved drawing on published local and international research in this area, grey literature from other state sector bodies, consultants and forestry related organisations; WorkSafe quantitative survey data; ACC claims data; and qualitative face to face interview and focus group data. The research project involved interviewing: managers of corporate forests; contractors working in corporate forests and focus groups with their crews; we interviewed contractors working on small scale lots and held focus groups with their crews; we interviewed farmers who had woodlots on their farms, both for supplementary income and environmental reasons and in one case as the dominant form of revenue generated on the farm. We also interviewed inspectors and assessment staff and asked them their views/experiences and perceptions of the key issues for small scale (farm forestry) now and what they thought they would be in the future. We reached saturation⁴ across all areas with a total of 100 participants. All of these interviews were digitally recorded, transcribed verbatim and subject to interpretative analysis. (See Appendix A for more detail).

OUR REGIONAL FOCUS

The research areas included: Northland, Gisborne, Central North Island, Hawkes Bay, Wanganui and Otago. In all of these areas future wood availability will come from small-scale forest owners who planted in the 1990s. While all areas will experience an increase in wood supply from small scale forestry, the Wanganui District is notable for its large number of small scale owners. The 168 470 ha of exotic forest area contributes only 9.4 percent of the national total, the region has 21.7 percent of the nation's forest owners, 85 percent of whom own less than 40 ha of forest. In terms of employment, it is anticipated that the biggest increases will be between now and 2020 and will be in the Southern North Island, with the smallest increases in Northland/Auckland region. The Central North Island will continue to be the main forestry region.

1.4 OCCUPATIONAL HEALTH IN FORESTRY

Health outcomes for workers in forestry are shaped by a complex range of exposures including: exposures related to the work environment generated by the industry itself including the machinery, tools and chemicals; the conditions that are produced by these exposures (eg noise, airborne particulates and industry product – timber). The exposures occur within a natural environment which in itself contributes to exposures relevant to health outcomes (eg weather, ultra violet radiation, soil, plants, and insects). How the worker experiences these exposures is shaped by a range of contextual factors, including external factors such as market prices and legislation; employer specific factors (eg pace of work, provision of Personal Protective Equipment); to task specific factors (eg repetition, worker control). And finally, health outcomes from these exposures can range from immediate to delayed and in duration from acute to chronic.⁵

⁴ Denzin, N.K. & Lincoln, Y.S. (2011) *The SAGE Handbook of Qualitative Research*. SAGE Publications, Inc.

⁵ Levy, B.S., Wegman, D.H., Baron, S.L. et al. (2006) *Occupational and Environmental Health: Recognising and Preventing Disease and Injury*. USA: Lippincott Williams & Wilkins.

MECHANISATION – THE INDUSTRIALISATION OF FORESTRY

Increased mechanisation of logging operations has led to changes in production practices and altered working conditions and employment opportunities for forestry workers. Specifically, the introduction of chainsaws, mechanisation of off-road transportation and felling has changed the nature of the worksite in large scale forests to that of industrial scale production, involving the reordering of specific tasks through machine capability and providing the potential to dramatically increase production rates. The trend in New Zealand with industrial scale forest owners has been to encourage contractors to move toward being fully mechanised and where ultimately there will be ‘no men on the ground and no hand on the chainsaw’.⁶ Mechanisation of felling operations has led to a dramatic decrease in the number of workers required for harvest and less men on the ground. However, it remains that while full mechanisation is being realised for some crews operating in industrial scale forests, there are still many crews who are not fully mechanised, or who continue to rely on cable based logging on steep sites (53 percent of forest operators), and harvesting practices that have changed little in the last 50 years.^{7,8} These two groups of contractors and their crews share occupational exposures in common, but mechanised crews have greater protection from some exposures and will experience new exposures linked to mechanised work.

MECHANISED WORKERS AND OCCUPATIONAL HEALTH

It is often assumed that increased mechanisation will result in improved injury and fatality rates as machine cabs will protect workers from a range of exposures, including being hit by falling objects, less exposure to ultra violet light and less exposure to noise.⁹ However, extraction on steep terrain also has the potential to increase injury rates because of the possibility of machine roll over on unstable and steep terrain. In addition, other environmental issues including sites being covered in debris, sites with poor soil bearing strength, high moisture content and terrain with or without slash represent challenges to ground based machinery engaged in harvest and potential risk to workers operating these machines.^{10,11}

Internationally, it has been documented that increased mechanisation and the work activity associated with it places different physical, mental and psycho-social demands on the worker. While some of these issues can be addressed through design (ergonomics) other issues may be unavoidable due to the nature of the production process. Mechanised harvesting in forestry involves repetitive movements for the workers operating the machinery controls and resolving problems of repetition can be a major challenge. Commonly the intervention involves job enrichment and job rotation, but this relies on having a large enough crew and crew having the skills to operate a range of machinery.

⁶ Berkett, H., Visser, R., Manley, B. (2011) Understanding Costs Associated with Woodlot Harvesting in New Zealand. In: Interim Progress Report – March 2011, New Zealand School of Forestry, Canterbury University.

⁷ Amishev (2011) Crew best practice – Costs and productivity. Future Forests Ltd. (FFR) NTN03-07.7.

⁸ Harrill, Hunter (2014) Improving Cable Logging Operations for New Zealand’s Steep Terrain Forest Plantations. PhD Thesis, School of Forestry, Canterbury University.

⁹ Axelsson, S. (1998) The mechanisation of logging operations in Sweden and its effect on occupational safety and health. *International Journal of Forest Engineering*. 9.

¹⁰ McMahon, W.S. (2006) Analysis of fatal logging accidents 1988 to 2005: Forest Industry Contractors Association. 1-8.

¹¹ Axelsson, S. (1998) The mechanisation of logging operations in Sweden and its effect on operational safety and health. *International Journal of Forest Engineering*. 9.

Working the harvesting machines involves sitting in machine cabs for lengthy periods of time, increased concentration where the worker is completing a range of tasks (eg fells, grade, stacks and loads at a constant and demanding pace). Mechanisation also contributes to a range of health issues, including loss of physical fitness and with this increased risk of slips, trips and falls (when getting in and out of machines), weight gain and associated co-morbidities. In addition, while the cabs protect workers from exposure to loud noise and ultra violet radiation, workers can become complacent when not in their machine and pay less attention to using their PPE gear when out on the site. Working at a faster pace and where intense concentration is required can result in a range of psychosocial outcomes, including greater stress from intensification of job tasks and the associated experience of increased job demand. Work related stress is associated with greater risk of injury and when a worker has an acute reaction can have psychological, physiological and behavioural outcomes that result in occupationally related ill health including, psychological disorders, cardiovascular disease and musculoskeletal disorders.¹²

Non-work factors can exacerbate and or ameliorate work-related stress and affect health outcomes. Some research suggests that job stressors can be buffered by strong social support and if individuals have range of coping skills. A range of lifestyle factors can also have the potential to buffer health effects for example: good nutrition, physical fitness and exercise, smoking cessation and stress management.¹³

Forestry workers are exposed to a range of hazards, including:

- > chemical and dusts
- > physical hazards (excessive noise, vibration, extremes of temperature and pressure, falling objects)
- > biomechanical hazards (heavy lifting, repetitive awkward or forceful movements that results in musculoskeletal disorders for example, carpal tunnel syndrome (CTS) and lower back pain)
- > biological hazards (zoonotic infections)
- > psychosocial stressors (high stress work environments resulting from excessive work demands on workers, long working hours, low control by workers as well as stress related to insecure employment; stress at home and its impact on work).

CHEMICALS AND DUSTS

Chemical exposures in forestry are more commonly associated with silviculture work and this is addressed in the Silviculture Report in this series. Most of the research focussing on respiratory effects of forestry has been conducted in Europe and Canada and focuses on inhalable wood dust and exposure increasing the risk of primarily nasal cancer.¹⁴

¹² Axelsson, S. (1998) The mechanisation of logging operations in Sweden and its effect on operational safety and health. *International Journal of Forest Engineering*. 9.

¹³ NIOSH. The changing organization of work and safety and the health of working people: Knowledge gaps and research directions. Washington DC : NIOSH, 2002, publication no. 2002-116.

¹⁴ Kauppinen et al (2006) Occupational exposure to inhalable wood dust in the member states of the European Union. *Annals of Occupational Hygiene* 50:549-561.

PHYSICAL HAZARDS

Falls and being struck by or against an object are the primary causes of injury. Crush injuries occur when worker(s) are pinned by logs or equipment,¹⁵ are struck by falling trees, kickback from chain saws, falling branches or rolling logs. Logging injuries include traumatic brain injuries; fractures of the spine, skull, and legs; eye injuries.¹⁶ Smaller less mechanised forestry operations are more likely to sustain crush injuries and cuts from blades and chainsaws.¹⁷

Exposure to heat and sun can lead to dehydration and cold is associated with cold related injury and hypothermia. Excessive exposure to solar ultraviolet radiation (UVR) has a significant association with skin cancers, non-melanoma and melanoma.¹⁸

BIOMECHANICAL HAZARDS

Those working with chainsaws are exposed to hand-arm vibration and may experience (1) white fingers; (2) peripheral neuropathy, with or without cold sensitivity (3) carpal tunnel syndrome (4) musculoskeletal disturbances (eg weakness, lancinating forearm pain, and bone and joint degeneration). Upper limb pain, muscle-tendon syndromes and carpal tunnel syndrome is more severe in forestry than it is in other manual occupations and vibration stress is an important contributor to the development of these disorders.¹⁹

Musculoskeletal disorders have been associated with both physical and psycho-social work factors and increasing psychological demand for forestry workers combined with a decreasing level of intellectual discretion (eg judging grade of wood, length of cut) has been associated with an increased prevalence in neck/shoulder disorders.²⁰ Increased mechanisation might contribute to a decreasing level of intellectual discretion as skilled machine operators concentrate on managing the discretion of the machine. Exposure to cold conditions can further increase the risk of vibration induced white finger.²¹ Corporate forest management have addressed white finger for those that work in their forests, it is however less clear whether white finger has been addressed for workers working in private or small-scale forests.

¹⁵ Wolf, C.H; Dempsey, G.P. (1978) Logging injuries in Appalachia. Forest Service Research Paper NE-416. Forest Service, US Department of Agriculture.

¹⁶ Johnson, CM; Lagares-Garcia, J.A.; Miller S.L.; (2002) When the bough breaks: a 10 year review of logging injuries treated at a rural trauma center in Pennsylvania. *Am. Surgery* 68:573-581.

¹⁷ Laflamme, L., Cloutier, E., (1988) Mechanization and risk of occupational accidents in the logging industry. *J. Occup Accid* 10:191-198.

¹⁸ Reeder, A.I., Gray, A., McCool, J.P. (2013) Occupational Sun Protection: Workplace Culture, Equipment Provision and Outdoor Workers' Characteristics. *Journal of Occupational Health* 55:84-97.

¹⁹ Bovenzi, M., Zadini, A., Franzeinelli, A. & Borgogni, F. (2007) Occupational musculoskeletal disorders in the neck and upper limbs of forestry workers exposed to hand-arm vibration. *Ergonomics* 34, Issue 5, 547-562.

²⁰ Hagen, K.B., Magnus, P. & Vetlesen, K. (2001) Neck/shoulder and low-back disorders in the forestry industry: relationship to work tasks and perceived job stress. *Ergonomics* 41: 10: 1510-1518.

²¹ Bovenzi, M. (2010) A longitudinal study of vibration white finger, cold response of digital arteries, and measures of daily vibration exposure. *Int. Arch. Occup Environ Health* 83:259-272.

02/

FINDINGS

IN THIS SECTION:

- 2.1 Fatalities
- 2.2 Severe Injury
- 2.3 Weather
- 2.4 Long hours
- 2.5 'Healthy on the outside, sick on the inside'
- 2.6 On being safe
- 2.7 Musculoskeletal
- 2.8 Health Monitoring, hydration and good nutrition
- 2.9 Psychosocial issues
- 2.10 Drugs and alcohol

In this section we address both the quantitative and qualitative findings of the research.

2.1 FATALITIES

There were an unusually high number of fatalities in the sector in 2013, but since then numbers have returned to pre-2013 levels and below (see Table 1).

YEAR	NUMBER OF FATALITIES
2008	4
2009	5
2010	4
2011	3
2012	5
2013	10
2014	2
2015	3

Source: SWIFT data (This dataset combines both the data from the industry group called 'Forestry and Logging' and the industry group called 'Forestry Support Services')

Table 1: Fatalities in the forestry sector (2008-2015 calendar years)

WorkSafe Swift data shows that tree felling has been the most common activity when a fatality has occurred with 15 of the 27 fatalities between 2010 and 2015.²²

All of the contractors and crews had lost somebody they knew in a forestry related incident. They stressed the impact this had on them, on the person's family and the community of 'bushmen' more generally. There was a strong consensus that the most dangerous work during harvesting was breaking out and felling. There was also a consensus that fatalities occurred because people cut corners, or had become complacent about safety and/or the person was pushing themselves to hard and that many bushmen do this. As one participant

observed, it is not always the young men, but often experienced bushmen who cut corners:

It was just because you've been round for a while you know a few tricks to keep yourself right, but eventually - your luck runs out eventually if you keep doing it, it's not something you'd do every day, but some days you had to do it, yeah, just to keep things going..

Crew Member

....all of sudden you've got four fatalities, you're thinking, why? Have people got complacent, or - often, I mean, when you look at some of the fatalities when you finally find out about them, too late down the track, mind you, often some of them are really experienced workers, it's not always, but sometimes it's very experienced workers who know better and yet they've just done some dumb thing on the day.

Crew Member

Some of the workers said that they had worked previously in crews where the contractor put them under pressure to meet demanding production outputs, but all of the workers that participated in this study said that their current contractor did not do this and in fact expected them to stay safe on site and to refuse to do anything they were not comfortable with. Many also said that it was more common for the worker to put pressure on himself - this was explained in terms of 'pride' and in some cases some crew said that some men do this 'out of ego'. Some of these workers thought that there were still 'bad' contractors in the sector, but that people did not usually work for these contractors for long. There was also a consensus that there had been considerable change in the sector since 2013 and that

²² Data for the 2016 calendar year will be available in March 2017.

health and safety was an increasing focus for them as crew, their contractors and the corporates. Crew were aware that their contractors were under increasing pressure to document things and that this was an additional 'stress' for them.

2.2 SEVERE INJURY

For the purposes of this report 'severe injury' is defined as claims that are accepted by ACC, where the worker receives weekly compensation wage replacement following more than a week away from work due to a work related injury. The severe injury rate has been trending down since 2009, yet none of the annual decreases have been statistically significant. However, the rate of injury in 2015 was statistically significantly lower than it was in 2012 and previous years (see Figure 1).

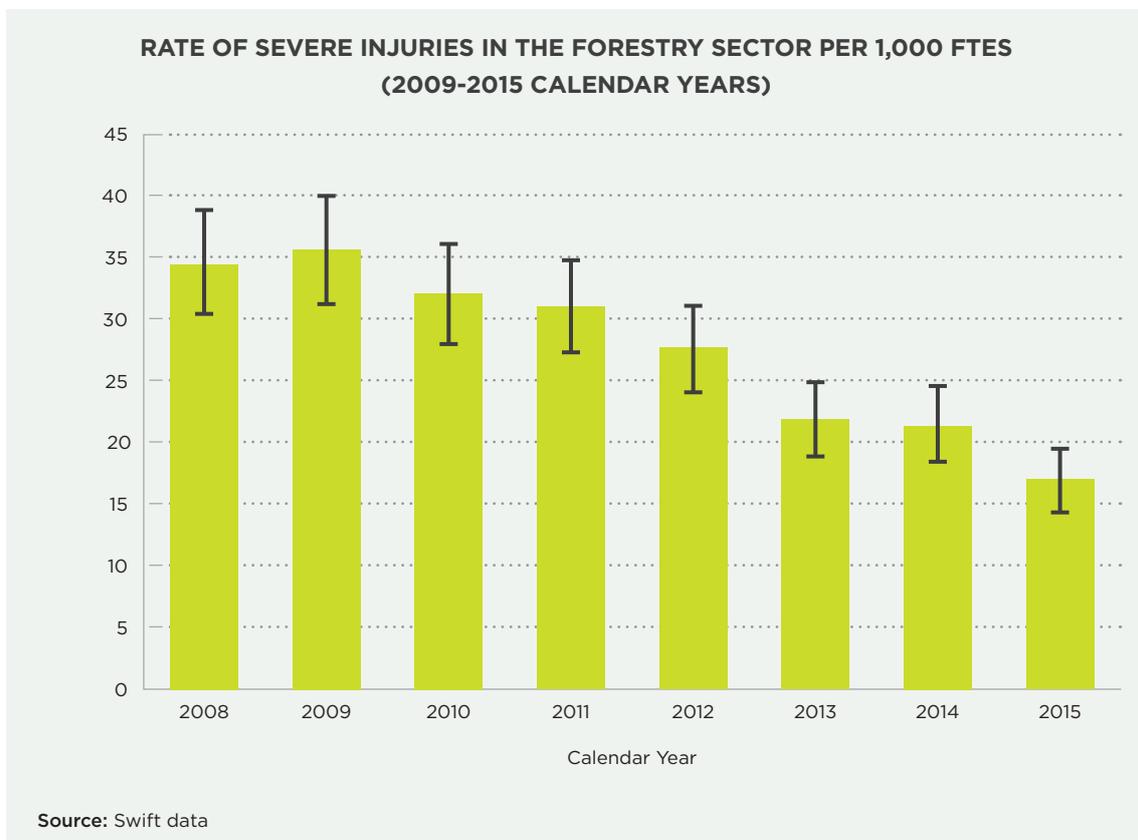


Figure 1: Rate of severe injuries in the Forestry sector per 1,000 FTEs (2009-2015 calendar years)

ROLLING LOGS AND CRUSH INJURIES

A number of the workers, both supervisors and crew, had experienced crush injuries caused by rolling logs on skid sites and when felling. All had had surgery in relation to these serious injuries and had a considerable period of time off work. In two instances men returned to work early and against the advice of their medical practitioner because the compensation they were receiving (and in one case it was stopped) was not enough to support their families. All of these men said that their injury still impinged on their life, both at work and at home and that they still experienced pain and at times compromised movement.

2.3 WEATHER

Crew spoke about the impact the weather had on them, wet weather and heat and cold.

At the moment we are working in mud up to our ankles and our chains get blown real quick, so it means we are working our saws harder and we're stopping and sharpening all the time. So it wears you out - especially when you've got a bit more pressure on your saw to make a cut, by the end of the day fatigue starts coming in..

Crew Member

In the southern forests, working in snow and in extreme heat in the summer was not uncommon. Fatigue was the main outcome that workers noted and cold related injury when working in winter.

2.4 LONG HOURS

Depending where the harvest was taking place most crew had experienced lengthy travel to the site and subsequently were up very early in the morning and home late, very long days were a common experience.

...at the moment, like I get up at half past three in the morning. I'm at the bottom of the gate at half past four, and I'm here until half past four, five o'clock...so it's just the nature of the beast really. I don't mind though, cos I get to cash in on it at the end of the day, but it still takes its toll. You know, I've been doing it now, for all those hours now for six months.. by the end of the week you're still knackered.

Crew Member

IMPACT ON FAMILIES

Workers also spoke about the impact their long working hours had on their families.

Never see your family, all that kinda personal stuff too comes into it...like I get home, I get back to town, I pick up my kids, go back home, I see them for an hour and half, two hours at night, and then you know, I'm gone at sorta four o'clock in the morning again...It does take a toll on the family..

*...the missus now gets really p**** off with me because the hours that I do, and I'm like you got no problem when it comes to payday though, do ya? And she's like yeah, all right. Sweet as. And then she'll have another b**** at me a couple of days later, and then she'll be like, got any money? Hang on a second, if I didn't do all these hours, no I wouldn't have any money, you can't have any anyway.*

Crew Member

Working long hours was common for crews who had a lengthy commute to the forest each day and having little time to spend with their families was also common for these crews. The 2015 Health and Safety Attitudes and Behaviours (HSAB) survey found that there was a significant increase in workers reporting working 51-60 hours a week from the level reported in 2014 (increasing from 11 percent to 18 percent of workers).

ADEQUATE REST

Some of the owners, contractors and supervisors raised the issue of the need for adequate rest when a person is working in such a physically demanding occupation.

*Yeah. But it's f**** rewarding at the end of the day. Like when I was down the hill, right, you get back home at the end of the day, and yeah, your body's rooted, but you're look yeah, mean day, mean day, f*** this, I'm going to bed. You know, and I still, you know, like I'll have a good day where I'll have like 12 trucks, and I'll be humming all day, and it'll just be full on, and there's no time to even fart, but at the end of the day I get home and my mind's just errr, my body wants to do something, but my mind's just frizzled, and then I'm like, good day Richard, f*** off to bed now cos you're up at two o'clock in the morning, you know?*

Crew Member

2.5 'HEALTHY ON THE OUTSIDE, SICK ON THE INSIDE'

For those crews who had health monitoring a number of supervisors commented on how this had 'opened their eyes' to health issues. Supervisors stressed that while the young workers look fit on the outside they are often sick on the inside. In particular, they stressed that while they had 'big muscles, their lung capacity was absolute rubbish' and (in reference to the Dr doing the tests) He was saying: "Well, you've got the lungs of an 80 year old", you know, "This is where you should be..and yeah they didn't care. You know their blood pressure is high and the diabetes, and "oh you are a candidate for diabetes" and, it was just "such is life".

"Yeah and these are fit, fit young men, but internally they are not. They look the part, but...Yeah Yeah - "look at my big muscles", you know, but their lung capacity was absolute rubbish and these fellas are out on the hill, they're on chainsaws, all that sort of stuff, but yeah, internally they are sick..."

Contractor

The health testing had an impact on some of the older workers who been surprised by their lung capacity results and had subsequently stopped smoking (tobacco) "he actually gave up smoking because of his lung capacity and...yeah...he goes "I want to be around for my grandkids" and that was enough and he stopped.

The nonchalance of the younger workers was explained by supervisors as being what young men are like, 'they think they are indestructible'.

2.6 ON BEING SAFE

Staying safe or being safe was expressed in a range of ways, safety more generally was defined in terms of staying out of harm's way, rather than by what it might be in and of itself.

BEING SAFE CAN COMPROMISE OTHER OBJECTIVES

While mechanisation was generally viewed positively in terms of improving safety for workers in forestry, for some mechanisation meant compromising other values that they valued as highly and this was typically employment. Mechanisation dramatically reduces the need for workers on the site and for Māori mechanisation would mean increased unemployment for their young – particularly in regions where forestry was a significant form of employment. As one contractor observed:

So that's our challenge, to not only, currently it's quite hard for contractors to get good competent staff but that demand is only going to increase and, you know, mechanisation is forming part towards solving the reliability issue but that doesn't necessarily tick our objective of trying to find employment for our people and people of the region...okay so machines may be safer than people on the ground, but you know, there is only a limited number of requirements for machine operators and it doesn't tick the objective of creating opportunities or entry level opportunities for our people. Yeah, so it's trying to find the right balance between machines and employment.

Contractor

FOLLOWING THE RULES TO STAY SAFE, THE PSYCHOSOCIAL IMPLICATIONS OF RULES

While following rules was considered essential to staying safe, all acknowledged that people do not always follow the rules.

Oh yeah. You can put things in place that try and keep people safe you know, like people stay out of zones but being humans, eh, you know, the breaker-out has got a safe zone but he only walks half the way and then beeps the hauler to say "Yeah, now haul it in" and he's still walking and then there's something that comes behind him and whacks him in the head. You know, you've just got to follow the rules. We try and put the rules in there to keep them safe but if they aren't going to follow them...

Contractor

While many in the crews understood the need for rules they also challenged rules, usually in terms of 'who makes the rules' and the idea that those that make the rules know very little about their working day realities. Many crew members contrasted their working realities with those of the people who made the rules, these people were office workers (white collar workers) and were commonly viewed as being ignorant of what it means to harvest and be a bushman, but while ignorant, too interested in controlling them and interfering with their world of work.

*The rules are just kind of just dumb. They don't know what it's like out here. They sit at an office looking at a computer, looking at notes, you know, they're safe, I mean out here in practice it's just bulls***. We will get them come out and do a winter, a solid winter out here and then seen what they think of it..*

Crew Member

At the end of the day all that you're doing is trying to look out for our best interests but really they don't know what it's like at all until they actually come and experience it with us.

Crew Member

The extra distance to run for breaker outs was a significant point of contention for crews. In one crew a very senior member who had considerable mana was punished for not following the new rule and was put on other duties. The crew were indignant about this and thought that he 'a very experienced bushman' was being treated badly. Crew hierarchy is based on experience, older more experienced bushmen are respected and 'new rules' that undermine this are not respected, particularly if they are thought to have originated from somebody who sits at a desk all day. In addition, rules that set the distance to run out challenged an experienced worker's ability to 'call it as they see it' or to exercise their own judgement. This means that for these experienced bushmen they are losing control over their work process and this can be a significant psychosocial stressor. For some too, rules were about establishing liability, before anything adverse had happened, and here a number of crew expressed their concern that the liability would fall on workers. As this crew member observed, the rules flatten their hierarchy and take away the prestige associated with gaining the title of 'head breaker out', rules also undermine their ability to exercise discretion and maintain worker control.

There's one thing would be with the rate now anyway with the distance there's no point of having a head breaker out with a ticket, if they aren't able to like, say they needed to pick the shorter distance because there's no need to run out that far, so what's the point where everyone else is competent for the job, what's the point in having a head breaker outer? At the end of the day they're just another worker, it's just someone to blame everything on, if something goes wrong.

Crew Member

.....at the end of the day the head breaker out can't call the shots, all he has to do is run their distance ..

Crew Member

2.7 MUSCULOSKELETAL

Men in the crews spoke of bad backs and bad knees, but were typically stoical about how they dealt with this, the following dialogue was typical:

It does a good job, your back.

About bad knees:

Knee replacements.

Take a harden-up pill.

Yeah, get a new set. Voltaren,

Worse case, alcohol.

Crew Member

2.8 HEALTH MONITORING, HYDRATION AND GOOD NUTRITION

Most of the corporate forests were conducting annual health checks for contractors and crews. The monitoring usually included focussing on: hearing, eyesight, blood pressure, skin checks (UV exposure), musculoskeletal, eyesight, and running blood tests. Health was addressed through 'records of learning' and here the emphasis was on the need to be fit for this very physical work, the need to maintain hydration and to eat properly (good nutrition).

You know, eating properly, getting the right rest and that sort of thing. Because when you look at it some of the work they're carrying out is like running a marathon a day, that's the sort of energy output. And, if you are doing that five days a week you've got to fuel the body properly otherwise, you know, eventually it will give up on you or you'll start making mistakes that you shouldn't be making, eh, that's probably more the thing that worries you, you know, health and safety wise, so, yeah, that sort of stuff.

Owner

This advice was however not always followed by crews. Most addressed hydration, but many contractors said their crews did not address their own nutrition adequately and that this had a number of implications for their overall health. One issue a number of contractors raised was worker susceptibility to infection and that this was linked to inadequate hygiene and nutrition and that both of these factors were an outcome of their living in crowded and poor housing and their economic status and constraints from providing for a number of people (kin). While others also noted that eating poorly was learned and ingrained and not an easy issue to address in the workforce as it trespassed into the realm of home and community over which an employer had little jurisdiction.

2.9 PSYCHOSOCIAL ISSUES

Others also addressed how home-life can impact on health and safety at work, stressing that sometimes when things go wrong in the forest it is because the worker is distracted and thinking about personal problems rather than focussing on the task at hand. Many supervisors were aware of this and noted that many men do not like to talk about their personal life, particularly if they are having problems. The inspectorate also made similar observations and were of the view that psycho-social issues are a significant factor for forestry workers and represent one of the biggest risks to health and safety at work in this sector. Many workers live in challenging social environments, have responsibility for often a large number of kin and are not always supported by those who they support. A number of contractors spoke about this and it was one of the main reasons why they had taken on a pastoral role in relation to their workers. This is a more holistic view of health and it typified both the approach toward Māori workers by both Māori and Pakeha contractors alike.

Yeah, so how do you continually address that and it's the managing, yeah, what happens when you go home if you're getting up at 4 in the morning, 5 in the morning are you going to bed at 8 at night or are you still going to bed at 11 and getting not enough sleep? Have you had a disagreement with your partner, how's that going to affect you talking about that at your tailgate and, hey, you know, be hoping to say, you know, you're a group of eight strong individuals and "Oh, last night I had a fight with the missus, maybe I should just go on the skid today and not go falling"

Owner

But while this is noted as something that should take place, it often does not as one person explained *"there's a testosterone thing in amongst all this s***...it's about, yeah, revealing yourself as being weak maybe in front of us..."*

2.10 DRUGS AND ALCOHOL

When addressing the key health and safety issues for crews, many contractors stressed the importance of monitoring drug and alcohol consumption and ensuring that nobody on site was under the influence of either.

We've quite a stringent drug and alcohol policy that's adopted by most forest companies in this region and, you know, currently at the moment we've got a lot of - our contractor would like to be employing a lot of people but they're known drug users, so, you know, quite a workforce shortage especially, yeah, where, our forests are located (over a vast area) and getting good drug free employees is a big challenge for us.

Owner

This challenge was noted by many owner/manager participants, being drug and alcohol free for work was a challenge for many of their workers who do not limit their consumption of drugs and/or alcohol to outside of the industrial clock (working day) and/or where consumption was great enough for the effects of both to be evident sometime after consumption. For many workers in the industry drug and alcohol consumption is part of a 'way of life' which has until recently been a feature of both their work and leisure time. Addressing this is a challenge for employers as they do not have any power over what happens at home or within the community and are only able to intervene at the worksite. Drug and alcohol random testing was employed by corporates and contractors operating in industrial scale forestry and was also common amongst smaller contractors in the industry. Positive test results for drugs and alcohol were met with a stand down and in most cases repeat offending led to dismissal. A number of employers referred those with positive tests to rehabilitation programmes – drug counselling, but this had mixed results, while some workers responded well to this, others did not. In one region employers kept a list of people who habitually tested positive and this was used to weed out these people when recruitment was taking place. There are significant recruitment and retention issues in the industry and many thought that screening now meant they were selecting from a better pool of candidates, but none-the-less a greatly diminished pool.

I am one of those statistics, one of those guys who smoked a lot of drugs and, yeah, and I'm actually really grateful to (name) and (name) cos they knew me up there, and they took me on, even knowing my history. Yeah, I turned a new page, don't do that stuff anymore, but like I went in deep real bad, there was staying up all week. Like five nights, five weeks, work the week out, real bad, real, real bad...I think the contractors are fixing it by doing zero tolerance really, but the question is who will be the people that are going to replace these people....

Crew Member

While marijuana was in common usage, increasingly methamphetamine (P) was becoming the drug of choice, while marijuana consumption can be detected days after consumption, P has a shorter life and it is in part why this drug has for some replaced marijuana as the drug of choice as it allows the user to be more likely to escape detection through random testing. This shift in drug preference was considered a significant problem for crews, contractors and corporates as the behaviours associated with the consumption of this drug (eg aggressiveness and unpredictable reactions toward others and the environment represented a significant safety issue on sites). While all thought sites should be drug free, many said that if they had to choose between the two drugs of choice, they would choose marijuana, as users were typically not aggressive. All, however, did acknowledge that marijuana did impact on a person's judgement and reaction ability and that people '*had to have their wits about them...*'

There are a range of physical and psychological health effects of methamphetamine use. The psychological harms are reasonably well known and covered in the media and include: psychosis, depression, suicide, anxiety and violent behaviours. This drug class also causes serious heart disease, has serious dependency liability and high rates of suicidal behaviours.²³

²³ Darke, Shane., Kaye, Sharlene., et al. (2008) Major physical and psychological harms of methamphetamine use. *Drug and Alcohol Review* 27:3:253-262.

Chronic methamphetamine use impedes memory and learning, psychomotor speed, and information processing, which clearly has serious implications for workplace health and safety.²⁴

There are also health effects from nonmedical cannabis use. Dependent use of cannabis can lead to cannabis withdrawal syndrome within 24 hours of consumption. The diagnosis of this syndrome rests on the person having at least two mental symptoms (eg irritability, restlessness, anxiety, depression, loss of appetite, sleep disturbances) and at least one physical symptom (eg pain, shivering, sweating, elevated body temperature, chills), with symptoms most evident in the first week of withdrawal but where they can persist for as long as a month.²⁵ Short term and long term cannabis use effects working memory, planning and decision making, response speed, accuracy and latency motivation, motor coordination, mood and cognition. There is also an association between cannabis use and psychosis or schizophrenia. Daily use in adolescence and young adulthood is associated with depressive symptoms and increased rates of suicidal ideation and behaviour.²⁶ Long term use also produces symptoms of chronic and acute bronchitis, in young users it can trigger myocardial infarctions and strokes; and there is suggestive evidence that testicular cancer is linked to cannabis smoking.²⁷

There are some very good reasons why this drug use needs to be addressed as it can clearly have significant impact on a workers ability to work safely and to remain healthy.

MONITORING DRUGS AND ALCOHOL – ASSURING HEALTH AND SAFETY

Monitoring plays a key role in shaping the focus of health and safety in forestry. It is the key mechanism that illustrates ‘what is being done’ about the health and safety of workers and it implicitly provides an assurance that if the company, contractor, employer is *monitoring* life-style practices that impair competency at work they are effectively addressing health and safety. However, while most of the participants stressed the importance of monitoring for drugs and alcohol in terms of safety on site, most did not address the long term impact of drug taking and alcohol consumption on workers’ health per se. and what the implications might be long term. While ‘fitness’ for work is a contentious issue primarily because it can be used in a manner that denies a worker their human rights, drug and alcohol use in workplaces not only puts the individual at risk but also the team, and monitoring use is an ethical²⁸ response to a serious health and safety issue.

DIFFERENT RULES FOR DIFFERENT FOLK

The focus on drug and alcohol testing was generally considered to be a good thing for the industry, but some observed that there were different rules for different people and working men were more likely to be monitored. They also observed that monitoring for drugs and alcohol had created a monitoring industry that was now self-sustaining:

²⁴ Meredith, Charles, W., Jaffe, Craig., Ang-Lee, Kathleen., Saxon,MD & S. (2005) Implications of Chronic Methamphetamine Use: A Literature Review. *Harvard Review of Psychiatry* 13:3:141-154.

²⁵ WHO (2016) The health and social effects of nonmedical cannabis use. www.who.int/substance_abuse/publications/cannabis_report/en

²⁶ Ibid.

²⁷ Ibid.

²⁸ Utilitarian ethics – for the good of all.

The (NZDA) did a roadshow around all the forest owners, going you know, meth is going to come and, you know, it's going to take over your workforce and all the white collared guys sitting in their office, you know sitting there drinking their wines on Sunday will think, oh yeah, no, we'll stop those boys, you know?

Contractor

However, some initially thought this way and changed their minds, as one supervisor observed:

*And I've told them, "I'm your boss", you know, "Three o'clock till six, any time after that mate is yours", "Don't come to work stoned, don't come to work p**** - sweet as". But it's yeah, like the culture has changed.*

Supervisor

OUTSMARTING MONITORING

Most in the industry considered that drug and alcohol monitoring had dramatically reduced the number of workers who came to work under the influence of either drugs or alcohol. Some spoke of attempts to game the system. While the following quote is almost certainly apocryphal²⁹ and illustrates that people will try and outsmart monitoring and smuggling somebody else's urine has been one way to fool the monitoring system:

*I know of a case where a joker went and had - it wasn't with us - it was another company - a joker went and had a urine test and the joker came out and said "I'm good", and he said (the tester) "no, no.. you're pregnant". And this guy just sat there and said "s**, my wife doesn't even know she's pregnant, and he had a bottle of his wife's urine in his pocket and he'd managed to get it through the system...*

Contractor

DRUGS ARE THE EASIEST THING TO FOCUS ON, THERE ARE BIGGER ISSUES

While most acknowledged that drugs and alcohol were an issue, many contractors observed for many crew members there were a range of issues that impacted on their ability to be safe and healthy, and in all instances they drew attention to the harder issues to address, such as poverty, intergenerational drug use in the community, insufficient support for young forestry workers at home and in the community, poor housing, crowded houses, poor nutrition. What is referred to as the societal aspects of occupational health and how societal disparity also plays out in our workplaces, where those who are the most disadvantaged often work in high

²⁹ Falsely attributed or inscribed.

risk occupations, enter those occupations having already experienced poor health outcomes in childhood (eg strep throat and rheumatic fever and rheumatic heart disease) and often have a range of comorbidities in early adulthood (eg early onset diabetes, high blood pressure). These contractors quite rightly stressed that these are the very difficult issues that need to be addressed. Occupational health outcomes and disparities have to be understood in their societal and historic context.³⁰

As one owner/manager observed:

Drugs are an issue, but they're not the only issue and I don't believe they are the biggest issue, but they are an issue that's easy to focus on...I think one of the biggest issues we have for a lot of our workforce is the environment that they live in when they're not at work and again that comes back to what I was saying about society...I've seen a lot of young guys who are really good young men in a way that they turn up for work, they do all of that but then when they are on their own time they take drugs because they're available and because the community that they live in, their peer group are taking drugs and they want to be part of that group but they can't work with the drugs in their system and so they get caught out eventually so then they are no longer working and it is a bigger problem in our industry...We can only manage it the way it is and we're not going to be able to change where they live. You are not able to change that sort of thing. That is a real impediment for some of our workers.

Owner

And another owner/manager:

...the best success we get is someone who comes out of school, they don't have any bad habits. Generally they've been asked to leave school but the big issue for us is family and whānau support so if mum drags the kid in by the ear and the kid sits there staring at the floor with mum there, we've probably got some hope because that kid needs to get out of bed every morning, put his boots on without losing them and have his lunch and be waiting to go to work. If he's not, I want someone to ring to ensure that it does happen. Once we can get through that then we're good and sometimes the kids have to leave home, it's impossible for us to keep training somebody and keep them at work sometimes with the home environments they've got and our advice to them is "you need to leave home, get away because otherwise you're gonna lose your job".

Owner

The hard issues are also viewed by many as being too difficult to address and as they lie outside of the workplace are considered to be beyond an employer's reach.

³⁰ Krieger, Nancy (2010) Workers are People Too: Societal Aspects of Occupational Health Disparities – An Ecosocial Perspective. *American Journal of Industrial Medicine* 53:104-115.

03/

DISCUSSION

Amongst this workforce there is a greater emphasis placed on ‘safety’ than there is on ‘health’. All agreed that drug and alcohol consumption impacted on safety at work, but nobody expressed what the implications might be for the health of the worker or what the long term health effect of alcohol and or drug consumption might be on a person’s ability to perform their work or to work at all, or to navigate the home work divide. Alcohol and drugs are as one participant pointed out the easy things to focus on, we can test for them and we can bar people from the workplace if they test positive. Nobody is disagreeing with idea that being either drunk or on P is not good if you are working in a high hazard occupation, but it is interesting that very little attention is given to ‘health’ the full range of health issues for workers in this sector.

Occupational health must be understood in its societal and historical context; occupational health disparities mirror health disparities in New Zealand society, they are an outcome of our history and are maintained by our present. The forestry workers who participated in this research had a range of health issues that are known to be societal health disparities, they go to work often with a range of health conditions that are at least in part determined by their place in society and by social injustices and they go home to their communities with conditions that are directly related to their occupation.^{31,32} And, because we know this to be the case it means that these conditions are preventable.

Contractors and owners in the sector are aware of all of these issues but health is in many ways the hard issue to deal with and there was a clear sense that it was beyond their control. This is understandable but it also suggests a need for the industry to adopt a more holistic approach toward the health of their workers and WorkSafe is placed to assist with this. WorkSafe’s Maruiti 2025 for Māori in the workplace is an example of a more holistic approach and is designed to address these issues for Māori in forestry, it may also have wider applicability. The number of contractors who expressed the need to address home and work suggests too that industry is receptive to a more holistic approach toward health and safety for workers in this sector. One task that needs to be done is to raise awareness about the full range of exposures for forestry workers and the health conditions that can arise because of the work that they do.

Workers are generally aware of the key safety issues they face while harvesting, they are aware of fatigue and the need to be hydrated. They are aware of the dangers of felling and breaking out and also being alert when on the skid. They are using their PPE and recognise the importance of knowing where people are on the site. Workers are less aware of exposures that impinge on their health. Drugs and alcohol are recognised by all as an issue, but the long term health effects of using drugs and alcohol are not the focus of attention.

The observations made by workers about rules and worker control indicate too that any intervention addressing health will have to be one that is negotiated with workers – health and lifestyle issues are their business. Fitness for work is a politically contentious issue and one that can raise serious human rights issues, again intervention design must be aware of this and the need for buy in and development of receptiveness to change. Health promotion is a well-developed field and the development of interventions that will raise awareness of health issues should draw on the vast literature which addresses various modes and delivery and implementation approaches.

³¹ Carter-Pokras and Bacquet (2002) What is “Health Disparity” ? *Public Health Rep* 117:426-434.

³² Krieger, N. (2005b) Defining and investigating social disparities in cancer: Critical issues. *Cancer Causes and Control* 16:5-14.



APPENDIX

IN THIS SECTION:
Appendix A: Methods

APPENDIX A: METHODS

The research involved a mixed-method approach, using both quantitative survey and claims data and qualitative interview and focus group data. The quantitative data provides us with an observation of what change has occurred over time. The qualitative interviewing and focus groups provide an insight and understanding of the views of those in the sector and their explanations of what has changed and why.

ACC AND WORKSAFE DATA

The research examined data from both ACC claims and WorkSafe's Guardian databases. The data provides a record of the rates of serious harm and severe injuries in the sector over time. The rates were calculated using a Statistics NZ's Household Labour Force Survey (HLFS) employment levels in the Forestry sector as the denominator. Three numerators were used to produce three rates, these are:

- > **Severe injury rate** – based on SWIFT data. The SWIFT data contains the number of employees who experience more than a week away from work (based on weekly compensation claims). ACC pays employees, shareholders and self-employed workers 80% of pre-incapacity income but it excludes the first week of incapacity (for employees this is paid by the employer).
- > **Serious harm rates** – based on WorkSafe administrative data. WorkSafe administrative data contains the number of fatalities and serious injuries that have been reported to WorkSafe – either through notification or proactive collection.
- > **Work-related Entitlement Claims rate** – ACC WorkSafe work account data. These are claims that have progressed past the medical fees only claim category. Compensation and support for returning to independence may have been required.

FOCUS GROUPS WITH WORKERS IN SECTOR

Focus groups provided an opportunity to hear from a greater number of participants than interviewing alone. Focus groups also give participants the opportunity to build off each other's observations and to discuss with the interviewer. This allows for a multiplicity of views to be recorded in this interactive setting and therefore also allows insight into when and how views differ in this context.

All focus groups were conducted with crews only, no contractors were present; this was to allow staff to be as open and honest as possible without fear of employment repercussions.

INTERVIEWS WITH FORESTRY OWNERS, PRINCIPALS, CONTRACTORS AND WORKERS IN SECTOR

Interviews with managers and staff provide in-depth information on their experience of working in the Forestry sector over the past two years. Interviews give participants the opportunity to discuss issues they may not be comfortable raising in front of a group. It also provides the chance to delve deeper into specific areas that is not possible in a focus group setting.

HEALTH AND SAFETY ATTITUDES AND BEHAVIOUR SURVEY (HSAB SURVEY)

This survey is run annually by WorkSafe NZ and involves around 290 employers and 380 employees in the forestry sector. It covers a number of questions about the attitudes and awareness of Health and Safety practices and the actions taken by both employees and employers to ensure a healthy and safe workplace. This provides sector level measures of the changes over duration of the research period.

REVIEW OF EXISTING STUDIES

Where applicable, the research draws on existing studies and research to support conclusions drawn from the current research.

ETHICAL CONSIDERATIONS

The research was conducted according to the ethical principles and associated procedures endorsed in the Association for Social Science Researchers.

Ethical considerations apply to the primary data collection – that is the focus groups and interviews with workers and employers in the sector, and interviews with WorkSafe staff.

WorkSafe staff were made aware prior to participation that though they will not be identified by name, they may be identifiable by their role within the organisation.

Informed consent was obtained from sector workers and employers participating in the focus groups and interviews and they are not identified personally by name or business. All attempts have been made to ensure confidentiality. If data could not be reported in a way that does not identify individuals from the sector, it was not reported.

Survey data is anonymous to WorkSafe and only figures that are statistically significant and do not identify individuals have been reported in the research.

Some of the data collection took place on site at a forest where harvesting work was being undertaken. A specific safety plan was developed for staff involved, in collaboration with a forestry inspector, to ensure that research staff were not placed at undue risk during the process of data collection. Personal protection equipment was supplied.

Those who participate in the employer and worker interviews and focus groups received a participant acknowledgement in the form of a \$30 supermarket voucher. Individuals who participated in both received one voucher. Participants were not made aware of this the voucher prior to participation to ensure there was no external coercion. A reasonable amount of food and drink was provided at the focus groups and interviews. Participants will be provided with a summary of the report findings.

All research data of a confidential nature is locked in a secure cabinet, and electronic data of this nature has been password-protected. Data will be held on site in accordance with the WorkSafe NZ National Records retention policy.

RESPONSIVENESS TO MĀORI

The Forestry industry has an over-representation of Māori employed in the sector, with 34.2 percent of employees in Forestry identifying as Māori in 2013, compared with 11.2 percent of the entire workforce identifying as Māori in the same period. This means this project is likely to involve a significant number of Māori workers and employers without any focussed sampling.

Te Ara Tika suggests that in the case of Māori centred research, a research team should consult with Māori Advisors within the Agency about the research approach and the need for Māori input and wider consultation. The research should include Māori fieldwork researchers and should consider Māori project leads and analysis.

At the time of writing, WorkSafe does not currently have Māori advisors. However, the National Manager, Māori was involved in the design of this project. Two members of the research team identify as Māori and will be involved in the fieldwork and analysis

DISCLAIMER

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