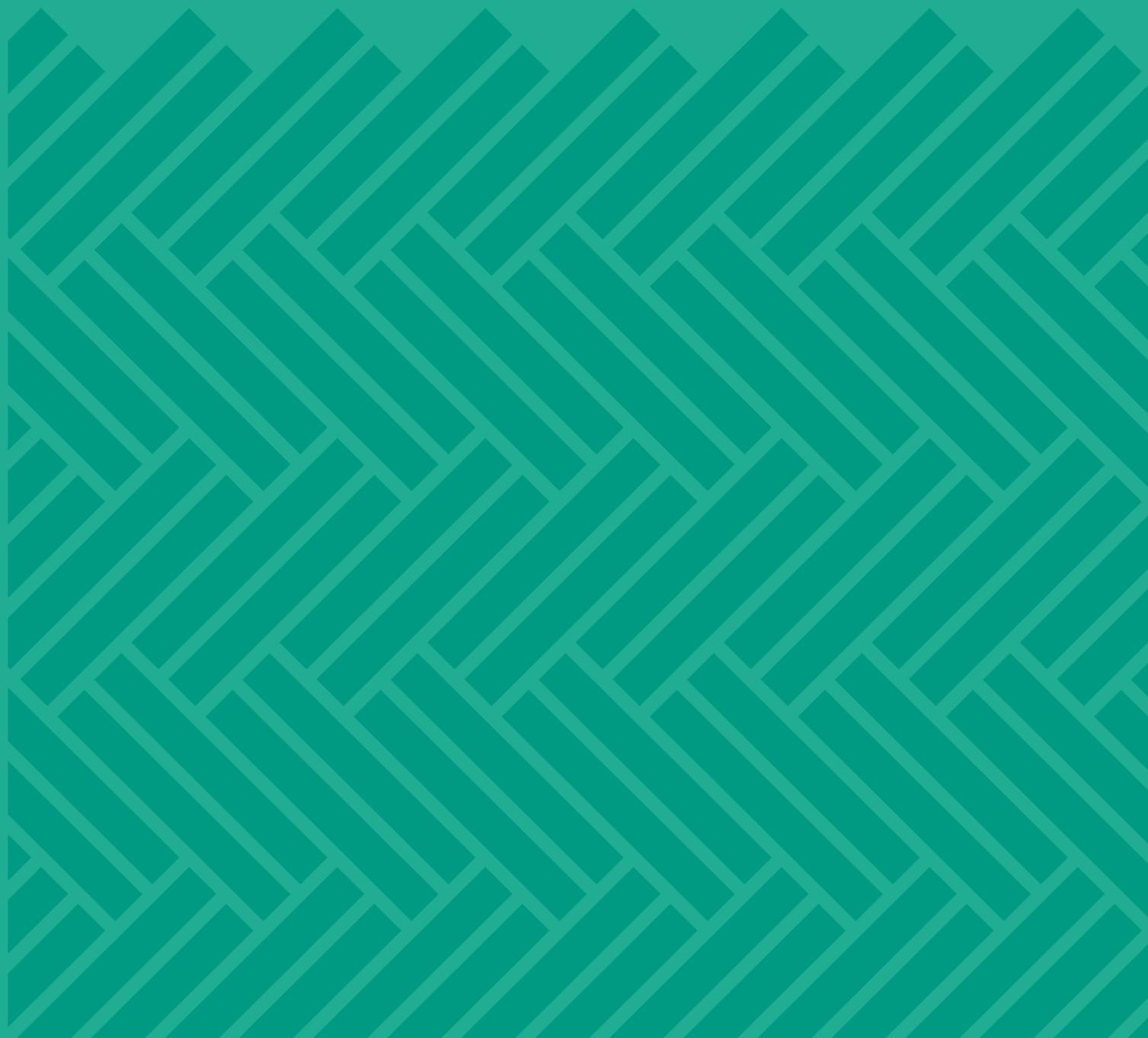


# “Well, I think there has been a lot of changes”

## CHANGES IN HEALTH AND SAFETY IN THE FORESTRY SECTOR

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NOVEMBER 2016



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#### **ACKNOWLEDGEMENTS**

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- > the forestry crews, contractors, owners, and principals who participated
  - > the inspectors who gave their time.
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# EXECUTIVE SUMMARY

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The forestry sector is one of WorkSafe's four priority sectors, with a high incidence of injuries and fatalities. WorkSafe has had a dedicated forestry programme, running since 2010 in different forms. The programme is currently in a phase of re-developing its future work. To inform the next phase of the programme, the project team requested research to understand what changes have occurred in the sector, and what the catalysts (both internal and external) for these changes were.

The primary purpose of this research was to understand what, if any, changes have occurred in the Forestry sector and the role these have played in the changes to serious injuries and fatalities observed by WorkSafe. The research gave equal focus to internal and external influences on the sector, and WorkSafe's role in the changes.

This research involved interviews and focus groups with over 100 participants in forestry across five regions, as well as WorkSafe staff. The researchers spoke to trainers, workers, contractors and owners/principals across the sector, including those working in silviculture, corporate logging and small-scale forestry.

## **HAVE THERE BEEN CHANGES IN THE RATES OF FATALITY AND INJURY WITHIN FORESTRY?**

This research found that there had been improvements in the severe and non-severe injury rates in forestry. 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.

However, there was a significant decrease in the number of non-severe injuries from 2014 to 2015, meaning we can say there was less risk of a non-severe injury in 2015 than in 2014, which is a success for the industry and WorkSafe.

There are limitations of reported injury data, as these can be affected by other changes – such as policy changes in accepting claims, and motivations for making a claim. However, taken together, the injury rates suggest that the forestry industry is moving in a positive direction.

## **WHAT HAS HAD A ROLE IN CHANGES TO PRACTICE WITHIN THE SECTOR?**

The changes have been driven through corporate owners/principals placing greater obligations on contractors, through the contracting process. Contractors have then taken on the new standards and obligations and implemented them, which is seen in more frequent tailgate meetings with staff, monthly health and safety meetings, annual safe start sessions, safe behaviour observations and other auditing occurring on site. Much less change or pressure to change was seen in small-scale forestry.

The negative media coverage, and private prosecutions taken by the CTU have influenced owners and contractors in their practice, but these had less impact on workers in the industry. Workers were most strongly influenced by their immediate employer – the contractor, who had increased the expectations of their crews in response to pressure they were experiencing.

## **WHAT HAS BEEN THE ROLE OF WORKSAFE IN ANY CHANGES MADE?**

WorkSafe is seen as having played an integral role in the changes. The approach taken by WorkSafe put pressure on owners and contractors to document their practice more thoroughly, and to lift their standards. Most owners, contractors and crews had noticed an increase in the frequency of visits from the inspectorate, particularly in 2014, while others would welcome more frequent inspector visits on site. They feel this will improve the relationships between WorkSafe and the industry, and also provide another chance to reinforce standards of practice expected.

Many of those interviewed said that WorkSafe had come out with a determined focus after 2013 and pushed for improvements. This was seen as being quite strongly enforcement in the early stages, followed by a noticeable shift to providing more education in recent months – particularly with the build up to the new legislation. The findings highlighted the integral role of the inspectors in any national programme of work, particularly at a crew and contractor level. Most contractors and crew members were not aware of the national programme, nor the work being undertaken at a national level. Their interface with WorkSafe was an inspector or assessment manager, and this local contact determined whether they had a positive view of the organisation and the level of credibility associated with WorkSafe. To their credit, the forestry programme team has involved inspectors extensively in their programme planning and work, and this was evident in this research – both in the way in which the inspectorate was incorporated in programme activity and the level of engagement of inspectors.

## **WHAT HAS GONE WELL?**

The research has found that through the contracting process, there was a noticeable increase in the incidence of basic good practice occurring – crews were holding tailgate meetings more often, and documenting their practice more. There is also evidence that the prevalence of some of the poor health and safety practices had reduced, with less workers reporting undertaking risky behaviours, and the qualitative data showing that contractors had used a number of different ways to drive compliance since 2013.

A clear picture of collaboration across industry and with WorkSafe was clear in the research. Following the independent review, the pressure from a more visible inspectorate, willing to take enforcement action if needed, and the expectations of owners and principals (pushed through the contracting process) has built a tension for change across forestry that has resulted in positive results for both severe and non-severe injuries.

## **WHAT COULD BE IMPROVED?**

While a picture of less poor practice, and some increased good practice emerged from the research, it was clear there was still room for more good practice to be implemented. This was particularly evident in the small-scale forestry part of the industry and with smaller operators across the industry. A recurring theme from these operators was a lack of resource and ability to implement improvements and changes to health and safety practice.

Formal training was also found to be lacking in a number of the areas visited. Many of the larger organisations were hiring in trainers and assessors to get around the shortage of available people in their area. However,

smaller businesses reported this was not viable for them, and meant some were experiencing long delays in accessing training or getting their staff assessed.

Work-related health is an area that is in need of improvement. Much of the focus of health and safety policies and practices was found to be on safety. Aside from annual health checks, drug and alcohol testing, and some ad hoc sessions on nutrition and hydration, there was little else being done on work-related health in the crews spoken to. Given this is a priority for WorkSafe, it is timely that WorkSafe consider how it can better support the forestry industry to implement practices that will lead to better health outcomes for those working in the industry.

Finally, there appears to be a practice amongst inspectors undertaking assessments to view health and safety documentation first and if they are happy, to conclude their visit. There were a number of inspectors that stated they would always try to go onto the skid when visiting as, in their view, documentation didn't guarantee practice, but a consistent theme of documentation checking still persisted. Owners, contractors and crews were clear that they would like to see inspectors out on the skid site more and less in the paperwork when visiting a crew. In discussions with programme staff, this is not what is expected of inspectors so this is an area that would benefit from greater attention going forward.

Related to the point above, an area for WorkSafe to consider going forward is the ratio of inspectors to crew and geographic area. WorkSafe data showed that there were 16 inspectors across the country who had undertaken more than ten inspections in forestry in 2015. This compares with over 400 crews, making a ratio of one inspector to over 25 crews. On the surface, these

numbers may not seem high but the crews are large distances from WorkSafe offices meaning inspectors have long days and can only visit one crew each day. With crews requiring multiple visits to follow up, this can mean inspectors are only able to visit a crew once a year or less. This was found to be having an impact on inspectors (in terms of workload, time spent travelling to sites, and ability to build relationships with crews in their designated areas) and industry access to proactive communication with WorkSafe, and as an employer and regulator is an area that WorkSafe could improve.

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## INTRODUCTION

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### IN THIS SECTION:

- 1.1 Background
- 1.2 Method
- 1.3 Introduction

## 1.1 BACKGROUND

The Forestry sector is one of WorkSafe's four priority sectors, with a high incidence of injuries and fatalities. WorkSafe has had a dedicated Forestry programme, running since 2010 in different forms. The programme is currently in a phase of re-developing its future work.

To inform the next phase of the programme, the project team requested research to understand what changes have occurred in the sector, and what the catalysts (both internal and external) for these changes were. The primary purpose of this research was to understand what, if any, changes have occurred in the Forestry sector and the role these have played in the changes to serious injuries and fatalities observed by WorkSafe. The research gave equal focus to internal and external influences on the sector, and WorkSafe's role in the changes.

The insights from the Forestry sector research have relevant information 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, *Maruti 2025*, and the *Healthy Work* Strategic Plan.

### KEY RESEARCH QUESTIONS

1. Have health and safety outcomes improved in the Forestry sector?
2. What is being done differently within the sector that has contributed to the change?
3. What has motivated the sector to change their practice?
4. What are the transferable lessons that can inform other areas of intervention?

## 1.2 METHOD

The research involved interview and focus groups with over 100 industry members across owners, principals, contractors and crews; interviews with WorkSafe Inspectors and Assessment Managers, analysis of WorkSafe and ACC Claims data, analysis of data from WorkSafe's Health and Safety Attitudes and Behaviour (HSAB) survey, and a review of existing studies. See Appendix A for a detailed description of the method.

## 1.3 INTRODUCTION

Whilst forestry has been an area of specific focus for WorkSafe and its predecessors since 2010, the industry experienced a high number of deaths in 2013, when 10 workers were killed whilst at work. Following this, the forestry industry commissioned an Independent Forestry Safety Review<sup>1</sup> that was published in October 2014. The government's initial response to the review was also published in October 2014, and laid out the actions it would take under four broad areas: Strengthening Forestry Leadership, Strengthening Regulatory Standards, Strengthening

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<sup>1</sup> 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](http://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)

Enforcement, and Strengthening the Workforce.<sup>2</sup> 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 in its 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.

### **WIDER HEALTH AND SAFETY CHANGES**

To add some context to the work being undertaken in the Forestry sector, this was on the back of the Pike River mine disaster that resulted in the loss of 29 lives, and initiated the Royal Commission on the Pike River Coal Mine Tragedy.<sup>3</sup> Following the report on Pike River (October 2012), the government commissioned an independent taskforce review of workplace health and safety, to advise on ways to meet the goal of reducing the rate of workplace fatalities and serious injuries by 25 percent by 2020.<sup>4</sup> The taskforce reported back in April 2013, and called for 'an urgent, sustainable step-change in harm prevention activity and a dramatic improvement in outcomes to the point where this country's workplace health and safety performance is recognised among the best in the world in 10 years' time' (Independent Taskforce, 2013). In October 2013, the government responded with Working Safer: A blueprint for health and safety at work.<sup>5</sup> The Blueprint laid out a programme of work until the end of 2016, and included the creation of WorkSafe New Zealand and the introduction of the Health and Safety at Work Act (2016).

### **THE FORESTRY INDUSTRY**

The market for logs was strong in 2013, with the average price for wood reported to the Ministry for Primary Industries hitting the highest it had since December 2010 in June and September 2013 at \$189 per ton (see Figure 1).

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<sup>2</sup> 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](http://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)

<sup>3</sup> For more information, see: <http://pikeriver.royalcommission.govt.nz/Final-Report>

<sup>4</sup> For more information, see: <http://hstaskforce.govt.nz/documents/report-of-the-independent-taskforce-on-workplace-health-safety.pdf>

<sup>5</sup> For more information, see: [www.mbie.govt.nz/info-services/employment-skills/workplace-health-and-safety-reform/document-and-image-library/working-safer-key-documents/safety-first-blueprint.pdf](http://www.mbie.govt.nz/info-services/employment-skills/workplace-health-and-safety-reform/document-and-image-library/working-safer-key-documents/safety-first-blueprint.pdf)

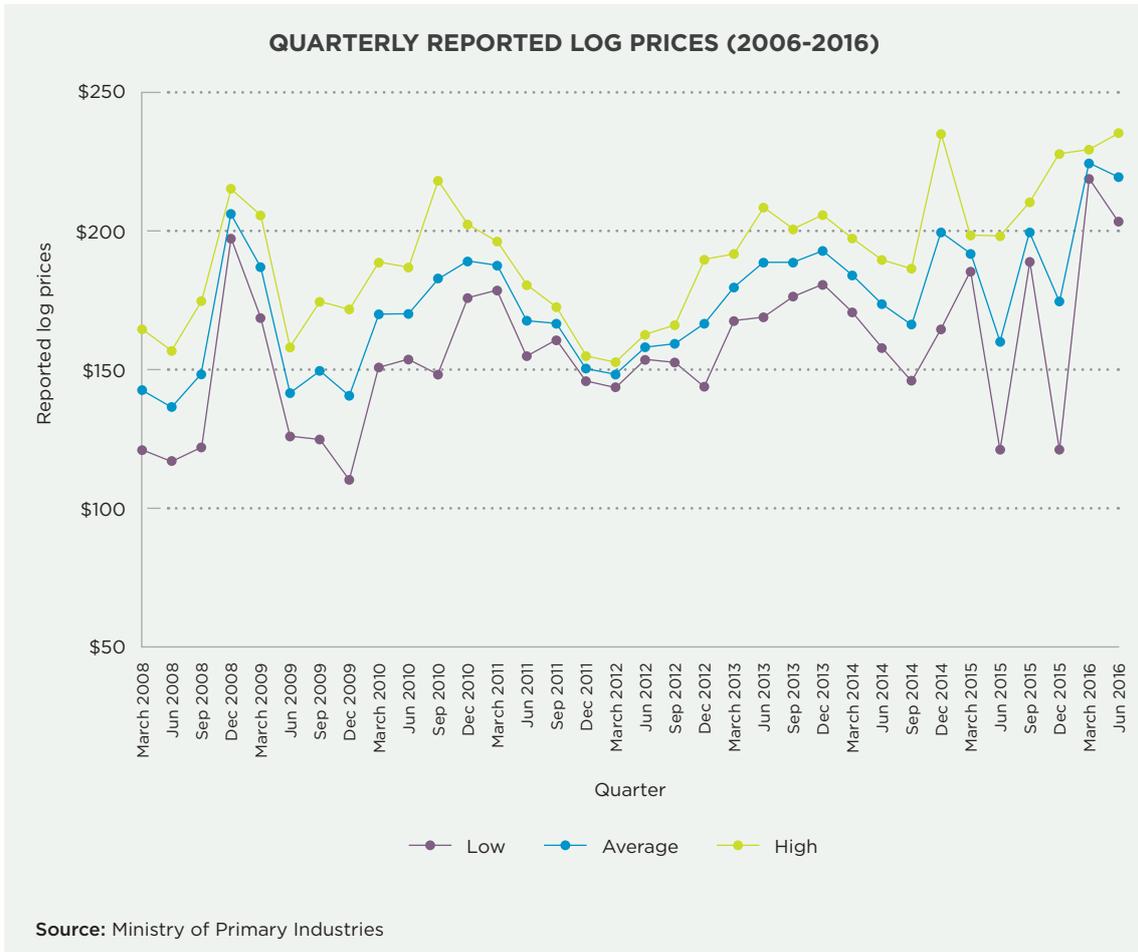


Figure 1: Quarterly reported log prices (2006-2016)

The September quarter in 2013 also showed the highest level of production seen to date with 7.882 million cubic metres of roundwood removed (see Figure 2).

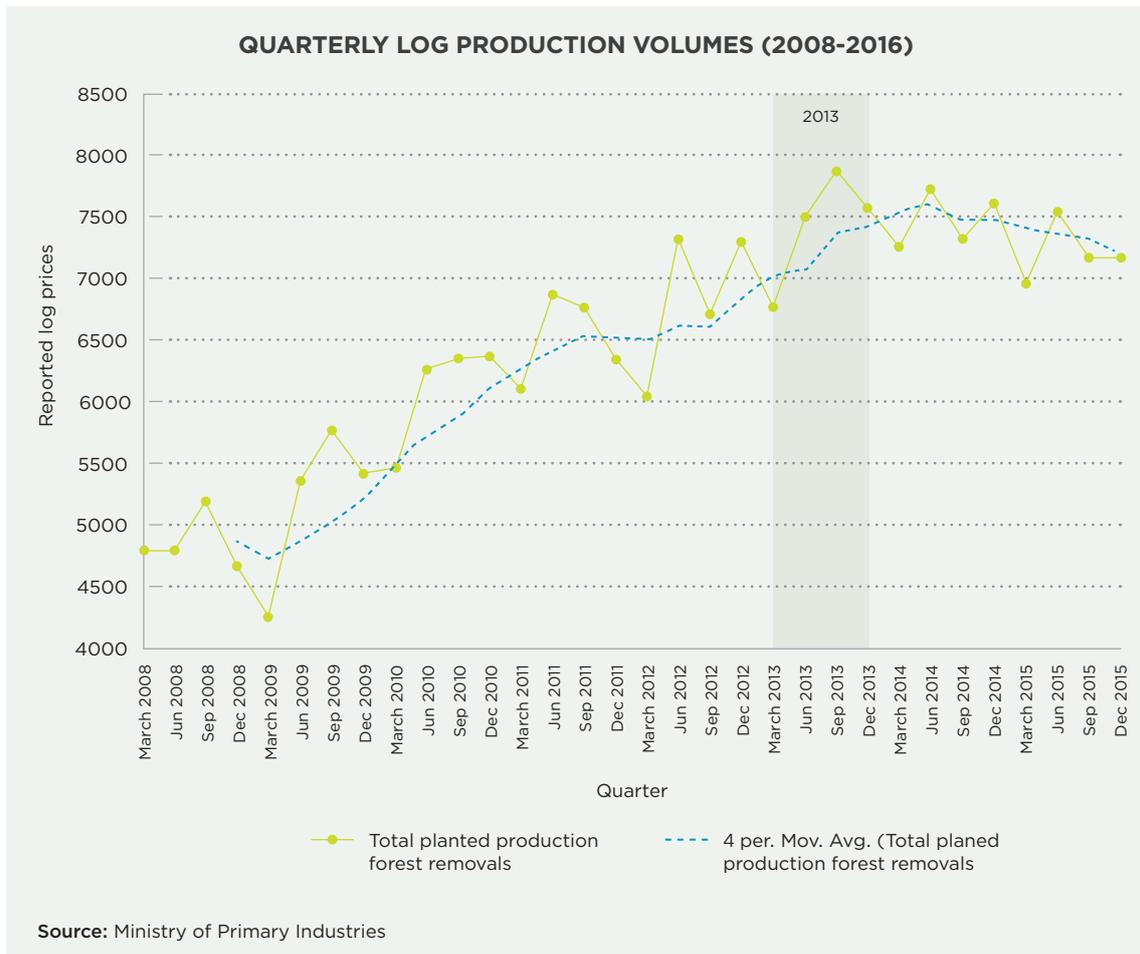
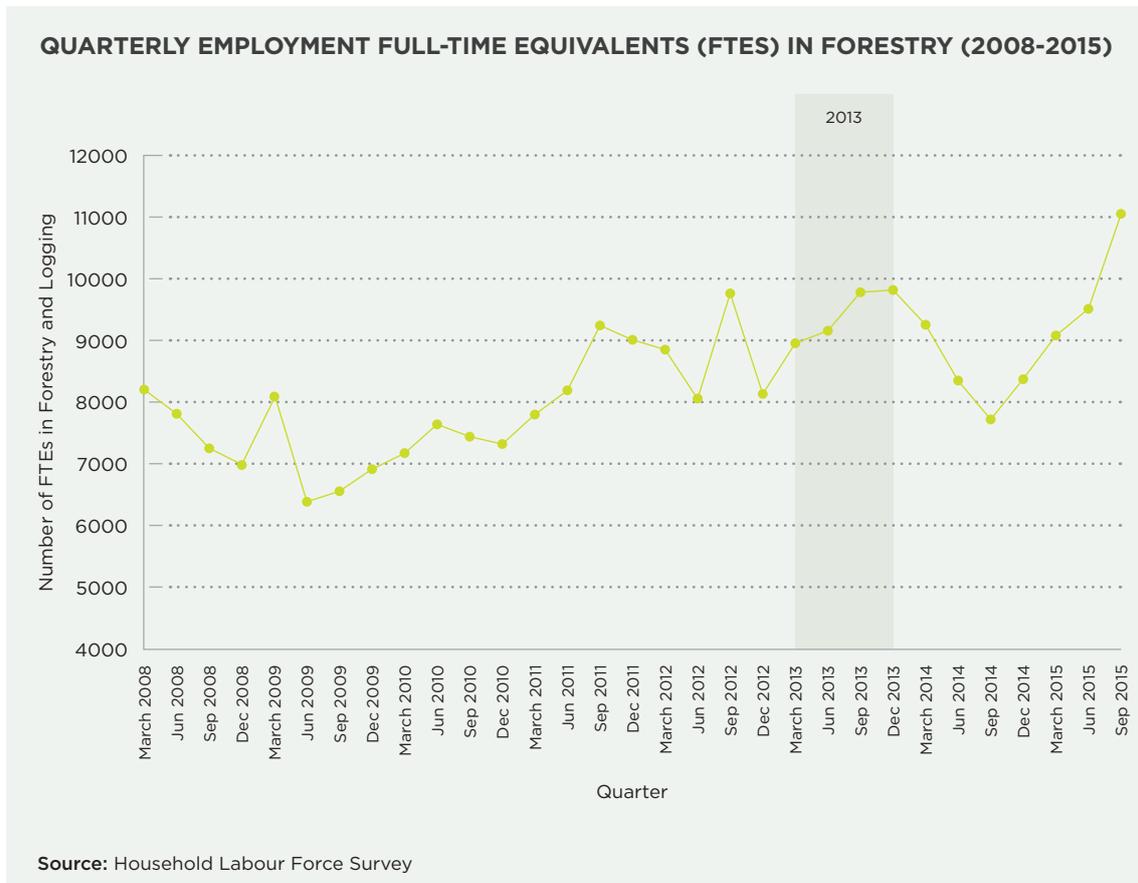


Figure 2: Quarterly log production volumes (2008-2016)

Employment was also high in 2013, with the December quarter being at the highest level recorded since March 2008 at 9,801 FTEs reported (see Figure 3).



**Figure 3:** Quarterly employment Full-Time Equivalents (FTEs) in Forestry (2008-2015)

These data show that the high number of deaths occurred at a time when the market was strong, and employment was high. Though this research did not run a regression analysis or test for a correlation between high prices, high production or high employment and the number of injuries or deaths, it was considered in the qualitative research. A number of industry members stated that it was times when the industry was buoyant that new operators entered, which had a negative impact on health and safety across the industry – through cut-rate pricing that was hard to compete with, whilst maintaining safety standards.

Workplace injury and fatality rates are pro-cyclical and a number of researchers have explored why it is that economic booms are associated with higher injury and fatality rates and recessions with lower rates of injury and mortality (Ruhm, 2000). Some have attributed this to people working longer hours during a boom, an increase in fatigue and work related stress during short booms and workers subsequently becoming less careful. Other analyses reveal that in boom times people are more likely to report injuries than they are during a recession. Low rates of reporting in a recession are explained by workers fearing that their employer will be more likely to lay off workers who have reported accidents. A more recent analysis of injury and fatality in 16 OECD countries revealed that higher rates in boom times are an outcome of greater reporting of injuries rather than changes in workplace safety (Boon & Ours, 2006). This research also demonstrated that fatal accidents do not seem to be related to labour market conditions. Clearly, this research challenges a number of assumptions about market factors shaping high injury rates and suggests that we should be circumspect about the impact of booms and recessions on actual injury rates, or whether it is reporting that is variable.

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## FINDINGS

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### IN THIS SECTION:

- 2.1 Some changes evident in the rates of fatalities and severe injuries in the Forestry sector
- 2.2 WorkSafe understanding of safety issues aligned with industry
- 2.3 A change in practice expectations
- 2.4 Still some areas to focus on in the future

## 2.1 SOME CHANGES EVIDENT IN THE RATES OF FATALITIES AND SEVERE INJURIES IN THE FORESTRY SECTOR

The ultimate goal of the forestry programme is to reduce the number of severe injuries and fatalities in the sector. To understand whether or not there has been progress made towards this goal an analysis of ACC and WorkSafe data was conducted. The results are discussed below.

### FATALITIES

From the data below, we can say that there were an unusually high number of fatalities 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 occurring when a fatality occurred with 15 of the 27 fatalities between 2010 and 2015<sup>6</sup> having tree felling listed. This is followed by vehicles and machinery (seven) and breaking out (six).

### SEVERE INJURIES

For the purposes of this report, severe injuries are 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.

<sup>6</sup> Data for the 2016 calendar year will be available in March 2017.

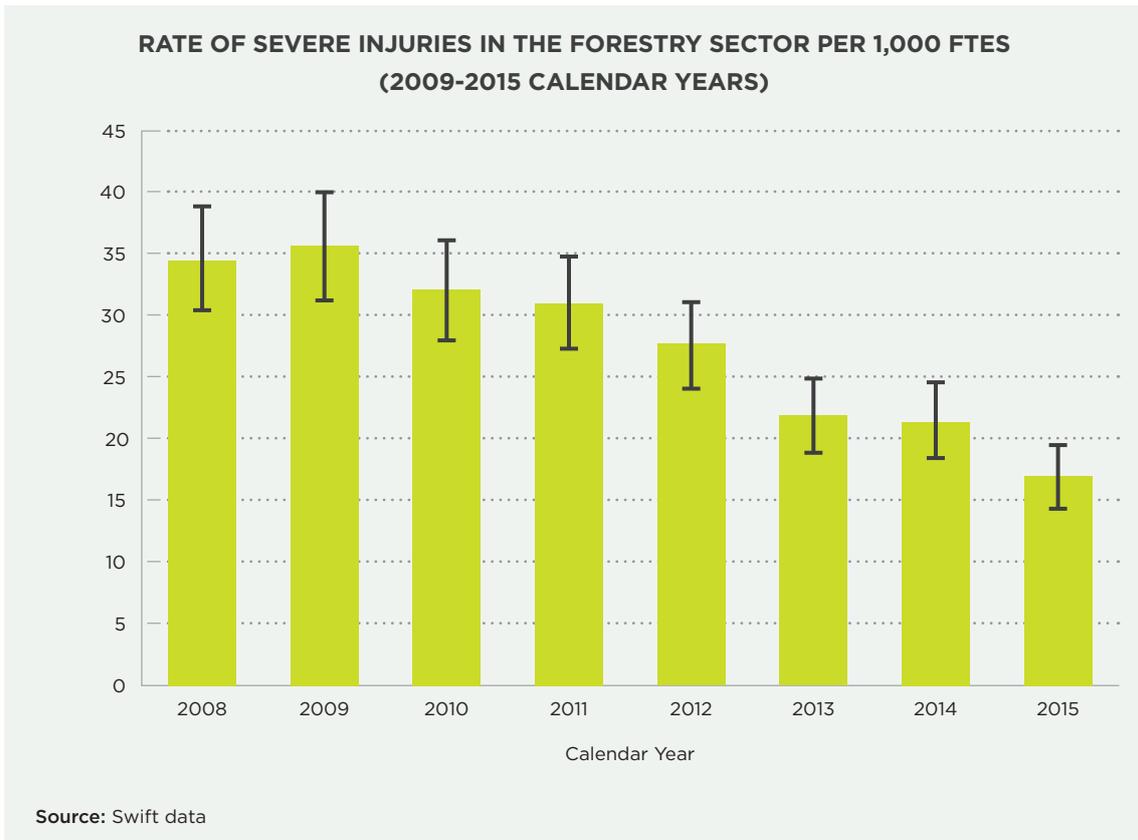


Figure 4: Rate of severe injuries in the Forestry sector per 1,000 FTEs (2009-2015 calendar years)

**NON-SEVERE INJURIES**

While the non-severe injury rate has been trending down since 2010, there was a statistically significant drop in the rate of severe injuries per 1,000 FTEs between 2014 and 2015 (see Figure 5).

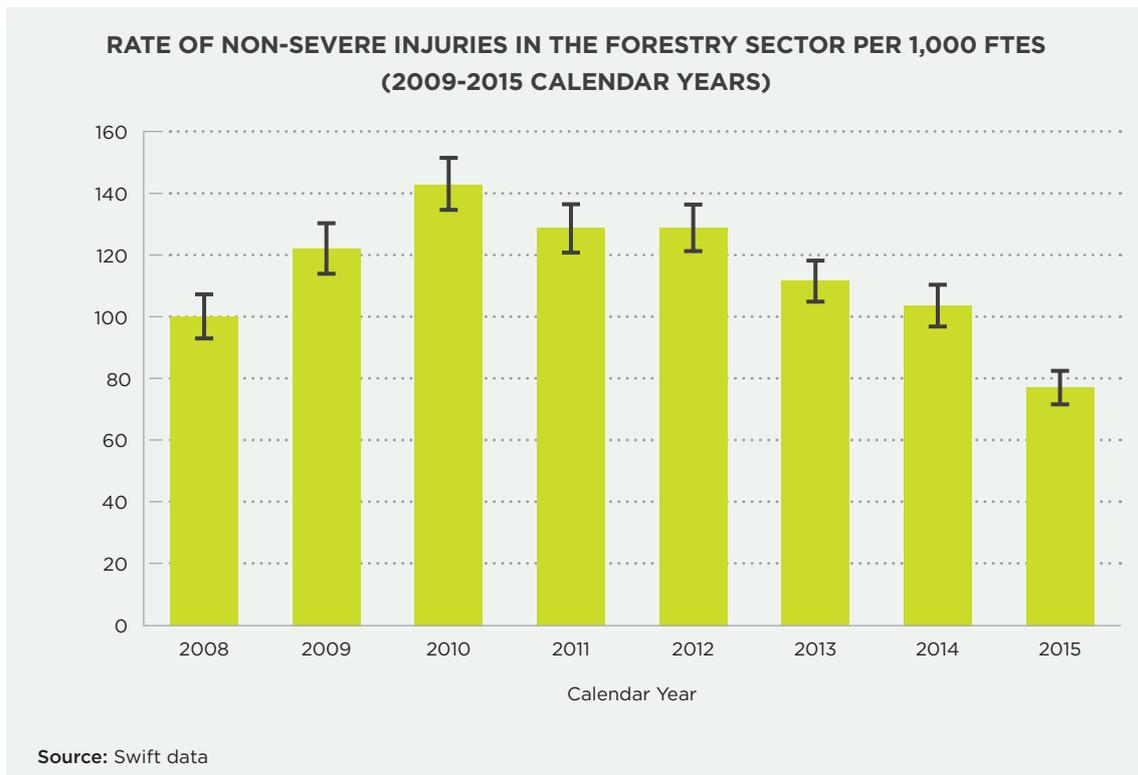


Figure 5: Rate of non-severe injuries in the Forestry sector per 1,000 FTEs (2009-2015 calendar years)

## 2.2 WORKSAFE UNDERSTANDING OF SAFETY ISSUES ALIGNED WITH INDUSTRY

All owners, contractors and crews were asked what the most common safety issues were that their staff faced. The answers given were consistent across the five regions and three groups, and also aligned with research findings from previous studies (see Slappendel, 1993; Thomas, Bentley & Ashby, 2001; Ashby, Bentley & Parker, 2002; Lilley et al., 2002; Ashby & Parker, 2003; Hide, 2015), as well as the areas WorkSafe have been focussing on, guided by the Government Response to the Independent Forestry Safety Review.<sup>7</sup> The areas of concern were:

- > breaking out
- > complacency of staff
- > drugs and alcohol
- > ego
- > fatigue
- > felling
- > individuals' headspace and mentality
- > poor planning

<sup>7</sup> 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](http://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)

- > production pressure
- > stacks of wood on the skid site
- > vehicles and machinery on site
- > visitors to site.

An area that emerged that has not yet received attention from WorkSafe is driving to and from work. This is an issue that is common to all industries, and will be a focus of the ACC and WorkSafe joint Reducing Harm in New Zealand Workplaces Action Plan. In terms of forestry-specific concerns, it was evident that both industry and WorkSafe are aligned in the issues they believe the industry faces.

### **2.3** A CHANGE IN PRACTICE EXPECTATIONS

The research found that there had been a clear change in the expectations of forestry owners and principals about health and safety standards for those in the corporate forest sector. The change in expectations of health and safety standards has led to changes in practice, including the introduction of new reporting practices and boosting of existing health and safety systems. These changes have been driven by corporate owners, managers and principals who have put pressure on contractors through the contracting process to implement these reporting practices and to conform to the legislative changes expected to boost the health and safety system. In turn, the contractors have engaged their workers in the process and raised their expectations of the importance of worker compliance to safer practice.

There was a clear theme in the interviews across sites, and roles in the industry, that there has been an increase in paperwork associated with new reporting practices. The increased reporting demands and paperwork as a subsequence of the new reporting requirements both on the part of WorkSafe, and corporate owners, managers and principals, was met with scepticism by contractors and their crews with the majority thinking paperwork does not bring about safer work down the hill or on the skid site. Both contractors and crews stressed that they worked in the sector because they wanted to do physical outdoor work and that most had left school because they hated the classroom and 'paperwork'. The changes in reporting for some had changed their jobs – or at least had taken away some of the pleasure that they had previously got from working in forestry.

Paperwork was not just seen as a burden but also as subsuming the work of inspectors, both contractors and crews thought that it was the key focus for WorkSafe inspectors who when on site checked the paper work but often did not go out on the skid, or down the hill to observe the crew working or to speak with crew. For some crew and contractors this was considered disrespectful – not going on the skid or down the hill to observe and converse with crew was the same as disregarding their work, their safe practice, and their skill. There was a clear theme that contractors and crews want to see more of WorkSafe inspectors out on the skid or down the hill, and not just looking over the paperwork of the crews. This also came through in the interviews with WorkSafe staff, who noted that whilst the practice guidance they had was that it was acceptable to check paperwork and if happy, to conclude their inspection there, they felt that paperwork didn't guarantee practice, and checking the site was still a necessary element of the inspection.

*What I'm finding right now, and I'd be interested to have those conversations with the other inspectors, is that the documentation sometimes has been completed but practically down the hill it's not been verified, they're not doing what they should be doing.*

---

#### **Inspector**

Crews were also very pleased to be interviewed and to be able to put their view forward. They were also, however, sceptical that what they had to say would be 'taken on-board' and thought that their views may be 'brushed aside'.

While much of the focus has been on improving documentation of practices (both by WorkSafe and owners and principals), there was also an increasing focus on practice, such as more regular auditing, and safe behaviour observations. Here, it was important to both contractors and crews that those doing the safe behaviour observations had some first-hand knowledge of forestry and the industry. A lack of this experience generated disrespect as they resented being told how to do something by someone who was relying on a guideline rather than first-hand experience. When engaged by someone with first-hand experience contractors and crews were more receptive to the behaviour-focused rather than the documentation-focused activity.

Amongst crews there was a strong focus on 'rules' and who made the 'rules' with many stressing that the changes for 'breaking out' were unrealistic and reflected the fact that the rule makers had no experience of working in forestry. As one crew member stated:

*...The rules are 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 (to) do a winter, a solid winter out here, and then see what they think of it.*

---

#### **Crew Member**

*...and break out with them for a few, you know, a couple of months...*

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

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#### **Crew member**

Here the crews, and in particular those who do breaking-out are referring to the requirement that they are two tree lengths away from the ropes before the hauling commences. All of the breaker outs stressed that this requirement made their job even harder as moving that distance on steep and debris covered terrain was exhausting and that the fatigue they subsequently experienced put them at risk of making bad decisions/mistakes. Some crews had put extra 'men on the slope' to address this, but all were of the view that this cost extra money as production was compromised, because the additional 'man on the slope' was taken away from another role in the crew. Compromising production was a theme for both contractors and crew; rules around observation while felling were also questioned - here both in terms of observation requiring

extra 'man' power, but also it meant that the observer's role was 'boring' and many believed all it achieved was putting somebody else (the observer) at risk.

### CHANGES IN PRINCIPALS/OWNERS

The biggest change in this area was seen with the corporate owners and principals. Owners and principals reported that they now discussed health and safety regularly, where they hadn't in the past.

*Well, I think there has been a lot of changes gone on. One is that it's now talked about a lot more. The health and safety is often, we've had meetings with companies and other people and it used to be only talked about the markets or this and that, but now the awareness of it is just raised.*

---

#### Owner

All those interviewed discussed experiencing a change in the expectations of owners and principals. It was reported there had been a noticeable change in the amount of documentation required. Contractors noted that rather than just needing to say they undertook safety meetings - such as tailgate meetings or monthly safety meetings, they were now required to take notes and have staff that were present sign the notes.

*I guess you'd have to say in general there was a heightened awareness of the need to focus on the detail, you might say...in the paperwork, because I suppose what became apparent for a lot of people was that regardless of what you've actually done, if it's not written down, you're going to get absolutely no credit for it pretty much. And that was a bit frustrating, that you could have several people say, "we did this and we did that" and it all sort of corroborates but if it's not written down, you wouldn't get any credit whatsoever for it.*

---

#### Principal

It was also clear that the frequency and depth of auditing had increased, with participants stating that representatives of owners and principals were on-site with crews at least once a week, with twice a week being consistent for most. During their time on site, representatives of owners and principals undertook regular safe behaviour observations, health and safety systems audits, training support, and more general quality control tasks.

*We're auditing our contractors all a lot more, and you know, (the inspector) has been saying that for years, he says, "don't go through their first aid kit and check if they've got enough bandages, you actually say, 'where's your first aid kit and when did you guys last check it?'"*

---

#### Owner

Additionally, principals and owners conducted more thorough quarterly audits, and held annual start-up breakfast sessions each year. These were designed to drive conversation about Health and Safety regularly so it remained a top of mind concern for workers.

There has been a strong push for mechanisation by corporate owners, particularly in the last few years. Nationally and internationally increased mechanisation for harvesting has reduced the need for large ground based crews and also reduced injury and fatality from falling objects, as the cabbed machines offer protection. Our research involved both ground based crews and crews that were heavily mechanised. It is very expensive to mechanise with machines costing in the vicinity of 1 million, contractors need to have some security of contract to raise the finance to purchase these machines. The corporate forest owners, managers and principals preferred mechanised crews. Mechanisation allows for greater production, reduces the need for a large labour force, provides protection for workers (eg from falling objects, exposure to ultra-violet light and noise exposure, vibration induced white fingers). However, mechanisation does not remove all risk; machines can roll over, machine operators lose fitness and can develop repetitive strain injuries. The increased pace of production can also result in fatigue amongst machine operators.<sup>8</sup> However, increased mechanisation is almost certain in New Zealand forests going forward. To support increased mechanisation owners were entering into longer-term agreements (some up to five years) so that contractors were able to access finance to purchase the machinery.

*We were heading in that direction but we were sort of encouraging, you know, you cannot force because of the level of capital investment and as well as the need to make it work on the ground. You know, you've got to take your contractors with you, but, I think we'd been taking that approach up until 2013, and then coming out of that, we felt that, right we know what works, it's not leading edge stuff, it actually is proven and it works so we decided we needed to change the approach and effectively mandate it.*

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**Owner**

Some owners and principals were using the tender process to drive better health and safety practice and recording, by incorporating a health and safety criteria to the tender evaluation process that privileged those with a good record. Previously, some contractors made it through the evaluation process though they still required improvement in the health and safety sphere, where now they do not as it was seen as too great a risk to the business.

*You know the good ones and the bad ones and the ones that are sort of close, and I thought, "oh well, if we work with them, we'll get them over the line," but we've ended up letting them go. So we're probably more selective now than we would have been five years ago.*

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**Owner**

Overall, the changes made by principals and owners have driven a reduction in non-compliant practices, but it has not driven an increase in good practice, which was only seen in some standout contractors. Some owners offered rewards and awards for good health and safety practice. This included things like reporting of near-misses being rewarded with a voucher, annual competitions between crews that included a focus on health safety, or a regional annual awards event that included an award for safety.

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<sup>8</sup> Axelsson, S.A. (1998) The Mechanisation of Logging Operations in Sweden and its effect on Occupational Safety and Health. *International Journal of Forest Engineering*, 9:2:1-8.

These changes were, in part, driven by the high number of deaths in 2013. Other factors that influenced owners and principals were a desire to be the best in the industry and the introduction of the new Act (Health and Safety at Work Act 2016). The new Act created an impetus for businesses to evaluate their compliance with the new legislation, particularly with the new liability detailed in the Act.

The number of deaths in 2013 had influenced owners to make changes for a variety of reasons. External to WorkSafe, the media attention and private prosecutions had played a role in influencing the behaviour of owners and principals. A number of owners discussed the bad reputation that forestry had and their frustration with this. There was a strong feeling amongst owners that this reputation was unfair (particularly when comparing the number of injuries and fatalities in forestry with other industries, such as agriculture and construction) and that this made it hard to attract young people into the industry. Many said that the mothers' of sons did not want their sons to go into forestry because it was too dangerous. A number stressed that this had led to recruitment problems and impacted also on the quality of candidates applying for positions to the point where even government departments, such as Work and Income, were only sending jobseekers that they deemed unemployable in other sectors/roles. This motivated them to make improvements so this image could be improved.

*I mean that perception that forestry's the last resort for people and that comes from the government down. You know, we've had WINZ people come into this room and talk about how when individuals, when they deem that they're no good for anything else, then they push them onto forestry courses...so that attitude does stem from the top down. And, you know, that's reflected in our schools and people's perceptions of the industry. We, most forest owners, agree that we'd like to attract a higher calibre of person to the industry but that's pretty hard to do that in an environment from government through to social welfare that if you going into that industry, all you're going to be is a chainsaw operator.*

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**Owner**

The approach WorkSafe took of increasing the number of assessment visits undertaken also had an impact. This was driven by concerns about prosecution, enforcement action, and lost profit due to work stoppages.

*The fact that WorkSafe started to put some emphasis on who was going to be responsible if things went wrong – that wasn't the only reason for it, but it definitely helped.*

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**Owner**

*I've done some wicked stuff, some absolutely out there, should-be-in-a-box scenarios, but that's just me, and probably some of the older generation that logged during the 90s, early 2000s. But with WorkSafe and everyone getting a bit tighter, and then 2013 just absolutely put the nail in the coffin. So from there, yep, I've seen a big shift in the health and safety culture, where guys have actually bought into it and starting buying into it.*

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**Supervisor**

Private prosecutions taken by the Council for Trade Unions (CTU) had raised the profile of health and safety issues in the sector and contractors in particular were concerned about how poor health and safety practice might impact on their business.

The research occurred during the very early days of the Forestry Industry Safety Council (FISC), at a time with the Technical Advisory Groups were just building their work programmes. While most principals and owners had a good understanding of FISC, with some involved in the Advisory Groups or sitting on FISC, the majority on contractors and crews had very little knowledge about FISC, with quite a few crew members not having heard of it. For those who had heard of FISC, they were looking for it to provide a voice for the industry and to establish what good practice looks like for small-, medium- and large-enterprises. At the point of the research, there weren't any reports of FISC having had an impact on practice yet.

## CONTRACTORS

The term contractors is used in this report to mean those who either own a forestry contracting business and employ workers, or those in a management position at the business. The research did not involve any sole trader contractors, and as such, all contractors were employers or managers of workers.

Contractor health and safety practice has changed, in particular for those who harvest corporate forests. Contractors and crews said that they were documenting their practice more than they had previously. Contractors and crews were most critical of the increased documentation requirements, stating that this did not guarantee the system and documented practice was occurring on the ground. They also felt that the paperwork was not only increasing in volume but in complexity to the point where a number of contractors were having to employ health and safety advisors to do the work, as they felt the knowledge required was so specialised.

*All the corporates, all they wanted to do was cover their asses basically and to me it's become a paper-world now. The more paper you can dot the i's and cross the t's on, the more likely you're going to survive out there, in some people's minds.*

*The practical side of things to me, the way I see it, if an inspector turns up and you've got 20 manuals all laid out, all signed off and that, he's really rapt...where we've been the other way, the practical side has always been very important to us because of our writing ability, mainly, and we just feel that nowadays, it's more important to have your i's dotted and t's crossed than it is to actually have the practical skills.*

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### Contractor

Contractors said that due to the requirements of corporate owners and principals, they were now putting greater effort into hazard identification, and near-miss reporting. This was also evident in the 2015 Health and Safety Attitudes and Behaviour (HSAB) survey, where there was a significant increase in workers who said that management report hazards, near-misses and accidents to workers between 2014 and 2015 (HSAB survey) and a significant increase (from 48 to 61 percent) in workers who said that a hazard was written into the hazard register or board once noticed from 2014 to 2015 (HSAB Survey).<sup>9</sup>

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<sup>9</sup> Note, this survey was undertaken prior to the change in legislation focus from hazard to risk.

Tailgate meetings at the start of each day, monthly health and safety meetings across the business and annual safe start meetings (usually across an entire forestry company) were ways that contractors were delivering messages about good health and safety practice, and the hazards identified on sites. Contractors consistently said they had increased the use of these mechanisms and that these had become business as usual. This was supported by findings in the 2015 HSAB survey that found significant increases in a number of measures of participation. These are outlined in Figure 6. Though numbers did not significantly increase from 2014, 88 percent of workers said that they had regular health and safety meetings in the 2015 HSAB survey.

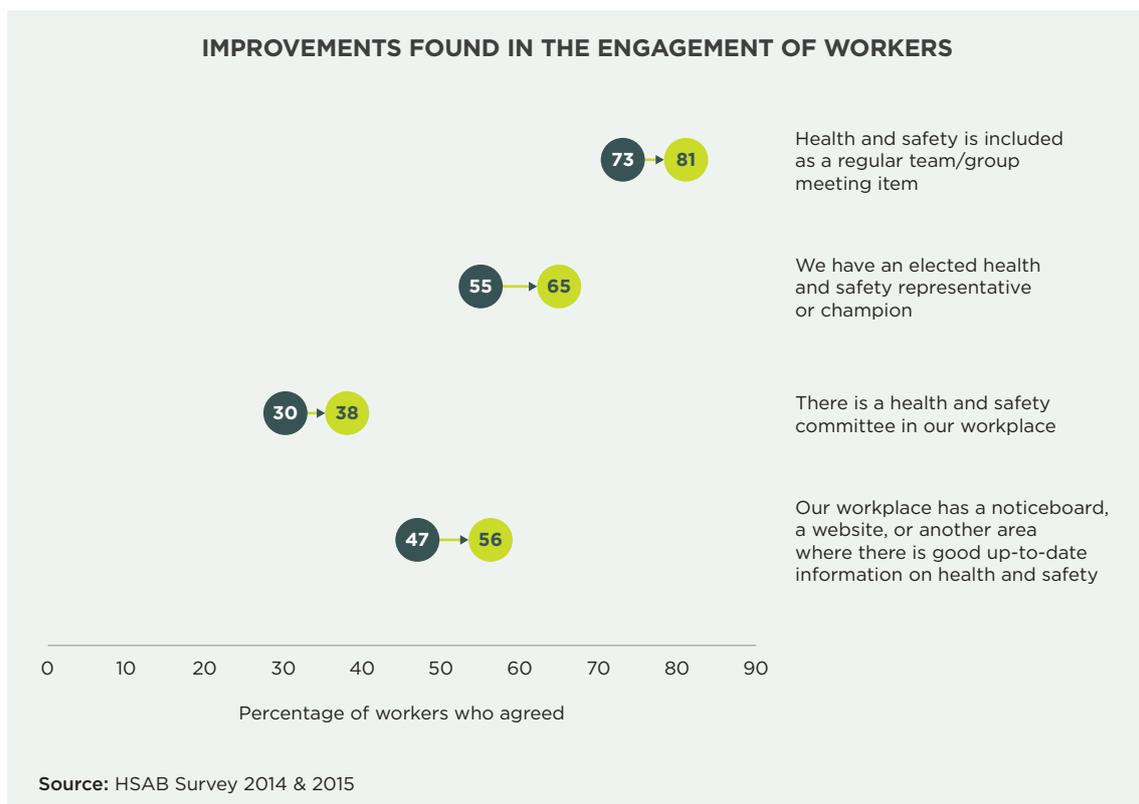


Figure 6: Improvements found in the engagement of workers

In addition to delivering health and safety messages themselves, contractors also discussed the use of training in improving health and safety. One of the ways that a person can be deemed competent to undertake a task is to achieve the related unit standards for that task. Contractors discussed getting formal training done for their tree fellers and breaker outs in particular, as these were viewed as the most dangerous tasks. The training is not health and safety specific, but contractors stated that most courses included how to do the tasks safely as part of their curriculum as this was part of doing a task well. In support of this finding, more workers reported having had training in the previous six months in 2015 than in 2014 (HSAB survey).

As well as reporting a desire to make the industry a safer place and ensure their staff went home safely, much of the motivation to do this work came from the pressure exerted by WorkSafe and the forest owners and principals. The private prosecutions taken by Helen Kelly and the Council for Trade Unions (CTU) also influenced owners and principals as it increased apprehension of litigation and accountability for contractors.

Contractors in small-scale forestry reported a different experience to those in the corporate forests. In particular, they discussed the impact of not having access to the corporate forestry health and safety systems, and the way in which this made health and safety a much more difficult aspect of their work.

*Not having a Principal and just trying to understand all the jobs that I should be doing. I wish I just had a tick list, that someone could come along and just go "This is the stuff that you need to be doing as a Principal" tick yes, I've done this, tick no, I need to do this. I wish someone was there to tell me what*

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#### **Contractor**

Added to this, they felt the scale of their business meant, they didn't have the extra resource to handle all the required documentation and to ensure the business understood their obligations, particularly with the new Act coming in. In spite of these challenges they were having tailgate meetings, recording near misses and encouraging their workers to say 'no' if they felt a request to do something on site was unsafe.

#### **WORKERS**

Workers had noticed changes in how health and safety was being addressed by their employer. They had tailgate meetings and were aware of the increase in paperwork to complete and an increase in auditing of their behaviour. The changes were driven by their employer (the contractor) who they perceived to following directions from the forest owners and or fear of prosecution from WorkSafe. These changes in practice were not entirely viewed positively; many thought that it was an unfair burden on the contractor – who was 'carrying the cost of health and safety'. As outlined above, many also thought that some of the new 'rules' were made by people who had no experience of working in the bush.

We asked crews whether they would stop a co-worker from doing something dangerous and many said that they would be reluctant to do this, particularly if the co-worker was more experienced and or senior to them.

*That's still a boundary; I think even in this crew a little bit it's still a boundary. I mean it'll get said, but if that fella's got no ears and still jumps in there with his gumboots and his red bands on and just carries on cutting you know, well.*

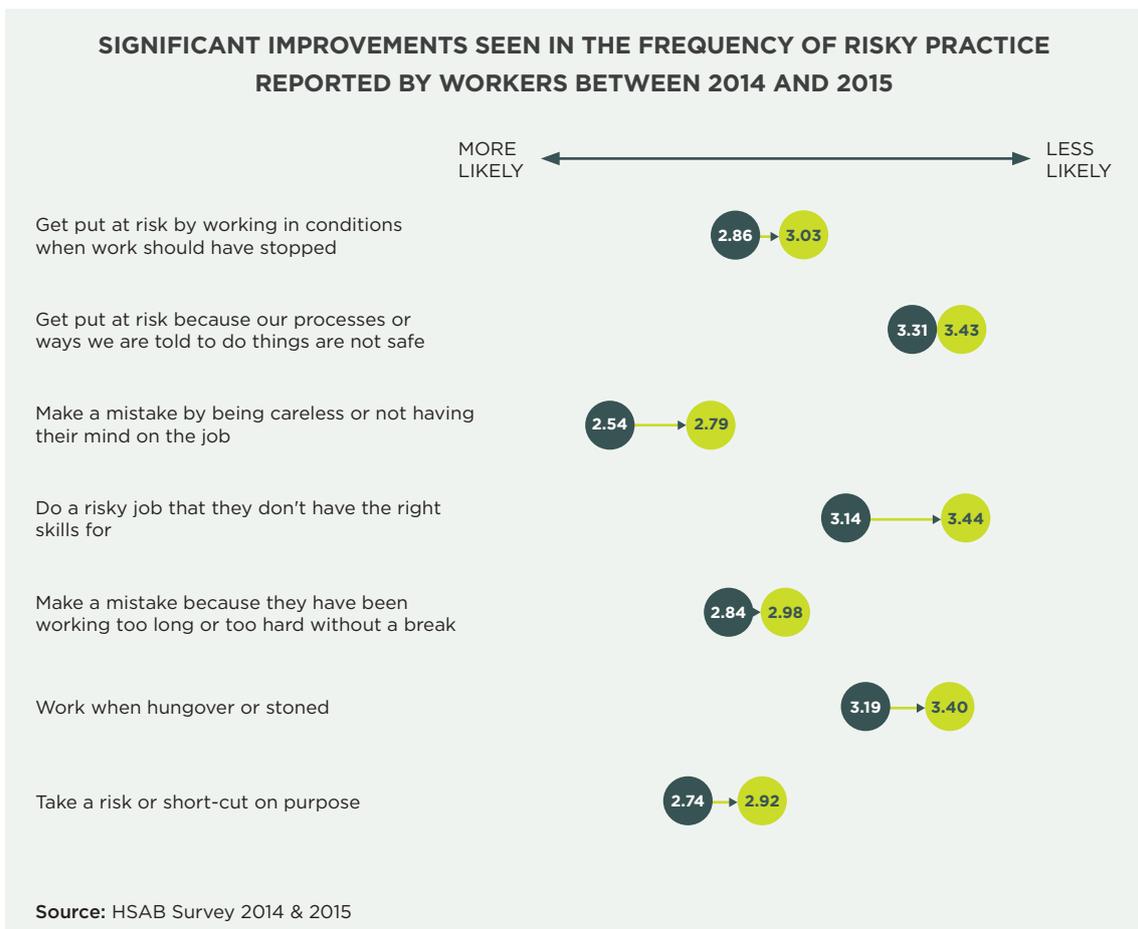
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#### **Worker**

Some crews had been told it was their responsibility to stop a co-worker if they were being unsafe, and that if they said nothing and their co-worker was injured or killed, they would be held personally liable for the incident. For some workers, this had the effect of pushing workers to stop unsafe acts, but for others it meant they were more likely to keep out of these types of discussions for fear of repercussions if their warnings were ignored.

When asked about participation in health and safety, most crews said they could raise site-specific issues at the tailgate meetings, but this was typically the only forum at which they expressed health and safety concerns. There were some standout crews who had health and safety committees and/or health and safety representatives. In these instances crews felt they could have input into policies and processes.

While there appeared to be room to increase the good practice, it is apparent that there has been a reduction in the amount of risky or poor behaviour in terms of Health and Safety. Data from the HSAB survey shows that there have been significant decreases in some risky behaviour at work (see Figure 7). In terms of improvements in the way managers are behaving, workers are reporting they are less likely to get put at risk by working for too long, or in poor conditions, or being told to undertake unsafe work or work they don't have the right skills for. In terms of workers' behaviour, they're reporting they're less likely to make a mistake from being careless or not having their mind on the job, work when hungover or stoned, or taking an unnecessary risk or short-cut. These changes from 2014 to 2015 are promising and show that there is some impact on the ground of all the work being undertaken to improve health and safety in forestry.



**Figure 7:** Significant improvements seen in the frequency of risky practice reported by workers between 2014 and 2015

Much of the changes seen in workers were driven by the expectations of their immediate employer – the contractor; and for those contractors working in corporate forests, the owners/principals had also driven change. Visits from inspectors also factored into their behaviour. The HSAB survey found a significant increase in workers who expected to see an inspector in the next year (between 2014 and 2015). This was also discussed in the interviews and focus groups with crews, who said they had noticed that WorkSafe was on their sites more often following 2013.

## **2.4** STILL SOME AREAS TO FOCUS ON IN THE FUTURE

### **SMALL-SCALE FORESTRY**

While a lot of health and safety documentation and system change is evidently seen in the corporate forestry sector, there is still room to improve in terms of those operating on the smaller-scale forestry lots. This improvement in large part is dependent on these small businesses finding the capacity and capability to respond to the new legislation and need to monitor health and safety for their workers. As with many small businesses this represents a significant burden and health and safety to-date is not considered a priority relative to the priorities of securing tenders and on-going work in the sector. This is an area that WorkSafe and FISC could address in future work. There were some contractors working in small-scale forestry who had made significant improvements to health and safety practice; however, this was the exception rather than the rule.

Small-scale forestry is addressed more fully in the report: [A Different Kettle of Fish: Small and Medium Scale Forests](#).

### **EMBEDDING A CULTURE OF SAFETY**

A theme of the research was that there was a strong culture of compliance across forestry, but not one of safety and even less so, health. As with much of the other themes in this report, there were some standout crews and owners where work on embedding a culture of safety was being undertaken. However, there were also a large number of crews and contractors who saw the health and safety changes as compliance activities that detracted from productivity. More work is needed to illustrate how health and safety benefits contractors, crews and productivity and building a culture of safety within crews.

### **WORK-RELATED HEALTH**

Related to the above point, work-related health was an area where the industry was operating at a rudimentary level – if businesses were addressing health, it was through annual or biennial health checks that focus on a combination of blood pressure, blood sugars, eye sight, lung function and hearing. It was evident that currently, much of the health and safety practice was focussed on safety, but in light of the new legislation, some contractors were starting to consider their obligations with regard to health. This is an area where knowledge of issues is comparatively low and contractors and owners reported wanting more guidance.

Work-related health is discussed in greater detail in the report: [“Healthy on the outside, sick on the inside”](#): [Work-related health in forestry](#).

### NUMBER OF INSPECTORS

A common theme emerging from the interviews and focus groups was that there had been a noticeable increase in the visits to site by inspectors, but this was still viewed as relatively sparse. WorkSafe data showed that there were 16 inspectors across the country who had undertaken more than ten inspections in forestry in 2015. This compares with over 400 crews, making a ratio of one inspector to over 25 crews. On the surface, these numbers may not seem high but the crews are large distances from WorkSafe offices meaning inspectors have long days and can only visit one crew each day. With crews requiring multiple visits to follow up, this can mean inspectors are only able to visit a crew once a year or less. Industry members were aware of the vast areas covered by inspectors and the relatively few numbers available. As an employer and regulator of health and safety, the number of inspectors operating in the forestry sector is a matter that WorkSafe should consider as there was evidence of it having a detrimental impact on both inspectors (in terms of workload, time spent travelling to sites, and ability to build relationships with crews in their designated areas) and industry's access to WorkSafe for proactive purposes.

### BETTER INFORMATION ON INCIDENTS

Crews, contractors and owners were interested in getting better and more timely access to information on injury and fatality incidents from WorkSafe to inform their practice. They suggested that they would like to see WorkSafe staff providing information on the day of, or on the day following an incident. This was viewed as a chance to get accurate information out. Those who wanted this information were cognisant of the reality that there are legal and temporal restriction to what could be reported and when, but they felt that any information would be better than the informal information channels that currently exist, such as truck drivers radio chatter and social discussions between crew members.

### TRAINING

Training is another area that was frequently raised as being an issue for the forestry industry. Access to quality training that covered relevant topics to the standard required was seen as a problem in some of the regions visited. Many of the corporate forests, and crews working within these, had brought in their own trainers or built a training programme internally. However, this is not an option for all contractors, and this is an area where FISC and WorkSafe could contribute to in future work.

Training is discussed more fully in the report: [If your pay's not going up, you're not going to progress anything – why would you stick around?": Training and workforce development in forestry](#)

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**CONCLUSION**

**The injury data clearly shows a marked improvement in injuries since 2013. Severe injuries have been trending down since 2010, and non-severe injuries have significantly decreased since 2013.**

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There were an unusually high number of fatalities in 2013, but since then numbers have returned to pre-2013 levels and below.

The forestry programme, in collaboration with industry, has been instrumental in a number of significant improvements in the health and safety practice of those in the industry. This research found evidence that much headway has been made in terms of addressing poor practice. However, there is still room for improvement in terms of increasing the incidence of good practice. There is evidence of more regular tailgate meetings each morning and monthly health and safety meetings, both of which improve communication in teams and allow for the regular transmission of health and safety information. Some standout contractors also have health and safety committees, where staff are able to participate in the formulation of policies and processes. Others incentivise good health and safety practice through the use of rewards, such as time off or bonuses. However, these remain the exception rather than the rule.

All those interviewed were eager to see more of WorkSafe on their sites, and a strong theme was that they would like to see the inspectors out on the skid site and down the hill more and engaging with the crew. A common issue that workers and contractors had was that the inspectors reviewed health and safety documentation, but would usually not go beyond this and observe what was happening on the site. For these contractors and crew it was a sign of respect to observe the work – and also for inspectors to have the opportunity to provide positive feedback on good practice. This finding is important given that currently inspectors believe they should check documentation and if satisfied with it, not to proceed further. While this may save time, it may also, overtime, undermine the engaging and educating component of the inspectorate role and undermine buy in for real change for those on the ground.

Contractors and crews consistently stressed the importance of having inspectors in the sector that had first-hand experience of forestry. Without this it was made clear they would have no credibility with anybody. Older contractors and crew stressed that inspectors needed to know what it was like working in the bush and to have had first-hand experience of felling and breaking out.

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## **APPENDICES**

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### **IN THIS SECTION:**

**Appendix A: Methods**

**Appendix B: References**

## 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.

**INTERVIEWS WITH WORKSAFE INSPECTORS AND ASSESSMENT MANAGERS**

WorkSafe staff and managers who interacted with the sector over the period were invited to discuss the changes they made to their practice, the changes they became aware of through assessments and investigations, and any other differences in the discussion or attitudes they witnessed during the research period.

**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.

**APPENDIX B: REFERENCES**

- Ashby, L., Bentley, T., & Parker, R. (2002) 'Felling injuries: An exploratory analysis of logging tasks and safety,' *Centre for Human Factors and Ergonomics Report*, 3: 3
- Ashby, L., & Parker, R. (2003) 'Factors contributing to injury - results of case study interviews,' *Centre for Human Factors and Ergonomics Report*, 4: 8
- Boon, Jan., Ours Jan, C. (2006) 'Are recessions good for workplace safety?' *Journal of Health Economics*, 25, 1069-1093
- Hide, S. (2015) 'Logging accidents and injuries: Literature review of systems failures, contributory factors and sample international interventions,' *Report for WorkSafe NZ*, Wellington, 79p
- Lilley, R., Feyer, A-M., Kirk, P., & Gander, P. (2002) 'A survey of forest workers in New Zealand: Do hours of work, rest and recovery play a role in accidents and injury?' *Journal of Safety Research*, 33: 1, pp 53-71
- Ruhm, C.J. (2000) 'Are recessions good for your health?' *Quarterly Journal of Economics* 115, 617-650
- Slappendel, C., Laird, I., Kawachi, I., Marshall, S., & Cryer, C. (1993) 'Factors affecting work-related injury among forestry workers: A review,' *Journal of Safety Research*, 24: 1, pp 19-32
- Thomas, L., Bentley, T., & Ashby, L. (2001) 'Survey of the health and wellbeing of workers in the New Zealand forestry industry,' *Centre for Human Factors and Ergonomics*, 2: 5

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