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**Skill mismatches and worker shortages in the New Zealand
arboriculture industry**

A thesis presented in partial fulfilment of the requirements for the degree of

Master of Business Studies

at Massey University, Albany, New Zealand

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2021

Acknowledgements

Throughout the writing of this dissertation I have received a great deal of support and assistance.

I would first like to thank my supervisors Jim Arrowsmith and Ralph Bathurst for their guidance, encouragement, and patient discussion of all aspects of this thesis.

I would like to thank my friend and employer Luke Cabrol for the flexible work arrangement which made this project possible and ongoing discussion regarding the practical application of the findings.

From the arboriculture industry, I thank Mark Roberts and Asher Bowyer for the introductions, enthusiasm and assistance in survey distribution and locating interviewees. Dale Thomas for organising my speaking slot at the 2020 national arboriculture conference.

Thank you to my parents Alec and Cheryl Isaacs for their support, encouragement and enthusiastic discussion of various aspects of the study. Alec spent a great deal of time proof-reading drafts. My good friend Cameron Hall for his valuable assistance in helping me navigate some of the economic aspects of this study. Melanie Marnet for her support and understanding throughout the writing process.

Finally, I would like to thank all those who gave their time to be surveyed and interviewed.

Abstract

There seems to be endemic shortages of skilled arborists in New Zealand. Economics largely treats labour shortages as a matter of wage with price determining the allocation of goods including labour. However, sociological and work psychology literature suggests working conditions and how people are treated by managers and the public may be important factors, especially in keeping employees. This study aims to explore factors that contribute to recruitment and retention difficulties with respect to skilled arborists.

An online survey was distributed via the industry association followed by 11 qualitative interviews directed toward a mix of both workers and employers. Participants were questioned about their experiences with the field arborist role, both positive and negative, as well as how they thought the occupation could be improved. Upon completion of the initial analysis a second round of 4 confirmatory interviews were carried out.

The findings suggest that the wage rates for skilled workers may be artificially low due to structural features such as intense product market competition, the dominance of small firms, and a lack of sector organisation by workers or firms. Supply is also limited due to the demanding nature of the work and insufficient training, as well as recent restrictions on overseas labour. However, this study also suggests that a focus on low wages as the cause of recruitment and retention problems provides an incomplete account of the problem. This is because low pay also contributes to skills mismatch in terms of labour deployment, reducing the intrinsic satisfiers associated with the role and subsequently pushing many workers into self-employment. This

increases quantities of small and often unprofessional firms, while increasing competition for work and staff.

Increased coordination of the industry to improve the wages and conditions of the field arborist role would provide benefits for both workers and employers. Fair Pay Agreements could be a mechanism for achieving this. I suggest, in that this process should be initiated by the firms themselves in the interest over overcoming the skill shortage and need not be driven by a union. Future study should take the form of action research documenting the implementation of this process.

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1. Introduction

In this chapter I introduce myself and what led me to this exploratory study. I provide a brief outline of how the industry works and some of its defining characteristics, concluding with a rationale for why this research needed to be done.

1.1. Motivation for the study

Over a period of around 6 years I was the managing director of a small arboricultural firm operating in Auckland's residential market and employing up to 8 people. While initial growth was quite rapid, staffing was always a problem. Arborists willing to work as employees were very difficult to find. Limited numbers of skilled staff seemed to be the main factor which prevented my firm from growing beyond a small size. This led to high levels of stress and frustration. Eventually, I sold the business and transitioned to an individual contractor role within the industry.

Since then I have wondered where I went wrong. Was there a better way I could have run my firm with respect to staff? Why do so many of my fellow small business owners talk about similar experiences? Why are employable arborists so difficult to find? My reading on the subject, including academic sources, failed to provide satisfactory answers or workable solutions. It was this frustration which led to this study. Upon commencing this project I returned to my old firm and gained employment as a full-time climbing arborist, the very position that was so hard to fill in my firm.

1.2. The arboriculture industry and occupation

The lack of an official definition regarding what constitutes an arboriculture is a potential source of problems. Worldwide, there are limited statistics regarding the industry as the profession is not well defined (Ball & Stimson, 2019). The New Zealand Arboricultural Association (NZArb) define an arborist as “Professional men and women who undertake the practice, planning and care of trees”. The daily activities of an arborist are listed as “tree maintenance, tree removal, planning and reporting, transplanting and planting, storm damage, pest and disease identification and management, and hazard and risk management” (New Zealand Arboricultural Association, 2019). Therefore, I will define an arboriculture firm as a business whose primary source of revenue is derived from one or more of these activities.

While there is an industry code for an arboricultural service (N731310) there is no published data as it is merely a subset of gardening services (N731300) and Statistics New Zealand does not drill down beyond this classification. However, according to the census 1614 wrote their occupation as “arborist” in New Zealand for 2018. (N. Saeed, Statistics New Zealand, personal communication, April 6, 2020).

The focus of this study is the shortage of climbing field arborists. The term field arborist refers to the manual workers who perform arboriculture activities and was taken from Bardekjian’s (2015) Canadian study. The term is not widely used in New Zealand with the *Australian and New Zealand Standard Classification of Occupations* (ANZCO) and the industry in general, simply

referring to this group as ‘arborists.’ – However, I thought ‘field arborists’ better distinguished the manual worker group from others such as consulting arborists and arboricultural managers who could also be labelled arborists in official and industry accounts.

The arboriculture industry is unique in many ways. It is undoubtedly blue collar with the majority of tasks being highly physical. When it comes to trimming or pruning there is a significant degree of craftsmanship involved and evidence of poorly executed work can remain apparent for many years, indeed some trees may never fully recover from improper pruning. There are also many aspects of the work which rely little on craftsmanship yet require a degree of skill to be done safely, such as when a tree is being entirely removed.

The main difficulty in describing how this industry operates is the fact that it is split into two main segments: Municipal and private. Municipal work would include large-scale contracts such as maintaining trees along road, rail and power line networks as well as council parks and similar areas. In New Zealand this part of the industry seems to operate as an oligopoly with the main contracts held by a small group of large firms. The exception to this is in some smaller towns and centres where no large firms exist. Due to the localised nature of arboriculture, municipal work in such areas must be carried out by smaller firms. Private work tends to be predominantly small-scale, residential jobs at people’s homes but can also include extensive work for commercial clients.

The main product that an arboricultural firm sells is the efforts of its workers, making labour the primary unit of production. Although these firms have trucks and machinery, the purpose of such equipment tends to be to maximise labour productivity rather than being a stand-alone item rented out alongside the labour product. When jobs are quoted (at least for residential work) labour and machinery costs are usually combined rather than itemised.

All field work tends to be done by a crew which generally consists of two or three people, one of which is crew leader or foreman. In a very small firm the crew leader will be the firm's owner. The small minimum effective size of such firms helps make entrepreneurship an attractive option for industry participants (Laguir & Den Besten, 2016). In such a situation the owner is in the ideal position to lead the team as he or she is working alongside them. As firms grow I observe many owners moving to more of an operations management role where they will plan the work and dispatch a crew or crews to complete it. Here they switch focus from maximising their own labour productivity to managing someone else's, a somewhat more challenging leadership scenario due to the lack of direct supervision.

Crews usually comprise of two or three people as this allows them to fit into one truck and tends to be an appropriate number to carry out most jobs efficiently. Maximising labour productivity while maintaining safe work practices is the goal. With too many or too few people, inefficiencies are created by forcing people to wait between work processes. This is because much of arboricultural work is made up of conjunctive tasks, which cannot be completed until each member of the group has completed their portion of the job (Steiner, 1966). For example,

when dismantling a tree the climber must not drop branches more quickly than the ground staff can clear them away. An individual branch by itself at the base of the tree is much easier and faster to clear than if it was sitting upon and tangled amongst other branches. The more branches that are added to this tangle, the more difficult they are to move. Therefore, in this situation, the effectiveness of the crew members clearing the branches is the limiting factor. If clearing the branches proves especially time-consuming, then an experienced climber might try dropping branches in smaller pieces which, whilst being more work for the climber, will make clearing them faster, therefore reducing the time for the whole task.

Crews must be equipped for a wide variety of jobs and will often complete several types in one day. It is the wide variety of required skills that give arboriculture a higher overall skill-level-rating than similar, more standardisable industries such as forestry (Hoffmann, 2004).

Arboriculture tasks are complex and cannot be planned in detail from a distance, thus knowledge must be localised within the crews carrying out the work (Thiel, 2007). Returning to the branch dropping example, the climber must make constant adjustments with respect to each branch cut. Multiple considerations must be taken such as: How heavy is the wood? How tangle-prone are these sort of branches? How strong and how many staff are clearing the branches below? Is it faster to cut smaller sections from the tree or drop larger sections to be cut up from the ground? Is it worth risking damage to the fence for the amount of time skipping the rigging step its likely to save? The answers to many of these questions can only come from experience and tacit knowledge that cannot be taught in a classroom.

1.3. Need for research

The present skill shortage in the arboriculture industry has been evident for a significant time, predating my own entrance into the sector around 14 years ago. The occupation was added to Immigration New Zealand's skill shortage list in the early 1990s but this reportedly made little difference (David Glenn, the arborist who organised the occupation's addition to this list, personal communication, July 2019). Furthermore, a shortage of skilled arborists is said to be a worldwide phenomenon (J. Oikawa-Radscheit, Technical Officer for International Arboricultural Affairs, European Arboricultural Council, personal communication, June 2020). A recent survey of NZArb members identified addressing the industry's skill shortage, as one of three key areas that the association needs to address, along with improving industry-wide professionalism and public awareness about the value of trees (Melville, 2018). However, the subject of skill shortages in the arboriculture industry has not been formally studied either in New Zealand or overseas. Firms have reacted to the problem with predominantly quick-fix and individualistic solutions such as a heavy utilisation of migrant workers, yet the underlying causes of the shortage appear to be insufficiently understood.

Orthodox economics tend to present skill shortages in terms of market failure. For example, prices (wages) failing to respond to insufficient supply. More sociological accounts explore issues such as poor management, limited career development, worker stigmatisation or other intrinsic factors such as limited opportunities to apply accumulated skills. These issues relate to structural characteristics such as firm size. Therefore, research was needed to explore how such

insights might fit with the reality of worker and employer experiences with the field arborist occupation.

2. Literature Review

This chapter outlines what is known already about skill shortages and how they relate to the labour market. I examine the aftermath of economic reform and the weakening of trade unions in New Zealand during the 1980s. From here the conditions of the job are examined including problems associated with physical work and aging, as well as societal stigmatisation of blue collar occupations and how this relates to vocational training. Finally I look at small business and entrepreneurship, including potentially negative aspects such as stress and burnout.

2.1.Skill Shortages

Healy, Mavromaras, and Sloane (2012) use a definition from the Australian Bureau of Statistics to define a skill shortage as “an insufficient supply of appropriately qualified workers available or willing to work under existing market conditions” (p. 10). Richardson (2007) suggests the following classifications for skill shortages (p. 7):

- Level 1 shortage – There are few people who have the essential technical skills who are not already using them and there is a long training time to develop the skills.

- Level 2 shortage – There are few people who have the essential technical skills who are not already using them but there is a short training time to develop the skills.
- Skills mismatch – There are sufficient people who have the essential technical skills who are not already using them, but they are not willing to apply for the vacancies under current conditions.
- Quality gap – There are sufficient people with the essential technical skills who are not already using them and who are willing to apply for the vacancies, but they lack some qualities that employers consider are important.

Which of these categorisations best describe the skill shortage in arboriculture is an important question because this dictates the kind of action needed to correct the problem. The term skill shortage seems to be used interchangeably with the term labour shortage (Richardson, 2007).

Based on survey data from small and medium businesses in Australia, Healy et al. (2012) diagnose the primary cause for skill shortages as a specialist knowledge requirement. Other causes include recruitment being too slow, wages being too high for businesses, a lack of adequate training and the geographic location of the business. The most common response to these shortages was found to be an increased utilisation of existing workforces by increasing hours. This was followed respectively by additional subcontracting, increased internal training, reduced output, increased wages, short-term employment contracts and an increase in external

training (Healy et al., 2012). It is important to note that due to the dataset used in the Healy et al. study they were unable to identify instances where migrant labour is used as a solution.

Healy et al. (2012) make several observations regarding the likely outcomes of skill shortages. An important outcome is that it increases the bargaining power of skilled workers. They also note that the number of unskilled workers in a firm increases due to substitution—where a less skilled worker is used in place of a more skilled one. A final, somewhat counterintuitive finding by Healy et al. (2012) is that complex skills shortages do not appear to be correlated with profitability and so far have not been shown to have a discernible effect on performance.

Lobo and Wilkinson (2008) provide an analysis of skill shortages within the New Zealand construction sector. The construction sector is heavily researched compared to arboriculture and shares a number of traits, such as being restricted to purely local markets that prevented industrialisation (Hoogenboom, Kissane, Prak, Wallis, & Minns, 2018) and tacit knowledge requirements that limit the utility of deskilling (Thiel, 2007). The authors note several causes identified by the New Zealand Department of Labour. These include a drop in numbers entering the trade, low numbers completing the necessary qualifications relative to those already in the trade, a net outflow of migrants during the 1990s, an upturn in the construction sector, and a lack of appeal for the job due to factors such as poor wages and working hours. The firms which make up the participants in the Lobo and Wilkinson (2008) study relied primarily on immigration, followed closely by substitution as their primary means of tackling the skill shortage. Many identified the main problem as a need to increase training. However, the authors

note that simply increasing the number of training positions would not address the problem of low training completion rates. Lobo and Wilkinson (2008) point out that skill shortages lead to a lack of firm growth. The solution proposed is a collaborative effort between government, industry and education similar to what can be seen in coordinated market economies such as Germany.

Clarke and Wall (1998) identify self-employment as a key cause of skill shortages within the construction industry in Britain. Additionally, they note a lack of appropriate training and difficulty attracting people to the industry due to poor conditions and pay. The authors also look closely at training and note a variable quality and fragmentation among training organisations. Clarke and Wall (1998) and Wall (1998), along with Lobo and Wilkinson (2008), identify drawing upon some of the successful elements of the vocational training systems in European countries such as Germany.

Briscoe (1990) describes the situation in the United Kingdom's construction sector during the 1970s and early 1980s. Conversely, the concern over this period was with large-scale unemployment and in 1984 the Economic Development Committee's (EDC) Skilled Manpower Steering Group declared, along with other commentators of the construction industry, that skill shortages were unlikely to be a problem in the near future. However, despite limited growth of the sector, just two years later there was widespread concern regarding shortages of construction skills. Briscoe (1990) continues to describe a trend toward poaching of workers with difficult to obtain skills and subsequent problems with training due to high levels of self-employment and

labour-only subcontracting. He concludes in a similar fashion to Clarke and Wall (1998) and Lobo and Wilkinson (2008) that perhaps much can be learned from the vocational training systems of France and West Germany.

Cappelli (2015) takes a slightly more pessimistic view of skill shortages stating that there is not necessarily a shortage just because an industry complains of one. He suggests that many employer problems to do with hiring are actually self-inflicted, for example, they could be caused by inadequate pay or training. Hiring might appear more difficult now because shorter tenures mean much more of it must be done. Finally, he critiques the common complaint that students are not enticed to pursue certain fields such as manufacturing by pointing out that while pay for such jobs has declined significantly, the skill requirements have moved toward computer use which is a field with higher pay. In other words schools do not advocate for these kind of programs because in large part they are not considered worth pursuing. Many of Cappelli's observations such as low pay and schools not advocating for programs, appear in arboriculture too and agree with Richardson's (2007) definition of a skill mismatch.

Mavromaras, Oguzoglu, and Webster (2007) outline a more direct connection between wage-rates and skill shortages, stating that if skill shortages persist over time without causing wages to increase, the wage-setting mechanism should be examined. They distinguish between efficiency-enhancing wage rises where increases are in response to labour supply conditions, and deleterious rises driven by other factors. Efficiency-enhancing increases are useful whereas deleterious ones tend to have a negative impact on the economy generating inflationary

pressures. Importantly, suppressing both types of increase is undesirable from an economic perspective. The authors identify that in general, the outcomes of skill shortages are largely dependent on the level of constraint within the labour market. For example, if wages were to increase in an occupation in which there was a deficit supply of skills, the presence of non-economic forces such as trade unions or institutions which define relative pay, would be expected to result in deleterious wage increases across adjacent occupations. The overall message from Mavromaras et al. (2007) is that wages should increase in occupations suffering a skill shortage. Richardson (2007) states this explicitly in her description of how the labour market works,

There is no fixed quantity of any particular skill supplied to the economy; nor is there a fixed quantity demanded. Rather, supply will rise as the terms of employment become more attractive; and demand will fall as the costs of employing people with particular skills rise. These are the conditions necessary for the forces of supply and demand to work through the market to solve the problem of a shortage (p. 22).

Her suggestion is that the labour market operates by supply and demand, just like any other market, with wages affecting the supply side and costs of employing affecting the demand side. Richardson states that a major reason wage increases are generally the last remedy any firm considers is that it increases the cost of everyone already employed, not just new recruits. However, in addition to wages she also observes that the future prospects of the position are very important. Expanding sectors, such as new technologies, are much more attractive employment

opportunities than sectors in decline such as the trades, even if wages are similar. In other words, employers do not need to pay as much to ensure adequate supply, if the job leads to something.

Aside from wages and conditions there is evidence of a correlation between the emergence of skill shortages and the weakening of trade unions. For example, Dorey (2016) provides a detailed account of Thatcher government's reform of trade union law, culminating in the 1984 Trade Union Act, which essentially rendered unions ineffective and shifted the balance of workplace power conclusively toward employers. Just two years later Briscoe (1990) witnesses the supply of construction skills changing from a situation where shortages were unlikely, to one where they were of widespread concern. Similarly, the introduction of the Employment Relations Act 1991 which is widely regarded as the event that dislodged New Zealand's unions from their position of power (Mintrom & Thomas, 2019), was swiftly followed by the net outflow of migrants and sharp drop in people entering the trade described by Lobo and Wilkinson (2008).

Beyond their effect on pay, which can be problematic for society if monopolies allow wages to be raised beyond efficient levels, unions play an important role as a mechanism for employees to raise concerns (Freeman & Medoff, 1984; Hirschman, 1970). For example, when workers come across negative aspects of their role, a union can be an effective way to communicate such dissatisfaction to management. Otherwise employees can lack 'voice,' and instead quit their jobs when confronted with such problems (Hirschman, 1970).

2.2.Economic reform

The weakening trade unions is generally linked to economic reform. Structural reform leading to neoliberal regimes occurred at various times throughout history but most notably around the 1980s. In the United States of America it happened under President Reagan, in the United Kingdom under Margaret Thatcher and in New Zealand under David Lange (Harvey, 2020). As noted previously, reform in the United Kingdom aligns with the time period in which Briscoe (1990) observes skill shortages becoming widespread. Various papers discuss the impact that this type of reform has on labour markets and economies (Harvey, 2020; Rodrik, 2018; Standing, 2011) as well as specific effects on the bargaining process (Borghijs, Ederveen, & Mooij, 2003; Visser, 2013) and how this can affect skill formation (Valiente, Zancajo, & Jacovkis, 2020).

The New Zealand transition, which is commonly known as ‘Rogernomics’ after its chief proponent Roger Douglas, was a sudden and extensive transition to a neoliberal regime. Kasper (1995) notes that “between 1984 and 1991 New Zealand converted its economic system from the most heavily regulated to the least regulated in the OECD” (p.1). Kerr (1997), who played a major role in this transition by informing Douglas via the Treasury (Mintrom & Thomas, 2019), describes the structural changes which happened in New Zealand over this period, the most relevant of which is the introduction of the Employment Contracts Act 1991 as well as changes to corporate tax rules and tariffs which exposed the country to international competitors.

S. Ryan and Herod (2006) note that New Zealand and Australia were the first two countries in the world to introduce compulsory conciliation and arbitration via arbitration courts. These courts were the core of industrial relations because they made it easier for weaker unions to protect workers' rights through their ability to force employers to improve pay and conditions rather than unions needing to rely on costly, drawn out industrial disputes.

In New Zealand the arbitration court system was dismantled via the Employment Contracts Act 1991 (Visser, 2013). The Act was a way to move New Zealand away from a system of collective bargaining and central wage fixing controlled by large bureaucracies, and toward decentralised, individual bargaining where labour is treated as a market product and wages a market price (Kasper, 1995). Visser (2013) describes how the introduction of the Act removed the obligation of employers to bargain with unions thus making individual bargaining the primary basis for employment. Limiting the scope of the arbitration court resulted in the complete elimination of unions in sectors where workers were less able to organise themselves such as agriculture, construction, retail, wholesale, accommodation and restaurants. It is not clear whether the arboriculture industry was ever strongly unionised, however it would be categorised as one of these kind of sectors.

The global aspect of neoliberal reform is said to have weakened the bargaining blue-collar workers in many industries by putting them in competition with low-wage workers in less developed countries through outsourcing (Appelbaum & Batt, 2014). In localised industries an alternative process called 'domestic outsourcing' is used to contain costs through work

intensification, subcontracting and a variety of low-wage alternative work arrangements (Appelbaum, 2017). Domestic outsourcing works by establishing production networks in which producers and suppliers are linked through contractual arrangements. The value able to be extracted by the firms involved depend on their power within the network (Appelbaum, 2017). For example, a corporation will acquire a large government contract then organise the work to be carried out through several layers of subcontractors. The lead firm is often able to dictate prices for subcontracts securing a disproportionate amount of value for itself while the weakest organisations, who are often the producers who do the work, struggle to remain viable. Wages and conditions in these producer-firms are likely to deteriorate (Appelbaum, 2017).

In Summary, the neoliberal reform of the 1980s is likely to have had a negative impact on the field arborist role. The removal of arbitration courts would have made organisation of workers in the industry difficult and unions in the sector would have been likely to collapse. Domestic outsourcing is a process which became popular in the same period and seems likely to be negatively impacting both wages and conditions in the arboriculture industry.

2.3. Work conditions

The physical work aspect of arboriculture is an important characteristic. The likelihood of developing long-term health problems as a direct result of their work as well as daily risk of personal injury or fatality were key concerns of participants in Bardekjian's (2015) study of field arborists in Canada. Many of these participants underwent a constant internal struggle between

their passion and desire to perform the physical work and ever-increasing limitations on their physical ability. In addition, these arborists worked long hours, often during inclement weather and were not paid well. Some common issues were reported, relating to time and fatigue, coming home late and not seeing their children before going to bed and being too tired to play or participate in domestic activities.

Laver's (2020) ongoing study examines the physical torques and forces placed on the various muscles and joints used during tree climbing. In his survey of over 340 arborists worldwide it was concluded that 86% of participants suffer from musculoskeletal injuries or pain due to climbing. A potential issue with this statistic is that the question does not seem to differentiate between different degrees of injury or discomfort. For example, there is a considerable difference between life-long joint damage and a sprained ankle, although both would induce pain.

Furthermore, if people are asked if they had ever suffered pain from sitting in a chair too long a similarly high number would probably answer in the affirmative. However, given my experience in the role this statistic does seem plausible. Due to the sheer physicality of the work, it is hard to imagine anyone doing it for a significant period without suffering some kind of injury. Laver's data also identified a variety of places the body gets injured with the most common being lower back, elbows and shoulders. That study also looks at some specific, potential causes and people's solutions to the problem of injury which include actions such as switching roles as well as leaving the industry. This links back to Richardson's (2007) point regarding workers placing high importance on the future prospects of a position. If the aftermath of an arboriculture career

is largely negative rather than leading into new opportunities, then this is likely to discourage many from pursuing it.

Ilmarinen (1992) studied the oxygen consumption of workers carrying out tasks in various industries as a way to measure aerobic capacity. Logging, which is somewhat comparable to arboriculture in this regard, had the highest oxygen consumption of any of the thirteen occupations analysed. One of the main findings in Ilmarinen's study was the importance of breaks and rest times, in particular for relatively older workers who tend to need longer recovery times after physical activity. Time pressure, which is frequently present in arboriculture (Bardekjian, 2015), is noted as a problem because it limits the possibility for breaks. Long working hours has a similarly negative impact. Aside from these points Ilmarinen also mentions factors such heavy lifting, working in the cold or hot, and static work which could combine to create a very challenging scenario. All of these factors are regular parts of arboricultural field work. In a later article, Ilmarinen (1997) describes important work environment factors as physical load, work movements and work postures. Once again, field arboriculture would score negatively in all these categories.

Krekula (2019) discusses temporal norms related to job mobility where individuals must plan for future limitations that are likely to arise as they age. She outlines how temporal organisation of working life is captured by the concept of a career timetable which includes age-based steps which individuals are expected to follow. Being ahead of the timetable tends to be viewed as positive while lagging behind is viewed as negative. This creates a shared perception of when

and how employees are expected to change units and work tasks leading to social norms becoming established. In the firm examined by Krekula (2019) the observation was made that transitions made by older workers – such as to less strenuous roles – were not based on formal routines, rather on individual bargaining. This had the effect of allowing a fear of ageism to have a disciplining effect on aging workers by placing them in a precarious position.

Another potentially negative aspect of the field arborist role is its potential categorisation as dirty work. The term ‘dirty work’ was first used by Hughes (1951) in a study of the nursing profession to describe the least prestigious, unskilled tasks of an occupation. These are generally considered drudgery by the workers who must do them but none-the-less need to be done by someone.

Hughes makes it clear that *all* occupations have their own share of dirty work. This is an important distinction as it suggests that Hughes did not consider entire occupations – such as nursing – to be dirty simply because they included some dirty tasks. Furthermore, he observed that because people are proud to be nurses, attempts were made to reserve the title of ‘nurse’ for the bundle of tasks with the highest prestige while repackaging the less desirable dirty tasks into new occupations to be carried out by someone with a different title. This is all part of transforming an art or occupation into a profession (Trice, 1993; Wilensky, 1964). However, Hughes (1951) subsequently states that these dirty tasks can be more easily endured when they are part of a role that is intrinsically rewarding, which implies that they might best be kept a part of nursing. Arboriculture undoubtedly involves some dirty work but just like the nursing profession, it would be incorrect to classify the whole occupation as dirty.

Ashforth and Kreiner (1999) elaborate on the idea of dirty work by introducing three categories of occupational taint. The greater the taint, the greater the stigmatisation by society. The first category is physical taint, which occurs when an occupation deals with garbage, death, effluent, physical dirt, or must be performed under dangerous or noxious conditions. Second is social taint which occurs through association with stigmatised individuals. This includes jobs such as social worker and public defender. Social taint can also occur when an occupation is of a servile nature such as a prison guard or house cleaner (Tracy & Scott, 2006). The third category is moral taint where an occupation is viewed as sinful or immoral. Examples include exotic dancers (Colosi, 2017), pawnbrokers and casino managers. It can also occur where a worker is viewed as needing to be deceptive, intrusive or confrontational, for example a debt collector.

It is conceivable that the field arborist occupation could fall into all three categories: Physical because it is physical, dirty and dangerous; social because the work is often of a servile nature to home owners; and moral because arborists are often viewed negatively for cutting down trees which should have been kept or conversely, advocating to retain trees that others deem problematic. The shared stigmatisation of the occupation members, can serve to strengthen group cohesion, culminating in a distinct occupational subculture (Trice, 1993).

These subcultures subsequently defend against the social stigma using three main techniques (Ashforth & Kreiner, 1999). The most effective is by reframing, where the meaning behind a stigmatised occupation is transformed. There are two types of reframing. The first is infusing, which is where the more negative aspects of an occupation are presented in a positive way. For

example the purpose of a lawyer might become ‘to give defendants a fair trial’ rather than ‘to defend murderers and rapists’. An arborist might provide ‘care for trees’ as opposed to simply cutting them. Tracy and Scott (2006) observe that firefighters maintain the ideal that ‘no one else could do this job’ in order to infuse meaning. Likewise Slutskaya, Simpson, Hughes, Simpson, and Uygur (2016) observe similar behaviour on rubbish crews where the endurance, effort and fortitude involved in the job lends it toward a display of masculinity. Arboriculture is imbued with identical behaviour. Masculinity was an important factor in Tracy and Scott’s (2006) study too where they observed that the blood of a slaughtered animal was proudly worn as a badge of honour but the runny nose of an elderly patient was viewed as a mark of lower status because it amounted to women’s work. The second type of reframing is neutralisation. This includes denial of responsibility, for example ‘just doing my job’, or denial of a victim or injury. In Gold’s (1952) study of janitors’ struggle for status, he observed that any tenants who opposed the janitor’s self-conceptions were labelled “bad” and regarded as crazy or ignorant.

Reframing is considered to be the most effective of the three techniques but it requires a stronger occupational subculture than the other two: Refocusing and Recalibration. Refocusing involves actively overlooking the tainted aspects of an occupation, for example a grave digger might enjoy working outside. Recalibration is where assessment is made to adjust the quantity of taint. For example, North American firefighters talk mainly about fire callouts over ambulance service callouts despite the former being just 10% of the job (Tracy & Scott, 2006).

As useful as these techniques are for raising the self-esteem of the workforce, they can also have negative consequences. For example, emphasising masculinity can result in a work culture which excludes women (Tracy & Scott, 2006). In arboriculture this manifests as workers being compared based upon characteristics in which men hold a considerable advantage such as strength and endurance. Another problem occurs when the recalibration technique is used to equate danger and risk as the most notable traits of an occupation (Tracy & Scott, 2006).

These kinds of defences can also be deployed from the organisational level. This is more likely to happen if the stigmatisation defines the organisation as a whole (Ashforth & Kreiner, 2014). The degree that this is so depends upon alignment of the occupational and organisational missions and whether or not the taint of the occupation colours the organisation as a whole. For example, a firm which solely provided arboricultural services would be just as tainted as the arborist occupation itself, whereas this would not be the case for a firm in which arboriculture was just one of many services it offered.

In addition to the above techniques, Tracy and Scott (2006) introduce the idea of a status shield to protect occupational members from stigmatisation. They use the comparison of firefighters and correctional officers, where the occupational prestige of the former affords protection which is unavailable to the latter. Ashforth and Kreiner (2014) elaborate on this idea with the suggestion that most physically and socially tainted jobs benefit from a necessity shield because their jobs are necessary for society. Blue-collar craft work does not normally attract high levels of social prestige (Torlina, 2011).

2.4. Vocational Training

The way that manual occupations are perceived by both insiders and outsiders is heavily influenced by how vocational training programs are framed. Jacoby (2014) observes some key ways that vocational training in Germany, known as dual VET (Vocational Education and Training), differs from what is available in North America—which resembles what we have in New Zealand. The first is that Germans do not view vocational training as something for struggling or at-risk students. Firms in Germany want skilled workers who can solve complex problems, rather than low-skilled staff who will soon be replaced by machines. Sector-wide bargaining removes firms' ability to poach these kind of workers by offering more money, so providing vocational training becomes the primary way of sourcing them (Soskice, 1990). These kind of incentives, as well as the benefits derived from firm-specific training and enhanced employee screening, have resulted in a willingness of many large employers in Germany to provide vocational training despite its high cost (P. Ryan, 2000).

What Jacoby (2014) is observing above is the main tension of vocational training systems, they can either be oriented toward social goals or economic ones (Di Maio, Graf, & Wilson, 2019). When vocational training is primarily organised by the nation state the focus drifts toward social inclusion as a way of finding a place for members of society for whom university study is not an option. The problem with framing vocational training as social inclusiveness is that it can weaken its attractiveness for both would-be candidates and the firms that hire them (Di Maio et al., 2019). When firms are more involved in the recruitment and training process, like in Germany, the goal moves away from social inclusion and toward finding the best possible

candidates to satisfy market demand. Through selection, entry is being controlled just like in a guild. The more influence the businesses have on the selection process the more difficult it becomes for poorly performing students to enter the training program, providing an increased incentive to work hard at school work, even if university is not an individual's goal (Estevez-Abe, Iversen, & Soskice, 2003). Recently, within the European Union, there has been a focus on attracting high-achieving students from academic paths (Šćepanović & Martín Artiles, 2020). Additionally, the more influence businesses have on the training curricula the greater the shift toward a more narrow selection of marketable, vocation- or even firm-specific skills at the expense of general knowledge (Di Maio et al., 2019; P. Ryan, 2000). This further protects the firms from poaching (Šćepanović & Martín Artiles, 2020).

Another important difference between the North American and German systems noted by Jacoby (2014) is the latter's centralised control. A standardised curriculum is developed by the state with high levels of input from the other social partners. This means all trainees learn the same skills in the same order and, in line with wage coordination described by Soskice (1990), there are set salaries for each year of the apprenticeship (Jacoby, 2014).

This kind of coordination is more easily achieved in what Hall and Soskice (2001) term 'coordinated market economies.' These include nations such as Germany, Japan, Switzerland, Sweden, Belgium, Norway and Austria. New Zealand, along with the United States of America, Canada, Britain, Australia and Ireland are known as 'liberal market economies'. The main difference between these two types of economy is the way coordination takes place. Liberal

economies primarily utilise hierarchy and market competition while coordinated ones use collaborative relationships between various social partners such as employer associations, trade unions and the state, also known as a corporatist governance structure. This allows firms in coordinated market economies to pursue strategies in which they would not have been led by market forces alone. The way collaborative vocational training schemes are operated is presented as the classic example of this (Hall & Soskice, 2001).

The main advantage of collaborative, or collective vocational training regimes over liberal market economies including New Zealand, is that they often result in higher quality training as well as greater volume (Emmenegger & Seitzl, 2020). For example, employers who hire apprentices (rather than simply poaching fully-trained workers) have a strong incentive to get them productive as quickly as possible. If left unchecked, this results in training of only the minimum requisite skills and can turn trainees into cheap substitutes for skilled workers (Previtali & Fagiani, 2015). In a collective regime the input of the other social partners, such as trade unions, as well as multi-employer collaboration, prevent this from happening (Šćepanović & Martín Artiles, 2020).

In summary, the physicality of the field arborist role is a potentially problematic feature. It has the potential to cause lasting damage to the human body and could make arboriculture a less-suitable career choice as people age, limiting future prospects. Furthermore, the 'dirty' nature of physical work can often result in societal stigmatisation of the people who do it. A key factor in how workers in certain occupations are perceived by the general public is whether vocational

training is geared toward social inclusion (everyone gets a chance) or economic efficiency (best person for the job). In New Zealand social inclusion is the focus which can result in more negative perceptions of workers than countries such as Germany where economic efficiency is the goal.

2.5. Self-employment

To escape the negative aspects of the field arborist role, many arborists transition to self-employment, which is often the only way such occupations progress in manual industries (Lipset & Bendix, 1952). Bourlès and Cozarenco (2018) categorise this as ‘necessity entrepreneurship’ because the behaviour is not motivated by the identification of market opportunities. It is an individualised solution to a group problem (Dahrendorf, 1959), namely, poor employment conditions. Massey and Lewis (2004) attribute the enhanced perception of self-employment to the change in labour market dynamics brought about by economic reform as I have discussed earlier.

The main attraction of self-employment tends to be greater autonomy and control over one’s own working conditions and income (Samujh, 2004). It also has potential to yield better long-term outcomes than the field arborist role. As noted previously, Richardson (2007) identifies the importance of a position’s future prospects and how this can be more important to people than immediate rewards such as wages. In this regard, self-employment could allow substantial future reward or serve as a springboard to a better job elsewhere. Conversely, continued work as a field arborist could result in one’s body may be ruined, with limited application for the skills outside

the field. Furthermore, entrepreneurs have been shown to overweigh the small probability of large future payoffs from their efforts (Wolfe & Patel, 2017).

Laguir and Den Besten (2016) present several factors related to firm size that reduce barriers toward self-employment. One is the minimum effective size of the firm type. Arboriculture fares well here with successful start-up achievable by a founder working alone. Generally, the smaller the firm the less risk involved in starting it. Another factor is the presence of entrepreneurial role models. Again, this is common, because the small firms are run by arborists, providing ample example for would-be arboriculture entrepreneurs. The final factor is low wages and poor employment conditions.

Arborists becoming business owners is a prime example of social mobility, where an individual moves between the various stratified layers of society. A Marxist explanation of this move might describe it as a transition from working class to middle class or the “new petty bourgeoisie” because a portion of the individual’s income is now derived from the redistributed surplus value of other people’s labour (Wright, 1980). This is one of the only options for manual workers to achieve significant upward mobility while remaining in the same occupational group as manual roles tend not to progress to white collar ones, rather self-employment is generally the end point (Lipset & Bendix, 1952). Whether or not the position of business owner sits hierarchically above the position of worker is somewhat irrelevant, rather the fact that the agent perceives this move as upward is what matters (Payne, 2017). While upward mobility which improves the lives of citizens is a justifiable goal of any society (Payne, 2017). However, as mobility increases, group

cohesion tends to be replaced by competition between individuals thus leading to high levels of individualism at the expense of collective problem resolution (Dahrendorf, 1959). This can have the negative effect of perpetuating group problems. For example, those which affect the desirability of the field arborist role, might get ignored in favour of individual progression.

Although such mobility might be an effective means of escaping the negative aspects of the field arborist role, the position of small business owner introduces its own set of problems for the individual. The new business owner can quickly become overburdened by responsibilities in which they are poorly equipped to deal with. These include recruitment and selection, staff promotion and retention, wages and salary negotiations, compliance with government and tax regulations as well as training and development (Mazzarol, 2003). On top of this, starting up a business in the arboricultural industry often necessitates a significant capital outlay for equipment. This tends to be financed by debt and even intertwined with the entrepreneur's home mortgage. High bankruptcy costs and low survival rates of small businesses often result in the lender's insistence upon personal guarantees from owners or their associates (Wellalage & Locke, 2011). The effect of this is that the arborist-come-business-owner becomes trapped in their new position, with overwhelming pressure to keep the operation afloat due to considerable personal investment (Bardekjian, 2016). The greater autonomy and control over working conditions and income described by Samujh (2004) can backfire in such a situation. Massey and Lewis (2004) observe that while employed workers are experiencing more intensive and uncertain work conditions, there is evidence of even greater levels of self-exploitation in contract or self-employed sectors.

Wellalage and Locke (2011) identify that small, owner-managed firms such as these tend to be more debt averse than other types of firms and that this is most likely due to the risk associated with high failure rates of small businesses. In a subsequent Newspaper article, Locke states that unless the owners of such enterprises are getting a return of over 25%, the risks of business ownership is not worth taking as, in the case that something goes wrong, debt holders collect first, followed by the Inland Revenue Department, and the owner, who is also the equity holder, typically finishes up with nothing (Nippert, 2014). It should be noted that this comment was made before the Health and Safety at Work Act 2015 increased the penalties in New Zealand for health and safety infringements by approximately six times (Stumpmaster v Worksfe New Zealand, 2018). It is realistic to suggest that an even higher rate of return would be required to make it worthwhile operating a business within the arboriculture industry as this sector carries a high risk of death or serious injury. As such, it also receives an increased focus of WorkSafe's enforcement efforts and a fine following a serious incident is likely to be severe (Dabee, 2016). With all factors considered it can be seen that small business ownership could be viewed almost as a trap rather than a path to prosperity. The following passage from Karl Marx sums up the situation well.

The cheapness of commodities depends, *caeteris paribus* on the productiveness of labour, and this again of the scale of production. Therefore the larger capital beats the smaller. It will further be remembered that, with the development of the capitalist mode of production, there is an increase in the minimum amount of individual capital necessary to carry on a business under normal conditions. The smaller capitalists, therefore, crowd into spheres of production in which

modern industry has only sporadically or incompletely got hold of. Here competition ranges in direct proportion to the number and in inverse proportion to the magnitudes, of the antagonistic capitals. It always ends in the ruin of many small capitalist, whose capitals partly pass into the hands of the conquerers, partly vanish. (quoted in Harris, 1939, p.346).

This passage seems to suggest that the capitalist mode of production seems to usher small-business entrepreneurs into sectors which are inherently, highly competitive and where eventual business failure is expected.

These risks are likely to result in a great deal of stress for the business owner. Hobfoll (1989) explains that stress can be understood as a reaction to an environment in which there is a threat of loss of resources. In the case of a business failure the owner not only stands to lose all the resources that went into creating and maintaining the firm but also perquisite resources such as status, economic stability and self-esteem which they may receive as a result of owning the firm. The fact that there is a constant threat of loss due to the nature of the business suggests to me that stress levels would be consistently high for the owner-manager of an arboriculture firm.

The stress resulting from potential firm failure as well as from occupational traits such as multiple roles; long working hours and high levels of ambiguity; conflict and responsibility, put the owner-manager at high risk of burnout (Fernet, Torrès, Austin, & St-Pierre, 2016). Additionally, Fernet et al. identify occupational loneliness as a key mediating factor of burnout. Occupational loneliness is a reflection of an individual's perception of deficiencies in their social relationships

and it stems from a lack of connectedness with others rather than a lack of social contact. A higher degree of occupational loneliness decreases a business owner's capacity to cope with the stressors described earlier. Conversely, a higher level of entrepreneurial orientation tends to increase their capacity to cope with such stressors. Entrepreneurial orientation reflects the owner-manager's adaptive capacity and is characterised by the extent in which they are inclined to be proactive, innovative and risk-taking. Lower levels of adaptive capacity makes an individual more emotionally responsive to events and thus, less effective at dealing with stress (Fernet et al., 2016).

2.6. Summary and research questions

In summary, the literature suggest that skill shortages are linked to wages and conditions but the future opportunities that a job may lead to are also very important. The physical nature of arboriculture is one of its defining features and this can have negative affects on the longevity of careers in the sector as well as the perception of occupational members by the rest of society. In New Zealand, the framing of vocational training as a tool for social inclusion could also have a negative affect on such perceptions. The emergence of skill shortages in both New Zealand and Great Britain seem to coincide with the weakening of trade unions. Aside from the impact this is likely to have had on pay, minimising the scope of unions can remove an important mechanism for employees to raise concerns when confronted with aspects of their job they find disagreeable. Without adequate 'voice' employees may exit their employment but employers will not know why. This leads us to the following research question:

What are the factors which contribute to recruitment and retentions difficulties with respect to skilled arborists?

3. Research Method

This chapter provides an overview the methodological constructs which underpin the study, followed by the methods used for data gathering and analysis.

3.1. Methodological overview

3.1.1. Introduction

I began this exploratory study to identify the reason(s) why, as an employer, it was so difficult to find and retain workers for manual arborist roles. After a broad review of the literature, driven in part by initial results, I decided upon three research question:

What are the factors which contribute to recruitment and retentions difficulties with respect to skilled arborists?

As a long-time participant in the arboriculture industry, I thought that I knew the issues better than most, yet being new to research my theoretical knowledge was lacking. Therefore, I decided early in the project that there would be a substantial focus on the literature.

Much of literature on skill shortages seemed to conclude that poor wages and conditions is a likely cause, but there was little details beyond this. For example, how are conditions poor and what causes this? Over the course of my career, I had frequently heard complains about wage rates as well as observing how poor remuneration tended to encourage long working hours. To me this demonstrated that low wages could cause poor work conditions. Furthermore, the industry seemed to be struggling with a variety of problems, many of which seemed to stem from

the large numbers of small firms. Therefore I chose to primarily examine the cause of the skill shortage, while also trying to identify how this fits in with the overall state of the industry. In this chapter I describe the overall framework and methodology of the study and the rationale behind it.

3.1.2. Purpose

This primary goal of this study was to identify the cause(s) of the arboriculture skill shortage in New Zealand and recommend actions that individual firms and the industry can take to address the problem. I envision that this project will serve as the planning phase of a larger action research study in which some of the findings will be acted upon. This action research project will form the basis of my doctoral study.

3.1.3. Insider status

The fact that I have a significant level of experience in the arboriculture industry establishes me as an insider of both the arborist and business owner groups involved in the study (Dwyer & Buckle, 2009). This insider status helped provide an increased depth and breadth of understanding which might have proved inaccessible to outsiders (Kanuha, 2000). However, it also created difficulties in respect to data gathering and analysis. Because I had 'lived' the problems of the industry, to me much of the data seemed mundane, simply confirming points I could not imagine not knowing already. Some of these points might have been useful findings that warranted further investigation. Instead, I spent a considerable portion of my time with the literature, uncovering theories and concepts that seemed to explain what I had experienced in the industry. Results data then served to support this with the discussion chapter reflecting upon the

insights gained from the literature rather than revisiting the results extensively. I expect this would make the work more useful from a practitioner's perspective.

Aside from merely being involved in the industry, I took on an active role as an arboriculture fieldworker – specifically, a full-time tree climber, for the duration of the project. This gave me a first-hand perspective on a number of issues such as treatment of staff by clients as well as the problem of becoming injured and the difficulty in recovering while performing a manual role.

However, despite working in this role, my experience of it was not typical for several reasons. For one, my employer was a firm I used to own and my boss a man I used to employ. This allowed me a great deal of autonomy compared to other workers as well as the opportunity to shape the role to my requirements. One such notable requirement was a four-day week so I would have time to complete this project. This turned out to have the added benefit of serving as a much-needed, mid-week rest day for my body to recover. Toward the end of the project two more climbers were employed at my firm on a four-day contract giving one the time he needed to renovate his home and the other to travel the country surfing. Being a bit older and spending the majority of my career as a business owner meant I was in a better financial position than the majority of field workers. This was a key factor in the four-day week working for me as well as shielding me from a range of financial stressors that many of my colleagues seemed to be dealing with. Finally, as noted in Thiel's (2007) study of class in the construction industry, the very fact that I was university educated and carrying out post-graduate study was somewhat of a differentiator. The potential future options this represented were very important as it allowed me the comforting belief that regardless of what happened in my arboricultural career I was well placed to do something else and that working in this occupation was a choice rather than a

mandate. This point took on particular importance when I injured my back and was forced to question my ability to perform the manual work going into the future.

As experienced by Torlina (2011) during his discussions with blue collar workers, my insider status seemed to play an important role during the interview process as an added assurance to participants that their answers will not be misconstrued or taken out of context. For example, one participant noted the removal of Auckland's 'general tree protection' legislation as a key cause for the skill shortage. This could justifiably be interpreted as arborists not wanting to cut down trees which should have been protected. While this is an important factor for many, what he was really taking about was the influx of small firms which entered the industry to take advantage of the new rules and the resulting drop in professionalism due to price competition. My experience in the industry informed me of the need to clarify points like this. It also allowed me to obtain more useful data from my interviews because most participants would not need to explain basic information regarding how arboriculture is carried out leaving more time for useful insight and experiences specific to their situation.

The main concern regarding insider status is the limited objectivity caused by being too close to the project (Kanuha, 2000). Therefore I was conscious to remain aware of the potential for the existing assumptions and beliefs to influence my perspective. Kanuha also identifies other issues such as where a participant would give a vague answer and conclude with something along the lines of "you know what I mean". Her insider status resulted in an initial tendency to neglect following up such a response with a request to further elaborate. To mitigate this problem I made use of active listening techniques such as briefly paraphrasing the points participants had made. This allowed for what Louw, Todd, and Jimarkon (2011) describe as a co-construction of

meaning, which can help participants clarify their own understanding while constructing a more meaningful response built on shared understanding.

The fact that for the duration of the project I also worked for a business employing and recruiting within the arboricultural industry meant there was a constant temptation to put any apparent findings into immediate practice. Sometimes this meant jumping to conclusions which later proved to be false or putting ideas into action without realizing potential ramifications of doing so. An example of this was getting the more senior field workers to quote some of their own jobs. While this proved positive for worker engagement and motivation it generated administrative problems that in many cases created more work for the already overworked manager than if he had simply done the quotes himself. It became apparent that putting this action into practice would require a significant restructuring of the way work was organized.

Another example was in the opening of a new branch in a rural town in which local staff could drive straight to site for an 8:00am start. Worksites were rarely more than a 15-minute drive from their home as opposed to an hour-long commute to the main city branch and a 7:00am start to avoid the morning traffic. Similar time savings were made on the commute home. Excessively long hours featured in both the survey and interviews as something participants disliked about the occupation. However, while the staff did acknowledge a somewhat improved lifestyle, their main feedback was that they disliked the effect that reduced hours had on their pay.

A key advantage of being a practitioner during this project was that it pushed me to ask, how the information could be useful. Asking this gave the project a contextual relevance (Stringer, 2014) rather than privileging the theoretical. This somewhat echoes the discussion of Ram, Edwards,

Jones, Kiselincev, and Muchenje (2014) regarding the use of action research techniques with critical realism. Action research involves a repeating cycle of planning, action, and observing the reflection (Carr & Kemmis, 1986). This ‘act’ stage is preceded by what Stringer (2014) terms ‘look’ and ‘think’ stages. The former involving data gathering and situation description and the latter including analysis and interpretation. While this project was not initially framed as action research, it covers the first two stages with its examination of survey and interview data. It also briefly touches on the third with the informal application of some initial findings described above. Future research in this area could focus on a more formal approach to the ‘act’ stage by defining, implementing and evaluating a plan of action based upon the analysis and interpretation of this project.

3.1.4. Ethics

The first area of ethical concern was a potential power differential between me and the arborists I work with and supervise at my place of employment. To mitigate this risk participants were limited to those outside of my organization.

Another ethical consideration of this research was maintaining the confidentiality of the people and organisations involved in the study. In order to mitigate this risk, the data was anonymized when necessary. Anonymization is defined as a process of removing identifiers from data prior to it being shared more broadly (Nunan & Di Domenico, 2016). In this case, pseudonyms in the form of single-syllable, common names were used in place of participant’s actual names. Names of organisations were excluded, and any potentially damaging information was omitted. Nunan and Di Domenico note that data anonymization can help build trust which is recognised as a way

of improving the level and quality of response. This seemed to be the case during the interviews. On several occasions participants requested for information to be stricken from the record where they considered that it could be taken out of context. On some occasions I would remind them that I was not a reporter fishing for a news headline and that ensuring the correct context was very important. As noted previously, understanding the context of participant responses was aided by my insider status within the industry.

A final ethical consideration that was not considered at the outset was the potential to poach employees from other firms. The nature of the study – interviewing arborists about why others like them are difficult to find and retain – and my involvement in recruitment for my own employer presented the possibility to use the study as a poaching tool. To mitigate this potential conflict, I maintained a strict researcher role for myself within all discussions. The key to this seemed to be keeping interviews focused on participants while avoiding being drawn into discussions about my own history and what I was doing. As a result, some participants even asked me if I worked in the industry while others seemed to assume that I was solely a researcher.

3.1.5. Critical Realism

Edwards (2005) suggests the use of a critical realist ontology for research in the field of employment relations in order to make methodological progress and strengthen links with social science. Critical realism emerged from the work of Bhaskar in the 1970s and 1980s. It draws from both positivism and constructivism (Fletcher, 2017). One of its main traits is that ontology (the nature of reality) cannot be reduced to epistemology (our knowledge of reality). This is in

stark contrast with positivism which aims to reduce the world to what can be empirically known, and constructionism which more or less views reality as constructed through human knowledge and discourse (Fletcher, 2017).

Critical realism views reality as three stratified layers. These are the ‘real’ which includes the underlying mechanisms and structures which cause events to happen but typically can’t be seen, such as gravity. The next layer is the ‘actual.’ This includes events caused by the real whether they are observed or not. An example would be an orange falling off the table due to gravity. The final layer is the ‘empirical’. This includes observable and experienced events as they are understood through human interpretation (Fletcher, 2017).

The goal of critical realism is to identify the causal forces which are responsible for the events identified at the empirical level (Fletcher, 2017). In this case, what are the causes of the observable factors responsible for people either remaining in or leaving the field arborist role? Critical realism is particularly suited to this sort of question because one of its main strengths is in identifying the underlying social processes which are at work beneath surface appearances in order to explain otherwise perplexing occurrences (Ackroyd & Karlsson, 2014). Bhaskar (1979) attributes this to the fact that social structures are activity-dependent. That is, causal forces only exist through the events they result in and cannot be empirically viewed independently of these (Fletcher, 2017). For example, the causal force of gravity can only be examined by observing the effect it has on the objects around us, which will vary depending on the context or situation. In the case of this study, it is not enough to conclude with vague and overly simplified statements such as “high levels of self-employment tend to result in skill shortages” or “the industry was found to be unattractive due to poor wages and conditions”. Rather, I wanted to know how self-

employment contributes to skill shortages; what caused the wages and conditions to be poor; and what prevents these issues from being properly addressed.

3.1.6. Mixed Methods

Critical realism holds that methodology should depend on what is being studied rather than being tied to a specific type of method such as quantitative methods for positivists and qualitative methods for interpretivists (Hurrell, 2014). Douglas (1976) states that as all research methods have differing costs and benefits, it is generally best for a researcher to use a combination of methods. Furthermore, there is a long established case for paradigm diversity in organisational research, with Hassard's (1988) summary of the debate outlining how the apparent incommensurability, or lack of a common measure between paradigms, can be overcome through shared language.

The main element of mixed methods is that it capitalises on the strengths of both quantitative and qualitative methods (Plano Clark & Ivankova, 2016) and is useful where either method on their own may not have captured the full story of what is going on (Levin, Brown, Blass, & Creswell, 2017). For this project a sequential design (Teddlie & Tashakkori, 2011) was chosen where a short survey was distributed to industry participants followed by qualitative interviews in year one. Results were analysed and a second round of confirmatory interviews were carried out toward the end of year two. Quantitative results from Likert-scale questions in the survey were used to support and enhance the qualitative data. This was done in three ways:

First, Bell, Bryman, and Harley (2019) note that one of the chief ways quantitative research can facilitate qualitative research is through the selection of people to be interviewed. This aspect of

mixed method proved invaluable, allowing the location of a wide range of participant types as well as automatically confirming their willingness to be interviewed.

Secondly, both the qualitative and quantitative data from the survey were used to inform the interview process. Here I utilized it in the creation of the interview guide and where participants had given interesting write-in responses they were asked to elaborate. The survey acted as a thought-primer for interviewees, meaning that they were not caught by surprise by any of my questions and in many cases had well-prepared responses allowing a continual flow to be maintained during interviews.

Finally, the quantitative data was used to help enhance the validity of the results. This was done through triangulation which is another important advantage of mixed method (Teddlie & Tashakkori, 2011). Triangulation involves a cross-checking of results obtained from one sort of research strategy with those obtained from another (Bell et al., 2019). For example, several interview candidates expressed concern regarding physical wear and tear, this also scored highly as a negative job trait in the Likert-scale section of the survey and the point was backed up by the literature as well.

3.1.7. Research objective

To identify what is causing a shortage of field arborists in New Zealand.

3.1.8. Research question

Like most researchers, critical realists typically begin with a research question guided by theory (Bhaskar, 1979). The research question for this study is:

What are the factors which contribute to recruitment and retentions difficulties with respect to skilled arborists?

3.2. Research Process

3.2.1. Literature Review

This project began with a review of the literature. The initial goal of this step was to identify potential explanations for observations I had made over the course of my career. This was not in the sense of *a priori* hypothesising, rather as a means to identify potential relevant areas of the literature from which to begin my investigation. This was helpful given the absence of research on the arboriculture industry or occupation, especially in New Zealand. The review quickly evolved into an almost endlessly expanding web of interconnected subjects which became a kind of maze for me to explore. For example, I had noticed many workers move into self-employment at a fairly young age, and therefore I began with the literature on small business and entrepreneurship. This led me to career paths and social mobility theory and subsequently to deskilling and the division of labour. The literature on skill shortages also linked with that of small business as well as deskilling. The deskilling literature linked back to skill shortages and so forth. It was this interrelatedness of the subjects that confirmed their relevance in a similar fashion to triangulation. Over time I started to get an intuitive sense of how subjects were likely to connect and where pieces of the puzzle were missing. In these instances I used active thought experimentation to fill the gaps and generate potential answers to ‘what-makes-this-possible?’ questions which arose (Kornberger & Mantere, 2020). This, along with input from my research

supervisors, helped direct me to the literature I was missing as well as generating new questions such as, would this apply in other industries and how are these industries similar to arboriculture? An important part of this connecting and ordering of subjects turned out to be the preparation for my presentation at 2020 National Arboriculture Conference in Queenstown, which is described later.

3.2.2. Data Sources

For critical realism research, a wide range of data sources are of interest at the outset of the project because at this stage causal mechanisms are unknown. These are then narrowed down once research gets underway (Ackroyd & Karlsson, 2014). This project initially used insights gained through my experience in the industry to help frame the problem and develop initial hypotheses followed by a discovery phase, short survey and qualitative interviews.

3.2.3. Discovery

Data collection began with a discovery phase primarily carried out with subjects at the 2019 National Arboriculture Conference in Napier. These conferences are held annually by the New Zealand Arboriculture Association in a different city each year. They typically run for 2-3 days and include a variety of local and international speakers. During this stage I spoke informally to major industry participants such as owners and CEOs of some of the largest firms in the industry as well as consultants heavily involved in the New Zealand Arboriculture Association. I obtained contact information which was used for follow-up phone conversations. Each conversation had a snowballing effect, yielding new people to contact. The goal of this phase was to identify an

overall direction for the research to address the skill shortage. I learned what actions had been taken already and what certain firms and the industry as a whole were doing about it. I also got to know some key people who were instrumental in the distribution of the survey and the analysis stage.

3.2.4. Informal interactions

Informal conversations with other industry people and work colleagues was an important data source throughout the project. I checked in with my employer frequently, gauging his reactions to some of my ideas and I regularly discussed the project with workmates and contractors and the directions it was going. This provided useful feedback from a variety of perspectives.

The annual conferences mentioned previously, were another useful resource for informal data. The discover stage was carried out at the 2019 conference and at the 2020 conference I attended as a speaker presenting my research. I requested a slot early in the conference to provide opportunities for further discussion with conference-goers afterwards. Immediately following the speech I received a lot of positive feedback as well as a detailed story from a pair of long-time industry members who recalled a period in which the wages of the industry were permanently driven down by competition exactly like I had just described.

3.2.5. Survey

The first stage of formal data collection comprised a short Qualtrics survey of industry participants which focused on the positive and negative aspects of the field arborist occupation. I decided not to restrict participation to a particular group such as employees or business owners

because I felt useful insights could come from all stakeholders (those doing the work and those managing) and given the small size of the industry I would need all the participants I could get. The study was carried out part-time over a period of 2.5 years with interruptions due to the COVID19 epidemic. The survey was distributed approximately 6 months in.

The survey comprised several demographic questions, some Likert-scale questions and the option for written responses. The primary goal of the survey was to obtain a wide range of willing interview participants as well as providing some initial data to serve as a guide for the rest of the project. Finding participants through the survey allowed me to get perspectives of lesser-known people within the industry such as apprentice arborists. The survey data was also useful for triangulation, with its main strength being its simplicity. The survey provided a clear indication of what people most liked and disliked about the occupation as well as how they thought it could be improved. See Appendix A for survey instrument and Appendix B for the interview guide.

3.2.6. The sample

The survey was distributed initially by the New Zealand Arboriculture Association via their Facebook page. This avenue seemed to get the greatest response rate with around 25 coming from this source. Total participants for the survey was 31. A high proportion of survey participants stated that they were willing to be interviewed although only a small number then responded to subsequent attempts to make contact.

The survey was also shared by some industry participants on various industry Facebook groups as well as directly to the staff of one firm. Distribution of the survey by the firm's owner to his

staff was done of his own accord and proved to be an excellent method with 2 out of 6 field arborists employed there volunteering to be interviewed. These staff would have been unlikely to get in touch with me through other channels. If I was to repeat this research process, my primary focus would be to push for more employers to share it with their employees. A useful way to do this could be to contact employers directly, perform interviews with them and then ask each to distribute an employee-only survey to their staff. I would expect this to yield a greater response and more interesting data.

Making statements regarding the employment make-up of the sample for this project is fraught with potential problems. While the survey had four distinct options for participants to choose from resulting in what seemed to be clear percentages of contractors, employees and business owners, the interviewees had much more career history information to consider. Take my own employment situation as an example, eight years as a business owner followed by three years employed, and at the beginning of my most recent employment I was also running a small contracting business on-the-side. Does this make me a business owner or an employee? Although undoubtedly an employee at present, the majority of my viewpoints and opinions were formed as a business owner. Several of the interview subjects were similar cases. One had spent much of his career employed, yet alternating between various periods of business ownership. Another was employed two weeks on one week off with the week off spent self-employed. This echoes Carpenter's (2005) observation that occupational categories became less important as her research progressed. She suggests that such classifications have become less useful given modern trends such as multi-tasking, multiple job holding and blurred occupational boundaries.

The main limitation of the survey sample is its small size of just 31 participants. This might be considered inadequate from a quantitative analysis perspective, however the data from this source still proved useful. It was enough for an ascending list of positive and negative job traits to be constructed, the resultant order of which appeared intuitive. This list aided validation of interview data by reaffirming the importance of certain themes. For example, several interviewees commented on bodily wear-and-tear and low pay as negative aspects of the role. The addition of the survey data allowed me to identify which aspect was of greatest concern as well as making it easier to distinguish sample-wide themes from individual opinions that were not shared by others. The survey was also a useful source of qualitative data with written responses highlighting issues such as task allocation, which were less explicit in interview data. The small survey sample still provided plenty of interview leads, the quantity of which snowballed due to participants recommending others.

Trades workers are known to be very time poor, and this is the case in the arboriculture trade as well. Carpenter (2005) also notes this as a problem when trying to interview trades workers about their careers. On a similar note, one of my participants said during their interview that this was also a problem for the arboriculture association which resulted in an overrepresentation of consultants and high-level managers because these were the only people who had the time to participate.

Therefore, the type of participant is another limitation of my sample. Many participants came through the arboriculture association's sharing of the survey link yet many arborists and arboriculture firms have no affiliation with the Association. To mitigate this problem the survey link was also shared on the New Zealand Tree Climbers Facebook page which is followed by

most arborists in New Zealand. It was also supplied directly to one firm which distributed it to their staff. Although the survey did not ask how participants received the questionnaire, the different channel distributions were separated by a two week period in which responses petered off toward the end. Therefore, the date of each response provided an indication of which channel it was likely to have come from.

3.2.7. Initial interviews

I began the first round of interviews around July 2020 upon the conclusion of New Zealand's first level 4 COVID lockdown. I would have started this stage earlier in the year but the stress and uncertainty generated by the pandemic meant participants were preoccupied with other matters. 11 people participated in this stage. This was a varied range of people comprising three managed, field arborist employees, one of which was a new apprentice; one trainer; a mix of managers, business owners and contractors, most of which had spent time as field arborist employees; and one ex-manager who had switched professions after a long arboriculture career.

The interviews were semi-structured and began with some background information about the participant's career and how they entered the industry or, in the case of participants who had already completed the survey, I asked them about their comments and responses. A full copy of the interview guide is provided in Appendix B. The purpose was to gain a better understanding of the commonly perceived problems with the field arborist occupation and how they might be addressed. It was also to identify what people liked about the occupation, what got them into the industry and what made them stay or leave. The first interviews were with survey participants who had indicated they would be willing to be interviewed. My initial desire was to conduct as

many interviews as possible in person, but this proved impractical as all participants were time-poor and meeting times were continually postponed. In addition, some were based out of town, so the majority of interviews were conducted via phone.

Often responses could be categorized as generalities, for example statements such as, “arboriculture attracts risk-takers”. In such instances I followed Smith and Elger’s (2014) recommendation to push for specific events and examples. This provided further opportunities to probe for more detail as well as cross referencing with data from the survey and other interviews. For example, in the case of the risk-taking example it was important to distinguish between risks taken for the mere thrill of doing so, as mentioned by one participant, and those taken in response to time-pressure, cost, or lack of resources, as described by another. Without such probing these two, very different motivations for risk-taking might have been combined into one theme despite having completely different contexts. The resultant combination would then appear to have greater relevance than reality would warrant.

Setting a time limit proved quite effective on some of the interviews. These tended to be set by the participants themselves who would say something along the lines of, “right, I’ve got thirty minutes for you”. These interviews got right to the point and were more straightforward to transcribe and analyse. Others were more casual which resulted in them being longer. The data from these was useful but more difficult to analyse because the audio recordings were much longer and conversations veered off-topic. All of these initial interviews were transcribed (see section 3.3.3), which was especially time-consuming for the longer ones.

3.2.8. Conference speech

During one of the interviews I learned that the participant was looking for presenters to speak on the *practitioner stream* at the 2020 National Arboriculture Conference in Queenstown. We both agreed that my research could be a good fit for this. I submitted a short summary of what I would talk about, and this was approved by the Conference Committee for a 30 minute speaking slot.

Preparation for the speech proved to be a valuable exercise as it forced me to get my thoughts in order and summarize what I had done so far. At this stage I had conducted interviews but not yet analysed the data. Due to the broad scope of the literature review I had numerous important subjects of which could easily be discussed for 30 minutes. I chose to go back to the start and explain skill shortages in general and what was known about them in the literature. Through this process I discovered various links within the literature I had not known about as well as discovering and filling gaps in what I knew and was able to explain. Knowing anything I said would likely be subject to harsh public scrutiny in the question-and-answer phase of the presentation provided me with an incentive to make sure all my information was logically arranged.

During the speech I discussed how competition, self-employment, poor wages and a lack of adequate training can act as interrelated causes of complex skill shortages concluding with a discussion of deskilling and the division of labour as a possible underlying cause.

The presentation proved very useful for data gathering. Upon conclusion, conference goers shared stories with me about their own experiences they thought relevant to my project. The

speaking slot also seemed to enhance my credibility within the industry, helping me gain access to some high-ranking industry participants which formed the basis for a round of confirmatory interviews.

3.2.9. Confirmatory interviews

Upon nearing completion of the first draft of this thesis I had gained an understanding of what I thought was going on and what aspects of the research seemed most important. I then interviewed 4 additional participants, all involved at high-level in the management of individual firms as well as the industry as a whole. Some of these focused on confirming and reinforcing key themes and findings and others on gauging enthusiasm for the recommendations proposed. These interviews were not transcribed because given their nature as well as time constraints this was deemed unnecessary. Information gleaned from these interviews was anonymised and used to reinforce existing results where appropriate. This process also helped uncover so weak points in my argument which spurred deeper analysis of the literature. For example, I realised my explanation of the driving force behind low wages was speculative and endeavoured to find literary accounts which more closely fit the observations.

3.3.Data Analysis

3.3.1. Survey data

The small sample size of just 31 participants meant that conclusions drawn from the quantitative data was of limited use. However, the 5-point, Likert-scale questions about the positive and

negative aspects of the field arborist occupation gave some interesting results. In order to rank the job attributes in order of their overall approval, I calculated the mean of each. Coding ran from 1 = strongly disagree to 5 = strongly agree.

In addition to the Likert-scale questions the survey included 2 opportunities for open-ended responses which produced useful data. The most useful of these was the question, “What do you think might be one or two key ways to make the arboriculture fieldworker occupation more satisfying and attractive as a long-term career option?”

The majority of participants responded to at least one of these and their comments were coded along with the interview data. I decided against coding these responses separately because they all covered the same topics as raised in the interviews. Indeed, many of the interviewees were the same people who chose to write in this section (As identified by contact email addresses provided). This was taken into consideration during coding so that statements from the survey that participants repeated during their interview were not erroneously given greater gravity.

3.3.2. Retroductive Analysis

To analyse the interview data and write-in responses from the survey I used retroductive analysis. Fletcher (2017) describes this process as beginning with coding the data and identifying demi-regularities such as events or observations at the empirical level of reality which reoccur throughout the data. The next step is abduction or ‘theoretical redescription’ which is where the empirical data is re-described using theoretical concepts. The final stage is retroduction. This stage aims to identify the necessary context for a particular causal mechanism to result in the empirical trends which have been observed.

3.3.3. Data coding

The choice was made to manually code the interview data using MS Word as opposed to using a specialized software system such as Nvivo. Bell et al. (2019) note that the use of such software often involves a considerable familiarization period and that this may not be worth the time when working with small datasets such as in this instance. Additionally, Weaver and Atkinson (1994) warn that the ease of the code-and-retrieve process that such software provides can result in the context of interview transcripts being lost. Finally, I felt it was important that I experience the process of coding manually so that I could get closer to the data.

The coding process began by transcribing the interviews. The first one was transcribed word for word, however, this proved too time-consuming and unnecessary. I decided to use paraphrase transcription for the majority of the data. Only sections that I quoted directly in the results, were transcribed verbatim and this was done at a later stage by re-listening to audio recordings. During coding, I read through each transcript several times, highlighting different themes in different colours and then copying the collections of excerpts for each theme into their own section within an MS Word document. This process helped me become more familiar with the data and produced various initial codes.

I then reread the transcripts with the research questions in mind. For example, I looked for potential answers to the questions, “which elements of the field arborist role do people like?” and “which elements do they dislike?” Through this process I was able to combine, expand or eliminate the initial codes to produce useful themes, or what Fletcher (2017) describes as demi-

regularities, many of which correlated to the results from the Likert-scale section of the survey. Finally, I added the write-in responses from the survey into the appropriate themes.

3.3.4. Abduction

The next stage of the analysis was abduction, also referred to as theoretical redescription (Fletcher, 2017). In this stage the data are re-described using theoretical concepts with the goal of identifying the likeliest possible explanation. This was done by writing about each theme and matching them with appropriate topics from the literature review. For example, one participant noted a lack of rest days as a cause of damage to the body from the job. This was a fairly good match to Ilmarinen's (1992) paper discussing the aerobic capacity of older workers which had concluded that adequate rest times were particularly important. This paper provided some validation for the participant's position while also expanding upon it with other aspects of work that contributes to physical damage of the body. This information along with that of related papers was subsequently used for retroduction.

3.3.5. Retroduction

The goal of retroduction is to identify the necessary contextual conditions for a particular causal mechanism to take effect and result in the empirical trends or demi-regularities to be observed (Fletcher, 2017). As noted earlier, the literature review had produced a map of the likely ways that various subjects were connected so once themes were matched to the literature in the abduction stage these connections were a good starting point for the creation of plausible explanations for the trends observed. The literature tended to describe similar scenarios to the ones described by interview participants. For example, often different industries would be

described with similar situations such as the effects of compulsory licensing within the security industry or those of deskilling in manufacturing. Therefore, the primary task was to identify which aspects of each explanation would be likely to apply in the arboriculture industry and which would not. This allowed for imagining a model of a mechanism, which, if it were real, would account for the phenomenon in question (Bhaskar, 2014).

Upon commencing this stage it became apparent that the literature review covered an excessively broad range of subjects. The themes from the results were used to identify peripheral subjects that could be excluded and important subjects needing greater exploration. Digging deeper into the more relevant literature topics subsequently yielded a better analysis of the results.

Upon write-up numerous weak points of my argument became apparent. Each time I would revisit the literature to better explain what was occurring. Each new explanation caused large sections to become irrelevant while indentifying new areas requiring deeper analysis. By the time the write-up was complete the discussion chapter had been completely rewritten several times. The result is a plausible explanation of causes and effects which align with with the results.

4. Results

In this chapter I present the results of the study, beginning with quantitative data from the Likert-scale as well as responses to the open sections of the survey. The chapter includes a retroductive analysis of the emergent themes from qualitative interviews written survey responses. I concludes with a summary of how the data from all sources fits together.

4.1. Survey Results

The answers to the 5-point Likert-scale survey questions regarding the best and worst aspects of the occupation were ranked in order of their means, presented in **Tables 1 and 2** below. These questions also included the option for “other” which an invitation to elaborate. These written responses are presented in **Table 3**. Participants answers to the question, “*what do you think might be one or two key ways to make the arboricultural fieldworker occupation more satisfying and attractive as a long-term career option?*” are presented in **Table 4**.

Table 1: Best aspects of the job

Job Aspect	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Total Responses	Mean
Working outdoors	0	0	1	11	14	26	4.50
Teamwork/camaraderie	0	0	1	12	14	27	4.48
Good fitness	0	1	1	11	14	27	4.41
No two days the same	0	0	3	12	12	27	4.33
Satisfying work	0	0	3	12	12	27	4.33
Impressive/awe inspiring work (E.g. big tree climbing)	0	1	6	10	10	27	4.07
Learn in-demand skills	0	2	5	16	4	27	3.81
Freedom of appearance (beards, tats etc.)	1	4	5	13	4	27	3.56
Autonomy (choose when and how work gets done)	0	1	13	11	2	27	3.52
After work drinks	4	1	12	7	3	27	3.15
Good pay	4	10	6	4	3	27	2.70

Table 1 demonstrates the level of agreement among survey participants with respect to various positive attributes of the field arborist role. The data for the job aspect ‘after work drinks’ is potentially misleading here because many firms have now banned alcohol at their depots.

Therefore for many it is not an aspect of the job at all. Historically, I would have expected this to aspect to rank much higher. Where participants chose to elaborate on this their written responses are recorded on **Table 3**.

Table 2: Worst aspects of the job

Job Aspect	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean
Wear and tear on the body	0	2	4	9	12	4.15
Low pay	2	2	5	10	8	3.74
Compromising one's integrity (E.g. pressured to carry out improper pruning, removing trees that should have been retained, violating H&S regulations)	2	3	5	9	8	3.67
Unprofessional employers	3	3	3	11	7	3.59
Long hours	0	7	5	10	5	3.48
Conflict (E.g. Disagreements with co-workers, arguments with clients, neighbours and similar)	3	2	6	11	5	3.48
Lack of career progression	2	4	6	12	3	3.37
Inflexible hours	0	10	4	9	4	3.26
Dangerous work	2	6	10	5	4	3.11
Low status (E.g. being treated as a second class citizen)	2	10	3	8	4	3.07
Working in the rain/cold	2	6	12	6	1	2.93
Uncertainty (E.g. lack of work over winter, erratic scheduling, chance of employer ceasing operation etc.)	6	10	5	5	1	2.44

Table 2 demonstrates the level of agreement among survey participants with respect to various negative aspects of the field arborist role suggested by me. The total responses for each question was 27. Where participants chose to elaborate on this their written responses are recorded on

Table 3.

Table 3: Best/worst aspects of job (written responses)

Big company in the utility sector, really looks after its employees, I feel as though Arb is still growing as a professional industry and some small companies have yet to jump on board with the professionalism, including keeping good employees happy.
The best aspects are teamwork and collaboration with the aim of finding the best way to carry out the task. Low pay and the perception that you are unskilled is the worst part.
I feel the standard of NZ tree care is lost, Arborist should be kaitiaki of the urban nagahere but it is all about cutting to client's specifications and not about tree care, for most companies.
Drug use amongst arborists, and generally low education levels
Lack of protection over trees.
If you are not cut out for it do something else
I enjoy my work. Work for a good company and we have an awesome professional group of people
Arborists don't have a code of ethics and blame government for a lack of tree protection while cutting everything down and posting it on social media as a status of their skill
Health and safety
Lack of care for trees by land owners and community
Being a woman and being treated differently and not given the opportunities same as a man despite being more qualified
Unprofessional co-workers
When I ran a business I worked a standard day and did not work weekends. Everyone should be able to have a life outside work and have the ability to rest the body. You have integrity or you don't, the job does not require people to compromise their integrity. The work is as dangerous as you make it.

Where participants chose to elaborate on their responses regarding the best and worst aspects of the job, all of these comments are recorded on **Table 3**

Table 4: Other written responses

Help workers develop as people not just as arborists, treat them like a mate
Career paths is a huge subject, and obviously all boils down to pay.
High pay Government auditing and regulation
The level of professionalism needs to be increased. We as an industry need to take the lead from other industries and have a high end consulting/advice portion that is separated from contracting. That way the public will hopefully view is like engineers, architects etc. when we get to that level.
The fear of prosecution in a health and safety heavy world. Poor wages forcing staff to do cashies to subsidise wages. Frustration with the lack of prosecution for pikies and those who fell trees of others. Low public value of trees and what we do.
Higher remuneration
Working to protect trees and pride in being a specialist looking after trees by proper tree care.
Better pay, less expectation of hours - draw the limit at 40
Regulation required in QLD Australia.
Regulation of the industry and pay increase for qualified and registered Arborists
Shorter hours and career progression
I'm not sure being an arb fieldworker is a good long-term aspiration. People should be planning at this early time in their career to transition through this area of arboriculture to other fields of arboriculture or industries where their experience and skills are valued and the work is less demanding on the body. It is no one's interest to see a climber get to 40, be injured or worn out, and then have to retrain.
Not using arborists as general labourers a lot - we spend little time climbing vs. brush dragging, chipping, stump grinding, hedge cutting etc. If companies here could follow European models, and have a dedicated climbing and pruning crew followed by a dedicated clean-up crew, then arborists would get to do what they actually wish to do - climb and cut. There is too much general "tree work" done by too many companies, who have to accept the crap work to keep afloat.
Better pay. Further training options for management, consultancy, type roles

More professional recognition all round, a greater awareness that arborists have a significant role in managing one of the greatest assets the planet has to offer.

More professional and regulated approach to consultancy.

Promote it at a high school level more. Some colleges in our area have logging industry courses for the kids that aren't into normal learning environments so they can get an education that's going to actually pay off for them. We should have an option at that level. Letting these teenagers know there's more to tree work than just felling pines over

Higher wages for more skills.

The survey included an opportunity for participant to suggest one or two key ways to make the arboricultural fieldworker occupation more satisfying and attractive as a long-term career option.

All responses to the question are presented on **Table 4**.

4.2. Retroductive Analysis

The retroductive analysis produced numerous codes, a lot of which were interrelated. These were combined into four main themes. These were the costs of the skill shortage, positive work conditions, negative work conditions and professionalism. A list of pseudonyms used for interviewees mentioned throughout the analysis is presented below in **Table 5**

Table 5: Interview participants

Pseudonym	Description
Pete	Owner of small arboriculture firm
Steve	Owner of small arboriculture firm
Stan	Manager at large arboriculture firm
Dan	Ex manager at medium-size arboriculture firm
Paul	High level manager at medium-size arboriculture firm
Ross	Ex climber, environmental firm manager
Bruce	Apprentice arborist, late 20s, small arboriculture firm
Jim	Climber, mid 20s at small arboriculture firm
Jack	Climber, mid 30s at large arboriculture firm
Stuart	Contract climber in early 30s
Tim	Trainer at large training institute
Confirmatory interviews	
Josh	High level manager at large arboriculture firm
Duncan	Owner of large arboriculture firm
Nick	High-level manager at large arboriculture firm
Jerry	Experienced arboriculture consultant

4.2.1. Costs of the skill shortage

Search costs

The main costs of the skill shortage reported during interviews were search costs. Arborists are very difficult to find with many job advertisements running a long time with mediocre results.

This was commented on by Nick, a high level manager at one of the large firms.

“There’s just no one out there, you run an ad for a month and you are lucky if you get one suitable inquiry. When we advertise for an admin job we get hundreds of applications and you have four or five potential candidates within a few days. It’s nothing like this with arborists, this demonstrates the scale of the shortage”

The time taken to fill vacancies for a particular is the primary indicator of the presence of a skill shortage (Richardson, 2007). Josh described search costs where his employer would send recruiters to the United Kingdom in search of potential recruits. While he was confident that this was worth the trouble it would seem likely that it would be more cost-effective to recruit locally if this was an option. In addition to the search costs these migrant workers require a greater level of screening and ongoing assistance to aid their integration to New Zealand.

Some others also commented on the difficulty of finding arborists,

“Difficult to find experienced people. Don’t necessarily want people straight out of school or tech as don’t have capacity to supervise. Guys from tech take time to reach a usable level but we often need people who are just ready to go.” –Stan

“Yeah we have problems attracting people. I started an Instagram account. Attracted lots of young guys who hadn’t been doing it long, and a lot of overseas guys” – Paul

Josh and Nick both expressed concern for how the industry was going to cope with border closures due to COVID19 given the heavy reliance on migrant workers.

Related costs

Nick also noted how high search costs can create additional problems with the disciplining of staff. He was concerned that in some cases workers seemed to have too much power due to their scarcity and were effectively able to hold their employers to ransom.

“You find yourself having to bite your tongue sometimes, where you otherwise might come down a bit harder on certain behaviour but you know that if you lose this guy it will take two years to replace him.”

Nick also expressed frustration that in some situations this scarcity allowed field arborists to negotiate wage increases year on year and he wondered at what point enough would be enough. Duncan, the owner of one of the other larger companies, expressed similar concerns in this respect. He described the possibility of surveying the firms within the industry to find out what they were paying certain sorts of staff as a way of mitigating this issue. This seems to be somewhat of an employer reaction to the use of poaching as a tool to increase wages suggested by the audience member during my conference speech. Such a survey bears resemblance to the

wage-setting method of the large firm described earlier except as a tool for intra-industry as opposed to inter-industry wage-equity.

This somewhat demonstrates that firms are concerned about how what they pay compares to what their competition pays, suggesting that higher wages would be tolerable as long as everyone else also had to pay them. Nick confirmed the accuracy of this prediction, stating that his firm would be open to increasing wages if such a move was coordinated across the industry.

4.2.2. Positive work conditions

My interviews revealed a combination of attributes which people tended to like about the role. These included the fun and fitness of physical outdoor work, overcoming challenges, the camaraderie of working in a team, and the opportunity to develop useful skills. Jim, an employed arborist in his mid-twenties, listed all of these when justifying his career move from psychology to arboriculture.

“I found I was burning out. A lot of hitting brick walls and glass ceiling. Lots of bureaucracy so thought screw this I’ll go do something fun, which was arboriculture. Outdoors, complicated, problem solving, much more relaxed... can grow a beard and long hair. I wanted to develop practical skills as well”.

Physical, outdoor work

Several participants also note the physical, outdoors aspect as something they particularly enjoyed. Paul, a manager at a medium sized firm stated,

“I don’t think I’ll ever be able to put the tools down. I just like doing things. If I’m stuck in the office all day I’ll go home mow the lawn, cut up some wood etc.”

Tom, a self-employed arborist in his early fifties commented,

“It helps my mental health. Feel a lot better with a bit of physical activity.”

Ex-contract climber Ross reminisced,

“I liked working outside, I liked working physically.”

Like Jim, Ross also enjoyed the problem-solving aspect of the job,

“I like that you have to come up with solutions all the time, you quote a job and you have to look at it and think gosh that’s a lot of wood that needs to be moved here, or those anchor points are looking semi bad for rigging, you know, there are so many tools in the tool kit which you alternate between. I liked the diversity of that.”

Skill Development and Recognition

The value of skill development was a frequent discussion point during interviews although interestingly, a large proportion of this was from managers and employers talking about their staff. Pete described one of his previous employees,

“When he started he was a climber with limited machinery skills but by the time he left he was just full time on the digger. Another skill he could take with him.”

Steve also commented on progression and upskilling, while also suggesting a new ‘master arborist’ qualification as a potential way of providing this,

“Progression’s a big part of it with younger generation. Wanting to upskill and increase their salaries. I’m a firm believer in master qualification like in Germany”.

Stan also mentioned a “master arborist” qualification.

“Some guys want to just stay on the tools. Would be nice to have a category of ‘Master Arborist’. Up to industry to find these sort of places for people”.

Pete, Steve and Stan all seem to be talking about creating career progression within the field arborist role. At present this does not seem to be possible given there are not multiple job types within the field. For example, the only options beyond the level 4 arboriculture qualification is the management-focused level 5 certificate and the consultancy-focused level 6 diploma (Wintec, n.d.). Therefore, from a qualification perspective, progression certainly seems to entail a transition “off-the-tools”. This raises the question, how would someone be perceived if they chose to remain a field arborist long-term. Rob suggests such a choice would garner little respect in New Zealand.

“In Europe it’s different in some ways [from New Zealand]. It’s quite respectful to be an old climber who’s been part of the game a long time.”

Stan took this topic a step further by suggesting an additional need for a career path for non-climbing arborists,

“We want to retain workers and give them a career path even if they don’t want to be climbers. Bucket truck, stump grinder, class 2 license. We don’t want to limit anyone’s career. Workers can progress to a truck driving career or similar [in another firm or industry]”.

At present there is no formal qualification for a non-climbing arborists aside from the fairly basic Level 3 certificate, and this still involves some climbing, making it more of a stepping stone than a career end-point. While Stan argues that career progression is possible in this kind of role he is essentially saying that much like the climbing role, the main way to progress is to leave.

Employed arborists also noted the value of skill development. Bruce, a recent entrant to the field, seemed to associate it with having a good employer.

“I got my TC [traffic controller] ticket, my tracks and rollers and now on an apprenticeship. Great for a guy like me—young, almost 30 with a young family.”

Bruce also mentioned some of the more patronising units that are more recent additions to the qualification. These are less-practical, general skills that would perhaps be more appropriately taught in primary school,

“Some units are a bit stupid... like listening, working in a team. These are really easy, other ones like tree ID are a bit more difficult” –Bruce

Jim, also described how the opportunity to develop his practical skills was a high point of his employment experience,

“I did a lot of really cool work that year. Work that really pushed my skillset and advanced my career”

Jack noted the benefits of working at a large firm over a small one in regard to skill development,

“The big company is great. They did all my training. Warranting, class 4 license, I’ve also done some really big trees. I used to think a 20m residential tree was big. Now its 35m pines and gums”

These employees clearly value the opportunity to learn useful, practical skills. This is perhaps one of the main attraction of skilled, manual occupations, where you learn how to do work which has a real, physical impact on the world. There was no apparent fear that these skills would become obsolete and I got the general impression that everyone agreed that these were useful to know, period. There was certainly no obvious “weighing-up” of whether or not learning the requisite skills was a worthwhile investment.

Aside from learning the skills, putting them into action and doing the work properly is something from which a great deal of satisfaction can be derived. When talking about the lines clearance sector, which has slogan ‘clearance not appearance’ Stan commented,

“...you can make that tree look nice and still get that clearance and that’s what I always try to push on to my workers. This *gives* you more enjoyment. You can stand back after taking maybe a third off and it still looks mint. You drive past five years later and the tree’s all bushy and healthy which wouldn’t have happened if you’d just hacked it. This makes you happy.”

The description above fits that of a situation where one might achieve the psychological state known as flow. Flow is described by Csikszentmihalyi (2014) as a mental state where someone becomes fully immersed in a feeling of energized focus, involvement and enjoyment of a particular task. There are three essential conditions for flow to occur, all of which could be present in the above example. First of all the task must have clear goals—clearance *and* appearance. It must also provide immediate feedback—does the tree still look good after having this huge hole cut in it? Finally, there must be a balance between the difficulty of the task and self-perceived ability of the person doing it. For example, successful completion of a goal right

at the limit of one's ability is the kind of instance that is required. Another important factor is not *having* to do the task. While the arborist above does need to clear the lines, he doesn't have to make it look good, rather he is doing that because he wants to, which is a big part of what makes it enjoyable.

Stan also seems to be referring to the artistic side of tree work. Stuart described pruning as fifty percent art and fifty percent technique. In my own experience this is a fitting description. Often the goal of pruning is to remove as much as possible while keeping the tree looking natural.

Pruning technique is based around pruning points, which are generally lateral branches of at least one third the size of the branch being cut off. The branch is shortened to one of these points and the lateral branch takes over the function of the removed section, negating the need for the tree to produce "reactive" growth. This challenge is that the shorter the limb is cut, the less appropriate growth points you have to work with, meaning there is an optimal point where this is balanced. Finding this point is definitely more of an art than a science, and can only be learned through experience. The desire to do this properly is a key source of conflict with customers which is a point we will return to.

Flexibility

Another thing people liked, but did not always have, was flexibility. This was mainly with respect to which days they had to work. This was generally commented on by those who had experiences in self-employment.

Ross recalled his past as a self-employed contractor,

“[I liked the] flexibility....If it was a rainy day you could do some office work, or I did a lot of volunteer work. When I applied at [Large arboriculture firm] they just said, ‘oh you need to provide a clean drug test,’ and I thought stuff you guys if that’s all the response you’re going to give me. Don’t want someone to actually help grow the business.”

Ross continued to explain how he had incorporated flexibility into his current venture,

“We sit and talk with our team and see how they want to work. Some want 6 days on 4 days off, or 4 longer days. It makes no difference to me what days they work as long as the work gets done”.

It must be noted here that Ross is describing an environmental firm which, while the work it carries out does involve some arboriculture, is not an arboricultural firm and the team is made up of individual contractors, not employees. Incorporating greater flexibility into the roles of employed arborists is perhaps a missed opportunity of the industry as present. Jim was the only participant who described attempts at a similar level of flexibility as an arborist employee.

Somewhat uniquely, Jim’s employer made a substantial effort to accommodate self-employment alongside his normal role,

“This time started back on three days per week but it was hard to administer so now doing one off, two weeks on. I work self-employed doing gardening and pruning on the week off. A bit more satisfying being able to do your own thing on your own timetable. I’m fortunate to have a lot of customers who are willing to postpone work for a few hours so I can go for a surf. Too difficult if you’re employed. That’s the main benefit of self-employment.”

Paul commented that his firm had no employees in a certain age group due to this being the age that people seem to try out self-employment,

“No one with 4-5 years’ experience, those 24-28 year old guys. They all want to go out contract climbing, spreading their seed.”

Interestingly, this is Jim’s age group so perhaps these guys are leaving in pursuit of flexibility. At my own employer, we introduced the option of four-day work weeks in light of this possibility and it has proved a very useful recruitment factor.

Teamwork/Camaraderie

Working as part of a team is potentially the most-liked aspects of the role. Survey results placed this at the top of the list.

Pete, a small firm owner of many years’ experience, described a somewhat unique business model he ran in which machine operators are contracted, short-term to other arboriculture firms and double as site foremen, giving the employees a great deal of autonomy. While happy overall with the arrangement he describes the drawback as follows:

“The downside is we don’t often work together. When we do we really like it but it doesn’t happen that often”.

A variation of this theme was ‘working with great people’. Several participants described working with well-known climbers as one of the highlights of their work. These accounts seemed to be mainly as part of subcontracting arrangements where the well-known climber

would be subcontracted to assist with a difficult job or where multiple subcontractors would work together on big projects such as the setting up of Auckland's Lantern festival.

This was sometimes described as “working together as a team to solve problems”. Learning from others with complimentary skills while successfully completing challenging work was something that participants agreed was particularly satisfying.

Dan, a former employed manager, also described camaraderie and the fun of doing the work as what he liked most about the occupation. The loss of this when he transitioned to management was a big factor in his decision to leave the industry.

“The thing I liked most about the job was the hands-on side of it, as opposed to the management. As I managed I was just getting further and further away from the trees themselves, whether it was physically working on them all of the fun which goes with that you know to working with the crews, the camaraderie, all of the things I really enjoyed didn't feature in management for me. –Dan

4.2.3. Negative work conditions

The management role

A managerial roles would assuably rank above that of the field arborists they are managing. However, given Dan's account, this does not necessarily mean that they are more enjoyable. They do not seem to be less work either. Stan described his management role at one of the larger firms,

“We’re paid on a salary based on a forty hour week. We generally do well over that. I think there were a couple of weeks over the COVID lockdown that I did one hundred and nine hours each week, but that wasn’t me out-and-about, more administration and stuff like that so it wasn’t exactly killing me just long-winded.”

While Stan did appear very enthusiastic about his role despite the long hours it is easy to imagine that some would not share his positivity. Stan’s point about large quantities of administrative work came up frequently in informal conversation as a negative aspect of these roles. It seems somewhat counterintuitive to take individuals with scarce arboriculture skills and put them to work on administrative duties for which there is likely to be an abundant supply of competent candidates.

While the hours described by Stan about are clearly not the norm, he did described a normal day’s start and finish times,

“Take me for example, I’m not on the tools but I leave my house at a quarter to six and I’m at the yard by six thirty, about half an hour drive as it’s still a busy part of the day. At night I can leave the yard at five and be home in about forty minutes”.

This is twelve hours per day away from home for work, four of which are completely unpaid. Jack made a comment comparing the managerial and manual roles,

“I know a trainer who went from a salary to an hourly rate on the tools, negotiated well and probably makes more on the tools now than he did in his managerial training role.”

It would appear that ‘progressing’ to a management role, while arguably being essential part of a long-term career, can be more of a sideways transition than an upward one in many cases. With the addition of unpaid hours it seems feasible that some managers would have lower hourly earnings than their “on-the-tools” counterparts. Furthermore, Josh, a high level manager in one of the larger firms, pointed out that the upper management roles tend to require a logistics skillset, not an arboricultural one. For example, the job will involve working out the most efficient way to deploy multiple teams throughout the city. This means that the majority of these roles go to people from outside firms and are not really part of the arborist career ladder. He commented,

“There is just not much demand for people who drive around just looking at trees, we need people who can do the cutting.”

This point from Josh suggests somewhat of a managerial divide. However, not necessarily between those who work with their hands and those who work with their minds as this concept is traditionally portrayed. Rather the divide would seem to be between arborists and non-arborists. Upon analysing the self-published (LinkedIn) career paths of upper-management in the large firms, it became clear that it was unusual for these roles to be held by former arborists with the exception of company founders. Only a couple of interview participants specifically mentioned a divide but in my own experiences both on-the-job and during informal conversation, I found the

“us-and-them” sentiment quite common from both workers and managers. Ross summed up the situation quite succinctly,

“When I applied at the [big companies] I never really liked the attitude that they had, where they were the deciders and you were the worker kind of thing. It felt like they just wanted someone to do the grunt work and not someone to help grow the company with. I suspect this might be different in smaller companies”.

Jim talked about this from a somewhat academic perspective, and seemed quite content with his decision to become an arborist.

“I come from a long line of working class people. I’ve never had a problem working. I’ve seen the various types of divides. I was the first in my family to be educated. It’s not an issue I try to tackle. Call me a proletariat or whatever.”

Stability

Low levels of attractiveness or indeed inaccessibility of managerial roles is a potential problem because they become necessary as people age and start to place more importance on stability. Paul explained his decision to abandon self-employment in favour of employment at a larger firm.

“[My firm] started to grow into something I couldn’t control and I had to employ people. I was working seven days a week and nights etc. Health and safety and so forth was falling by the wayside. My arb company wasn’t professional enough for me. I wanted something a bit more

stable. A steady pay cheque where I could just come home and be Dad, not writing up invoices and so forth.”

While this kind of account seems like a common description of the realities of small business ownership, it is not what people imagine when they embark on this journey. Many arborists try self-employment out of necessity, only to find it was not necessarily what they signed up for. The hard work and sacrifice which is tolerated because it is meant to be temporary, ends up becoming the norm. For every problem that is solved it feels like two more are created from the solution. This was my own experience in small business. Pete commented on this point,

“Everyone I know who has tried to go big has ended up thinking ‘screw this’, its just isn’t worth the stress and the years it probably takes off your life.”

Yet it is a generally accepted fact that you cannot work as an arborist forever and it is prudent for the individual to come up with some kind of solution. Jack outlined this internal dilemma of this transition,

“Once you’re worn out I’m not sure how you’d go walking into a firm and saying, ‘hey, I want a job as an off-tools arborist,’ without a bit of a track record. So that’s why I moved to [large firm]. I have a reputation here now. They know I work hard, have knowledge, show up on time etc.”

The drive for stability is closely related to bodily wear-and-tear which we will address soon.

Conflict with customers

Conflict in general scored quite highly in the survey as a negative aspect of the occupation. This links back to the *skill development* section where arborists are understandably enthusiastic to utilise their skillsets to produce high-quality work. Conflict arises when they are pressured to perform arboriculturally substandard work. From an arboricultural perspective what is important is cutting appropriately sized branches in appropriate places in an effort to achieve the goals of the pruning—for example, maximize clearance from a building—as best as possible while also maintaining the health and beauty of the tree as described in the *skill development* section. The arborist will want to do a good job for the sake of doing it whereas many clients would prefer branches to be cut at an arbitrary point of their choosing and are not interested in the nuances of proper pruning nor the future health of the tree. Ross noted what he called, “cutting to client specs,” as one of the main reasons he left private industry. He concluded with the comment, “I wouldn’t argue with a plumber and say I want the pipe over there. The customer is not always right. Plenty of times working in restaurants I wouldn’t just do what they want because they had the money.”

Jim made the following observations regarding conflict.

“[Conflict seems to arise when] ...people are forced into tree work by disgruntled neighbours. Neighbour comes over and wants more taken off, also people with tight timeframes or unrealistic expectations. People who want stuff done to trees outside of minimum industry standards”

Time pressure

Pressure to break the rules was a common theme for both workers and managers. Several comments on this subject were in regard to the training of staff. Jack noted the problems encountered by a trainer at his firm.

“...found it hard liaising between management and getting the job done. Pressure to sign people off so they can get out there and get the job done. But hard as a trainer as you’re putting your name behind them. You want them to actually be competent.”

Tim noted time pressure while working as one of the main drawbacks of on-the-job training when compared to his full-time course.

“On the work site there is a lot more time pressure ‘hurry up and just cut that branch off!’”
whereas I can put in the time one-on-one and make sure they do it properly.”

Time pressure is often cited as a reason for corners to be cut and risks to be taken. Jack once again noted the difference between the small and large firms.

“We have less pressure to just get it done. We can always state some sort of safety regulation as a push back. Felt I was willing to take more risk at the smaller firm”

Wear and tear on the body

The most noted negative aspect of field arboriculture relates to the physicality of the job. However, this is not to say that people dislike that the work is physical, indeed as we have discussed at the beginning of this chapter, the physical aspect is something people particularly

like. The primary issue is that the quantity and intensity of physical activity seems to wear out the body. This was a frequently raised topic in Bardekjian's (2016) study of field arborists in Canada and the significance of the issue is supported by an ongoing study by Laver (2020) both discussed in the literature review. In addition, I have met two arborists through my own workplace who have gained training in physio therapy in the hope of improving this situation. Stan cited such problems as the reason he transitioned to management,

“My shoulder's had it, back gives me numerous issues. I haven't spent a lot of time climbing but I can't really do it anymore. I was wanting to move into management anyway. Earlier than it might have been.”

Jim commented,

“I think arboricultural years can be quite similar to dog years, 17 years probably makes you about 55 in the arboricultural industry and there's a bit of a toll on your body climbing full time”

“Always hear it's hard on your body and you have a limited lifespan as an arborist. I'm 35 this year and though not the oldest at the yard I am among the oldest. Sensible for me to start looking for what I'm going to do when I get older” – Jack, a climbing arborist at one of the larger firms.

Two participants made the comparison with professional athletes. Dan commented,

“Yeah and the thing is we're not really paid as much as say a professional athlete or something I guess so we could perform for 10-15 years physically and then retire.” Dan's account of his transition suggests that he might have preferred a role which retained some of these positive attributes rather than cutting them completely. As noted earlier, it was the physicality of the role

which prevented Dan from continuing with the manual side of arboriculture. Jim made a similar observation, stating,

“Look at the All Blacks, they train regularly but they don’t play a test match every day or they wouldn’t be the world champions. Need to balance rest days, not overworking.”

Long Hours

This point about overworking seems important given the long hours that have become the norm in the industry. If workers were able to choose how many hours they felt like doing it is likely they would chose less. This point was summed up quite well by the following statement from Steve, an experienced owner-manager, talking about a highly qualified new recruit who lacked experience in the field.

“Now after four or five months on he’s finding the reality of the job a bit tiring. You can’t just do as much as you feel like. You need to just decide this is what I do and get on with it.”

This suggests that at least some arborists, if given the choice, would opt for fewer hours than is standard within the industry. According to Stan, the large arboricultural employer for which he works as a manager, has field arborists on 47.5 hour per week contracts with regular over time as well as having workers on-call for emergency work. He recalled that the firm had considered cutting this back to just 40 hours but decided against it, fearing a reduction in working hours would necessitate an increase in hourly rates. The 47.5 hour per week figure was confirmed by Jack who was employed by the same firm at a different location. Along with Stan, Jack viewed the hours positively as it allowed him a way to prove a sufficient income for his mortgage

application to be approved. This links the long-term, bodily wear-and-tear aspect to pay rates.

Workers are enticed to work longer hours because they are paid at low rates and by the hour.

Dan suggested that to cope with these low pay rates many arborists also take on additional “cash jobs” on the weekends.

“I think a lot of arborists cope with the lower wages by carrying out cash jobs... which further harms the value which people place upon the work. And I’d be guilty of it myself. On many occasions I’d subsidise my wages with a tree that needed cutting down for a family friend.”

Aside from the potential negative impact this might have on wages by increasing competition, it certainly amounts to a greater total number of hours spent physically working, both while under employ and after hours.

Low pay

Second only to wear and tear on the body, low pay was widely regarded as one of the worst aspects of the job by survey participants. The lowest rates for trained arborists seem to be around \$25.50 which is the lowest amount you can pay a migrant worker on a skill shortage visa. The highest rates seemed to be around \$35 per hour but the data gathering efforts did not specifically target this information. As noted previously, low pay is linked to long work hours and subsequent wear and tear on the body. Paul even provided some confirmation of predictions from the literature review that raising pay might alleviate the skill shortage. Here he described a high-paying firm in London,

“Best money I’ve been on over there. Incentivised with 35% from each job. Your percentage of that 35% depended on your position within the crew. Not necessarily same everywhere in London. No problems with staff there. Thirty guys with so much experience due to the incentives and the cool work we got to do” –Paul

Low pay was a common theme throughout the interviews with comments such as:

“Rates could do with increasing. Perhaps what the qualified guys get so it’s an incentive to get qualified. Like plumbers etc.” –Jack, experienced climber.

Dan recalled from his time as a manager at a medium-sized firm,

“I’d look around a large yard and there’d be guys on bloody low wages supporting entire families and still struggling, and they’d often still not be well treated”

Low wages seemed to be attributed to competition with participants suggesting that the industry needs additional regulation such as licensing, mainly in the hope it would decrease competition.

This sentiment is common within the New Zealand Arboricultural Association (NZArb) too, with programs such as International Society of Arboriculture (ISA) certification and NZArb’s Approved Contractor scheme appearing to be a step in this direction. Stan suggested,

“[The skill shortage is] caused by removal of RMA (tree protection). Lots of very small, cowboy companies under-pricing. Limits a company’s earning potential, ability to pay adequately and to keep people in an industry where you seem to get to a pinnacle that you can’t seem to go above.”

Jack also linked wages to regulations with the comment,

“More regulation would lead to better wages. I feel like wages have taken a bit of a bump in the last few years. But still think it has a little way to go to be in line with other ‘regulated’ trades. It would hold us accountable for poor work”

Stan commented that a high minimum wage was challenging for employers because it made it difficult to differentiate the wages of climbers enough to attract people to the role.

“Minimum wage is so high that people can happily live on a minimum wage of \$20 so it’s not possible to make the climbing wage \$40 or whatever it would need to be to entice people to strive for it. Doesn’t seem to be the same level of drive for most of the younger generation”

High levels of competition leading to low wages or preventing an increase in wages is a point noted by Healy et al. (2012) in their skill shortage research which formed an important part of my presentation at the 2020 national arboriculture conference. At the conclusion of the talk a group of older industry participants pulled me aside and told me their recollection of when the world’s largest arboriculture firm, entered the New Zealand market in 1990. They stated that the firm bid such low rates on the main council contracts that they assumed they would be uncontested. However, they were subsequently underbid by New Zealand’s largest arboricultural firm, in a pattern which repeated year on year, driving prices down and forcing a drop in wages. It was said that the original workforce initially rejected the lower rates but were eventually replaced by new recruits who accepted the new lower rates as the norm. On top of this, the city council is said to have taken further advantage of its monopsony position by insisting on budget cuts year on year forcing contract prices down further. The comment was also made that arborists were on the same rates of pay before this happened as they are now, thirty years later.

Another wage-related point raised at the conclusion of my presentation was in response to my comments on the deterring effect that the poaching of skilled workers has on firm's willingness to train. The audience member's concern was that without workers being poached back and forth by firms, wages would be even lower. While this is difficult to know if this is the case, it does suggest a link between wage-rates, retention and training.

Later in the study I got in touch with Josh, who was a high-level manager at one of the larger firms. Josh explained how the larger firms set the wage rate for arborists based upon the wages of similar types of occupations. The wages of similar occupations are set by the larger 'price-setter' firms from their respective industries. Characteristics such as job complexity, responsibility and skill level are used to compare occupations with each other in a process aided by a worldwide database compiled by a multinational consulting firm. Through this process large firms are able to arrive at a market price for all types of wages. However, the results of this remuneration review were simply that most wages were already about right suggesting that this process is not the primary reason for low wages.

However, Josh disagreed that low wages had anything to do with the skill shortage, reaffirming that pay-levels were aligned with other industries and that given the number of hours, arborists could earn attractive annual salaries. He attributed the shortage primarily to the fact that the industry had a very narrow demographic from which to recruit, namely young males up to around thirty years' old. He described an attempt to widen this demographic by targeting female candidates and reported positive results where such recruitment had been successful. He also confirmed a heavy reliance on migrant labour—notably from the United Kingdom—of which supply had been significantly hampered by changes to immigration law, followed by the impact

of COVID19. Changes to the regulations around vocational training had also made the utilisation of this more difficult.

4.2.4. Professionalism

Professionalism

Stan and Jacks comments regarding regulating the industry to improve pay-rates provides a link between pay and professionalism. Improving professionalism is one of the New Zealand Arboriculture Association's primary objectives and there was a high level of agreement that 'unprofessional employers' was one of the worst aspects of the job. As noted in the literature review chapter, professionalism is linked to the type of tasks performed by members of the occupation (Trice, 1993; Wilensky, 1964). In response to the survey question regarding ways to improve the occupation, one participant commented directly on the type of tasks arborists are used for:

“Not using arborists as general labourers a lot - we spend little time climbing versus brush dragging, chipping, stump grinding, hedge cutting etc. If companies here could follow European models, and have a dedicated climbing and pruning crew followed by a dedicated clean-up crew, then arborists would get to do what they actually wish to do - climb and cut. There is too much general tree work done by too many companies, who have to accept the crap work to keep afloat.” –survey participant

Stuart, a contract climber in his early thirties who began in arboriculture when he left school, described a similar work structure he followed in Australia,

“In Melbourne, the climbers just do the climbing, we’d just rock around in a ute doing all the climbing and the clean-up guys would follow along chipping everything with the truck. The chipping guys didn’t want to be climbers, they were happy just chipping. We were happy with that too.”

An important point to make here is that in most parts of Australia, wages are much higher. In New Zealand the highest rates paid to climbers seemed to be around 35–NZD per hour with migrant labour from the United Kingdom on the Immigration New Zealand minimum of 25.50NZD per hour. These rates are seldom part of job advertisements. In Australia positions are advertised with starting salaries of 30-35AUD per hour for groundsmen (non-climbing arborists) and 35–45AUD for climbing arborists (See Appendix C). This is evidence that the conditions of the job are directly correlated with the wage-rate. However, the majority of comments had nothing to do with task allocation. As mentioned in the *stability* section, Paul cited a lack of professionalism as one of the main reasons he abandoned self-employment

“[My firm] started to grow into something I couldn’t control and I had to employ people. I was working seven days a week and nights etc. Health and safety and so forth was falling by the wayside. My arb company wasn’t professional enough for me” –Paul

Stan suggested that a lack of formal rules and enforcement caused problems,

“Bring back RMA tree protection or Worksafe needs to start chasing up bad operators. People working for cash. Skip health and safety and do a \$2000 job for \$500.”

Jack had a similar view point describing the potential for exclusive jurisdiction over arboricultural tasks,

“I’d love to see a reintroduction of tree protection law in this country. You could have registered companies and we could charge more saying you have to use a registered company for this within a distance of a house, road, protected tree etcetera. You could pay the qualified guys more. Incentive to train and properly qualify your staff.”

It became apparent that Jack and Stan seemed to share a similar point of view on a variety of issues. While it was unlikely that they knew each other due to being geographically separated, interestingly they were both employed by the same firm but at different branches. Ross noted professionalism too when comparing the arboriculture industry to the environmental sector in which he now works,

“Raise professionalism. Make them proud. A lot of people working in environmental are really proud of what they’re doing even if its shit work like killing rats, they see the bigger picture and I think that’s what’s missing in arb. The bigger picture of looking after and saving trees, improving greenery for the community.”

The desire to be viewed as professional links closely to a negative public perception of arborists. There was a general feeling that small, unprofessional companies were ruining the public perception of arborists and that this contributed to other problems such as low pay as mentioned earlier. The following comments summed up this point well.

“Cowboy industry ruining people’s perception of arborists. Everyone knows someone who’s had a bad experience... like the guy that takes the money then doesn’t do the work. You only hear about the bad... People were very abusive of [our firm] over lockdown despite the work all being essential.” –Stan.

“I think another big thing is the public’s perception of trees and the value they put on them. There are people out there who realize the worth of a tree or who place the value we might place on a tree but it’s still nowhere near where it needs to be. Now unless people value the trees, and value the skills we put into it. They’re not going to pay what we need, what we deserve for the care of the trees or for even just not removing that tree because it has a value. Pay money to care for it instead.” –Dan

“...there’s also the “I can do it myself” situation which people apply.... At different levels of optimism into the full range of what we do. Whether it’s climbing up something large and taking it apart or, you know, taking out those shrubs around the house. That’s an issue for us too. And then there’s also the lawn mowing man with a chainsaw, pikey, you know who brings us all into disrepute.” –Dan.

This links back to task allocation. When the industry involves itself in tasks which only loosely required arboricultural skills it is likely that much of this could indeed be done by customers. This customer attitude described by Dan was something I came across frequently during my own interactions when pricing work. Customers would let me know that they were considering just doing the job themselves. Interestingly, I found it tended to be males that did this, and their partners were often the ones who were pushing for a contractor to do the work which suggests

masculinity was a factor. Therefore, I would expect such an attitude to be more common when the tasks to be performed are ones that rely mostly on strength and endurance over technical expertise.

In addition to the interviews, the majority of survey comments regarding ways to improve the industry, were related to professionalism. One such comment was,

“Arborists don’t have a code of ethics and blame government for a lack of tree protection while cutting everything down and posting it on social media as a status of their skill.”

This comment suggests there is some confusion regarding what professional arborists are meant to be doing. It seemed generally accepted that it is more professional to save trees than to cut them down but this does not stop most firms from carrying out tree removals, including unjustifiable ones. Developing a code of ethics is a key step in an occupation becoming a profession (Trice, 1993; Wilensky, 1964). Perhaps if such a document were written it could outline the purpose of the industry. For Example Ross’s “bigger picture of looking after and saving trees, improving greenery for the community” or something along the lines of “to help people and trees co-exist”.

Value of trees

Educating the public of the value of trees is a common theme at the national conferences and within NZArb. There is also a strong focus on this by the International Society of Arboriculture in the United States of America (International Society of Arboriculture, 2021). Only one participant spoke about this at length but that could be attributed to the way the survey and

interviews were structured which focused more on the job itself rather than overall industry issues.

The value placed on trees seems to be closely linked to the value and public perception of arborists and therefore, perhaps the likelihood of arboriculture being recognised as a profession. At the time of the interviews the now infamous case of the Canal Road trees was unfolding. This involved a group of historic mature trees which were scheduled for removal by a developer. This is a regular occurrence in Auckland City but in this case a significant public opposition was mounted with crowds of people protesting and blocking access to the site and a group arborists camping for several weeks in the canopies of the trees. Almost every arboriculture firm from Auckland and some from beyond sent in their branded work shirts as a show of support. The overall message from the protestors was to reinstate Auckland's general tree protection laws which would have prevented cases like this by making it illegal to remove any tree over a certain size without a permit. The demonstrations were reported by the media (see Neilson, 2021) and the general feel from participants was that the whole situation was a good thing for the industry. When discussing the event Dan expressed disappointment that NZArb were not very public about their position on the matter.

“Canal Road has gone a long way toward restoring [faith in] the industry. Zane on TV and radio talking about value of trees. I'd like to see NZArb beside him or appearing in the same article at least.” Zane is a well-known arborist in New Zealand whose current role is that of an arboricultural trainer at one of the large training institutes. His strong opinions and courage to voice them publicly has resulted in several media appearances, mainly on the topic of tree protection.

The Canal Road debacle eventually ended with the trees being removed by an unknown firm in unmarked vehicles. As explained by Zane in a TVNZ interview (TVNZ, 2021), these contractors lacked the most basic of knowledge regarding tree felling techniques which strongly suggests that they were unqualified. It is likely that they were the sort of “cowboy” operators that Stan described as bringing the industry into disrepute.

It is worth noting here that despite television footage clearly showing two policemen literally running for their lives as the trees were felled, Worksafe–New Zealand’s primary health and safety regulator–did not attempt to prosecute any party over this incident. As noted earlier, this kind of lack of enforcement was another of Stan’s points regarding professionalism. However, Stan’s interview was before this incident and he was actually referring to an earlier one that happened in mid-2019 (Tokalau, 2019). Here a school boy suffered serious rope burns caused by the recoil of a snapped rope somehow being used to pull a branch from the side of the park. Once again neither the firm nor the way they carried out their work would be considered professional by the arboriculture industry. The media however, still described the workers as arborists. Much like the Canal road incident, Worksafe stated that “the incident did not meet the threshold for an investigation and no further action would be taken.” This position was lightly challenged by the New Zealand Arboriculture Association without success.

Following the Canal Road incident several Facebook groups were established by the public to name-and-shame firms “caught” cutting down trees. While in some instances this could be viewed quite positively it often seemed to result in firms being lambasted over necessary work such as the removal of diseased trees or weed species. A large project involving the removal of pest species from Western Springs Park in Auckland had to be put on hold because of the

likelihood for protest. It is noted that despite strong support for the protection of the Canal Road trees by arborists, their public image still seems to have been negatively impacted. A contract climber from Auckland commented on the Facebook group protests,

“It’s definitely a good thing [the public starting to care about trees], but it’s a shame it had to come to this”.

Lack of understanding about what arboriculture is

As noted, the general consensus is that professional arborists should not cut down trees unnecessarily. Most firms want to be viewed as professional and caring about the environment, as demonstrate by the work shirts being sent in to show on the news report. However, observed behaviour suggests this is more of a “nice idea” than reality. Beyond this two participants noted general confusion regarding the difference between arboriculture and forestry. Both were from the same small town which is well-known as having a strong forestry sector.

Bruce stated,

“People don’t know it exists. There is more to trees than just cutting them down. Before I started I didn’t know what arboriculture was. I thought it was just felling trees same as a forester. People don’t understand the difference. I didn’t even know you could do an apprenticeship in arb”

Jim commented,

“Not many people know about arboriculture, the benefits of trees and how to look after them.”

He continues to describe how the council arborist position is in fact held by a forester, not an arborist.

“The council arborist knows little about trees. Came from forestry, did some time in gardening. There’s a blurred line and lack of understanding of the differences between arborist and forester.”

This confusion was noted by Worksafe board member and ex-Treescape (NZ’s largest arboriculture firm) CEO James Fletcher during his 2020 arboriculture conference speech. Here he suggested a need to distinguish the industry from forestry by recording incident rates relative to hours worked and then presenting this data to Worksafe. Forestry has a high incident rate and workers are described as low-skill relative to arboriculture.

ANZCO (Australian and New Zealand Standard Classification of Occupations), which is a document that classifies all occupations and jobs in the Australian and New Zealand labour markets relative to skill level, acknowledges such confusion with the following sentence in its description of forestry and logging workers.

“Tree Surgeons are excluded from this unit group. Tree Surgeons are included in Unit Group 362212 Arborist” (Trewin & Pink, 2006, P.747).

Professionalization is all about claiming exclusive jurisdiction over what an occupation does (Wilensky, 1964), so making it clear what this is, especially to regulatory bodies, would seem to be an important step.

Training

Several candidates mentioned the length of their training and as expected there was significant variation with older participants stating around five years to gain the level 4 qualification and a recently enrolled apprentice stating just 28 months.

Paul stated that almost twenty years ago,

“I finished the on-job apprenticeship after five years...”

Stan noted a similar time taken at the same firm but at present,

“It takes five years to train an arborist. My old boss couldn’t believe how long it took versus a line mechanic at just three to four years.”

“A lot of things that *have* to be learned on the job such as anchor points with different timbers, different species” - Jack

Bruce, who had recently enrolled as an apprentice arborist, described a shorter time frame in line with what is stated on the Primary ITO training institute’s website (Primary ITO, n.d.)

“I’m on a full 28 month apprenticeship for a level 4 arborist. Right now I’m working on the ground. Going hard on my tree ID at the moment.”

It is worth repeating Bruce’s comments on some of the content of the course,

“Some units are a bit stupid... like listening, working in a team. These are really easy, other ones like tree ID are a bit more difficult” –Bruce

A new full-time course was mentioned where the full level 4 arboriculture qualification could now be achieved in just one year. While the short course and especially the trainer—who we will call Tim—seemed to be held in very high regard, there were also concerns which are summed up well in the following statement from Jack,

“The only thing that keeps [Tim’s] course working is him. He instils so much passion and competence into his guys and the people that come out of that course are amazing considering only one year. Level 4 took me five or six years”

Other comments seemed to be aimed at this course though did not mention it explicitly.

“Difficult to find experienced people. We don’t necessarily want people straight out of school or tech as they don’t have capacity to supervise. Guys from tech take time to reach a usable level but we often need people who are just ready to go.” –Stan

“Nowadays they just go straight to college and come out as fully trained arborists. But they don’t know what they’re doing.”–Steve

In one of the later interviews with Pete, an employer who had around twenty years of industry experience, I chose to question him directly about the new course. He had not yet heard about it but his reaction was in line with informal conversations I have had with others in the industry:

“I didn’t know about that, that’s fairly quick isn’t it....That’s [level 4] really as high as you go isn’t it? I wouldn’t have thought that would be the way to structure it. Is this just an idea? It doesn’t sound very fair.”

Finally, Tim—the trainer mentioned above was interviewed. It was revealed that the course itself was not actually that new and had in fact been running for a number of years. However, the addition of him as trainer as well as the course becoming free through the ‘fees-free’ scheme (www.feesfree.govt.nz) had resulted in a significant jump in popularity. He seemed to accept that the short duration of the course was not ideal and that the level 4 arborists the course produces still required a lot of training unlike in the past when the qualification took longer.

“10 years ago or even longer, if you got someone who is coming out of a qualification they were ready to be foremen... almost. And it’s just not like that anymore. The course itself is 36 weeks long, 3 days a week. Two practical days of the week, so that’s 60-70 days of practical time, and they come out with a *full* qualification. Anyone who’s worked in the arb industry knows you cannot make an arborist in 70 days. You know, no good arborist is made within a couple of years and that’s even if they’re doing 50 hours per week.”

Tim continues to describe how the short duration of the course seems to be driven by employers:

“The way it used to be was like two years to get the qualification you have here now. But one of the things the industry has said, this was before I came into it, this is what I was told when I very first turned up at [the training institute] they said ‘look, the industry has indicated that the qualification takes too long and they want work-ready people who hold a qualification to be on a worksite a lot earlier’, but they won’t come with the same level of skill.”

One of the competing training institutes which provides the 28 week apprenticeship-based course seems to view the qualification in the “old” way. At the time of writing they suggested on their website that upon completion of their *Level 3 & 4 apprenticeship* “You’ll also be able to lead a

team of arborists, and take on leadership responsibilities” (Primary ITO, n.d.). Clearly this is the complete opposite of how Tim from the first training institute views the qualification. This inconsistency is understandably demoralizing for experienced arborists who struggle to complete written parts of their qualification given the small amount of free time their long work hours allow. In an informal conversation with one such arborist he stated that he no longer wanted to bother completing his qualification because the same certificate could be gained so easily by people with zero experience via the one-year courses and hence had limited value.

Tim’s course was partnered with the Southern Initiative with the goal of upskilling the youth of South Auckland (www.tsi.nz/about-us). This is a good example of vocational training in New Zealand arboriculture being used as a tool for social inclusion. Some year’s this reportedly resulted in 100% job placements for graduates which suggests it is quite effective for this purpose.

The final point on training was raised by Dan. He identified the exclusion of powerline clearing from the qualification as a big problem and how this seemed to be an intentionally created barrier to this kind of work,

“We required Wellington electricity approval to work on their network and part of that was qualifying staff to work around powerlines, and it was just an absolute mission. I sent guys at different times to New Plymouth, Palmerston North, or paid exorbitant fees to host a training session myself. That one aspect of the apprenticeship is quite fraught. It prevents other firms from entering the work because it’s so hard to qualify as a preferred contractor for electricity and then it’s so hard to maintain that status. It’s a barrier to larger contracts. There’s no reason why a

two-man firm can't work around the powerlines but there's no two-man firms doing it. That's an issue"

Jerry, a consulting arborist contacted in the later stage of the project confirmed this,

"...important skills are not being taught by training providers because the skill is too expensive to teach, [Large Training Institute] are and have always been fully accredited to teach electrical work but have never offered utility arb training... every arborist at some point or another has to deal with electrical lines."

4.3. Summary

The results demonstrate that the skill shortage is indeed a major issue for employers and there is some openness toward ideas to rectify the issue. The overall impression I got from people both past and present who had performed the role was that they enjoyed it. Aspects such as working as a team, learning new skills and putting them into action to overcome a dynamic range of challenges, were viewed particularly favourably. What many agreed were the most positive attributes of the role in the survey all featured to some extent in the interviews too.

Wear and tear of the body ranked highly in both the survey and interviews. For several participants this was the reason they could no longer do field arborist work, while others were actively considering what they would do when they were no longer able to do the work. There is definitely a general acceptance that one cannot perform arboriculture fieldwork forever. This suggests that workers look ahead with respect to their career paths, and an existence or lack of future rewards is a factor in their decisions. Career progression was suggested twice in survey

responses as a way of improving the role while others suggested a need to better develop the consultancy side of the industry, perhaps as a place to progress to. Although there are management roles to move into, these are scarce as well as seeming to be a career end-point. Upper management positions at the larger firms are not typically held by former arborists. Furthermore, there was general agreement that low pay was one of the worst aspects of the field arborist role and given the possibility of unpaid hours it is unlikely that lower management positions do not fare much better in this respect.

There were some comments in the survey (see Table 4) which seem to identify some quite important points which I would envision many in the industry would agree with, yet the topics did not come up in interviews. For example, the comment about using arborists as general labours and the need to divide the role seemed particularly relevant, yet interviewees seemed to accept low-skilled, labour-intensive tasks as just part of the job. There was also less discussion about consultancy and professionalism than might have been expected based on some of the comments in Table 4.

Another interesting point from the survey data was that there seemed to be a higher level of agreement regarding the best aspects of the job (Table 1) than the worst aspects (Table 2). The reason for this is unclear but it could suggest a lot of variation with respect to business practices between firms. Some firms may have found ways of mitigating some of the negative attributes of the role while others have not. For example, 'dangerous work' was almost half-and-half in its level of agreement. Jack, a climber who had transitioned from a small firm to a large firm, noted that he was more willing to take risks at the smaller company. Similarly, the talk about

unprofessional, 'cowboy' firms could be viewed as frustration on the part of those at firms who follow certain processes, such as those around safety, while other firms do not. To me this suggests a lack of coordination between firms.

Self-employment was hardly mentioned among participants despite the apparent large number of small firms in the industry. Neither workers or managers seemed to be dreaming of one day starting a business in the sector yet. This provides some support to the idea that such transitions are driven by necessity rather than opportunity. However, in the survey, 10 out of 27 people indicated that they envisioned being a business owner in 5 years' time, making it the most popular choice. However, it is not clear how many of these participants were business owners already. Just 8 expected to be employed in the industry and 5 expected to be in a different industry.

5. Discussion

In this chapter I discuss how wages in the industry might be too low but businesses seem constrained on raising them because of competition in the product market. This might affect the structure of the role by discouraging task division. I explore how problems within the field arborist role, such as negative future health prospects, could be encouraging arborists to transition to self-employment, increasing competition for work and staff while creating the small and often unprofessional firms which are blamed for the many of the industry's problems.

Finally, I examine how a lack of formal distinction between qualified, new-entrants and experienced arborists could be causing problems with respect to how the skill shortage is being addressed. The focus appears to be on training new-entrants whereas the shortage seems to be of experienced arborists, made evident by firm tendencies to poach and recruit internationally. This suggests that the type of skill shortage in the arboriculture industry may have been miscategorised. The results are not revisited extensively in this chapter, rather I reflect on insights in light of expectations provided by the literature review.

5.1. Wage Rates

Wage rates seem to be inescapably linked to competition and market structures (Borghijs et al., 2003; Healy et al., 2012; Visser, 2013). A firm's relative power in the supply chain governs the amount of value it is able to extract which in turn can limit the level of wages it is able to afford (Appelbaum, 2017). The account from the *low pay* section of the results is potentially an example of this. Prior to 1990 a city council had a large amount of work which needed doing and there was only one local firm large enough to do it. This firm had a certain level of power relative to the council and it was able to pay a certain level of wages. In addition, the presence of unions gave workers power, relative to their employer allowing them to demand higher wages.

When a foreign competitor entered the market the local firm's power was immediately diminished relative to that of the council, limiting the amount of value it could extract. It now had to compete on price, which the council is said to have leveraged to its own advantage. The entry of the foreign-owned firm into the market swiftly followed the economic reform of the 1980s discussed in the literature review. This suggests that it may have been drawn here by some aspect of the changes to New Zealand's economic system such as reduced corporate tax rates.

Another such change was the introduction of the Employment Contracts Act 1991, which limited the scope of the arbitration court resulting in the collapse of unions in difficult to organise sectors such as construction, agriculture, retail, wholesale, accommodation, restaurants (Visser, 2013).

Arboriculture probably falls into this category too.

The resulting inability to coordinate their actions meant workers' power diminished relative to that of employers, reducing the amount of value they were able to extract from the supply chain.

In other words, their real wages were now able to drop due to competitive erosion (Visser, 2013). This is said to have happened through ‘grandparenting’ where new recruits are hired under less-favourable employment conditions. Conway (1998) describes a similar scenario in the supermarket industry around this time, where wages and conditions were reduced using this method. Admittedly, I was only able to find anecdotal evidence of what happened over this period in the arboriculture industry.

The influence of competition on wages prevents the labour market from responding to demand as a market would usually be expected to do (Mavromaras et al., 2007). Mavromaras et al. states that the outcome of skill shortages depends on the ability of the market to adjust freely and if such shortages persist without causing wage increases, the wage-setting mechanism should be examined. Upon brief examination of this mechanism in the arboriculture industry I found the method used seemed to be based primarily on relative equity, where fairness relative to other occupations is the primary concern (Akerlof & Yellen, 1990; Summers, 1988). Although my investigation into pay-setting was not sufficiently robust to reach firm conclusions, I observed that this system did not seem to control wage-rates, rather it aligned them across industries whose wage-rates are themselves dependent on bargaining power. If anything it might increase the bargaining power of employers relative to workers by coordinating and justifying the wages on offer.

Regardless of how this works, the effect is that the market for arboricultural skills cannot reach equilibrium. This is where there is the same number of suitably trained people wanting to work

as arborists for a given set of employment conditions, equals the amount of work that needs to be done that can support such conditions (Borjas, 2013). The rate of pay which induces equilibrium is called the market clearing wage (Akerlof & Yellen, 1990; Gerritsen, 2017). When this concept was discussed with selected participants in the second round of interviews there was openness to the idea of raising wages as long as the increase was coordinated across the industry. This provides some confirmation that product market competition is indeed restricting wages in the arboriculture industry.

Therefore, coordinating wages at an industry-wide scale could be a solution. An example of this is when a union will negotiate wages for a whole sector so that every firm pays the same amount for the same kind of worker. With wages aligned like this it takes them off the table when firms look for ways to cut costs (Barth, Bryson, & Dale-Olsen, 2020; Visser, 2013). This puts a limit on how low each firm can bid for work. Importantly, high wages in this situation do not need to hurt profitability because charges can be increased where necessary. The amount that firms must charge becomes dependent on the agreed wages rather than the other way around. This means that firms remain competitive with each other regardless of what level wages are set (Franzese, 2003), allowing the labour market to become more responsive to demand.

However, coordination like this does not need to involve a union at all, rather just a group of firms enthusiastic to alleviate the skill shortage. These firms would simply need to agree on a sufficiently-high wage floor for the occupation and communicate this to the rest of the industry. Fougère, Gautier, and Roux (2018) describe extensive use of such occupation-specific wage

floors in France which are set at industry level and independent of the national minimum wage. This is along similar lines to the Fair Pay Agreement legislation presently being introduced in New Zealand, allowing for sector-wide negotiation of standards of wages and conditions (Newman, 2021). However, Fair Pay Agreement's still seem to be based upon bargaining between unions and employers. I suggest that a union is not necessary here, given this kind of sector in which workers have historically had difficulty organising themselves (Visser, 2013). It is in the interest of employer to attract workers into their industries and some firms in the arboriculture industry have already indicated they would be open to supporting actions like this. Furthermore, improvements in wages and conditions would mean more to workers if they came from employers trying to advance the industry rather than a mandate from a union.

5.2. Role structure and working conditions

While pay is an important factor, the structure of the role appears to be an area that could also be improved upon. Indeed, the sector-coordination described above could cover additional areas which affect working conditions as well as wage-rates. The tasks within field arboriculture can be broadly grouped into two main categories – skilled and unskilled labour. One survey participant commented on exactly this when describing how the occupation could be improved, identifying climbing as the activity arborists want to do and listing brush dragging, chipping, stump grinding, and hedge cutting as examples of undesirable activities. The latter activities are low-skilled, taking only a few days in which to become proficient and a few weeks to master. The task of climbing, as well as being what arborist would rather be doing, is one that takes years to master and includes a wide range of techniques which must be taught to ensure safety.

Therefore, splitting the role might allow for better utilisation of climbing skills as well as making the position more attractive.

Survey results identified the wear and tear of the body as the worst part of the job and it was evident from several interviews that entire careers are planned around this point. The physicality seems to have a negative impact on the working lifespan of arborists. Although even the high-skilled manual components are of arboriculture, such as climbing, can be intensely physical, there is at least some scope to mitigate this problem through technique (Laver, 2019). This is less practical for most of the lower-skilled, physical tasks. For example, cutting up a 500 kilogram log and throwing it over a fence is intensely physical work, regardless of technique.

The addition of these physical tasks expands the amount of work there is to do while potentially reducing the number of people willing to do it. This necessitates longer hours and increases the physical toll on the individuals who carry it out. The physicality of the role was also a key issue in Bardekjian's (2016) study of field arborists in Canada and is the focus of an ongoing study by Laver (2020). The Laver study is primarily focused on the physicality of climbing so a useful exercise could be to compare this to the physicality of these other activities, such as log-carrying, as well as determining what proportion of the field arborist role is presently comprised of this low-skilled work.

The level of pay in the sector seems likely to affect how much of this lower-skilled work there is. Appelbaum and Batt (2014) note that historically, it has been high union wages which encourage firms to invest in labour-saving technologies. Examples of such technology in arboriculture are machines such as mini-loaders for moving branches and elevated work platforms (EWPs) which

reduce the need for climbing. This kind of machinery is costly and less economically viable if wage-rates are low. The same goes for supplement workers, for example, there is no need to employ lower-skilled workers for more laborious task if they are only slightly cheaper than a fully trained arborist who is likely to be much more useful to the firm.

One participant recalled his work experience in Melbourne, Australia where the arborist occupation seems to have already been split. Here a separate group of workers follow the climbing team, chipping the branches they leave behind. Wages are higher in Australia and some of the firms are much larger which could explain the difference. The “chipping guys” from the Melbourne example are probably the groundsman described in Australian job advertisements, who start on 30–35AUD (Appendix 3). At least some of these groundsman will need truck-driving licences, a transferrable skill which makes them valuable to other industries and demonstrates that this is not completely unskilled work. Dragging branches and feeding a chipper is also very labour-intensive, especially in the Australian sun, so the combination of wages and other work conditions must be sufficient to make this worth doing over other jobs for which they are qualified, such as truck driving. Set salaries for this work suggests that in Melbourne, ‘groundsman’ seems to be recognised as an occupation in-and-of-itself, perhaps even as a respectable career choice. The high wages paid to climbers have made it possible to divide the tasks of the arborist occupation further than has been done in New Zealand. With migrant climbers starting at just 25.50NZD (Immigration NZ, 2021) in New Zealand this does not leave much room to create an attractive groundsman position beneath it. At the time of writing the minimum wage is 20NZD per hour. This was touched on during interviews with complaints that

a high minimum wage made it difficult to differentiate the climbing-arborist-rate enough to entice people to train for it.

Braverman (1998) criticises the use of such task division to preserve scarce skills, arguing that dividing a craft cheapens its individual parts. However, this does not seem to hold true in the case of arboriculture because the tasks involved cannot be organised from a distance and the skill to do them must be localised within the person carrying out the work. This knowledge requirement provides a shield from automation, bureaucratisation and managerial domination (Thiel, 2007) while preventing the craft from being broken down to the degree in which Braverman was concerned. Climbing involves working-at-height, which many find unappealing, further limiting the pool of potential workers. Indeed, it could be argued that the role should be split on this basis alone, rather than by skill level. Either way, further division could be beneficial, rather than damaging to the occupation. Each division yields a diminishing return so at some point a limit is reached where the cost of dividing up tasks further exceeds the benefit of doing so (Lanz, Miroudot, & Nordås, 2013). From an economic perspective, wage-rates are an important factor in determining the point at which further division becomes unnecessary.

The undesirable arboriculture activities listed above (brush dragging, chipping, stump grinding, and hedge cutting) are the occupation's dirty work, described by Hughes (1951) as the least prestigious, unskilled tasks of an occupation. While it is acknowledged by Hugh that all occupations have their share of this kind of work, I propose that low wages could allow for more of it by preventing division of the role. If this is the case, it suggests that the negative effects of low prestige, stigmatisation, and the associated problems caused by accompanying defence

mechanisms are also linked to pay (Ashforth & Kreiner, 1999, 2014; Slutskaia et al., 2016; Tracy & Scott, 2006). This could even contribute to the exclusion of females from the industry given masculinity is one such defence.

The dirty work literature largely focuses on how members of stigmatised or low-prestige occupations band together to form subcultures which help the group mitigate negative impacts on self-esteem (Ashforth & Kreiner, 1999). However, this relies on workers identifying as a group in the first place. The comment of one survey participant stated that careers should be designed around transitioning through the role of field arborist as early as possible. So some workers seem to view the position as a temporary stepping-stone, rather than a viable career choice. This could be a form of reframing which Ashforth and Kreiner call neutralisation. For example, occupational stigmatisation would not apply as strongly to an individual who is temporarily working as a field arborist as it would to someone who *is* a field arborist. A tendency for arborists to view themselves in this way would hinder collective defences, aligning with Dahrendorf's (1959) observation that group problems tend to be ignored in favour of individual progression.

5.3. Self-employment

Problems such as low wages or those associated with the structure of the position culminates in a force pushing people out of the field arborist role. Survey responses suggested a need for better access to progression options such as consultancy. However, at present there are not a lot of

alternative positions in the industry and many end up self-employed. The result is large numbers of small firms which compete with each other for work and contribute to the depression of wage rates described earlier. They also must compete for staff exacerbating the shortage. There is likely to be no market need for the additional firms that are created given the high level of competition which already exists. This is termed ‘necessity entrepreneurship’ because it is driven by need rather than opportunity (Bourlès & Cozarenco, 2018). I suggest that the creation of these firms is effectively a mismatch of arboriculture skills. Indeed, many arboriculture skills, such as the ability to climb trees, are of only limited use when setting up and running an arboriculture firm.

Furthermore, at least some of these firms must end up as the “cowboy companies” described by participants. For example, Paul stated the reason he left self-employment was that he was unable to make his firm as professional as he felt it needed to be. This implies the structural limitation of firm size is the issue, not necessarily the people operating them. Indeed, it is commonplace for small business owners to become overburdened by responsibilities in which they are poorly equipped to deal with (Mazzarol, 2003) and this could well make a small firm seem less professional. Newman (2021) asserts that these cowboy firms are the result of attempts to cut cost when competition drives prices down.

The idea that these small firms are to blame for a range of employment problems, low prices and a lack of professionalism in the industry, gains a new dimension when their creation is attributed to problems with the field arborist role. Samujh (2004) observed that many are drawn to self-employment by the opportunity to utilise their talents and to organise their own work-time,

reaping the rewards of money and recognition for doing so. It is not beyond imagination that some of these draws could be better incorporated into field arboriculture. If this role could be made sufficiently attractive and viable as a long-term career choice it would reduce the number of these potentially problematic firms which in turn might improve the industry, making it a better place to work.

5.4. Professionalism

Making the industry more professional was a key theme from both the survey and interviews as well as being an important focus of the New Zealand Arboricultural Association (Melville, 2018). Wilensky (1964) states, “Any occupation wishing to exercise professional authority must find a technical basis for it, assert an exclusive jurisdiction, link both skill and jurisdiction to standards of training, and convince the public that its services are uniquely trustworthy” (p.138). The job of a professional should be technical and based on systematic knowledge acquired through long periods of prescribed training which cannot be all learned on-the-job (Wilensky, 1964). Not only would this rule out the dirty work of brush dragging, chipping, stump grinding, and hedge cutting, but tree climbing would also seem to be unsuitable, despite taking a long time to master. Tree climbing is learnable on-the-job, as evident by the existence of excellent climbers who have never set foot in a classroom. According to Wilensky, the operational test for “technical” is that in hiring, preference is given to those who have proved competence to an external agency. This is certainly not the case in arboriculture where fresh graduates cannot be counted on to be competent and great climbers are often not qualified.

This highlights a potential discrepancy between the definition of professionalism provided by Wilensky (1964), and participants' understanding of it. When talking about small firms being unprofessional, participants do not mean that the services they perform are not based on systematic knowledge that can only be acquired through long prescribed training, rather they seem to view professionalism as a business simply being run properly, or perhaps more accurately, being run like a larger business. There is evidence that the New Zealand Arboriculture Association views professionalism in this way too, with their approved contractor programme (New Zealand Arboricultural Association, 2021) appearing to be significantly focused on business systems such as health and safety, client service, continuous improvement and human resource management alongside qualification, experience and work-standard requirements. Wilensky's focus is on turning occupations into professions rather than simply operating in a professional manner. Participants' talk about licencing the arboriculture trade and claiming exclusive jurisdiction over the work is something that is part of becoming a profession so there appears to be some confusion here.

The tasks that do have a more technical basis seem to be those based around the preservation of trees such as pruning and disease management. Proper pruning requires all sorts of knowledge about tree species and their physiology which would be difficult to learn solely on-the-job. Likewise for disease management and control. A lot of the more technical, knowledge-based aspects of arboriculture seem to have been separated into the realm of specialist consulting. While this small portion of the industry might be well positioned for professionalisation, it is

questionable whether there is sufficient demand for this. If we recall Josh's comment from his interview, "There is just not much demand for people who drive around looking at trees."

Therefore, it would perhaps be advantageous to incorporate this kind of technical, knowledge-based work into the climbing role while separating some of the low-skilled tasks from it to create a new occupation. Essentially, this new occupation would be established to do the tasks with a technical basis that require arboricultural skills. This is the kind of work in which arborists might successfully claim exclusive jurisdiction (Wilensky, 1964). If the pay and working conditions of the new occupation were sufficiently attractive, which they would have been if the labour market were to clear, then this would result in people wanting to acquire the necessary skills. This in turn sends the correct signal to training institutes that these are the skills in demand (Mavromaras et al., 2007), creating an opportunity for the necessary linking of the skills to training standards described by Wilensky.

5.5. Training and development

The requisite time to acquire scarce skills is an important factor in the classification of a skill shortages (Richardson, 2007). There is a considerable difference in the productive output of a climber of 5 years' experience compared to one of just 2 years. The staff qualifying experience requirement of the New Zealand Arboriculture Association's *Approved Contractor Programme* is, "a recognised arboricultural qualification (equivalent to NZQA level 4 advanced certificate) and has been continuously working as an arboricultural contractor for a minimum of 2 years post qualification or five years continuous experience" (New Zealand Arboriculture Association,

2021, p. 9). This suggests a 5 year timeframe to master this task. Interview participants also noted a five year timeframe to complete apprenticeships, although one who had just started said his was to be just 28 months. It is also possible to gain the qualification in just one year of classroom-based learning but it is acknowledged by the trainer of this course that these graduates are still only entry-level climbers. One manager commented on this specifically, stating that his firm was not looking for trainees straight from a training institute, rather, they needed workers who were ready to work unsupervised. This suggests that there is a shortage of experienced arborists and not necessarily qualified ones. This is an important distinction because the former take 5 years to create where the latter takes just 1 year. It demonstrates the essential role which firms have in the training of every arborist, even those who are pre-qualified, and suggests there is a discrepancy between what is needed and what is being requested from training institutes. Recalling the conversation with Tim from the training institute, it was the firms who pushed for the qualification to be delivered in a short timeframe. This is perhaps due to a lack of formal distinction between a trainee arborist and an experienced one. A similar situation was observed by Braverman (1998) with respect to plant operators who were highly skilled but were not recognised as such outside their firms because the skills were not formally recognised.

As noted in the literature review, vocational training can be focused on either social inclusion or economic efficiency (Di Maio et al., 2019). The former is common when the nation state operates the system as in New Zealand. The combination of the short training timeframe above and the shortage of arborists seems to lend itself well to social inclusion. As described by Tim, this allows at-risk-youths to undergo just 1 year of state-funded training and be almost guaranteed a job upon completion. However, the usefulness of this to the industry must be

limited because these workers can only be utilised to the extent that a firm has the capacity to supervise them. Therefore, from an industry-perspective it could make more sense to devote scarce training resources to more advanced courses which better equip the existing workforce. The continuing education programme of the International Society of Arboriculture was something the Canadian arborists interviewed by Bardekjian (2015) were very enthusiastic about. This suggests that a similar focus could improve retention of arborists in New Zealand as well better preparing them for more advanced roles that are difficult to fill.

The practice of poaching workers instead of training them is common in the New Zealand arboriculture industry. This supports the idea it is experienced arborists that firms are searching for. Such poaching is encouraged by high levels of competition brought about by large numbers of small firms (Healy et al., 2012). These small firms often lack the resources to train because it requires pulling a difficult-to-find, trained arborist away from production. As noted in the results, some workers have identified being poached, or transitioning from firm-to-firm as the only way they can get a fair wage. This practice accelerates turnover and can make skill shortages appear more severe (Briscoe, 1990), it is also risky from the employer perspective because there is less opportunity for employee screening (P. Ryan, 2000). The popular practice of recruiting fully-trained, migrant workers is similar to poaching as it is another way of avoiding training costs. This could be viewed as 'international poaching,' where candidates are lured away from the firms who might have trained them in their home country. Restrictions on immigration due to COVID19 and law changes which occurred beforehand, were of grave concern to managers I interviewed.

5.6.Type of skill shortage

As stated at the outset of this thesis, Richardson (2007) suggests the following classifications for skill shortages (p. 7):

- Level 1 shortage – There are few people who have the essential technical skills who are not already using them and there is a long training time to develop the skills.
- Level 2 shortage – There are few people who have the essential technical skills who are not already using them but there is a short training time to develop the skills.
- Skills mismatch – There are sufficient people who have the essential technical skills who are not already using them, but they are not willing to apply for the vacancies under current conditions.
- Quality gap – There are sufficient people with the essential technical skills who are not already using them and who are willing to apply for the vacancies, but they lack some qualities that employers consider are important.

The discrepancy between the level of worker which training institutes have been asked to produce and what the industry seems to need, could indicate a potential misclassification of a level 1 shortage as a level 2. If what firms need are candidates with 5 years' experience who are

able to work unsupervised or ideally lead a team of arboricultural workers, then a focus on short courses which produce entry-level arborists is unlikely to solve the problem on its own.

However, there is also evidence to suggest that the skill shortage faced in arboriculture would be more accurately categorised as a skill mismatch. For example, reports of large portions of the field arborist role comprising unskilled tasks would support this. The observation of large numbers entering self-employment could also indicate a kind of mismatching. Categorisation as a mismatch over a level 2 shortage has some important ramifications. If a significant proportion of arborists transition to self-employment once they have acquired the desired 5 years' experience, and some of these set up small firms requiring additional arborists, then it is unlikely that a focus on worker-supply is going to alleviate the problem. This could also explain the limited success reported when 'arborist' was added to the national skill shortage list allowing supply to be supplemented by migrant workers. Managers in the sector confirmed a heavy reliance on migrant workers but still complain of a labour shortage.

Conclusions

This study uncovered multiple factors likely to contribute toward recruitment and retention difficulties in respect to skilled, field arborists. The findings suggest that the wage-rates for skilled workers may be artificially low due to structural features such as intense product market competition, the dominance of small firms, and a lack of sector organisation by workers or firms. Supply is also limited due to the demanding nature of the work and insufficient training, as well as recent restrictions on overseas labour.

However, this study also suggests that a focus on low wages as the cause of recruitment and retention difficulties provides an incomplete account of the problem. This is because low pay seems to affect the structure of the role, discouraging task division to the extent observed in other countries such as Australia. The result is that a wide range of low-skill tasks such as brush dragging, chipping, stump grinding and hedge trimming come to form a major part of the field arborist's job, potentially mismatching staff with scarce climbing skills to unskilled tasks. Aside from the potential to introduce skill utilisation inefficiencies this negatively affects the attractiveness of the role. Splitting the role based on the skill-requirement of tasks or into climbing and non-climbing roles could be advantageous.

High levels of self-employment are also prevalent in the sector. I suggest that this is primarily a result of 'necessity entrepreneurship' to escape problems of the field arborist role such as low pay and poor future prospects. This limits group cohesion and hinders the subculture formation necessary for arborists to defend against the stigmatisation of the manual role. The new firms are

created in crowded markets where they too must compete for arboriculture talent, exacerbating the skill shortage and further increasing product market competition. Small firm management represents limited utilisation of arboriculture skills while demanding new skills which most arborists do not possess. Participants reported high numbers of unprofessional, poorly-run firms, many of which could be the result of arborists setting-up on their own. I propose that arborists putting themselves to use in the creation of these largely unnecessary firms represents further mismatching of scarce skills.

Professionalism is a key concern of many in the industry but there seems to be some confusion in respect to running a firm in a professional manner and turning an occupation into a profession. While ensuring the firms in the industry are well-run is important, turning the occupation into a profession has more to do with the type of work performed. This work should be based upon systematic knowledge acquired through long prescribed training. Attempts to licence the industry should be based on claiming exclusive jurisdiction over this kind of work, which is not necessarily the same as what many firms in the sector are already doing.

There is little formal distinction between an experienced arborist able to lead others and do the job completely unsupervised, and one who is new to the industry with only a basic understanding of the work. The former are the type of worker in most dire shortage taking an estimated 5 years to train. The latter take only a single year of training and are the type of worker that the industry has indicated to training institutes as being needed. However, the use of these trainees is limited

by the number of experienced arborists available to provide supervision. This suggests training resources might be better utilised upgrading the existing workforce.

The study uncovered a variety of areas which warrant future study. It would be useful to know what proportion of the average arborist's daily tasks are skilled versus unskilled and how the physicality of each type of tasks compare. What would be the outcome of splitting the role? Could this be incorporated into training schemes? Beyond this, the affect that wages have on such task allocation could be explored. For example, would the ratio of skilled to unskilled tasks increase if wages were raised? Finally, it is evident that increased coordination in the industry could allow wages and conditions to be improved, providing some relief from chronic labour shortages and a net benefit for both firms and workers. The new Fair Pay Agreement legislation could be a way to achieve this. Action research which explored how this could be done and in particular whether it could be done without the input of unions, would provide valuable insight for both practitioners and academics.

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Appendices

Appendix A: Survey Instrument

Start of Block: Informed Consent

Skill shortage research

Welcome to this research on employment and management in arboriculture!

We are interested in understanding issues around labour retention, skills development, careers and firm growth within the sector. We hope this will benefit workers and business owners alike.

Most of the questions focus on arboricultural fieldworkers, and the survey should take around 5-10 minutes to complete.

Please be reassured that your responses are completely confidential. A copy of aggregate results will be available to participants.

This project has been evaluated by peer review and judged to be low risk. Consequently it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz.

Contact:

James Isaacs (Researcher) james@isaacs.net.nz

Prof. Jim Arrowsmith (Research supervisor) J.Arrowsmith@massey.ac.nz

Dr Ralph Bathurst (Research Supervisor) R.Bathurst@massey.ac.nz

By clicking the button below, you acknowledge:

Your participation in the study is voluntary.

You are at least 16 years of age.

You are aware that you may choose to terminate your participation at any time for any reason.

I consent, begin the study (1)

I do not consent, I do not wish to participate (2)

End of Block: Informed Consent

Start of Block: Demographics

Do you work in the New Zealand arboriculture industry?

Yes

No, never

No, but I used to (please answer following questions as though you were still working in the industry)

No, but I intend to

What best describes your employment situation?

- Employed full or part time
 - Self-employed contractor
 - Business owner
 - Other (please specify) _____
-

How many permanent staff does your organisation employ?

- Just you
 - 1-3
 - 4-5
 - 5-10
 - 10-20
 - 20-49
 - 50+
-

What is your age group?

Under 20

20-25

26-35

36-50

50+

How long have you been involved in the arboricultural industry?

Less than one year

1-2 years

3-5 years

5-10 years

10-20 years

20+ years

End of Block: Demographics

Start of Block: Survey questions (Likert scale)

Best For you personally, how far do you agree or disagree that the following are among the best aspects of arboricultural fieldwork (E.g. Climbing, ground work)?

Note: If you are not presently an arboricultural fieldworker please answer as if you were

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Working outdoors	<input type="radio"/>				
No two days the same	<input type="radio"/>				
Teamwork/camaraderie	<input type="radio"/>				
Autonomy (choose when and how work gets done)	<input type="radio"/>				
Good pay	<input type="radio"/>				
Learn in-demand skills	<input type="radio"/>				
After work drinks	<input type="radio"/>				
Satisfying work	<input type="radio"/>				
Freedom of appearance (beards, tats etc.)	<input type="radio"/>				
Good fitness	<input type="radio"/>				
Impressive/awe inspiring work (E.g. big tree climbing)	<input type="radio"/>				
Other (Please specify)	<input type="radio"/>				

For you personally, how far do you agree or disagree that the following are the least attractive aspects of arboricultural fieldwork

Note: If you are not presently an arboricultural fieldworker please answer as if you were

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Low pay	<input type="radio"/>				
Lack of career progression	<input type="radio"/>				
Wear and tear on the body	<input type="radio"/>				
Long hours	<input type="radio"/>				
Inflexible hours	<input type="radio"/>				
Unprofessional employers	<input type="radio"/>				
Compromising one's integrity (E.g. pressured to carry out improper pruning, removing trees that should have been retained, violating H&S regulations)	<input type="radio"/>				
Conflict (E.g. Disagreements with co-workers, clients, neighbours and similar)	<input type="radio"/>				
Dangerous work	<input type="radio"/>				
Working in the rain/cold	<input type="radio"/>				
Low status (E.g. being treated as a second class citizen)	<input type="radio"/>				
Uncertainty (E.g. lack of work over winter, erratic scheduling etc.)	<input type="radio"/>				
Other (Please specify)	<input type="radio"/>				

Feel free to explain or elaborate upon the answers given above in terms of what you see as the best/worst aspects of work in this sector

From which perspective are your views of the arboricultural fieldworker occupation mainly taken?

- Experience doing the job
 - Experience employing others doing the job
 - Experience/observations made as a contract climber or similar
 - Observations as a customer/client
 - Observations as an industry supplier(4)
 - Observations as an industry trainer/educator
 - Other (Please Specify) _____
-

Where ideally do you see yourself in 5 years' time?

- Employed full or part time (arb industry)
- Self-employed contractor (arb industry)
- Business owner (arb industry)
- A different industry
- Other (please specify) _____

OPTIONAL: What do you think might be one or two key ways to make the arboricultural fieldworker occupation more satisfying and attractive as a long-term career option?

Would you like to be provided with a copy of the research report once complete? (Late 2021)

- No (1)
- Yes (Please provide contact email below) (2)

Would you be willing to have a short (20-30min) interview, remotely or in person, to discuss the topics raised in this survey?

No (1)

Yes (Please provide contact email below if not provided for previous question) (2)

End of Block: Survey questions (Likert scale)

Appendix B: Interview Guide

Goals of the Interview:

Find out what people like and dislike about the field arborist role, what they see as the main problems within the industry or occupation and changes they think should be made.

1) Introduction:

- What is your present position? Briefly, what does this entail?
- What drew you to arboriculture? How did you end up in this industry?
- How long have you done this work?
- What did you do before arboriculture, or can you tell me about your early career?
- Tell me about your training

2) Work content:

- Identify whether candidate spends time physically working in the field, “on-the-tools”
- If not why not, what prompted transition to present role
- Discuss physicality of the role, mitigation, personal experiences
- Likes/dislikes about field arborist role

3) Work Conditions:

- Tell me about your work conditions in the field
- What are your key responsibilities
- How does it compare to what they are doing now (if different).
- How does your present firm/employer compare to previous ones. For example, differences between small and large firms

- How does the arboriculture industry in [other countries worked] compare to New Zealand

4) Probing:

- Elaborate on interesting comments made in survey
- Tell me about special initiative at you firm/practice or position candidate is known for

5) Skill shortage/industry problems and solutions

- Why is there a skill shortage in this industry?
- Is there anything you would suggest to fix it/can it be fixed?
- Is the shortage a problem for your firm? [If owner/manager]
- What does your firm do to address the shortage? [If owner/manager]
- What would you do/what should be done to improve the industry or occupation?

6) Other insights

- Is there anything else you can tell me that might be useful to this study?

7) Referrals

- Is there anyone you can recommend that I should interview for this project?

Appendix C: Australian job advertisements

Advertisement 1



Arborist

[Share](#)

Sunshine Coast

Trades & Services • Gardening & Landscaping

\$35 - \$49.99 per hour • Full time

Posted 23d ago

[More jobs from this company](#)

Apply

Save

We have positions available for qualified Arborists.

Our company is based on the Sunshine Coast, Queensland and operates throughout South East Queensland in both the private and commercial markets.

Successful applicants will be offered consistent hours, great wage rates, a work environment focusing on quality, OH&S and ongoing training opportunities.

Relevant industry certification essential; first aid and MR licence preferred.

Flexible working hours can be negotiated to accommodate family commitments.

Advertisement 2

[Job Search](#) [Profile](#) [Career Advice](#) [Company Reviews](#)

Arborist Climber

[Share](#)

[REDACTED]

ACT
Trades & Services • Gardening & Landscaping
\$38 - \$42.00 per hour • Full time

Posted 6d ago

[More jobs from this company](#)

[Apply](#) [Save](#)

Climber Arborist required by Canberra based amenity tree care company. Full time 38 hr week award conditions with above award wages and overtime if you want it. If you are a working, climbing, arborist with all the skills and tickets (Truck licence, close approach power line clearing, chainsaw, white card, first aid, ewp) and you would like to work for a close knit, go ahead business with good equipment and be a name not just a number, we have a position for the right person with an immediate start.

Employer questions

Your application will include the following questions:

- Do you have a heavy vehicle driver's licence?
- Do you have a current licence to operate an Elevating Work Platform (EWP)?
- Do you have a current chainsaw ticket?
- Do you hold a Construction Induction Safety certificate (White Card)?

Advertisement 3



TREE CLIMBERS OF AUSTRALIA



██████████ · 20 m ·

Full time positions For Arborists & Groundsmen
Join a fast growing company with great staff &
good equipment
Great rates for both Arborist & Groundsmen with
company vehicle Also
Arborists \$35 - \$45
Groundsmen \$30 - \$35
Must be able to get a police check & working with
children's check as most jobs are government
contracts & school work
Must be committed to working Monday - Thursday
10 hour days with over time & weekend work
available.
Based in Newcastle NSW
Please message me directly or email
chopchoptr@██████████.com

Like

Comment

Send

Advertisement 4

Arborist / Labourers ×

ArborWork Tree Services
Humpty Doo NT 0836
\$30 - \$50 an hour - Full-time, Part-time, Casual

[Apply Now](#) 

Company description

ArborWork Tree Services provides tree pruning, removal and Arborist reporting to Darwin, Palmerston & Rural area.

Job description

ArborWork Tree Services is seeking experienced Arborists and Tree Ground Crew to join the growing team.

Experience working with chainsaws and wood chippers preferred but training will be provided. Must be fit and able to work outdoors in Darwin conditions.

Competitive pay based on skills and experience. Opportunity for further training and development.

Job Types: Full-time, Part-time, Casual, Permanent

Salary: \$30.00 – \$50.00 per hour

Benefits:

- Professional development assistance
- Relocation assistance

Schedule:

- 8 hour shift

Supplementary Pay:

- Overtime pay
- Performance bonus

Work Remotely:

- No