APPROVED CODE OF PRACTICE

Safe practice for forestry and harvesting operations

APPROVED CODE OF PRACTICE

August 2025

Te Kāwanatanga o Aotearoa
New Zealand Government

WORKSAFE
Mahi Haumaru Aotearoa

ACKNOWLEDGEMENTS

We would like to acknowledge the considerable help, input and expertise that we received from so many members of the forest industry including:

- contractors and workers
- Forestry Industry Safety Council (FISC)
- Forest Industry Contractors Association (FICA)
- Forest Owners Association (FOA).

We would also like to acknowledge the kaimahi who gave so generously of their knowledge and time.

NOTICE OF APPROVAL

WorkSafe New Zealand leads the national effort to improve health and safety at work in New Zealand, aiming to lower the high number of work-related deaths, injuries, and illnesses. One of its main focus areas is the forestry industry.

The code of practice for *Safety practice in forestry and harvesting operations* outlines what WorkSafe expects when it comes to identifying and managing health and safety risks related to forestry operations.

This code is designed to help businesses and workers meet their legal duties under the Health and Safety at Work Act 2015 and its associated regulations.

WorkSafe worked closely with people such as forestry sector leaders, industry organisations, worker groups, and key partners like the Council of Trade Unions and Business New Zealand to develop this code.

As such, I, Brooke van Velden, confirm that the required consultation process under section 222(2) of the Health and Safety at Work Act 2015 has been met and:

- I approve the code of practice for *Safety practice in forestry and harvesting operations* under section 222 of the Health and Safety at Work Act 2015
- I approve the revocation of the approved code of practice for *Safety and health in forest operations* under section 222 of the Health and Safety at Work Act 2015
- I approve the revocation of the approved code of practice for *Safety and health in forest operations – roles and responsibilities of principals and contractors* under section 222 of the Health and Safety at Work Act 2015.

Hon Brooke Van Velden
Minister for Workplace
Relations and Safety

28 July 2025

FOREWORD

It gives me much pleasure to introduce this approved code of practice (ACOP).

The *Safe practice for forestry and harvesting operations ACOP* provides guidance on the many aspects of health and safety in modern forestry.

Forestry has a proud and long history in this country. It has changed and developed, particularly in the last decade, with the mechanisation of many operations. Despite this the forestry sector has remained stubbornly high in the statistics. Between 2004 and 2014, 49 people were killed in forestry. Between 2015 and 2024 there were still, tragically, 40 people killed. As it stands today, forestry has a fatality rate 20 times higher than the average for any other industry.

Neither the forestry industry nor WorkSafe New Zealand want this. The revision of this ACOP is a step towards improving those statistics and ensuring that kaimahi/workers and others have the highest level of protection against harm to their health and safety.

I would like to thank all in the forestry industry who have contributed their time and expertise in producing this ACOP. A lot of hard work has gone into it, from everybody.

If it helps forestry kaimahi/workers return home safely each day, the effort will be well worth it.

Thank you.

Jennifer Kerr
Chair

1 July 2025

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1.0
About this approved code of practice

IN THIS SECTION:

1.1 Who is this for?

1.1.1 This approved code of practice is for persons conducting a business or undertaking (PCBUs) involved in forestry and harvesting operations.

1.1.2 This includes:

- owner or owners of the land where the forest is planted
- forest owners and managers
- tree buyers/owners
- roading and earthworks contractors
- log buyers
- forest contractors and sub-contractors
- logging transport contractors.

1.1.3 Workers of contractors/subcontractors, and others associated with the industry, might also find this approved code of practice useful.

1.2 How can this be used?

1.2.1 This approved code of practice sets out WorkSafe's expectations for managing health and safety risks in forestry and harvesting operations in a healthy and safe way. It:

- explains what PCBUs must do under the Health and Safety at Work Act 2015 (HSWA) and relevant regulations
- gives examples of good practice.

1.2.2 PCBUs may adopt other practices to achieve compliance, as long as they provide a level of work health and safety equivalent to or higher than the standard in this code.

1.2.3 This approved code of practice can be used:

- to inform health and safety systems, processes and procedures, and training for workers
- as a template around which compliance or your health and safety audits can be based
- as a standard against which alternative approaches to health and safety can be measured.

1.3 What work is covered?

1.3.1 This approved code of practice broadly follows the forest operations process from establishing the forest through to harvest and the transport of logs to the forest boundary.

1.3.2 The guidance is split into the following Parts:

- Part A: Managing health and safety through the contracting chain
- Part B: General requirements:
  - safe worker
  - workplace requirements and facilities
  - first aid
  - emergency plans
  - personal protective equipment (PPE)
  - training, information, instruction and supervision
  - communications
  - alcohol and drugs

- Part C: Site access and preparation
- Part D: Establishment and silviculture
- Part E: Mobile plant and harvesting:
  - mobile plant
  - mechanised harvesting including winch-assisted harvesting
  - manual felling including machine-assisted felling
  - cable logging including manual breaking out
- Part F: Work on landings and loading and unloading including wood residual and biomass processing.

1.4 What if something is not covered in the guidance?

1.4.1 There may be instances where a forestry task will arise that is not covered or varies from what is in the guidance. If this happens, follow usual processes to identify, assess and manage risk (Appendix 6).

1.5 What things mean: certain terms and symbols used in this approved code of practice

1.5.1 Table 1 shows what certain terms and symbols mean in this approved code of practice.

TERM OR SYMBOL	MEANING IN THIS DOCUMENT
'you'/'your'	Refers to the PCBU involved in forestry and harvesting operations.
'must' and/or 	The related action/task/duty is a legal requirement under HSWA or regulations. You have to comply with the requirement. All mandatory requirements have the exclamation symbol on the lefthand side of the page.
'make sure', 'do not', 'check' or similar wording	This wording indicates how WorkSafe expects certain health and safety risks to be managed. It is **not mandatory** to follow these expectations. You may adopt other practices, as long as these practices provide a level of health and safety as good as or better than the standard in this code.
'worker' 'operator'	The word 'worker' is used alongside the word 'operator' in this guidance. They are interchangeable. An operator is a worker who operates some form of plant or machinery. Operators have the same rights and responsibilities as other workers.

TABLE 1:
The meaning of certain terms and symbols in this document

An example of the difference between 'must' and other wording

Workers must have an effective communication system when working remotely.

This is a legal requirement. You must ensure all workers have an effective way to communicate.

Make sure all workers have an RT system when working remotely.

It is not mandatory for all workers to have an RT. If you have technology or a system which is as good as or better than an RT, then you could use that.

1.5.2 See Appendix 1: Glossary for further terms.

Industry best practice

1.5.3 There are times when industry has identified a preferred way to manage a risk. For example, separation distances (such as two tree-lengths).

1.5.4 Any industry practices included in this guidance will be indicated as such (for example, 'It is industry best practice to…').

PART A

Managing health and safety through the contracting chain

IN THIS PART:

TERM OR SYMBOL	MEANING IN THIS DOCUMENT
Must	A mandatory legal requirement under HSWA or regulations.
Other wording including 'check', 'make sure', 'design', 'do not'	How WorkSafe expects certain health and safety risks to be managed. This is not mandatory to follow – you may adopt other practices, as long as these practices provide a level of health and safety as good as or better than the standard in this code.
You/your	Refers to the PCBU involved in forestry and harvesting operations.

2.0
Introduction to Part A

IN THIS SECTION:

2.1 What does this Part cover?

2.1.1 The Health and Safety at Work Act 2015 (HSWA) is New Zealand's key work health and safety law.

2.1.2 All work and workplaces are covered by HSWA unless they have been specifically excluded.

2.1.3 This Part provides:

- an explanation of the duty holders in HSWA
- an overview on how PCBUs in a contracting chain could work together to manage health and safety
- your duty to manage risk
- some things to consider when managing health risks including using exposure and health monitoring.
- the common health risks to forestry workers, and what you can do to eliminate or minimise these risks
- expectations of principals, contractors, subcontractors, and other PCBUs.

2.1.4 This Part does not explain all the duties that PCBUs may have under HSWA.

2.1.5 Certain duties will be introduced where relevant later in the guidance.

3.0
Introduction to HSWA

IN THIS SECTION:

3.1 Who are the duty holders?

3.1.1 HSWA sets out the work health and safety duties that duty holders must comply with.

3.1.2 There are four types of duty holder under HSWA:

- a person conducting a business or understanding (PCBU)
- an officer
- a worker
- an 'other person' at the workplace.

3.1.3 Most duties under HSWA relate to **how** work is carried out. However, some duties are linked to **where** work is carried out: the workplace.

> A **workplace** is a place where work is being carried out or usually carried out for a business or undertaking. It includes any place where a worker goes or is likely to be while at work (section 20 of HSWA)

DUTY HOLDER	WHO ARE THEY?	EXAMPLES	WHAT ARE THEIR DUTIES?
Person conducting a business or undertaking (PCBU)	A PCBU may be an individual person or an organisation. The following are not PCBUs: – officers – workers – other persons at a workplace – volunteer associations that do not have employees – home occupiers (such as home owners or tenants) who pay someone to do work around the home (section 17 of HSWA)	– a business (includes principals, contractors and sub-contractors) – a self-employed person – partners in a partnership – a government agency – a local council – a school or university.	A PCBU has many duties. Key duties are summarised below. **Primary duty of care** (section 36 of HSWA) PCBUs must ensure, so far as is reasonably practicable: – the health and safety of their worker(s) and workers they influence or direct – that the health and safety of other persons is not put at risk from its work. For more information: – see Resources webpage – see Appendix 2 for an explanation of 'so far as is reasonably practicable'. **Managing risks** (section 30 of HSWA) Risks to health and safety arise from people being exposed to hazards (anything that can cause harm). A PCBU **must** manage work health and safety risks. A PCBU **must** first try to eliminate a risk so far as is reasonably practicable. This can be done by removing the source of harm – for example, removing faulty equipment or a trip hazard. If it is not reasonably practicable to eliminate the risk, it **must** be minimised so far as is reasonably practicable. For more information, see Appendix 6. **Overlapping duties: working with other PCBUs** (section 34 of HSWA) A PCBU with overlapping duties **must**, so far as is reasonably practicable, consult, cooperate and coordinate activities with other PCBUs they share duties with. For more information, see Section 3.3 and Appendix 3. **Involving workers: worker engagement, participation and representation** (Part 3 of HSWA) A PCBU **must**, so far as is reasonably practicable, engage with their workers (or their workers' representatives) about health and safety matters that will directly affect the workers. A PCBU **must** have worker participation practices that give their workers reasonable opportunities to participate in improving health and safety on an ongoing basis For more information, see Appendix 4.

DUTY HOLDER	WHO ARE THEY?	EXAMPLES	WHAT ARE THEIR DUTIES?
Upstream PCBU	A PCBU in the supply chain	– a designer – a manufacturer – a supplier – an importer – an installer, constructor, or commissioner.	**Upstream PCBU** (sections 39–43 of HSWA) An upstream PCBU **must** ensure, so far as is reasonably practicable, that the work they do or the things they provide to other workplaces do not create health and safety risks. For more information, see Appendix 5.
Officer	A specified person or a person who exercises significant influence over the management of the business or undertaking (section 18 of HSWA)	– a company director – a partner or general partner – a chief executive.	**Officers** (section 44 of HSWA) An officer **must** exercise due diligence that includes taking reasonable steps to ensure that the PCBU meets their health and safety duties. For more information, see Resources webpage
Worker	An individual who carries out work for a PCBU (section 19 of HSWA)	– an employee – a contractor or sub-contractor – an employee of a contractor or sub-contractor – an employee of a labour hire company – an outworker (including homeworker) – an apprentice or trainee – a person gaining work experience or on work trials – a volunteer worker.	**Workers** (section 45 of HSWA) A worker **must** take reasonable care of their own health and safety, and take reasonable care that they do not harm others at work. A worker **must** cooperate with reasonable policies and procedures the PCBU has in place that the worker has been told about. A worker **must** comply, as far as they are reasonably able, with any reasonable instruction given by the PCBU so the PCBU can meet their legal duties. For more information, see Resources webpage
Other person at the workplace	An individual present at a workplace (not a worker)	– a workplace visitor – a casual volunteer (not a volunteer worker) – a customer.	**Other person at the workplace** (section 46 of HSWA) An 'other person' has a duty to take reasonable care of their own health and safety, and not adversely affect the health and safety of anyone else. They **must** comply, as far as they are reasonably able, with reasonable instructions relating to health and safety at the workplace. For more information, see Resources webpage

TABLE 2: HSWA duty holders and certain duties

3.2 Introduction to contracting chain PCBUs

3.2.1 Contracting is when a PCBU (called the contracting PCBU), hires another PCBU (called a contractor) to do work for them.

3.2.2 The forestry industry has traditionally referred to these roles as 'principals' and 'contractors' so these terms are used in this guidance.

3.2.3 In a contracting chain, and for HSWA purposes, employees of the contractor are workers of the principal (as well as being workers of their employer) (Figure 1).

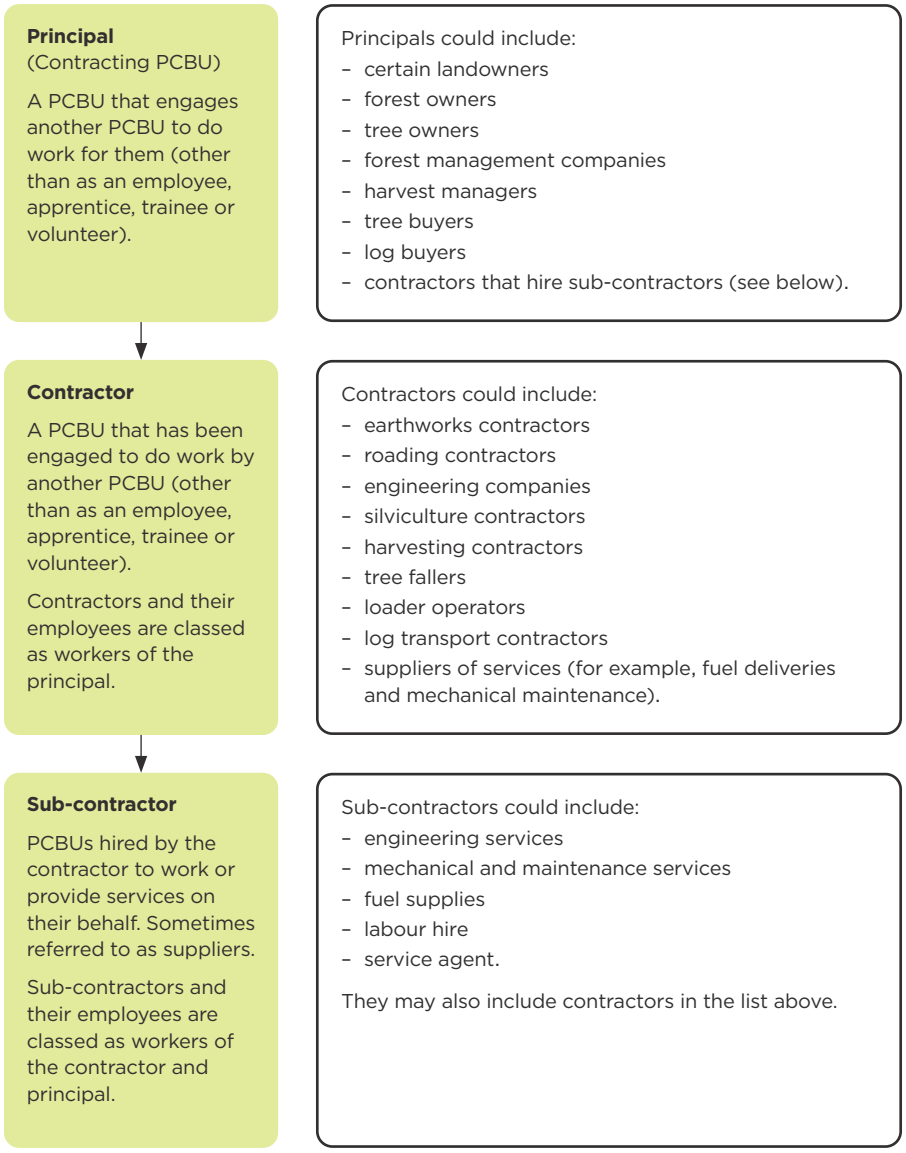


FIGURE 1: PCBUs in the contracting chain

3.3 Working with other PCBUs to manage health and safety through the contracting chain

What are overlapping duties?

3.3.1 As a PCBU, you **must**:

- ensure, so far as is reasonably practicable, the health and safety of your worker(s) and other workers you influence or direct
- ensure, so far as is reasonably practicable that the health and safety of other persons is not put at risk from the work that you do.

3.3.2 PCBUs operating in a contracting chain are likely to have shared health and safety duties with other PCBUs in that contracting chain in relation to the same matter. They all have a duty for keeping workers safe. This is known as overlapping duties.

3.3.3 Examples of overlapping duties could include:

- managing shared health and safety risks
- notifying WorkSafe when notifiable work is to begin or when a notifiable event occurs.

3.3.4 Overlapping duties are explained next.

3.3.5 If you are new to risk management, see Section 3.4 for guidance.

How can PCBUs work together?

3.3.6 Where there are overlapping duties, all PCBUs **must**, so far as is reasonably practicable:

- consult with each other
- cooperate with each other
- coordinate their activities.

3.3.7 Each PCBU is responsible for making sure their own duties are met. PCBUs cannot contract out of their health and safety duties or transfer responsibility for meeting their duties to others in the contracting chain.

3.3.8 The extent of the duty depends on the ability of each PCBU to influence and control the matter.

How can PCBUs work out the extent of their duty?

3.3.9 The extent of each PCBU's responsibility to carry out their duties will most likely be different. This will depend on what ability the PCBU has to influence and control the health and safety matter. The more influence and control a PCBU has over a health and safety matter, the more responsibility it is likely to have.

3.3.10 A PCBU can have influence and control over health and safety matters through:

- control over work activity: A PCBU in control of the work activity may be in the best position to control the health and safety risks.
- control of the workplace: A PCBU who has control over the workplace (and/or plant and structures at the workplace) will have some influence and control over health and safety matters relating to work carried out by another PCBU.
- control over workers: A PCBU will have more influence and control over its own employees and contractors than those of another PCBU.

3.3.11 A PCBU with a higher level of influence and control (and with the greatest share of the responsibilities) will usually be in the best position to manage the associated risks.

3.3.12 A PCBU with less control or influence may fulfil their responsibilities by making arrangements with the PCBU with the higher level of influence and control.

3.3.13 The size of the PCBU or its financial resources (for example, a large company versus a sole trader) does not equal a PCBU's ability to have control or influence over health and safety matters. This means that the PCBU with the most financial resources does not automatically have most of the responsibilities.

One simple way of understanding overlapping duties

3.3.14 Stand back from what you are doing and look at what is going on around you, and who is going to do what.

3.3.15 Talk to the other PCBUs involved. Agree on how risks are going to be managed:

- talk about what is going on – and what will be going on in the future – and who is going to be doing it
- discuss the level of control that each PCBU has over the activity
- agree on who will manage what and how it will be managed
- agree on shared facilities, if applicable
- talk about how they are going to monitor and check on things.

3.3.16 For more information:

- Appendix 3
- see Resources webpage

Example: Notifying WorkSafe

An example of a shared overlapping duty is the duty to notify WorkSafe in the event of:

- the commencement of hazardous work
- a death
- a notifiable injury or illness or
- a notifiable incident (for example, a hazardous substance spill, an electric shock, or engineering failure).

The PCBUs in the contracting chain decided which PCBU would notify WorkSafe. They agreed on the process to be followed:

- If there is a death at the workplace, WorkSafe will be called immediately on 0800 030 040.
- For other events, WorkSafe will be notified through the Notify WorkSafe page of the WorkSafe website.
- The notifying PCBU would then tell the other PCBUs that a notification had been made.

While only one PCBU has been nominated to notify the regulator, all PCBUs are responsible for ensuring a notification has been made.

Example: PCBUs in a forestry contracting chain working together to create a fatigue management policy or agreement

The PCBUs agreed not to create situations where there is pressure on PCBUs further down the contracting chain to meet requirements that are likely to result in fatigue or unhealthy work pressures for workers.

They developed a fatigue management agreement that included:

- minimum hours of sleep opportunity between shifts and at least two full nights between each week of work
- maximum shift length, considering:
- time of day
- type of work
- maximum travel time before and after a shift
- maximum hours to be worked in a week
- maximum hours to be worked in a month
- procedures for detecting, reporting, and addressing fatigue.

The PCBUs together monitored and reviewed the agreement to make sure fatigue is being managed effectively. If needed, the PCBUs would together investigate incidents where fatigue may be involved.

3.4 How to manage risk

Overall duty to manage risk

3.4.1 PCBUs have the duty to manage work-related health and safety risks.

3.4.2 You **must** eliminate risks so far as is reasonably practicable. If you cannot eliminate the risk, you **must** minimise it so far as is reasonably practicable. You **must** do this to the extent to which you have, or would reasonably be expected to have, the ability to influence and control the matter to which the risks relate.

3.4.3 You **must** consult, cooperate and coordinate activities with other PCBUs you have overlapping duties with (see Section 3.3).

3.4.4 An approach to managing risk is covered in Appendix 6.

3.4.5 In addition to their HSWA duties, PCBUs must follow specific requirements for managing certain risks. These include risks from remote or isolated work, and risks from falling objects and working under raised objects.

Requirements for managing remote or isolated work

3.4.6 Work can be remote or isolated from the assistance of other people because of location, time, or the nature of the work.

3.4.7 Remote or isolated work includes:

- working alone or separated from colleagues
- working in an isolated or inaccessible area – where the nearest emergency help (for example, fire service or hospital) is some distance away
- working outside normal business hours or shift/night work
- working in locations where communication is difficult.

3.4.8 PCBUs **must** follow the prescribed risk management process to manage the health and safety risks to workers who carry out remote or isolated work.

3.4.9 The PCBU **must** provide a system of work that includes effective communication with workers.

3.4.10 For more information about the prescribed risk management process, see Resources webpage

Requirements for managing the risks of falling objects and working under raised objects

3.4.11 A lot of your day-to-day practice on a forestry site is about stopping things falling on people. PCBUs have specific steps to take when deciding how to manage the risks from falling and raised objects.

3.4.12 PCBUs **must** follow the prescribed risk management process to manage the health and safety risks from raised or falling objects.

3.4.13 If it is not reasonably practicable to eliminate the risks, the PCBUs **must** take specified steps to minimise risk.

3.5 Managing work-related health risks

How can worker health be harmed?

3.5.1 More workers will be affected by work-related health issues than acute injuries.

3.5.2 A worker's health might be harmed by:

- physical factors such as the repetition of a task, the length of time doing a task, and stresses and strains on the body
- environmental factors such as noise, temperature, and sun exposure
- organisational factors such as rosters and shifts, training and levels of experience, and worksite communication
- individual factors such as fitness, fatigue, and previous injury
- psychological factors such as production pressure, job demands, stress, workplace relationships, and workplace support.

3.5.3 There is a two-way relationship between work and health. Work can affect a worker's health and a worker's health can affect their work.

Example

A worker is part of the breaking-out crew. Their job requires fitness and stamina. The crew needs to be agile and to concentrate on what they are doing.

Usually, the crew take breaks or swap tasks with co-workers so they do not get fatigued.

But this day:

- the crew is short-handed so workers cannot swap tasks
- the crew is running behind so workers take shorter breaks.

Because the crew is working faster, workers are more fatigued. One worker strains a muscle.

The head breaker-out does not notice it and the injured worker does not tell them. Instead, the injured worker keeps working because of the pressure to get the job done. But the muscle discomfort gets worse and becomes a distraction.

Because the injured worker is not paying full attention to the job, the risk of making a mistake increases considerably.

The individual factors alone may not cause a risk but added together they increase the risk of causing harm.

How can exposure monitoring and health monitoring be used to effectively manage health risks?

3.5.4 Figure 2 explains what exposure monitoring and health monitoring are.

3.5.5 Monitoring is not a control measure. It does not replace the need for control measures to eliminate or minimise worker exposure to harm.

Exposure monitoring

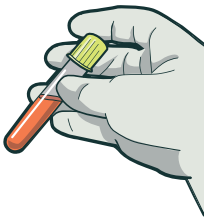
Exposure monitoring measures and evaluates what your workers are being exposed to while they are at work.

This can involve workers wearing a device while they work. Examples of personal exposure monitoring:

- measuring the level of noise workers are being exposed to
- measuring the amount of a chemical workers are being exposed to
- measuring the amount of vibration workers' arms, hands or whole body are being exposed to.

It should be carried out by suitably qualified, trained and experienced people who know how to carry out the monitoring you need (such as Occupational Hygienists).

Biological exposure monitoring is another type of exposure monitoring. It usually involves taking blood or urine samples to test for a substance (or a metabolite of a substance) workers are working with.



Blood or other invasive samples must be taken by a health practitioner such as an Occupational Health Nurse or phlebotomist (for blood).

A suitably qualified, trained and experienced person is needed to interpret the results.

Health monitoring

Health monitoring looks at whether a worker's health is being harmed because of what they are being exposed to while they are at work.

Examples:

- carrying out hearing tests to check for hearing loss from being exposed to noise
- checking for skin damage from being exposed to chemicals
- checking for nerve, muscle or circulation damage from being exposed to vibration.

Well-being programmes, employment prescreening and fitness-to-work examinations are **not** health monitoring.

Monitoring should be carried out at the beginning of a worker's employment (to get baseline readings). Then regular (ongoing) monitoring should be carried out.

It should be carried out by suitably qualified, trained and experienced health practitioners with the knowledge, skills, training and experience to carry out the monitoring you need.

For example, an Occupational Health Nurse could carry out initial health assessment (health screening) and subsequent routine regular testing. If suspected, workers should be sent to a health practitioner who understands occupational health for a full medical assessment/formal diagnosis and feedback to the PCBU. This could be an Occupational Physician or GP with relevant experience.

FIGURE 2: Exposure monitoring and health monitoring

3.5.6 Exposure monitoring and health monitoring – along with verifying that control measures are working effectively – can be used to manage health risks (Figure 3). Health monitoring can also confirm that control measures are preventing harm.

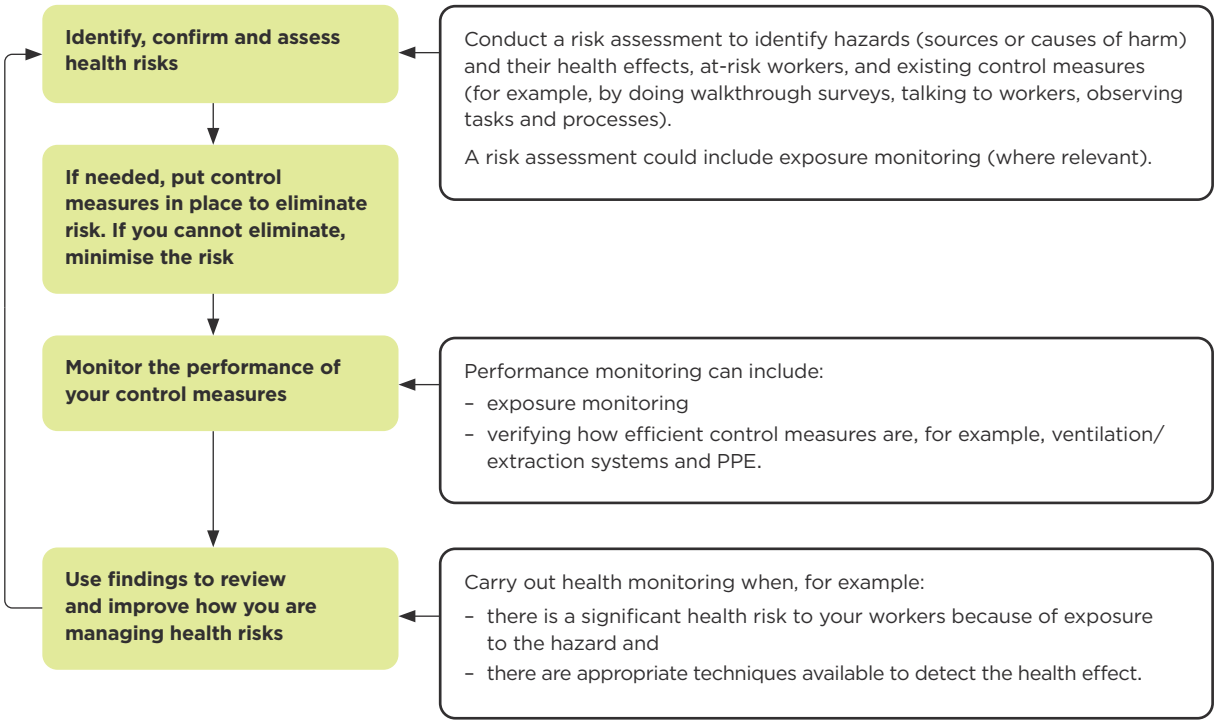


FIGURE 3: Role of exposure monitoring and health monitoring in managing health risks

WHEN TO MONITOR?

3.5.7 You **must** ensure, so far as is reasonably practicable, the health and safety of workers, and that other persons are not put at risk by your work. In some circumstances, this could mean monitoring worker exposure and/or the health of workers.

3.5.8 You may be required to monitor worker exposure or worker health in circumstances specified in HSWA regulations.

3.5.9 WorkSafe could also request you carry out monitoring to meet your primary duty or HSWA regulation requirements.

3.5.10 For further information see Resources webpage

WHAT TYPE OF MONITORING?

3.5.11 The type of monitoring depends on the kind of work you do.

3.5.12 You will need to talk to a suitably qualified and experienced health and safety professional to advise if monitoring is appropriate for you - and if so, what type and how often. You could need initial monitoring carried out, and then regular (ongoing) monitoring.

3.5.13 For more information on selecting external monitoring providers, putting in place monitoring programmes including what to do if workers do not want to take part, see Resources webpage

What are common hazards that can harm workers' health?

3.5.14 Health hazards that forestry workers could be exposed to include:

- fatigue
- mental health harm
- noise
- vibration
- temperature extremes (hot and cold)
- UV/sun exposure
- harmful substances
- hazardous manual tasks (work-related musculoskeletal disorders).

3.5.15 These may not be the only health hazards your workers are exposed to, but they are a good place to start. These topics are addressed next.

Fatigue

WHAT IS FATIGUE AND HOW CAN IT HARM?

3.5.16 Fatigue is a state of physical and/or mental exhaustion.

3.5.17 Forestry work relies on workers being physically and mentally alert. A worker's fitness to work can be affected by fatigue. This can create a risk to their health and safety and the safety of those around them.

3.5.18 The more fatigued a worker gets, the more likely they are to be affected and make bad decisions.

3.5.19 Fatigue can also cause micro-sleeps, where the person briefly falls asleep. Micro-sleeps can be dangerous if they occur at the wrong time (for example, when the person is in control of mobile plant).

Things that can lead to workers experiencing fatigue include:

- long driving times (many workers travel considerable distances to get to their sites)
- longer shifts
- the physical nature of many forestry jobs
- mental demands
- using certain machines
- personal health or lifestyle factors.

Fatigue can be made worse by:

- cloudy days
- not being able to see clearly (mist or haze)
- high temperatures
- dehydration
- low temperatures (frost/snow)
- wet weather
- loud noise
- tasks which are difficult or carry on for long periods of time
- tasks which are repetitive, monotonous and boring
- difficult conditions underfoot (slippery ground or stems, high hindrance undergrowth).

FIGURE 4: Causes of fatigue

WHAT ARE POSSIBLE CONTROL MEASURES?

3.5.20 Table 3 describes control measures that can be used to reduce the chances of workers experiencing fatigue.

POSSIBLE CONTROL MEASURE	EXAMPLES
Create work schedules that allow for sufficient rest during work shifts and between shifts (in consultation with your workers)	– Keep a log of hours worked to make sure working hours are not too long. If longer working days are required, consult with your workers before deciding these hours. – Check that casual staff or labour hire workers have not recently worked a shift somewhere else (for example, the same day or the previous night). If they have they might already be tired. – Consider staggered start and finish times, longer rest breaks, and periods off work: - build in a minimum 15-minute break every three (3) hours, or two 30-minute breaks per day - encourage workers to take microbreaks. A break of five (5) minutes per hour can make a big difference. – Factor in travel times to work sites. Long travel times to remote worksites will contribute to fatigue, as will the effects of staying away from home for days at a time. – Monitor and place limits around the number of overtime hours that can be worked. Avoid incentives to work excessive hours. – Monitor and put limits around shift swapping and on-call duties. – Design rosters that follow natural sleeping rhythms and allow for good sleep opportunity and recovery time. – If night work is required, limit the number of night shifts in a row that your workers can work. – Do not allow workers to work if fatigued.
Schedule tasks suitably throughout a work period A worker's ability to remain alert and focused can be reduced between 3.00am and 5.00am, and between 3.00pm and 5.00pm	– Take workers' alertness and focus into account when managing the risks of higher risk activities. For example, tree felling/breaking out, manual tasks, or tasks using mobile plant or vehicles taking place between 3.00am and 5.00am and 3.00pm and 5.00pm.
Limit periods of excessive mentally or physically demanding work	– Rotate tasks between workers. – Make sure plant, machinery, and equipment are fit-for-purpose. – Make sure workers take breaks if they lose concentration.
Make sure workloads are manageable	– Set reasonable timeframes. Take into account workflow changes due to factors such as machinery breakdowns, unplanned absences, or resignations. – Do not let production pressure affect decisions.
Provide workers with training and information on fatigue management so they can self-manage outside of work hours	– Train workers: - to recognise the signs and symptoms of fatigue - how to avoid fatigue - how to make sure they are well-rested and ready for work at the beginning of their shift.
Provide a process for workers to report fatigue-related issues to management	– Encourage workers to: - communicate with their manager if they start showing signs and symptoms of fatigue - report fatigue-related incidents.
Develop a fatigue management plan	– With workers, develop a fatigue management plan that outlines the actions you will take to minimise the risk of fatigue (see Section 3.3).
Use technology to monitor for fatigue	– In consultation with your workers, consider wearable devices and systems that monitor and alert when fatigue is detected.

TABLE 3: Possible control measures for fatigue

3.5.21 For more information, see Resources webpage

Mental harm

HOW CAN MENTAL HEALTH BE HARMED?

3.5.22 Harm to mental health may be immediate or long-term. It can come from a single event or repeated exposure.

3.5.23 Harm to mental health can decrease workers' mental wellbeing resulting in, for example, increased stress, reduced work performance and increased risk of self-harm and suicide.

WHAT ARE RISK FACTORS FOR MENTAL HARM AND POSSIBLE CONTROL MEASURES?

3.5.24 You **must** manage risks to your workers' mental health as well as risks to their physical health and safety.

3.5.25 Many potential risks to worker mental health can be minimised by PCBUs working together at the planning and design stages of work.

3.5.26 Table 4 shows causes and possible control measures.

CAUSE OF MENTAL HEALTH HARM	POSSIBLE CONTROL MEASURES INCLUDE:
– conflicting demands – repetitive tasks – unreasonable deadlines – shift work, night work, working away from home – long periods of remote or isolated work.	– Provide workers the resources they need to do the job properly and safely. – Set reasonable deadlines. – Design shifts to allow for adequate rest and notify workers of changes in advance (see Section 3.5). – Clarify roles so everyone understands their responsibilities.
– bullying, harassment, poor interpersonal relationships at a worksite (this risk can increase when there are multiple PCBUs working at a site) – lack of supervision or support, or conflicting directions (especially when there are multiple PCBUs and it is unclear who controls the worksite).	– Create a positive work environment where workers are encouraged and supported. Promote workplace dignity, respect, and the upholding of a person's mana (status). – Have clear policies on stress, bullying and violence, how workers raise concerns, and how bad behaviour will be responded to. – Make sure site managers/team leaders are accessible and available to workers. – Have a clear process to raise issues with other contractors, subcontractors, or co-workers. – Where possible, be aware of personal circumstances that affect your workers and provide support as appropriate. Allow flexibility or time off where needed.
– trauma (such as witnessing injuries and death).	– Provide incident response training for all workers on: - what to do in emergency or trauma situations - how to deal with the emotional aftermath of witnessing traumatic situations - where and how they can seek help for themselves if needed. – Minimise exposure to traumatic events: - limit the number of people who witness the scene. Keep workers that are not directly involved away - identify the roles and responsibilities of those who will step up if a situation occurs - develop a trauma response plan that covers these situations and how they will be handled. – Make sure workers who have witnessed injuries and death are supported: - make sure workers (including managers) know where they can get extra support from an appropriately qualified person. Where reasonably practicable, allow for workers to access support services during paid work time. Especially if the need for help has been triggered by work factors - consider the cultural needs of your workers. For example, workers may wish to have a rahui lifted at the site of a fatality before feeling spiritually safe to continue work at that site.

TABLE 4: Cause of mental health harm and possible control measures

3.5.27 For more information, see Resources webpage

Noise

HOW CAN NOISE BE HARMFUL?

3.5.28 Noise is a common hazard on forestry sites. The biggest noise risks come from chainsaws and mobile plant.

3.5.29 Noise is considered hazardous when it reaches 85 decibels (dBA) or more. If people have to raise their voices or shout to be heard in a conversation, then the noise level may be too high.

3.5.30 Working in or near machinery can expose workers to continual or excessive noise. If the noise levels are too high, or prolonged, they can lead to hearing loss.

3.5.31 Noise induced hearing loss is permanent. It can have a significant impact on a worker's life. Loud noise can also lead to tinnitus – a persistent ringing or buzzing in the ears.

3.5.32 You **must**, so far as is reasonably practicable, make sure that workers are not exposed to noise levels that are:

- equivalent to 85 decibels averaged over 8 hours, or
- a peak noise level over 140 decibels.

3.5.33 This always applies, whether or not your workers are wearing hearing protection.

WHAT ARE POSSIBLE CONTROL MEASURES

CONTROL MEASURE	EXAMPLES
Eliminate the source of the noise	– Change work processes to eliminate hazardous noise (for example, stop using a noisy machine).
Minimise exposure of workers to excessive noise	– Replace noisy plant, equipment, and vehicles with quieter plant, equipment, and vehicles. – Fit silencers (such as mufflers or enclosures) on noisy plant. – Enclose engines (insulation) and heavy equipment workstations to contain the noise. – Sound-proof cabins. – Make sure workers keep doors and windows closed while working. – Keep workers out of high noise areas if they do not need to be there. – Reduce exposure time for workers operating noisy equipment. – Make sure plant is well maintained to reduce noise from friction, vibrating surfaces, mechanical impacts, high velocity air flow or liquid flow, and fan blades.
Provide hearing protection for workers to use (Grade 5) Only rely on hearing protection when you have taken all other reasonably practicable steps to minimise exposure to noise.	– Figure 6 shows examples of hearing protection. – Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks. Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

TABLE 5: Possible control measures for noise

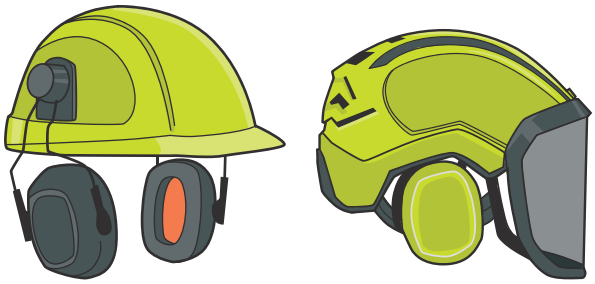


FIGURE 5: Examples of hearing protection

What about exposure monitoring and health monitoring?

3.5.34 Exposure monitoring checks the amount of noise your workers are exposed to. It can be used to inform you:

- if control measures are needed
- what level of hearing protection is required
- whether existing control measures are being effective at minimising the risk.

3.5.35 Consider including health monitoring (hearing tests to check for hearing loss) into your health monitoring programme.

3.5.36 For more information, see Resources webpage

Vibration

WHAT IS EXCESSIVE VIBRATION AND HOW CAN IT HARM?

3.5.37 Exposure to excessive vibration can cause permanent and disabling damage to forestry workers.

3.5.38 Forestry workers can be exposed to harmful levels of vibration through various sources. For example, from:

- spending long periods of time sitting on or operating mobile plant, vehicles, or machinery that vibrates
- using tools or machinery that vibrate for long periods of time.
- working in cold conditions can increase the harmful effects of vibration on the body.

3.5.39 There are two main types of vibration that can harm workers - whole body vibration and hand-arm vibration (Figure 6).

Whole body vibration

- occurs when vibration is passed through the body from a surface where a worker sits or stands on
- occurs most often in workers driving or operating machinery or other vehicles over rough or uneven surface
- can affect the body in several ways and can contribute to several health disorders.

Hand-arm vibration

- occurs when vibration is passed through the hands and arms, usually from hands or power tools
- workers can develop Hand-Arm Vibration Syndrome (HAVS), Carpal Tunnel Syndrome (CTS), and other musculoskeletal conditions if they regularly use hand-held power tools and machines, especially for long periods of time.

FIGURE 6: Whole body vibration and hand-arm vibration

WHAT ARE POSSIBLE CONTROL MEASURES

CONTROL MEASURE	EXAMPLES
Eliminate the source of the vibration	– Use tools or machines operated by remote control or use mobile plant-mounted tools rather than hand tools.
Minimise exposure of workers to excessive vibration	– Use power tools and plant that produce less noise and vibration. – Use methods of work that produce less vibration (for example, use hydraulic rather than compressed air tools). – Isolate vibrating machinery, mobile plant, or vehicles from the operator by providing fully independent seating. – Use mats or insoles to reduce foot-transmitted vibration. – Choose power tools and plant that direct cold air (for example, from the tool's exhaust) away from hands. – Train workers on choosing the right tool or plant for the job (one which has the appropriate size, power, and capacity for the task and work conditions). – Make sure workers know how to safely use the plant or tools in a way that minimises the levels of vibration. – Maintain power tools and machines regularly. Repair faults as soon as possible. Make sure suspension systems are well maintained. – Maintain vehicle seats and seat suspension. – Limit the time workers are exposed to vibration, especially while working in cold conditions (for example, job rotation, lots of breaks). – Discuss with workers how exposure to vibration can harm them and train them how to identify the symptoms of HAVS and CTS. Tell workers how they can report their symptoms – Reduce exposure to working in the cold, providing warm/hot drinks. Have workers take breaks in a warm place.
Provide PPE for workers to use Only rely on PPE when you have taken all other reasonably practicable steps to minimise exposure to vibration.	– Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks. Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard. – Use thermal PPE to keep workers warm and dry (for example, thermal non-slip gloves that are not too thick).

TABLE 6: Possible control measures for vibration

What about exposure monitoring and health monitoring?

3.5.40 Exposure monitoring checks the amount of vibration your workers are exposed to. It can be used to inform you:

- if control measures are needed
- whether existing control measures are effective at minimising the risk.

3.5.41 Consider including health monitoring (that looks for signs and symptoms of vibration-related illness or injury) into your health monitoring programme:

- For hand-arm vibration, health monitoring checks for nerve, muscle or circulation damage in hands, wrists and arms.
- For whole body vibration, health monitoring checks for lower back, neck or shoulder pain or other signs of discomfort.

3.5.42 For more information, see Resources webpage

Extreme temperatures

HOW CAN WORKING IN EXTREME TEMPERATURES HARM WORKERS AND WHEN CAN IT HAPPEN?

3.5.43 The outdoor nature of forestry means forestry workers are particularly vulnerable to the effects of working in extreme temperatures.

3.5.44 Exposure to extreme hot or cold temperatures can cause serious harm to forestry workers.

Working in extremely hot environments can put workers' bodies under stress

- If their bodies have to work too hard to stay cool, it can cause heat-related illness and injuries. These can be fatal if ignored.
- Heat-related illness and injuries are a risk, especially when working outdoors in summer or in high humidity, or when exposed to radiant heat.
- High body temperatures that can cause harm to workers can occur:
  - in the summer months
  - in humid environments
  - during highly physical activities when warm or heavy clothing is being worn, including personal protective equipment (PPE)
  - when working near a source of radiant heat such as machinery or generators.

Working in extremely cold environments can put workers' bodies under stress

- If their bodies have to work too hard to stay warm, this can cause cold-related illness and injuries which can lead to permanent tissue damage and death.
- Low temperatures can occur:
  - in wet conditions (being damp or wet can significantly increase the rate a body cools)
  - winter conditions (frost or snow)
  - at night (outside temperatures drop even further at night)
  - in windy conditions (high winds can amplify the effects of cold)
  - in alpine regions
  - in open vehicles.

FIGURE 7: Causes of heat and cold-related illness and injury

WHAT ARE POSSIBLE CONTROL MEASURES?

3.5.45 Table 7 shows possible control measures for work at extreme temperatures.

CONTROL MEASURE	EXAMPLES OF CONTROL MEASURES FOR EXTREME HEAT	EXAMPLES OF CONTROL MEASURES FOR EXTREME COLD
Minimise sources of heat	– Replace heat-producing plant with plant that produces less heat. – Insulate heat-producing plant or use heat screens to reduce radiant heat.	
Use plant appropriate for the conditions	– Make sure vehicle and mobile plant cabs have air conditioning.	– Have plant that is designed with built-in protection against cold injuries (such as thermally-insulated handles and heated operator cabs).
Schedule the work to minimise exposure to extreme temperature	– Where possible, schedule work for cooler times of the day or year. – Frequently rotate workers on tasks. Use mechanical aids to reduce worker effort. – Allow extra rest breaks and provide rest facilities away from the heat and sun. – Encourage self-paced work where possible. – Make sure workers are acclimatised to the conditions. – Provide cool drinks. – Avoid putting workers with pre-existing medical conditions that may make them susceptible to heat stress in jobs where they will be exposed to extreme heat.	– Where possible, schedule work for warmer times of the day or year. – Allow extra breaks for warming up or rotating workers more often when they are exposed to cold conditions. Provide a shelter away from wind and rain during breaks. – Encourage self-paced work where possible. – Make sure workers are acclimatised to the conditions. – Provide warm drinks. – Avoid putting workers with pre-existing medical conditions that may make them susceptible to cold stress in jobs where they will be exposed to extreme cold.

CONTROL MEASURE	EXAMPLES OF CONTROL MEASURES FOR EXTREME HEAT	EXAMPLES OF CONTROL MEASURES FOR EXTREME COLD
Provide training to workers	– Train workers on how to identify signs and symptoms of heat-related illness in themselves and their workmates. – Train workers on the importance of staying hydrated. Encourage them to drink water at the beginning and end of the day.	– Train workers on how to identify signs and symptoms of cold-related illness in themselves and their workmates.
Provide PPE to workers Only rely on PPE when you have taken all other reasonably practicable steps to minimise the risk. Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks. Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.	– Provide PPE specialised protective clothing that shields workers from a hot environment. Examples of PPE include: - heat-reflective clothing - face shields - sunhats - heat-resistant footwear. – Make sure PPE is as light as possible and breathable so workers can sweat freely (without compromising its protective function).	– Provide specialised protective clothing that protects from cold, wind, and water. – PPE may include thermal and weather-proof clothing, that protects workers from cold, wind, and water. – Make sure clothing is made of materials that provide good insulation and waterproofing (where required) but are still breathable. – Encourage workers to wear layered clothing to maximise insulation and allow them to add or remove layers to keep comfortable when changing environments.

TABLE 7: Possible control measures for work at extreme temperatures

Dehydration

It is important that workers drink water regularly and drink well during the day.

It is recommended:

- workers carry enough water to drink regularly throughout the day
- workers drink enough water that they have to urinate regularly during the workday
- workers avoid drinking energy drinks or soft drinks and cordials during the workday
- workers drink plenty of water at night to recharge the body for the next day
- for machine operators, make sure the air conditioning (if it is fitted) in the cab is working effectively. If it is not working, tell workers to let the foreman know so it can be fixed.

WHAT ABOUT EXPOSURE MONITORING AND HEALTH MONITORING?

3.5.46 Exposure monitoring checks the thermal conditions your workers are exposed to. It can be used to inform you:

- if control measures are needed
- whether existing control measures are effective at minimising the risk.

3.5.47 Consider including health monitoring (that looks for signs and symptoms of heat or cold-related illness or injury) into your health monitoring programme.

3.5.48 For more information, see Resources webpage

UV/sun exposure

HOW CAN UV/SUN EXPOSURE HARM WORKERS?

3.5.49 Exposure to ultraviolet (UV) radiation from the sun can increase the chance of workers developing serious health conditions. UV radiation can harm a worker in several ways, including skin cancer and eye damage (such as cataracts). All skin types can be damaged by UV rays.

3.5.50 The total amount of UV radiation that a worker may be exposed to when working outside depends on the factors described in Table 8.

FACTORS AFFECTING UV EXPOSURE	THINGS TO CONSIDER
The time of day and the time of year	UV levels are highest when the sun is high and during summer when the sun is in the sky for longer
The weather conditions	UV levels are generally higher on a cloudless day. However, UV radiation can pass through cloud cover and reach harmful levels even on a cloudy day.
Work surfaces	Workers can be exposed to UV radiation as it reflects off lighter colour surfaces. The lighter the colour of the surface, the more UV radiation will be reflected.
Medication and chemical exposure	Certain medication and chemical exposures can increase the chance of UV damage because they cause photosensitivity, which makes a person more sensitive to UV radiation.

TABLE 8: Factors that can affect UV exposure

WHAT ARE POSSIBLE CONTROL MEASURES

CONTROL MEASURE	EXAMPLES
Provide shelter	– Provide shade during breaks.
Schedule the work to minimise exposure to UV	– Rotate workers on jobs where there is the most UV exposure.
Provide training to workers	– Train workers on the risks of UV exposure, for example: - how they can keep themselves protected - what warning signs of UV damage to look out for - what to do if they suspect sun damage.
Provide PPE to workers Only rely on PPE when you have taken all other reasonably practicable steps to minimise the risk. Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks. Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.	– PPE for UV radiation may include: - sunscreen and lip protection - breathable protective clothing - protective hats or sun protection attached to helmets (Figure 9) - protective eyewear or sunglasses. When considering what PPE options are appropriate, check that the proposed PPE is not going to introduce new risks. Examples include: – workers overheating if the material is too heavy or not breathable – PPE equipment or clothing getting caught in machinery if it is too loose – wide brimmed hats or dark glasses limiting vision.

TABLE 9: Possible control measures for UV radiation

FIGURE 8:
Example of sun protection that can be fitted to hard hats and helmets

WHAT ABOUT HEALTH MONITORING?

3.5.51 Consider including a system that checks workers for the risks from sun exposure. This could include:

- encouraging workers to regularly check their own skin. Encourage workers to get an abnormal mole, freckle or spot checked by their doctor (consider funding this expense)
- providing annual skin checks by a doctor or nurse trained in skin cancer detection
- offering yearly vision checks
- encouraging workers to report incidents of sun exposure and sunburn.

3.5.52 For more information, see Resources webpage

Harmful substances

WHAT KINDS OF HARMFUL SUBSTANCES COULD WORKERS BE EXPOSED TO?

3.5.53 Exposure to harmful substances can cause serious harm to forestry workers. Harmful substances include:

- substances classed as 'hazardous substances' (for example, flammable, explosive and toxic substances such as fuels, oils and hydraulic fluid, weed spraying chemicals (herbicides), explosives)
- other substances such as the lithium inside batteries or diesel exhaust.

3.5.54 For those harmful substances that are classed as 'hazardous substances', you **must** follow the Hazardous Substances Regulations that set out the rules for hazardous substances including for transporting, storage, handling and training.

3.5.55 For more information, see Resources webpage

WHAT RISK MANAGEMENT PROCESS MUST YOU FOLLOW?

3.5.56 You must follow this process when managing risk associated with substances hazardous to health

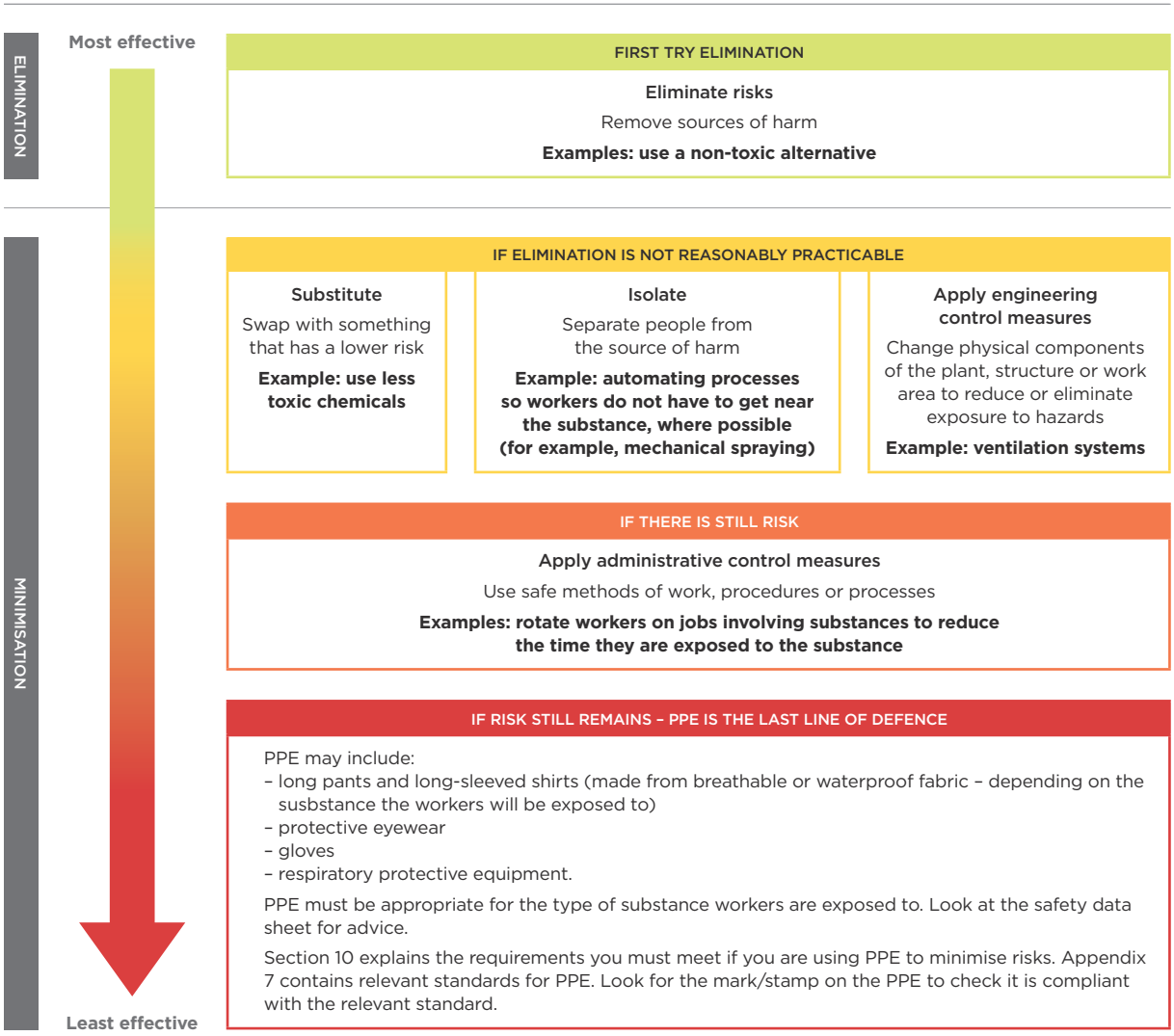


FIGURE 9: Approach to manage risk from harmful substances

WHAT ABOUT EXPOSURE MONITORING AND HEALTH MONITORING?

3.5.57 You may be required to monitor worker exposure or worker health if your work involves certain harmful substances. For more information about what harmful substances this applies to, see Resources webpage

3.5.58 Exposure monitoring to check the amounts of harmful substances in the work environment can help to inform you whether the control measures are being effective at minimising the risk.

3.5.59 Any exposure monitoring and health monitoring recommended will depend upon the harmful substance workers are being exposed to.

3.5.60 For example:

- for airborne particulates (for example, wood dust, welding fumes), exposure monitoring could involve measuring the amount of the substance in the air. Health monitoring could involve checking for loss of lung function.
- for substances that can irritate the skin (for example, wood dust), exposure monitoring could involve measuring the amount of substance on the skin. Health monitoring could involve checking for skin inflammation/dermatitis.

3.5.61 For more information, see Resources webpage

Hazardous manual tasks

WHAT ARE MANUAL TASK RISKS AND WHAT HARM CAN OCCUR?

3.5.62 Some manual tasks may cause musculoskeletal disorders (hazardous manual tasks). This includes muscle sprains, back and joint injuries. Examples of manual tasks in forestry include:

- lifting gear in or out the back of a truck
- carrying heavy loads
- dragging gear, chains, wires or vegetation
- operating machinery
- tree planting.

WHAT ARE POSSIBLE CONTROL MEASURES?

3.5.63 Table 10 shows possible control measures.

CONTROL MEASURE	EXAMPLES
Eliminate hazardous manual tasks	– Consider using alternative work methods that do not require manual tasks.
Buy equipment that meets ergonomic standards	– Consider: - cab access - cab visibility - the ergonomics of the operator's seat and controls - working posture.
Adjust equipment to the user	– Adjust seating and controls for each operator before they start operating the machine.
Climb in or out of machine or mobile plant carefully	– Keep handrails, steps and non-slip surfaces maintained. – Keep steps and the cabin clean and free of mud and debris. – Keep three points of contact when climbing in or out of the machine.
Care when hooking and unhooking logs	– Where possible use a grapple. – When the breaker-out is pulling out chokers from a motorised carriage, face the carriage directly to minimise twisting.
Choose tools and machinery with built-in controls to reduce physical impacts on the operator	– Select equipment that is easy to handle. – Make sure that the right tool is available and is used for the right job. – Make sure tools and machinery are regularly maintained.
Limit the amount of heavy lifting required by workers	– Use mechanical lifters where possible. – Replace heavy items with lighter or smaller items.
Move workers between tasks to vary the physical demands	– Move between tasks that involve sedentary work (for example, machine operators) and movement. – Plan tasks that involve walking. – Plan light work after repetitive physical work.

CONTROL MEASURE	EXAMPLES
Schedule regular breaks/ microbreaks	– Have operators rest muscles frequently with micro-pauses while working the machine. – Have operators take regular breaks and stretch their muscles and joints outside of the machine.
PPE Only rely on PPE when you have taken all other reasonably practicable steps to minimise the risk.	– Make sure workers wear gloves and safety boots to protect against cuts and crushed toes. – Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks. Appendix 7 contains relevant standards for PPE. Look for the mark/ stamp on the PPE to check it is compliant with the relevant standard.

TABLE 10: Possible control measures for manual risks

WHAT ABOUT HEALTH MONITORING?

3.5.64 Consider including health monitoring (checking workers for signs of discomfort, pain, or injury to muscles, ligaments, bones, tendons, blood vessels, and nerves) into your health monitoring programme.

3.5.65 For more information, see Resources webpage

4.0
What is expected of principals, contractors, subcontractors and other PCBUs?

IN THIS SECTION:

4.1 What is expected of principals?

Duties of principals

4.1.1 Principals (contracting PCBUs) engage other PCBUs to do work for them (other than as an employee, apprentice, trainee or volunteer).

4.1.2 As a PCBU, you **must**:

- ensure, so far as is reasonably practicable, the health and safety of your worker(s) and other workers you influence or direct
- ensure, so far as is reasonably practicable, that the health and safety of other persons is not put at risk from the work that you do
- make sure, so far as is reasonably practicable, the provision and maintenance of safe plant and structures and the safe use, handling, and storage of plant, substances and structures
- consult, cooperate and coordinate with other PCBUs in the contracting chain to manage shared duties.

4.1.3 Section 3.3 provides guidance to help PCBUs work out the extent of each PCBU's responsibility to carry out their overlapping duties.

DUTY OF A PCBU WHO MANAGES OR CONTROLS A WORKPLACE

4.1.4 A PCBU who manages or controls a workplace **must** ensure that, so far as is reasonably practicable, the workplace, the means of entering and exiting the workplace, and anything else arising from the workplace are without health and safety risks to any person.

DUTY OF A PCBU WHO MANAGES OR CONTROLS PLANT (FOR EXAMPLE, MACHINERY, VEHICLES, TOOLS) AT A WORKPLACE

4.1.5 A PCBU who manages or controls plant at a workplace **must**, so far as is reasonably practicable, ensure that the plant is without risks to the health and safety of any person.

What is expected of principals

4.1.6 The following sections cover some general expectations of principals. Expectations may differ depending upon the nature of the contracting. For example, a one-off job versus a long-term contract.

4.1.7 Principals are expected to:

- engage competent, safe contractors taking into consideration the type of work to be carried out and the equipment needed to ensure healthy and safe work
- give contractors all the information they need to keep them and their workers healthy and safe while working
- monitor the contractors' health and safety performance
- take the lead in encouraging good health and safety practices throughout the contracting chain.

Choosing a capable contractor

4.1.8 When choosing a contractor, consider their health and safety record as well as their ability and capacity to do the work.

4.1.9 Consider:

- the contractor's incident and hazard and risk reporting procedures
- doing an assessment of their health and safety performance, including:
- any work injuries or near misses over the past five years
- information on prosecutions they have undergone
- their finances, capacity and equipment to do the work
- if they have a relevant industry certification (such as Safetree certification).
- the contractor's ability to provide competent workers and equipment needed for healthy and safe work
- whether the contractor has effective worker engagement. For example, do they have worker representation and are there opportunities for workers to have their say?

Look for positive signs, for example:

- evidence of proactive steps they have taken to improve health and safety
- evidence of ongoing improvement in health and safety
- evidence that they have good worker engagement and relationships.

Check contractors have a documented health and safety system

4.1.10 Confirm that the contractor has a documented health and safety system. This could include:

- a health and safety policy
- a drug and alcohol policy, including testing
- training and supervision
- health and safety meetings
- hazard identification and risk assessment and management
- auditing and inspection programmes
- incident reporting and investigation
- emergency procedures.

4.1.11 However, further information may be needed for more complex work. See Sections 4.2.8–4.2.9 for more information.

What to cover in contracts?

4.1.12 Make sure your contracts and agreements clearly define responsibilities and duties including subcontracting processes to ensure health and safety requirements are appropriately addressed within the contracting chain.

4.1.13 Work with the contractors to identify any work or workplace hazards and risks and any other health and safety requirements.

4.1.14 Once the scope of the work has been agreed, provide a job prescription. This might take the form of a planting or spraying prescription, a job specification, or a harvesting or logging plan.

Planning

4.1.15 The planning stage of any operation is a good chance to identify hazards and eliminate risks at an early stage.

DEVELOPING HARVEST PLANS

4.1.16 This works best when you include, if possible, earthworks and roading contractors, harvesting contractors and log truck operators.

4.1.17 Consulting and coordinating with the relevant parties can help with:

- deciding on the best extraction method
- the design of the roading network
- the position, size and design of the skid sites
- the elimination of risk before work starts.

4.1.18 Include information from the pre-harvest inventory and constraints assessments in the harvest plan. The harvest plan should include recent topographical maps of the site showing:

- location of the site-specific constraints and hazards
- access points and routes (including shared access ways)
- proposed road system
- location of skid site
- maximum and average haul distances (for log extraction)
- overhead power lines
- underground utilities
- areas of steep terrain, cliffs or quarries
- areas with windthrow
- boundaries onto neighbouring properties
- rivers and creeks – water management needs
- wāhi tapu and other areas of historical or cultural significance
- areas with poor ground conditions (erosion-prone, unstable or wet soil)
- areas of public access such as roads or walking and mountain biking tracks.

4.1.19 The harvest plan should also provide guidance on:

- the equipment contractors need to complete the work
- the tree extraction method
- reporting expectations
- electrical hazard management
- how the risks from any shared access ways will be managed.

4.2 What is expected of contractors?

What are the duties of contractors?

4.2.1 A contractor is a PCBU that has been engaged to do work by another PCBU (other than as an employee, apprentice, trainee or volunteer):

- If you (the contractor) have subcontractors, you are classed as a principal for the purposes of this guidance.
- If you are a self-employed contractor/sole trader/lone operator, you are classed a PCBU and a worker.

4.2.2 Contractors are responsible for planning and carrying out the work they are engaged to do.

4.2.3 As a PCBU, you **must**:

- ensure, so far as is reasonably practicable, the health and safety of your worker(s) and other workers you influence or direct
- ensure, so far as is reasonably practicable that the health and safety of other persons is not put at risk from the work that you do
- make sure, so far as is reasonably practicable, the provision and maintenance of safe plant and structures and the safe use, handling, and storage of plant, substances and structures
- consult, cooperate and coordinate with other PCBUs in the contracting chain to manage shared duties.

4.2.4 Section 3.3 provides guidance to help PCBUs work out the extent of each PCBU's responsibility to carry out their shared duties.

DUTY OF A PCBU WHO MANAGES OR CONTROLS A WORKPLACE

4.2.5 A PCBU who manages or controls a workplace **must** ensure that, so far as is reasonably practicable, the workplace, the means of entering and exiting the workplace, and anything else arising from the workplace are without health and safety risks to any person.

DUTY OF A PCBU WHO MANAGES OR CONTROLS PLANT AT A WORKPLACE

4.2.6 A PCBU who manages or controls plant at a workplace **must**, so far as is reasonably practicable, ensure that the plant is without risks to the health and safety of any person.

4.2.7 The following sections cover some general expectations of contractors. Expectations may differ depending upon the nature of the contracting, for example, a one-off job versus a long-term contract.

Have a health and safety management system that is suitable for the size of the business and level of risk

4.2.8 For guidance on a minimum health and safety management system, see Section 4.1.10.

4.2.9 For more complex work, further information may be needed. For example, contractors that manage a worksite could have a system that covers:

- clearly defined roles and responsibilities
- regular work hazard and risk inspections by workers and supervisors
- the process to check that the PPE used onsite is up to standard
- first aid available on site
- plant and equipment inspection and maintenance
- managing sub-contractors
- managing visitors
- who will be responsible for keeping in touch with other parties outside the worksite that are affected by the work (for example, neighbouring properties), and managing any conflicts that arise
- worker competency assessments and training plans
- return-to-work policies and assessments
- dynamic risk management training

- stop-work processes for weather extremes and unusual conditions
- management of work around power lines
- vehicles
- transport and mobile plant
- working at height
- landing size and capacity.

Having competent people

2.10 A competent person is someone who can consistently demonstrate the skill and knowledge derived from experience and/or training for the type of work the person is tasked to do.

4.2.11 Section 11 explains the requirements you **must** meet for training, information, instruction and supervision.

Site supervision (if relevant)

4.2.12 Have a competent person in charge of the worksite.

4.2.13 Their role involves:

- effectively supervising and controlling the work
- understanding and managing the health and safety system (including emergency procedures).

4.3 What is expected of subcontractors?

What are the duties of subcontractors?

4.3.1 Subcontractors are PCBUs hired by a contractor to work or provide services on their behalf. Sometimes subcontractors are referred to as suppliers.

4.3.2 If you are a self-employed contractor/sole trader/lone operator, you are both a PCBU and a worker.

4.3.3 As a PCBU, you **must**:

- ensure, so far as is reasonably practicable, the health and safety of your worker(s) and other workers you influence or direct
- ensure, so far as is reasonably practicable that the health and safety of other persons is not put at risk from the work that you do
- make sure, so far as is reasonably practicable, the provision and maintenance of safe plant and structures and the safe use, handling, and storage of plant, substances and structures
- consult, cooperate and coordinate with other PCBUs in the contracting chain to manage overlapping duties.

4.3.4 Section 3.3 provides guidance to help PCBUs work out the extent of each PCBU's responsibility to carry out their shared duties.

4.3.5 The following sections cover some general expectations of sub-contractors. Expectations may differ depending upon the nature of the contracting. For example, a one-off job versus a long-term contract.

Work with other PCBUs in the contracting chain

4.3.6 Work closely with the contractor to manage risks:

- be involved, where practicable, in any risk management planning
- alert the contractor when control measures are not adequate, or when new risks arise.

Be aware of the onsite rules and procedures

4.3.7 Be aware of on-site rules and procedures including inductions, toolbox talks, health and safety plans and reporting procedures.

4.4 Other PCBUs in the contracting chain

4.4.1 There are other PCBUs that may be involved in providing professional services, materials, plant, or people in and around the contracting chain. For example:

- engineers
- suppliers of plant
- labour hire
- plant servicing and repair.

4.4.2 They may have the same duties as other PCBUs in the contracting chain.

4.4.3 As a PCBU, you **must**:

- ensure, so far as is reasonably practicable, the health and safety of your worker(s) and other workers you influence or direct
- ensure, so far as is reasonably practicable that the health and safety of other persons is not put at risk from the work that you do.

4.4.4 For example, when servicing, repairing or modifying plant including safety equipment.

Upstream duties

4.4.5 PCBUs that have upstream duties are those that:

- design plant, substances, or structures
- manufacture plant, substances, or structures
- import plant, substances, or structures
- supply plant, substances, or structures
- install, construct or commission plant or structures.

4.4.6 These PCBUs **must**, so far as is reasonably practicable, make sure the plant, substances, and structures they design, manufacture, import, supply or install are without health and safety risks when they are used for their intended purpose in a workplace.

4.4.7 Upstream businesses are in a strong position to eliminate or minimise risk. They can influence and sometimes eliminate health and safety risks through designing or manufacturing products that are safe for the end user.

4.4.8 For specific duties for upstream PCBUs, see Appendix 5.

4.5 What is expected of landowners?

You may have duties under HSWA

4.5.1 If you own the land and are putting it into forest, you may be a PCBU with duties under HSWA.

Consider engaging a forest manager

4.5.2 A forest manager or forestry consultant can plan and coordinate the whole process from site preparation and planting through to the eventual harvest.

4.5.3 If you engage a forest manager, engage a reputable company with robust health and safety systems.

If you plan ahead, you can eliminate or, at the least, minimise those risks

4.5.4 If you are planting a new forest, many of the risks will not happen until harvest occurs which could be in 20 to 30 years' time.

Know what hazards and physical constraints there are on your land

4.5.5 Use aerial photos, farm maps, topographic maps, LIDAR or drone footage. Identify constraints and hazards such as:

- tree damage (for example, wind affected)
- tracks, roads and bridges
- overhead power lines
- drains and culverts
- underground utilities
- areas of steep terrain, cliffs, sink holes and drop-offs
- rivers and creeks (particularly with respect to any downstream uses)
- flood prone areas
- erosion-prone or unstable soils
- areas of public access
- boundaries onto neighbouring properties.

4.5.6 For more information, see Resources webpage

PART B

General requirements

IN THIS PART:

TERM OR SYMBOL	MEANING IN THIS DOCUMENT
Must	A mandatory legal requirement under HSWA or regulations.
Other wording including 'check', 'make sure', 'design', 'do not'	How WorkSafe expects certain health and safety risks to be managed. This is not mandatory to follow – you may adopt other practices, as long as these practices provide a level of health and safety as good as or better than the standard in this code.
You/your	Refers to the PCBU involved in forestry and harvesting operations.

5.0
Introduction to Part B

IN THIS SECTION:

5.1 What does this Part cover?

5.1.1 This Part provides guidance on:

- safe worker
- general workplace requirements and facilities
- first aid
- emergency plans
- personal protective equipment (PPE)
- training, information, instruction and supervision
- communications
- alcohol and drugs
- mobile plant.

6.0
Safe worker

IN THIS SECTION:

6.1 Mentally and physically fit workers

6.1.1 Workers in forestry operations need to be physically fit, alert and mentally capable to do their job safely.

6.1.2 Encourage workers to:

- get good sleep
- keep physically fit
- take good rest breaks
- drink lots of fluids and eat healthy
- not carry out work under the influence of drugs or alcohol
- not work when fatigued or injured.

6.1.3 Before starting, make sure each worker is physically and mentally prepared for the task. This includes checking on level of fatigue and general wellbeing.

6.2 Workers' duties

6.2.1 Workers have their own duties:

- A worker **must** take reasonable care of their own health and safety, and take reasonable care that they do not harm others at work.
- A worker **must** cooperate with reasonable policies and procedures the PCBU has in place that the worker has been told about.
- A worker **must** comply, as far as they are reasonably able, with any reasonable instruction given by the PCBU so the PCBU can meet their legal duties.

6.2.2 Other specific duties (for example, for PPE) will be discussed where relevant.

6.3 Involve workers in managing risks

6.3.1 You **must** engage with workers when identifying hazards, assessing risks, and deciding how to eliminate or minimise those risks.

6.3.2 Make sure all workers know and understand the hazards and risks they will face while on the job and the control measures to manage those risks.

6.3.3 Before starting any new block, involve all workers in identifying significant hazards and risks on the ground and in the operational process. Make sure they know what the control measures are for those risks and how to apply them.

6.3.4 Document all hazards and risks and control measures and make accessible to workers.

6.3.5 For each working day, involve all workers in daily tailgate meetings and daily work planning. Make sure workers are told:

- who is on site or might be coming on site
- of any changes in conditions or people that may affect work that day (for example, changing weather, a key person being away or a piece of equipment being out of action).

6.4 Make sure workers have the right training and supervision

6.4.1 As a PCBU, you **must** ensure, so far as is reasonably practicable, workers:

- have adequate knowledge and experience so they are not likely to cause harm to themselves or other people
- are adequately trained in the safe use of plant, objects, substances or equipment.

6.4.2 Workers still gaining adequate knowledge and experience **must** be adequately supervised by someone with that knowledge and experience.

6.4.3 The training and supervision requirements are explained in Section 11. Training or supervision for certain roles will be discussed as relevant.

6.5 Facilities and equipment for workers

6.5.1 There are facilities and equipment (including first aid and PPE) you must provide workers under certain circumstances. These are discussed in the following sections.

7.0 General workplace and facilities requirements

IN THIS SECTION:

7.1 Introduction to general workplace and facility requirements

7.1.1 Workplaces must meet certain requirements, including having certain facilities for workers.

7.1.2 This section provides guidance on the general workplace requirements and facilities PCBUs **must** provide so far as is reasonably practicable.

7.1.3 You **must** engage with your workers when proposing changes that may affect their health or safety, and when making decisions about the adequacy of facilities for the welfare of workers.

7.2 What are the general workplace requirements?

7.2.1 A 'workplace' is any place where:

- a worker goes or is likely to be while at work
- work is being carried out or is usually carried out.

7.2.2 This includes temporary or mobile workplaces, which are typical of forestry work.

7.2.3 In relation to workplaces there are certain requirements to meet. For example, you must ensure the following, so far as is reasonably practicable:

FEATURE	REQUIREMENTS
Layout	People must be able to enter, exit, and move about easily and safely, including in an emergency.
Work areas	Workers must have enough space to complete tasks safely.
Lighting	Lighting must be appropriate for the work being completed and sufficient to enable safe evacuation in an emergency.

TABLE 11: Summary of general workplace requirements as applied to forestry

7.3 What facilities must be provided?

7.3.1 You **must** make sure adequate facilities are provided to workers, so far as is reasonably practicable, including:

- toilets
- hand-washing facilities
- clean drinking water
- eating and rest facilities
- first aid facilities (see Section 8 for further guidance).

7.3.2 Make sure workers can access these facilities freely and reasonably.

7.3.3 So far as is reasonably practicable, these facilities **must** be:

- sufficient in number
- maintained to be in good working order, and clean, safe and accessible.

7.3.4 To make sure the facilities are sufficient and meet the needs of your workforce, you **must** consider the:

- size, location, and nature of your workplace
- number of workers and composition of your workforce
- nature of the work being carried out and workplace hazards.

7.3.5 The principal and the contractor/sub-contractor have a duty to make sure adequate facilities are accessible for workers. In the planning stage of work, make arrangements for how these facilities will be provided, or made accessible. This is especially important when portable facilities may be required.

7.3.6 The following sections provide examples of ways these facilities can be made available to forestry workers.

7.4 Toilets and handwashing facilities

7.4.1 Workers **must** be provided clean toilet facilities and handwashing facilities so far as is reasonably practicable.

7.4.2 Examples of toilet facilities include:

- installing portable toilets
- transporting portable toilets on trailers
- toilets attached to containers
- camping toilets.

7.4.3 Make sure toilets are reasonably accessible, and in a safe place.

7.4.4 Portable toilets **must** be regularly cleaned.

7.4.5 Depending on the nature of the work and composition of your workforce you may need to have facilities for washing the body and sanitising facilities, along with bins for sanitary products.

7.5 Clean drinking water

7.5.1 Workers **must** be provided fresh clean drinking water so far as is reasonably practicable.

7.5.2 This may mean transporting bottled water in.

7.5.3 Access to drinking water is particularly important when working in the summer, or in hot environments.

7.6 Eating and break facilities

7.6.1 Workers must have facilities to eat and take breaks so far as is reasonably practicable.

7.6.2 Provide workers a sheltered place to sit during break times.

7.6.3 Vehicle cabs can be used when there is no other reasonably practicable option, as long as the basic requirements for worker rest can be met.

FIGURE 10:
Example of a container used as a smoko hut

Be respectful of other people's practices

Where possible, keep food preparation areas separated from personal hygiene areas. Encourage workers to understand the importance of keeping tapu or sacred things separate from things that are considered noa or common.

Other examples include:

- avoid sitting on tables
- avoid leaving hard hats on food tables
- avoid washing clothing and tea towels together.

7.7 More information

7.7.1 For more information, see Resources webpage

8.0
First aid

IN THIS SECTION:

8.1 Introduction to first aid

8.1.1 This section provides guidance on what first aid equipment, facilities and first aiders PCBUs must provide.

8.1.2 You **must** consider all relevant matters including the following when deciding what first aid equipment, facilities and first aiders to provide:

- the size, and location of your workplace
- the number of workers and composition of your workforce
- the nature of the work being carried out and workplace hazards.

8.1.3 You **must** engage with your workers when proposing changes that may affect their health or safety.

8.2 First aid facilities and rest areas

8.2.1 You **must** ensure that workers have access to first aid facilities.

8.2.2 So far as is reasonably practicable, workers **must** also have access to a place to rest if they become unwell and they are unable to leave the workplace at short notice (such as when working as part of a team in a remote area).

8.2.3 See Section 8.1.2 for what you **must** consider when making decisions about first aid facilities.

8.3 First aiders

8.3.1 You **must** ensure that:

- there is an adequate number of workers trained to administer first aid at the workplace or
- workers have access to an adequate number of other first aiders (for example, from another nearby location).

8.3.2 See Section 8.1.2 for what you **must** consider when making decisions about first aiders.

8.3.3 Consider having most or all your workers trained to make sure a first aider is always present.

8.3.4 Consider forestry-specific first aid training when deciding what training to provide. Consider individual team members' health needs (for example, allergies).

8.3.5 Consider providing additional training for your first aiders in advanced techniques if it would take some time for emergency services to reach your work site.

8.4 First aid kits and other equipment

8.4.1 You **must** ensure that:

- adequate first aid equipment is provided for the workplace
- each worker at the workplace has access to the equipment.

8.4.2 See Section 8.1.2 for what you **must** consider when making decisions about first aid equipment.

8.4.3 Make sure first aid equipment is easy for all workers to access ideally within minutes in an emergency or when doing work with a high risk of injuries.

8.4.4 Consider where to place first aid kits, for example in the main worksite, in machines, with manual felling crews or remote or lone workers.

First aid kits

8.4.5 The contents of your first aid kit may vary depending on the type of work.

8.4.6 Figure 11 shows examples of things to consider for remote worksites.

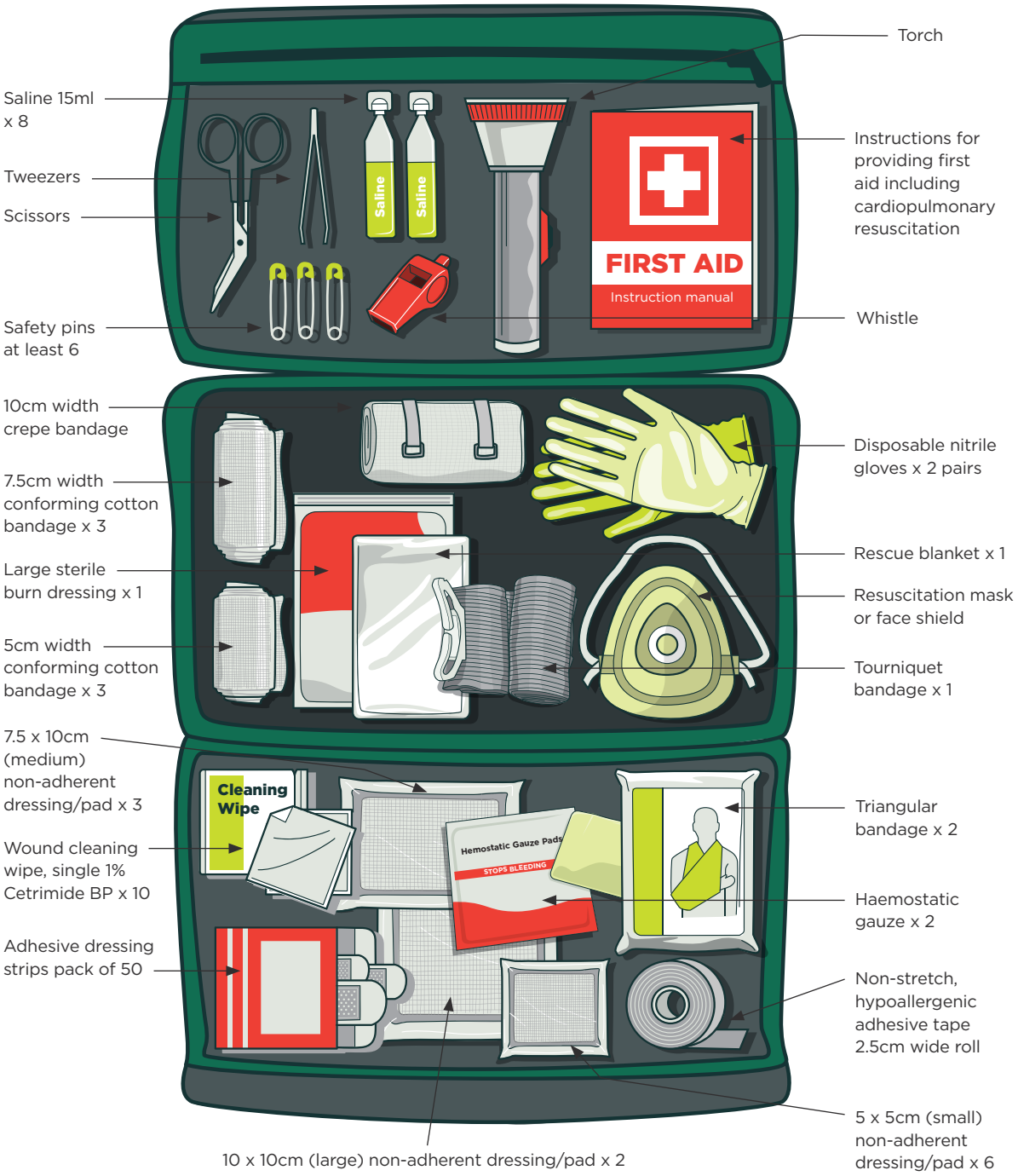


FIGURE 12: Example of a first aid kit for remote worksites

8.4.7 The actual contents will depend on the nature of the work carried out and its risks. For example, haemostatic bandages or tourniquets used to stop life-threatening bleeding.

8.4.8 For higher risk work, consider a triage trauma kit.

8.4.9 You may also want to consider including a small notebook and pen to record things such as dates, times, observations, and equipment used.

8.4.10 Keep first aid kits up to date. Check them regularly and replace any missing or expired items.

Other first aid and emergency equipment

8.4.11 In addition to first aid kits, consider whether you need other first aid or emergency equipment for the worksite. For example:

- emergency locator beacons
- an automated external defibrillator
- stretchers.

8.5 Information for workers about first aid

8.5.1 Give workers clear information about the first aid available at their workplace, including the:

- location of first aid kits including those in mobile plant
- names and locations of first aiders
- location of a first aid room (if there is one)
- procedures to follow when they need first aid.

8.5.2 Give this information:

- when a worker is first employed (for example, at induction)
- when there is a change in the nature or location of their work
- when there is a change in first aiders (for example, if a first aider leaves or a new one is added).

8.5.3 Make sure workers can contact first aiders or emergency services, and know how to respond in an emergency.

8.6 More information

8.6.1 For more information, see Resources webpage

9.0 Workplace emergency plans

IN THIS SECTION:

9.1 Introduction to workplace emergency plans

9.1.1 An emergency plan tells people in the workplace what to do in an emergency.

9.1.2 This section provides guidance on the requirements for preparing and maintaining an emergency plan for your workplace.

9.1.3 You **must** ensure that an emergency plan is prepared for the workplace and then maintained and tested.

9.1.4 You **must** implement the emergency plan when an emergency occurs.

9.1.5 You **must** engage with your workers when proposing changes that may affect their health or safety.

9.2 What to include in an emergency plan

9.2.1 Emergency plans **must** include the following:

- emergency procedures including:
  - an effective response to an emergency
  - evacuation procedures
  - procedures for notifying emergency services at the earliest opportunity
  - medical treatment and assistance procedures
  - procedures to make sure there is effective communication between the person authorised by you to coordinate the emergency response and all other persons at the workplace
- providing for testing of the emergency procedures, including the frequency of testing
- providing information, training, and instruction to be given to relevant workers for implementing the emergency procedures.

9.2.2 Include a detailed site plan in your emergency plan showing where emergency equipment and first aid supplies can be found, and the location of utilities.

9.3 What to consider when making an emergency plan

9.3.1 When working out your emergency plan, you **must** consider:

- the size and location of the workplace
- the number and composition of the workforce
- the nature of the work being carried out
- the nature of the workplace hazards.

9.3.2 This could include the types of emergency situations your workplace may face. For example, bush fires, adverse weather (lightning, cyclones) or other natural disasters. Think about:

- Could your workers need an escape route?
- What equipment and training could you need to deal with the emergency?
- What resources would be needed at the worksite if workers become stranded?

9.3.3 Tailor emergency plans to the type of work and workplace. In higher risk situations, more comprehensive plans will likely be required.

9.3.4 Make sure all workers know who is responsible for activating and coordinating emergency procedures and what they need to do to keep themselves and others safe in an emergency.

9.4 Maintaining and testing emergency plans

9.4.1 You **must** maintain the emergency plan for the workplace so that it remains effective.

9.4.2 Review and update the emergency plan:

- when there are changes to work activities or the physical workplace
- if the workers who have emergency responsibilities change
- if new risks have been identified.

9.4.3 Test emergency plans. Following any testing, conduct a review to identify areas for improvement or updating. Seek and consider feedback from your workers.

9.5 Managing the risks of fires

9.5.1 In the event of any fire, make sure that there is an agreed process to manage the risk. This could include:

- calling 111
- notifying anyone else in the forest
- notifying neighbours
- exiting the forest to a designated safe location.

9.5.2 Removing people from the risk is the most important thing.

9.6 More information

9.6.1 For more information, see Resources webpage

10.0 Personal protective equipment (PPE)

IN THIS SECTION:

10.1 Using PPE to manage risks

10.1.1 If you are required to, or choose to, use PPE as a way of managing risks, you must comply with certain requirements. This section provides guidance on these requirements.

10.2 Who can provide PPE

10.2.1 If PPE is being used to manage risks, a PCBU who directs the carrying out of work at a workplace **must** provide PPE to workers.

10.2.2 PPE can also be provided by:

- another PCBU (costs could be shared)
- the worker (if they genuinely and voluntarily choose to provide their own PPE).

10.2.3 You cannot pass on the cost of providing PPE (in full or part) to your worker.

10.2.4 You cannot make your worker provide their own PPE as a condition of employment.

10.2.5 If the worker chooses to provide their own PPE, you **must** still make sure the PPE will provide appropriate protection. Workers can change their mind about providing their own PPE. They must give you reasonable notice of this.

10.3 PPE must be fit-for-purpose

10.3.1 For forestry work, PPE may include:

- hard hat or helmet
- eye protection/face shields
- protective clothing (such as chainsaw chaps and wet weather clothing)
- gloves
- protective or steel-toed boots
- high-visibility clothing - day-night for added visibility
- lone worker (man-down) alarms
- hearing protection (Grade 5)
- fall-arrest or restraint equipment when working at heights.

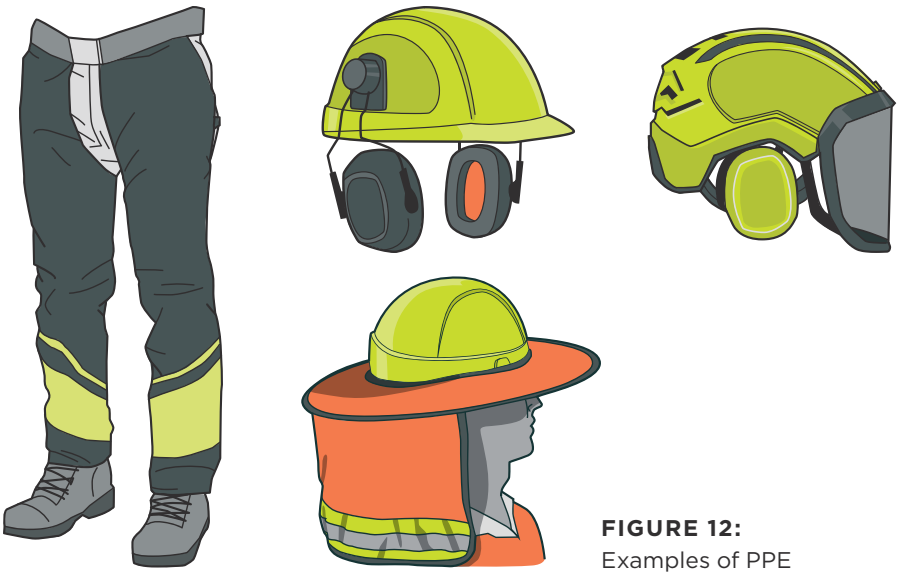


FIGURE 12:
Examples of PPE

10.3.2 When selecting PPE, you **must** make sure it is:

- suitable for the nature of the work and any hazards associated with the work
- a suitable size and fit and reasonably comfortable (for example, does your worker wear prescription glasses, have facial hair or other features that could affect how well PPE fits?)
- compatible with any other PPE your worker is required to wear or use.

10.3.3 You **must** engage with your workers when making decisions about ways to eliminate or minimise work risks and when proposing changes that may affect their health or safety.

10.3.4 Workers **must** receive training in how to wear or use their PPE.

10.4 Industry standards for PPE

10.4.1 Industry has accepted standards for different PPE such as for high-vis clothing, leg protection and safety helmets (Appendix 7). Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

10.4.2 While these standards are not mandatory under HSWA, they may indicate an adequate level of protection in prescribed circumstances. However, as a PCBU, you decide what PPE is suitable under your circumstances.

10.5 Make sure PPE does not create new risks

10.5.1 When assessing PPE needs, discuss with your workers what new risks the proposed PPE may create and how you can eliminate or minimise those risks. The following are examples of risks associated with different types of PPE:

Hearing protection

10.5.2 Some types of hearing protection can affect workers' situational awareness (for example, preventing them from hearing approaching mobile plant).

10.5.3 There are types of hearing protection that can protect workers hearing without compromising situational awareness.

Heavy or thick clothing

10.5.4 Heavy or thick clothing may cause workers to overheat, affect their mobility, or create entanglement risks. Talk with your workers about alternative clothing options (such as lighter more breathable fabrics or closer fitting options).

10.5.5 Make sure workers only wear approved beanies under helmets.

Long sleeves and trousers

10.5.6 Long sleeves and trousers can provide good protection. However, having blanket site rules requiring long sleeves and trousers may lead to unnecessary discomfort for workers (especially during summer months).

10.5.7 Consider if alternative protection may be appropriate. For example:

- for work under shade from trees, it may be suitable for chaps and gaiters to be worn over shorts
- if workers are exposed to UV radiation, it may be more suitable for lighter, more breathable fabrics to be worn.

10.6 Keep PPE in good working order

10.6.1 PPE **must** be clean, hygienic, and in good working order.

10.6.2 You **must** make sure that PPE is maintained, repaired, or replaced so that it continues to minimise risk to the worker who uses it, including PPE provided by workers.

10.6.3 Workers **must** receive training in how to maintain and store their PPE correctly.

10.6.4 Replace PPE whenever it becomes worn out, is no longer providing adequate protection, or is past its use-by date. Assess when PPE needs to be replaced – replacing PPE on a yearly basis may not be sufficient.

10.6.5 You **must** not charge workers for providing PPE.

10.7 Worker duties for PPE

10.7.1 Workers **must** wear or use PPE in accordance with any information, training or reasonable instructions by the PCBU.

10.7.2 Workers **must** not intentionally misuse or damage PPE. Workers must inform the PCBU when PPE is damaged, not working properly or needs to be cleaned/decontaminated.

10.8 More information

10.8.1 For more information, see Resources webpage

11.0 Training, information, instruction and supervision

IN THIS SECTION:

11.1 Duty to provide training, information, instruction and supervision

11.1.1 This section provides guidance on how to make sure your workers have the right training, information, instruction or supervision.

11.1.2 All forestry workers **must** be provided appropriate training, information, instruction and supervision so they work in a healthy and safe way.

11.1.3 You **must** ensure, so far as is reasonably practicable, workers who carry out work of any kind, use plant of any kind, or deal with a substance of any kind that is capable of causing a risk in a workplace:

- either have adequate knowledge and experience of similar work so they are not likely to cause harm to themselves or other people, or are supervised by someone who has the relevant knowledge and experience and
- are adequately trained in the safe use of all plant, objects, substances, or equipment the workers are or may be required to handle, as well as all PPE that the workers are or may be required to wear or use.

11.1.4 You **must** ensure that the supervision and training provided is suitable and adequate, having regard to:

- the nature of the work carried out
- the nature of the risks associated with the work at the time the supervision or training is provided
- the control measures implemented in relation to the work.

11.1.5 You **must** ensure, so far as is reasonably practicable, the training is readily understandable to the workers it is provided to.

11.1.6 Make sure competent persons provide training.

11.1.7 Make sure training is tailored and fit-for-purpose.

11.1.8 You **must** engage with workers when making decisions about procedures for providing information and training to workers.

11.2 Check workers have required training

11.2.1 Worker training requirements will depend on:

- the level of risk their job involves
- industry or task-specific qualifications or training requirements (for example, Safetree certification, NZQA qualifications)
- the knowledge, experience, and previous training of the worker.

11.2.2 All PCBUs have a responsibility to make sure workers have the appropriate training for the work they will be doing. This includes workers that may be several steps down the contracting chain. (See Section 3.3 about overlapping duties.)

11.2.3 Where reasonably practicable, make arrangements to specify and check these training requirements at the planning stages of a project.

11.3 Check worker competency before work begins

11.3.1 A competent person is someone who can consistently demonstrate the skill and knowledge derived from experience and/or training for the type of work the person is tasked to do.

11.3.2 Before starting work, assess each worker's competence and experience, and what further training they may require. This is usually done by the site manager or someone you deem competent to make that assessment.

11.3.3 Undergoing training is not always an indication of workers' actual level of competence when on the job. In some instances, workers may need further onsite training or retraining before starting work, particularly if there have been gaps in employment.

11.4 Supervise new or inexperienced workers

11.4.1 Supervision is likely to be needed for new or inexperienced workers until they have shown they are competent to carry out the tasks unsupervised. Consider having experienced workers act as a mentor for new workers.

11.4.2 Experienced workers may also need to be supervised for new tasks or if they have not done a particular task in a long time.

11.4.3 There are different levels of supervision - ranging from direct and constant one-on-one supervision to less intensive supervision.

11.4.4 Choose the most appropriate level of supervision based on the worker's competence and experience. High-risk tasks such as manual tree felling and manual breaking out may require additional supervision.

11.5 Ongoing training

11.5.1 Give workers ongoing training, which may include:

- refresher training when needed
- training when new vehicles or plant, or new features are introduced
- training when the work changes and the task needs to be done differently
- when workers are due for recertification
- when competence or qualification requirements change
- continuing professional development.

11.5.2 Monitor training needs.

11.6 Keep a record of all training

11.6.1 Keep a record of all training that has been completed for each worker including when refresher training is due. This will help make sure the most appropriate person is allocated a particular task and identify workers who need refresher training.

11.6.2 Make this information available to others in the contracting chain that have a duty towards those workers (provided the worker has consented to this information being shared).

11.6.3 All storing and sharing of worker training information is subject to the Privacy Act

11.7 More information

11.7.1 For more information, see Resources webpage

12.0 Communications

IN THIS SECTION:

12.1 Having effective communication systems

12.1.1 For remote or isolated work (see Section 3.4), PCBUs **must** provide a system of work that includes effective communication with the worker.

12.1.2 Equip workers with a good, reliable and effective communications system.

12.1.3 Have at least two forms of communication. Do not rely on a worker's personal mobile phone.

12.1.4 Make sure there is access to a reliable communication device for emergency calls.

12.1.5 Have a communications protocol to check-in with workers.

12.1.6 Certain activities have specific communications needs. These are discussed where relevant.

13.0
Drugs and alcohol

IN THIS SECTION:

13.1 How can drugs and alcohol cause health and safety risks?

13.1.1 A worker's fitness to work can be affected by medication, drugs, and alcohol. This can create a risk to their health and safety and the safety of those around them.

13.1.2 Do not allow workers to work if they are affected by:

- alcohol or illegal drugs
- prescription or over-the-counter medication.

13.1.3 You **must** engage with your workers when making decisions about ways to eliminate or minimise work risks and when proposing changes that may affect their health or safety.

13.2 What are possible control measures?

13.2.1 Table 12 explains possible control measures to take.

POSSIBLE CONTROL MEASURE	EXAMPLES
Put a drugs and alcohol policy in place	– With workers, establish a drug and alcohol policy which includes strategies to deal with illegal drugs and prescription/over-the-counter medications, and alcohol use during work hours. – Make sure the drug and alcohol policy contains the position on the consumption of alcohol or drugs on site: - what action will be taken if a worker is suspected of being affected by drugs or alcohol while at work - what the drug testing regime is. – Consider supporting workers who want to seek help for drug or alcohol problems.
Include your alcohol and drug policy including drug testing in inductions and training	– Make sure all workers understand the policy. – Regularly remind workers of the policy during team meetings.

TABLE 12: Possible control measures to manage the risks from drugs and alcohol

13.3 More information

13.3.1 For more information, see Resources webpage

PART C

Site access and preparation of log landings

IN THIS PART:

TERM OR SYMBOL	MEANING IN THIS DOCUMENT
Must	A mandatory legal requirement under HSWA or regulations.
Other wording including 'check', 'make sure', 'design', 'do not'	How WorkSafe expects certain health and safety risks to be managed. This is not mandatory to follow – you may adopt other practices, as long as these practices provide a level of health and safety as good as or better than the standard in this code.
You/your	Refers to the PCBU involved in forestry and harvesting operations.

14.0
Introduction to Part C

IN THIS SECTION:

14.1 What does this Part cover?

14.1.1 This guidance looks at how to manage the risks around roading, construction and access in forestry and harvesting operations.

14.1.2 There are sections on:

- constructing and maintaining access roads
- constructing crossings
- constructing log landing and loading areas
- traffic management and signage
- marking ropes rigged across roads
- controlling authorised visitors.

14.2 What are the common health and safety risks faced by workers constructing or using access roads and landing sites?

14.2.1 Table 13 gives examples of how workers can be harmed.

14.2.2 There may be hazards that are not identified in this table. You will need to identify and assess health and safety risks arising from your own work.

WHAT COULD GO WRONG?	POSSIBLE CAUSES
Mobile plant comes off the road during construction or later road use	– Plant slips down moderate to steep slopes due to distraction or road failure. – Poorly constructed narrow roads fail.
Workers injured by mobile plant	– Small or poorly designed landings cause congestion and make it difficult for vehicles and machinery to work safely around other machines and pedestrians.
Shared access/general driving	– Loose gravel. – Log trucks.
Landslides endanger workers, block access to forestry site	– Poorly constructed earthworks leading to sediment and debris flows and build-up during heavy rain.

TABLE 13:
Examples of what could go wrong – roading, construction and access

14.2.3 The following guidance provides good practice on how to manage these risks. To manage the health risks, see Section 3.5.

14.2.4 Guidance that is common to activities (for example, on requirements for worker training) has been placed in Part B.

14.2.5 See Appendix 6 for an approach to manage health and safety risks.

15.0 Managing the risks from site access and preparation of log landings

IN THIS SECTION:

15.1 Duty of PCBUs who manage or control the workplace

15.1.1 A PCBU who manages or controls a workplace **must** ensure that, so far as is reasonably practicable, the workplace, the means of entering and exiting the workplace, and anything else arising from the workplace are without health and safety risks to any person.

15.1.2 You do not owe this duty to anyone who is at the workplace for an unlawful purpose.

15.2 Constructing and maintaining access roads

Constructing access roads to harvesting sites, log landings or processing areas

15.2.1 Construct and maintain roads to the engineering standards appropriate for their intended use. See the *New Zealand Forest Road Engineering Manual*.

15.2.2 When constructing access roads:

- make sure the road is built to the correct width and gradient as outlined in the *New Zealand Forest Road Engineering Manual*
- consider waterways (dry or flowing) and the impact they might have on any roading in heavy rain
- check the initial road construction plan and remove overhead hazards from road, bridge and log landing construction areas
- if the road areas are adjacent to a moderate-steep slope:
  - put in place control measures to prevent machinery slipping down the slope
  - there may also be risks from upslope hazards to be managed
- remove hazardous trees
- make sure felled trees are clear of standing trees and left in a safe position
- mark or tape off any dangerous areas
- use safe systems of work such as traffic management plans which allow road users and adjoining landowners to pass through and around the road works when it is safe to do so.

Maintaining access roads

15.2.3 Unsealed access roads can deteriorate and put workers and other road users at risk.

15.2.4 Maintain roads to ensure a reasonable quality road surface.

15.2.5 Put in place traffic control measures as needed during maintenance. See the *New Zealand Forest Road Engineering Manual*.

15.3 Constructing crossings

15.3.1 Design and construct crossings and their approaches to engineering standards appropriate for their intended use. See the *New Zealand Forest Road Engineering Manual*.

15.4 Constructing log landings or log loading areas

15.4.1 Design and prepare log landing or loading areas to allow safe operations. This can be done by:

- managing the risk from surrounding trees
- managing the risk of earthflows
- minimising where workers and machinery interact.

15.4.2 There are many factors that can affect the size and shape of log landings, including the:

- terrain, soil types and underlying geology
- size and type of yarder and associated stem landing area (less than 3% fall)
- processing area needed
- loader configuration
- log capacity
- log size and length
- space available (topography).

15.4.3 Consider the size, location and layout of landings in the early harvest plan. Ideally all PCBUs (and their workers) work together to identify the most effective and safest sites and harvest systems when designing the landings.

15.4.4 Have landing areas that:

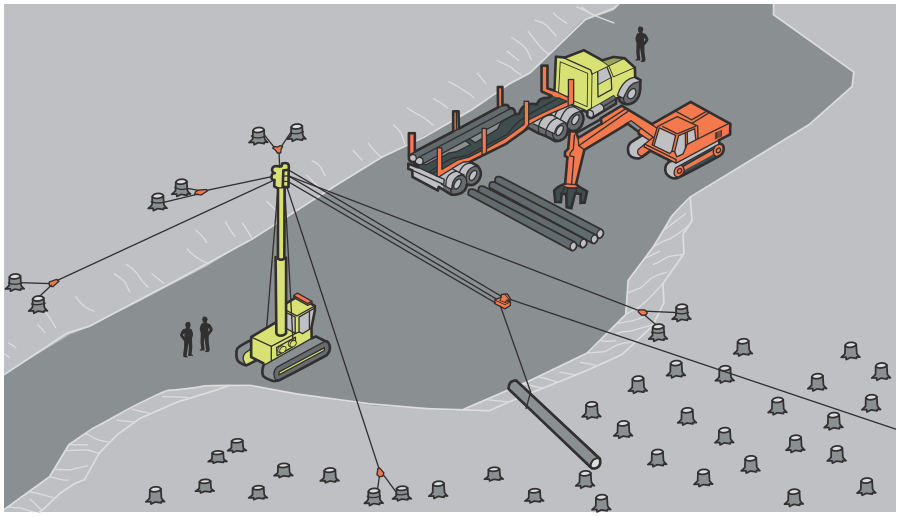
- have a solid and flat foundation (for example, for loading so logs will not slide or roll towards workers or equipment)
- have good water control (for example, good ground water drainage) so log trucks do not get stuck or require assistance to access or move about the landing
- are cleared of hazardous trees, particularly those trees:
  - leaning towards the landing
  - on the prevailing wind side
  - disturbed during landing construction
  - in or leaning into the corridor of the guyline
- are clear of any powerlines or have powerlines with specified safe zones under and around them.

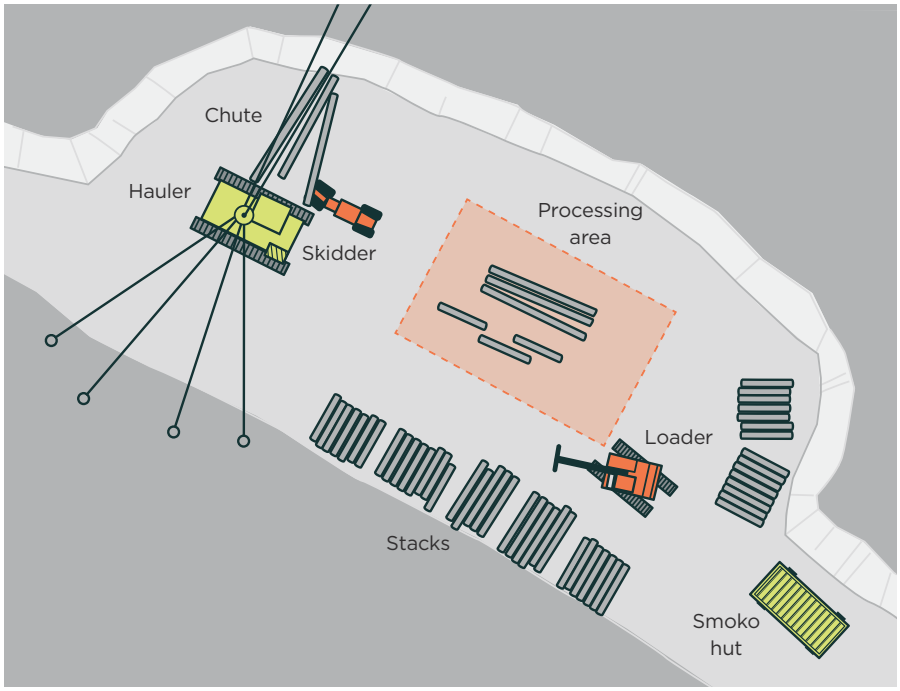
15.4.5 Make sure landings:

- allow traffic to pass the operation safely
- allow operators to easily see anyone arriving at the landing
- have visitor control procedures
- allow the safe entry and exit by all truck types
- allow for parking, turning and moving mobile plant and trucks (this may require berms)

- have space for inspecting, maintaining and repairing mobile plant
- have a safe and level loading zone for log trucks and trailers, and a safe area for drivers to view the loading process
- have separate working areas for each landing activity with suitable separation distances. For example, for activities like:
  - loading
  - stacking (logs to be turned and swung without hitting standing timber, rigging or other equipment or objects) and measuring
  - log quality control checks
  - saw sharpening by ground workers
- allow at least two-thirds of the stem/drag to be landed safely and securely (for hauler operations), or if this is not practicable have alternative means to manage the risk of stems sliding back down the hill
- have sufficient space for the number of products to be safely stored, loaded and for the volume of wood to be handled
- have sufficient space for any slash and processing debris to be held on site
- have compliant storage areas for chemicals and fuel
- have space for parking worker vehicles safely away from landing activities
- have space for a sheltered smoko/rest area
- have a safe location for the toilet. If there is no safe area on the landing, chose a reasonably accessible and safe location nearby.

15.4.6 Figure 14 shows examples of different landing sites.





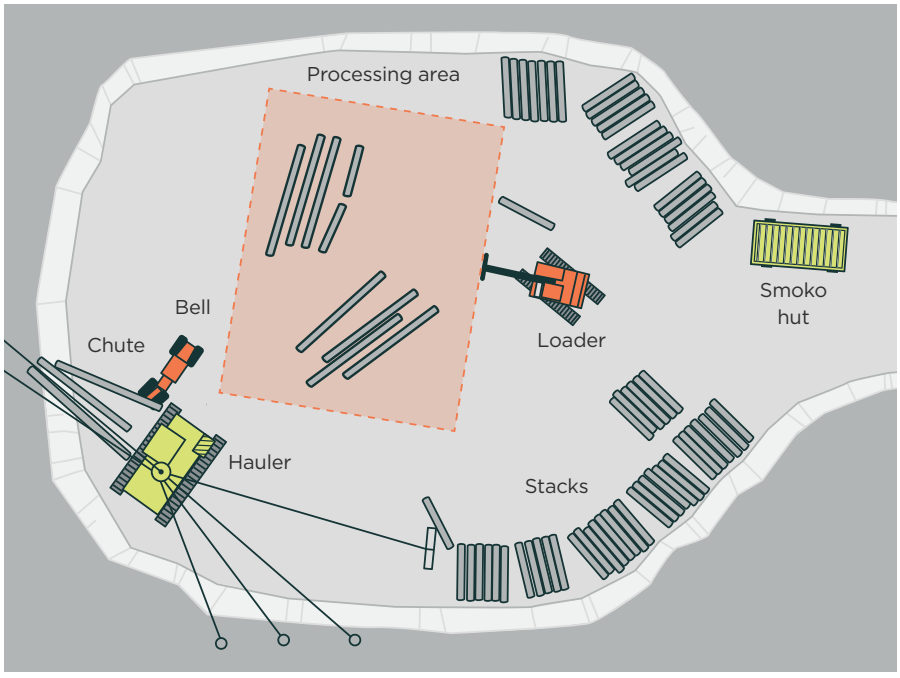


FIGURE 13:
Examples of landing sites[1] (processors not shown)

[1] Adapted from Safe Work Australia's guidance: Forestry: Guide to managing risks in cable harvesting (2013) and Safetree Best Practice Guidelines for Cable Logging (2005)

15.4.7 For downhill yarding, make sure landings are large enough to have sufficient space between the base of the slope and the tower to allow for safe landing of logs without endangering the yarder. It is industry practice to have at least 1.5 tree lengths (Figure 14).

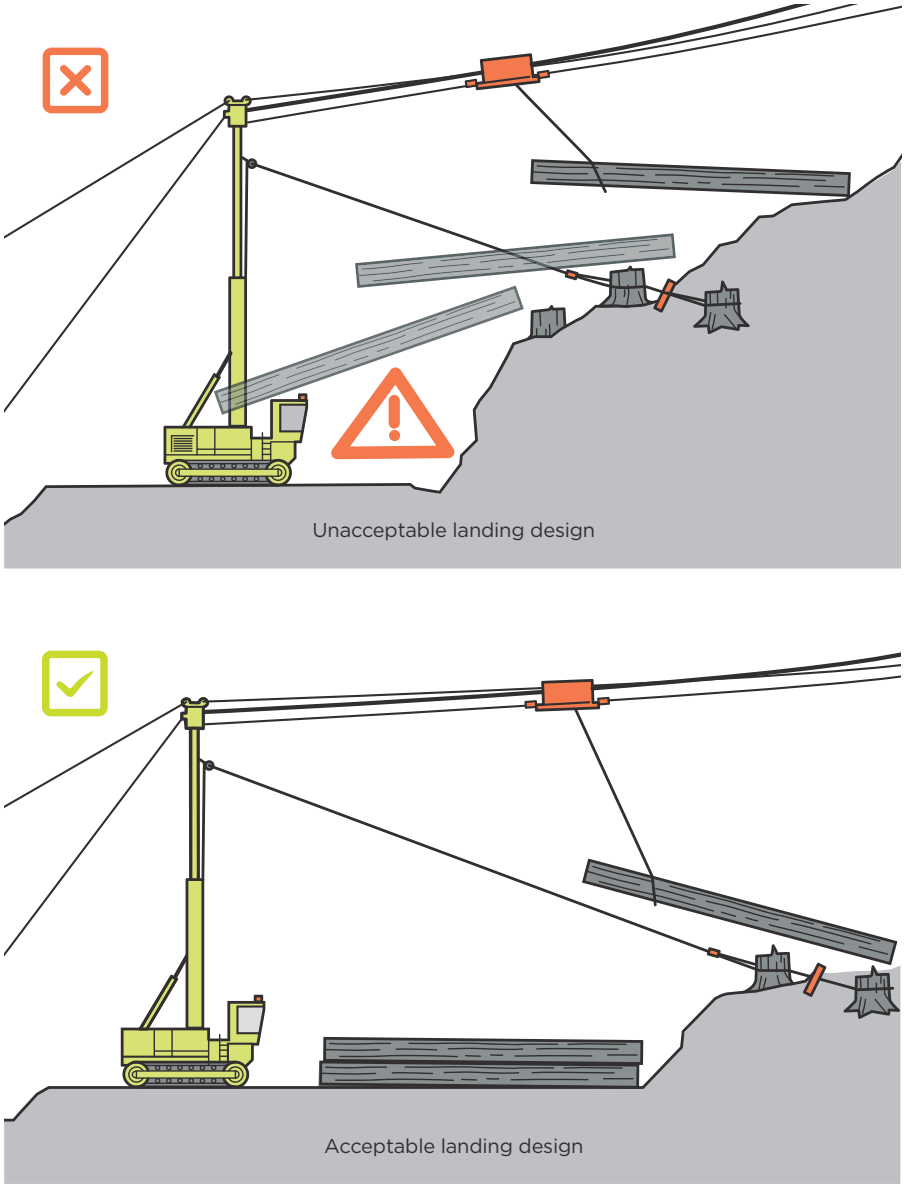


FIGURE 14: Landing design for downhill yarding[2]

15.4.8 For more information on different landing layouts, see the *New Zealand Forest Road Engineering Manual*.

[2] Adapted from Safe Work Australia's guidance: Forestry: Guide to managing risks in cable harvesting (2013)

15.5 Traffic management and signage

Managing traffic

15.5.1 Make sure you have a plan to manage traffic agreed to by the person or entity who controls the road.

15.5.2 Who this is will depend on the type of road. In general:

- for public roads, the road controlling authority (RCA) is usually a local council (for local roads) or the New Zealand Transport Agency (NZTA) (for state highways)
- for private roads, the person controlling the road could be the forest owner, the landowner or a utility owner.

15.5.3 The *Best practice guidelines for temporary traffic control on private forest roads* has specific guidance on:

- direction and protection signs, and usage
- banners and barriers used for road closures
- planning and application.

Signage

15.5.4 Make sure signage is clear and readable, and appropriate for the work being carried out. Use reflective signage for operations carried out in the dark.

15.5.5 Examples of signs include 'Tree Felling', 'Logging Operations' and 'Road closed' (Figure 15).

FIGURE 15: Examples of signs for tree felling operations

15.6 Traffic entering and exiting the forest

15.6.1 Make sure that all traffic entering and exiting the forest on access roads or using forestry roads is managed safely by:

- using signage at the entrance to the forest to indicate the correct radio channel and to turn lights on
- including easily visible road markers at appropriate intervals so traffic using forest and access roads can call their position on the roads
- using correct signage to warn road users when they are approaching logging operations
- using signs including contact details and RT channel to instruct the driver to stop and contact a supervisor for authorisation to continue to the worksite.

15.7 Marking ropes rigged across roads

15.7.1 Clearly flag or mark any static ropes rigged across any road for road users.

15.7.2 Install signposts to warn of clearance restrictions where any overhead ropes are lower than 6m above the road surface when slack.

15.7.3 If any of the ropes rigged across the road are operating ropes, put traffic control measures in place.

15.7.4 Do not allow vehicles under operating ropes when the ropes are in use.

15.8 Controlling authorised visitors

15.8.1 Put in place arrangements to manage visitors to the work area including providing a site induction.

15.8.2 The site supervisor needs to ensure visitors:

- have been briefed on hazards that may impact their health and safety
- understand and comply with safe work procedures
- have and use PPE where it is required.

PART D

Establishment and silviculture

IN THIS PART:

TERM OR SYMBOL	MEANING IN THIS DOCUMENT
Must	A mandatory legal requirement under HSWA or regulations.
Other wording including 'check', 'make sure', 'design', 'do not'	How WorkSafe expects certain health and safety risks to be managed. This is not mandatory to follow – you may adopt other practices, as long as these practices provide a level of health and safety as good as or better than the standard in this code.
You/your	Refers to the PCBU involved in forestry and harvesting operations.

16.0
Introduction to Part D

IN THIS SECTION:

16.1 What does this Part cover?

16.1.1 Silviculture covers a wide range of activities around the establishment, growth and management of forests. This Part provides guidance on managing the health and safety risks of:

- weed control and spraying (before and after planting)
- planting
- pruning
- thinning
- seed collection.

16.2 What are the common health and safety risks faced by silviculture workers?

16.2.1 Table 14 gives examples of how workers can be harmed.

16.2.2 There may be hazards that are not identified in this table. You will need to identify and assess health and safety risks arising from your own work.

WHAT COULD GO WRONG?	POSSIBLE CAUSES
Workers being injured in slips, trips and falls	– difficult terrain (for example steep slopes, waterways) – falls when working at height.

Impaired or distracted workers making mistakes resulting in injuries	– fatigue from:
	  - long work hours
	  - long travel times to and from the worksite
	– dehydration
	– being under the influence of drugs or alcohol
	– distracted by cellphones, work pressures, home pressures.

Worker being hit by falling objects	– adjacent trees, dead limbs and intertwining branches – being struck by falling trees, limbs or other debris – dead trees – pruning tools coming loose while working – unrestrained tools in work vehicles.
Workers fall from height	– unsafe practices while pruning or collecting seed – slipping on ladders when climbing up or down – ladder sway in windy conditions.
Workers being harmed by poor or extreme weather conditions	– UV exposure – hot or cold temperature extremes – heavy rain, flooding – strong winds.
Workers being injured carrying out manual tasks	– repetitive physical action (for example, while tree planting, or doing weed control – including lifting, carrying, frequent bending and digging – carrying heavy equipment (slashers, shears, and hand-held motorised plant like brush cutters, spray units).
Workers being exposed to harmful fumes, excessive noise or vibration while using plant	– handling noisy machinery.
Workers being cut by tools or plant	– chainsaw hazards such as kickback

WHAT COULD GO WRONG?	POSSIBLE CAUSES
Workers being exposed to harmful substances while working	– handling hazardous substances such as petrol and diesel – applying herbicides for weed control/being close to where herbicides are being sprayed.
Workers being cut, scratched or punctured or stung	– from contact with undergrowth such as gorse and blackberry. – bees, wasps and other stinging hazards. – cuts from hand tool blades – loppers, spades, slashers – cuts and abrasions from mishandling equipment. – carrying equipment while walking through thick undergrowth.
Workers contacting live electrical wires	– working close to powerlines.

TABLE 14: Examples of what could go wrong – silviculture

16.2.3 The following guidance provides good practice on how to manage these risks. To manage the health risks, see Section 3.5.

16.2.4 Guidance that is common to activities (for example, on requirements for worker training) has been placed in Part B.

16.2.5 See Appendix 6 for an approach to manage health and safety risks.

17.0 Managing the risks of establishment and silviculture

IN THIS SECTION:

17.1 Managing the risks – weed control and spraying

17.1.1 Manual weed control involves frequent bending and heavy physical work using implements such as loppers and hand-held motorised plant (for example, brush cutters).

17.1.2 Chemical weed control involves application of herbicides which may be applied manually with spray units, by machines with spray units or booms, or by aerial means such as helicopters or drones.

17.1.3 Weed control can occur before planting or after planting (manual release). The following are good practices for carrying out manual and chemical weed control practices.

Manual weed control

PPE

17.1.4 It is industry best practice for the following PPE to be used:

- a safety helmet (as required)
- eye protection
- lace-up footwear (or equivalent) providing ankle support and a non-slip sole
- high-visibility clothing – day-night for added visibility
- leg protection
- wet weather gear
- sun protection.

17.1.5 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

17.1.6 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

SAFE PRACTICE

Brush cutters

17.1.7 Take the following actions if brush cutters are used.

- Make sure appropriate PPE (including adequate eye protection) is worn.
- Use all brush cutters in accordance with manufacturer's specifications.
- Make sure all safety features are fitted and in working order.

Chemical weed control

PPE

17.1.8 It is industry best practice for the following PPE to be used:

- footwear providing ankle support and a non-slip sole
- wet weather gear
- sun protection
- PPE to protect workers from herbicide exposure – refer to the herbicide's safety datasheet (SDS) for what PPE to wear.

17.1.9 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

17.1.10 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

SAFE PRACTICE

Working with hazardous substances

17.1.11 Take the following actions:

- First check if you can use a less toxic or non-toxic herbicide instead.
- Check the requirements in the SDS before deciding how you will transport, handle and store the herbicide.
- Use manufacturers and suppliers who can provide the herbicide in smaller, lighter packaging and provide lifting points or aids to minimise the use of force.
- Workers **must** be trained in the safe use of the herbicide.
- Make sure workers know how to correctly use spraying machines and safely mix and apply herbicides and other substances such as granulated fertilisers.
- Make sure the site and spray plan is accessible.
- Make sure that there is a suitable work–rest regime for the conditions if workers are wearing layered PPE (for example, protective overalls on hot days).

17.1.12 See Section 3.5.53 for information on managing the risks of harmful substances.

Mechanised spraying

17.1.13 Take the following actions:

- Where possible, select machines with enclosed cabins and air conditioning units with appropriate air filters.
- Use pumps to deliver herbicide and water into spray tanks where hoses are not available.
- Use herbicide-proof PPE when checking and calibrating nozzles.

Exclusion zones and safe work areas

17.1.14 Take the following actions after completing a risk assessment.

- Keep a safe working distance between machine-based spraying (heavy plant/tractor) and other operations.
- Keep a safe working distance between vehicles or trailers fitted with spray units and other ground workers.
- Keep a safe working distance between individuals using spray units and other ground workers.

Aerial spraying and drone spraying

17.1.15 The aerial spraying contractors, including drone operators, are responsible for meeting Civil Aviation Authority (CAA) requirements and permissions before spraying.

17.1.16 Take the following actions.

- Make sure you have a comprehensive spray plan that includes the spray area, target species and herbicides to be used.
- Make sure that sensitive areas such as waterways are identified and that processes are in place to ensure there is no off-target damage or water contamination.
- Make sure neighbours are informed.
- Make sure that there is a ‘spray halt’ plan if wind speed, direction or other weather event changes could cause harmful drift.

17.1.17 Check the SDS before handling, mixing or loading the herbicide.

17.1.18 Make sure that all workers involved in the handling, mixing and loading of herbicides wear the correct PPE.

17.1.19 Make sure that there are no workers in, or near, the spray exclusion zone during spraying.

17.1.20 Make sure that workers do not enter the spray zone after spraying until it is safe to do so.

17.1.21 Have a plan in place to address any potential emergencies if they occur (see Section 9).

17.2 Managing the risks – tree planting

17.2.1 The following are good practices for carrying out tree planting.

Personal protective equipment

17.2.2 It is industry best practice for the following PPE to be used:

- steel-toe lace-up footwear (or equivalent) providing ankle support and a non-slip sole
- cut-resistant gloves (for example, for blackberry)
- high-visibility clothing – day-night for added visibility
- wet weather gear
- sun protection
- helmet (if required).

17.2.3 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

17.2.4 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

Safe practice

MANUAL HANDING PRACTICES

17.2.5 To manage the risks of work-related musculoskeletal disorders, take the following actions.

- Make sure workers perform warm-up and warm-down exercises before and after planting sessions.
- Provide information and training on techniques to reduce risks (for example, neutral postures, change of hands)
- Make sure workers use planting tools (for example, purpose-built spades) that minimise or eliminate the need for bending and minimise forces.
- Make sure workers use carry frames, backpacks and harnesses that are ergonomically designed.
- Make sure workers restock carry frames on the ground or have someone else do it to avoid twisting and lifting while wearing the frame.
- Where possible, make sure workers use a machine to carry planting stock to the planting site.

17.2.6 The guidance for managing hazardous manual tasks is covered in Section 3.5.62.

SLIPS, TRIPS AND FALLS

17.2.7 To manage the risks of slips, trips and falls, take the following actions.

- Assess the site for hazards and risks before starting work. Consider setting setback distances from areas above bluffs where no planting occurs. Discuss at toolbox talks.
- Make sure workers have a suitable work-rest regime for the conditions to manage fatigue.
- Make sure workers wear non-slip safety footwear.

SAFE SITE

17.2.8 Take the following actions.

- Do not work directly above or below other workers on steep slopes where there is risk of material coming down.
- Make sure workers stay a safe working distance from all-terrain vehicles and other machinery on site:
  - while the machines are in operation
  - until the operator has been contacted, equipment grounded, and the operator has called the worker in.
- Make sure workers comply with all warning signs on site.

17.3 Managing the risks – pruning

17.3.1 Pruning involves the removal of branches from the main trunk of a tree to improve the quality and value of the wood produced.

17.3.2 The following are good practices for carrying out pruning. For industry guidance, see Resources webpage

PPE

PERSONAL PROTECTIVE EQUIPMENT

17.3.3 It is industry best practice for the following PPE to be used:

- a safety helmet, eye protection, and cut-resistant gloves (as required)
- lace-up footwear (or equivalent) providing ankle support and a non-slip sole
- high-visibility clothing – day-night for added visibility
- wet weather gear
- sun protection
- chainsaw chaps and hearing protection when using a chainsaw.

17.3.4 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

17.3.5 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

Safe practice

SAFE CLIMBING PRACTICES

17..3.6 Take the following actions:

- Section 11 explains the requirements you **must** meet for training, information, instruction and supervision.
- Make sure workers work from ground level where practicable.
- Make sure workers are competent in tree assessment, particularly for prune height and access method.
- Make sure cutting methods do not cause limbs to fall into the ladder or climber.
- Do not carry out pruning operations during extreme weather conditions when the movement and dynamic loading on the tree can be unpredictable.
- Ensure a clear walking path before moving from one tree to the next.

LADDERS

17.3.7 Take the following actions:

- Use a purpose-built ladder that fits to the tree trunk at its top and has its feet placed firmly.
- Make sure all ladders meet the appropriate industry standard (Appendix 7) and have their safe working load certified by the manufacturer or a suitably competent person such as a Chartered Professional Engineer (CPEng).
- For ultra-high pruning, use a ladder with:
  - a working platform at least 400mm wide and 200mm deep
  - a 'V' shape to fit against the tree
  - the feet of the stiles pointed for stability of use
  - a chain to secure the ladder when the pruner reaches working height.

PRUNING FROM A LADDER

17.3.8 To meet their duties under HSWA, PCBUs **must**, so far as is reasonably practicable, manage the risks of falling from any height. This applies to all work, including pruning from a ladder.

As well as these duties under HSWA, there are also specific requirements under regulations.

17.3.9 Where workers could fall more than 3m (measured from the person's feet above the ground), employers **must**, so far as is reasonably practicable, ensure that suitable means are provided to prevent them from falling.

These means could include a suitable fall restraint device or other suitable fall protection.

17.3.10 If this is not reasonably practicable, PCBUs will need to consider other ways to manage the risk.

17.3.11 Where workers are pruning greater than 4.5m or more above the ground (measured from their feet), make sure the worker wears a suitable fall restraint device.

ULTRA-HIGH PRUNING

17.3.12 Ultra-high pruning is when pruning is above 5.8m to 6.5m.

- When carrying out ultra-high pruning, make sure the worker wears a fall restraint device with an adjustable lanyard that is:
  - of steel or wire core construction
  - fastened around the tree when the worker reaches working height.
- The fall restraint device needs to have a 'D' ring on the chest of the harness for use in an emergency rescue.
- Fasten ladders used in ultra-high pruning with a chain around the tree at two to three rungs below the top of the ladder.
- If using chainsaws, make sure ultra-high pruners:
  - carry and wear the standard equipment for chainsaw use
  - wear a purpose-designed harness to carry tools, chainsaw fuel and water. This harness needs to be able to be used in an emergency to attach a rescue rope.
- Make sure workers:
  - have demonstrated their competence at lower-level pruning before working on ultra-high pruning
  - are trained in the use of fall restraints and work positioning devices
  - are trained in rescue techniques in the event another ultra-high pruner becomes disabled up a tree.
- Make sure rescue equipment is available at the work location.
- Make sure ultra-high pruners keep sight or voice contact during ultra-high pruning work.

PRUNING EQUIPMENT

17.3.13 Take the following actions.

- Always use a scabbard or holster to carry pruning equipment (for example, secateurs, loppers, saws) and always pick up loppers using the handles.
- Make sure chainsaw operators observe safety precautions. For industry guidance, see Resources webpage
- Regularly maintain and sharpen pruning equipment to keep the equipment and any safety features in good working order.

SPECIALISED SAFE CLIMBING PRACTICES

17.3.14 There may be occasions where workers need to climb higher than any ladder would allow. This will require specialised skills and techniques.

- Assess the tree to determine suitability for climbing, extra precautions needed, or special techniques required.
- Assess the weather conditions to determine if it is safe to climb.
- Make sure that tree climbing is only done by workers with the relevant skills required.
- Have a minimum of two workers present:
  - one climber
  - one ground person who is also assessed as competent and able to climb if the first climber is injured and unable to descend the tree.

- If a climber needs to disconnect the climbing rope or strap in order to move past an obstacle, make sure there is a second climbing rope or strap to ensure continuous protection while passing the obstacle.
- Make sure there is only one climber working in a tree. In most situations this is the safest method.
- Make sure you have an emergency response and rescue plan that is documented and tested regularly.

Climbing equipment

17.3.15 Take the following actions.

- Make sure climbers use an approved tree climbing harness (Appendix 7).
- Make sure all climbing equipment is checked for safety and is in good condition prior to use and throughout the day.
- Make sure a climber uses:
  - a safety belt
  - a climbing rope or strap
  - climbing spurs.
- If there is a possibility of a climbing rope or strap being severed in the conditions present at a climbing work site, make sure:
  - the rope or strap is made of material that cannot be severed
  - the climber has a second climbing rope or strap they can use.
- Make sure all points of attachment are correctly set and visually inspected before placing weight on them (knots are correctly tied and checked, carabiners are closed and locked).
- Make sure anchor points are sound, and suitably strong. Make sure they are positioned in such way that a slip or fall would swing the worker away from power lines or other potential hazards.
- Make sure the safety line is secured in such a way that the climber cannot fall more than 500mm (half a metre).
- Make sure a duplicate set of climbing equipment is available for immediate use at the climbing work site for emergency rescues.

Exclusion zones and safe work areas

17.3.16 Take the following actions.

- Make sure there is a distance of at least two tree-lengths between the climbing activity and other operations such as falling or road construction.
- Make sure there is a defined safe zone underneath the climber.
- If there are power lines in the vicinity, make sure there are safety observers to ensure safe separation distances from the power lines are maintained.

17.4 Managing the risks – chainsaw thinning

17.4.1 Thinning is the removal of trees to allow the best trees to grow without competition.

17.4.2 The following sections describe good practices for carrying out thinning work. For industry guidance, see Resources webpage

PPE and other equipment

PERSONAL PROTECTIVE EQUIPMENT

17.4.3 It is industry best practice for the following PPE to be used:

- a safety helmet with eye protection
- steel-toe lace-up footwear (or equivalent) providing ankle support and a non-slip sole
- high-vis clothing with day-night for added visibility
- chainsaw chaps
- hearing protection
- wet weather gear
- sun protection.

17.4.4 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

17.4.5 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

OTHER EQUIPMENT

17.4.6 Other equipment to carry includes:

- a first aid kit with two wound dressings
- a fully charged fire extinguisher or fire blanket
- drink bottle
- spares kit
- wedge hammer, or mallet and a minimum of three wedges
- fuel and oil in approved containers
- RT.

Safe practices

17.4.7 Take the following actions.

- Section 11 explains the requirements you **must** meet for training, information, instruction and supervision.
- In case of an emergency, have at least two people on the site and equipped with an emergency locator beacon.
- Depending on the size of your crew, make sure an adequate number of people hold a current first aid certificate (see Section 8).
- Make sure thinners have a reliable communication method.
- Check the communication system before starting work, and periodically throughout the day.
- Make sure thinners check-in regularly with a contact person.
- Do not allow thinners to work away from the rest of the crew unless there are effective ways of getting help.
- See Section 21.12 for guidance on tree driving.

THE TWO TREE-LENGTH DANGER ZONE

17.4.8 Anything within two tree-lengths of the tree being thinned is in the danger zone (see Figure 16).

- The crew owner/foreperson makes sure the two tree-length danger zone is calculated, understood, and obeyed by workers.
- Make sure thinners understand and manage the two tree-length danger zone from other thinners, roads, safe zones and any nearby work.

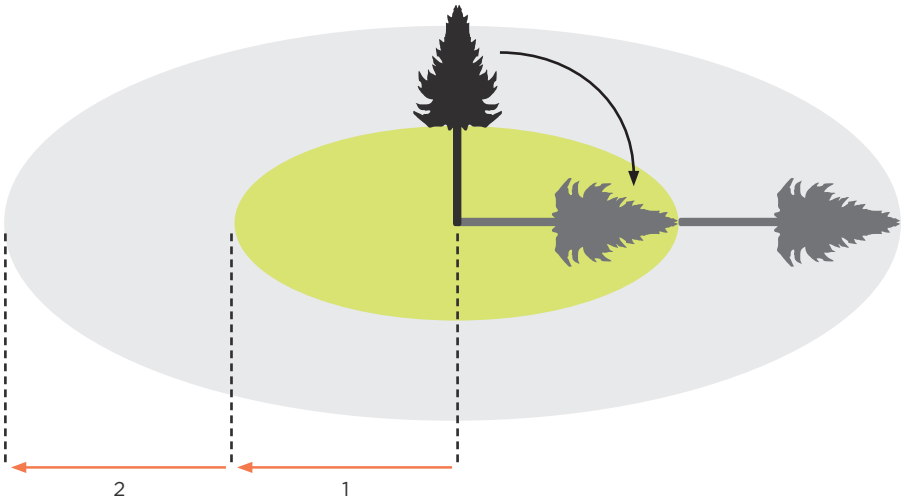


FIGURE 16:
The two tree length danger zone

SAFE THINNING PRACTICE

17.4.9 Take the following actions.

- Take care when moving between trees:
  - cut scrub only when not moving and with firm footing
  - use the saw below shoulder height
  - cut within reach and do not over-reach.
- Make sure all thinners understand and apply the five-step felling process (see Section 21.7).
- Make sure thinners are trained in and understand:
  - using a chainsaw safely
  - the different felling techniques according to trunk size
  - the methods for dealing with hang-ups including any trees left standing after the back cut
  - posting.
- If using tree driving or brushing to remove a hang-up, see Section 21.12.
- Keep equipment maintained and in good working order – including any safety features.

17.5 Managing the risk – chemical thinning

17.5.1 Chemical thinning involves using herbicides to selectively kill unwanted trees. Common practice is that a hole is drilled into the trunk of the tree and a dose of herbicide injected.

17.5.2 The following are good practices for carrying out chemical thinning work.

PPE and other equipment

PERSONAL PROTECTIVE EQUIPMENT

18.5.3 It is industry best practice for the following PPE to be used:

- lace-up footwear, or equivalent, providing ankle support and a non-slip sole
- wet weather gear
- sun protection
- PPE to protect workers from herbicide exposure – refer to the herbicide's safety datasheet (SDS) for what PPE to wear.

OTHER EQUIPMENT

17.5.4 Other equipment includes:

- a spillproof container or backpack bladder for carrying herbicides
- a holster or backpack for carrying battery-operated drills and spare batteries
- a fire blanket in the event of a lithium battery fire.

Safe practice

17.5.5 For more information on working with harmful substances, see Section 17.1.9.

17.5.6 When drilling, and injecting the herbicide, always operate below eye level to minimise the risk of splashback.

17.5.7 For information about the safe use of lithium-ion batteries, see Resources webpage

17.6 Managing the risks – mechanised thinning

17.6.1 For guidance on managing the risks of mechanised thinning, see Section 20 – Mechanised felling.

17.7 Managing the risks – seed collection

17.7.1 Seed collection can take place at ground level after thinning.

17.7.2 There may be some instances where seeds are collected by climbing or using mechanised height equipment.

17.7.3 For more information on climbing, see Section 13.3.12 on specialised climbing practices.

PART E

Mobile plant and harvesting

IN THIS PART:

TERM OR SYMBOL	MEANING IN THIS DOCUMENT
Must	A mandatory legal requirement under HSWA or regulations.
Other wording including 'check', 'make sure', 'design', 'do not'	How WorkSafe expects certain health and safety risks to be managed. This is not mandatory to follow – you may adopt other practices, as long as these practices provide a level of health and safety as good as or better than the standard in this code.
You/your	Refers to the PCBU involved in forestry and harvesting operations.

18.0
Introduction to Part E

IN THIS SECTION:

18.1 What does this Part cover?

18.1.1 This Part covers managing the risks of:

- mobile plant
- mechanised harvesting including winch-assisted harvesting
- manual felling including machine-assisted felling
- cable logging including manual breaking out.

18.2 What are the common health and safety risks faced by workers?

18.2.1 Table 15 gives examples of how workers can be harmed.

18.2.2 There may be hazards that are not identified in this table. You will need to identify and assess health and safety risks arising from your own work.

WHAT COULD GO WRONG?	POSSIBLE CAUSES
Workers being hit by falling objects	– broken branches sitting in the canopy – trees during felling including rebounding butts – dead trees.
Workers being struck by stems, dislodged material or rigging, including while breaking out	– being hit by loose objects, rocks, stems, branches and pieces of wood in the cut over – being hit by rolling or sliding stems while working on steep slopes below the landing.
Workers being struck by ropes, chains or cables	– being struck by equipment, ropes, rigging which fails – wire rope sprags.
Workers being struck by mobile plant	– see Section 19.
Mobile plant tipping, rolling or losing control	– see Section 19.
Impaired or distracted workers making mistakes resulting in injuries	– fatigue from long work hours, working at night or long travel times to worksite – dehydration – being under the influence of drugs or alcohol – distracted by cellphones, work pressures, home pressures.
Workers harmed during repairs or maintenance activities	– plant not being de-powered/no energy isolation.
Workers being harmed by poor or extreme weather conditions	– sun/UV exposure – hot or cold temperature extremes – heavy rain, flooding – strong winds.
Workers being injured carrying out manual tasks	– repetitive physical actions – operating mobile plant controls.
Workers being exposed to harmful fumes, excessive noise or vibration, cutting edges for example, while using plant	– excessive noise from machines – chainsaw hazards such as kickback.
Workers being injured in slips, trips and falls	– difficult terrain (for example, steep slopes, waterways) – falls when working at height.

TABLE 15: Examples of what could go wrong – harvesting

18.2.3 The following guidance provides good practice on how to manage these risks. To manage the health risks, see Section 3.5.

18.2.4 Guidance that is common to activities (for example, on requirements for worker training) has been placed in Part B.

18.2.5 See Appendix 6 for an approach to manage health and safety risks.

19.0
Mobile plant

IN THIS SECTION:

19.1 Introduction to mobile plant

19.1.1 Mobile plant is an essential part of the forestry industry. Examples include:

- wheeled and tracked skidders
- forwarders
- excavator-based machines
- haulers
- mechanised harvesters and processors
- wheeled loaders
- bulldozers
- other vehicles like light utility vehicles (LUVs) or quad bikes to move people or things.

19.1.2 In this document, 'mobile plant' does not include log trucks, utes or crew vans.

19.1.3 Each machine has its own characteristics and requirements and will have its own risks to be managed.

19.1.4 This section looks at the general risks of mobile plant and how to manage them. Some of this guidance applies only to certain mobile plant. For industry guidance, see Resources webpage

19.1.5 Table 13 describes how workers can be harmed.

19.1.6 There may be hazards that are not identified in this table. You will need to identify and assess health and safety risks arising from your own work.

WHAT COULD GO WRONG?	POSSIBLE CAUSES
Ground workers being struck by mobile plant or being hit by object while working close to mobile plant	– poorly managed mobile plant/ground worker separation – hit by object struck by mobile plant (for example, stems) – mechanised processor chain breaking (chain shot).
Operators injured while using mobile plant	– mobile plant tips or rolls – intrusion of object into the cab (for example, stems) – poorly maintained or defective safety equipment and structures – hydraulic equipment fails.
Workers are harmed during servicing and maintenance	– lockout-tagout system not used – machine not de-energised – incorrect maintenance procedures.

TABLE 16: Examples of what could go wrong - mobile plant

19.2 PPE

19.2.1 It is industry best practice for the following PPE to be used:

- high-vis shirt, vest or jacket with day-night for added visibility
- high-vis helmet
- hearing protection (Grade 5)
- safety footwear (make sure machine operators do not wear spiked footwear)
- gloves – leather or thick cotton (when dealing with wire ropes or chains)
- protective eyewear.

19.2.2 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

19.2.3 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

19.3 Safe machine

19.3.1 A PCBU who manages or controls plant at a workplace **must**, so far as is reasonably practicable, ensure that the plant is without risks to the health and safety of any person.

19.3.2 PCBUs **must** ensure, so far as is reasonably practicable, the provision and maintenance of safe plant and the safe use, handling, and storage of plant.

Safety and protective structures

19.3.3 Make sure any mobile plant brought into the forest is safe and compliant for its planned use.

19.3.4 Make sure mobile plant has appropriate protective structures and equipment that:

- are certified by the manufacturer or a Chartered Professional Engineer
- are suitable for their planned use
- meet or exceed industry or equivalent standards (Appendix 7).

19.3.5 Table 17 shows examples of protective structures and equipment. In some cases, and particularly with more modern machines, these different protective structures could be the same structure.

MACHINE, LOCATION AND TASK	HAVE THE FOLLOWING PROTECTIVE STRUCTURES AND EQUIPMENT
Machines working in or near standing trees	– falling object protective structures (FOPS)
Machines working where there is risk of objects entering the cab	– operator protective structures (OPS) – approved chain shot guards – polycarbonate protective windshields appropriate for the proposed use and risk (for example, 32mm on the front shield of a harvester or processor)
Machines (not including hydraulic excavators) working on sloping or rough terrain that may cause instability	– rollover protective structures (ROPS) – an approved seatbelt system or other safety restraint (Appendix 7)
Hydraulic excavators working on sloping or rough terrain that may cause instability	– cabin operator protective structures (COPS) or tip-over protective structures (TOPS) – an appropriate seatbelt system or other safety restraint (Appendix 7)
Machines working at night	– lights capable of illuminating the area being worked
Machines with structures that may come into contact with overhead power lines	– appropriate warning displayed in the cab – consider use of proximity alarms or warning devices
Machines with exposed drumlines and rotating flywheels	– guarding in place and secure.
Machines with hydraulic systems involved in lifting, for example, lifting trailers	– hose burst protection.

TABLE 17: Protective structures and equipment for mobile plant

19.3.6 For more information, see Resources webpage

Emergency exits

19.3.7 Make sure all machines and processors have emergency exits that can be activated internally and externally.

19.3.8 For the emergency exits, make sure:

- there are at least two (2) emergency entry/exits that can be manually opened
- emergency exits are not blocked or hindered by protective structures
- all emergency exits are accessible and usable by the operator – the operator will be able to exit quickly in the event of an emergency
- tools required to activate emergency exits (for example, hammers for glass) are kept in the machine
- where the machine has doors with latches, the latches function properly. Make sure doors are kept closed and latched when the machine is in use
- there is a process in place to get operators out if all emergency exits are blocked or cannot open.

19.3.9 Make sure training for machine operators includes checking their knowledge and use of emergency exits in the machine they will be operating and their ability to easily use those exits.

Working near water

19.3.10 Make sure there is a process to manage the risk of water entering the cab if the mobile plant enters the water. Consider the suitability of emergency exits (can they be manually opened?), escape tools, and a supplementary breathing system.

Braking standards

19.3.11 Make sure:

- all machines have a braking mechanism capable of holding itself and its load on any slope which it is operating on
- where winch-assist is being used, the winch braking system is capable of holding the machine if traction or stability is lost. (see Section 20.5).

Fire extinguishers and fire suppression systems

19.3.12 Make sure the type and number of fire extinguishers are appropriate for the size of the machine and they are serviced as recommended.

19.3.13 Make sure fire extinguishers are secured, easily identified, and easily accessible.

19.3.14 Make sure plant has a fire suppression system in the engine bay, so far as is reasonably practicable. If you do not have a system, you need another method to adequately manage the risk of fire in the engine bay.

19.3.15 Machinery used in the forest needs to be turbo-charged or needs to be fitted with efficient spark arrestors.

Seating, seatbelts and seat restraints

19.3.16 Have ergonomically designed seating and controls to minimise risk to the operator. Have seating with pneumatic or other suspension-type vibration mechanisms.

19.3.17 Have seating and controls that can be adjusted to suit the operator.

19.3.18 Make sure all mobile plant is fitted with seatbelts that meet relevant industry standards (Appendix 7). For mobile plant working on slopes with a gradient greater than 8 degrees, fit the plant with multi-point harnesses which provide shoulder restraint.

19.3.19 Make sure seatbelts and harnesses are always worn when the machine is in operation.

Emergency stop

19.3.20 Make sure mobile plant operated on steep slopes have an emergency stop button that immediately brakes the machine or winch (if relevant).

19.3.21 If the plant is used as a winch-assist anchor, have a monitoring system to detect machine movement (see Section 20.5).

Objects secured in cab

19.3.22 Secure all loose objects in the cab so they do not interfere with the operator or the safe operation of the mobile plant.

19.4 Safe practice

Machine operation

19.4.1 Operate all mobile plant to the manufacturer's specifications and limits (if supplied) or as modified by a suitable competent person.

19.4.2 Develop and put in place a specific hazard management plan if there is any risk of instability of the mobile plant because of slope, terrain or ground conditions.

19.4.3 Make sure the operators are familiar with:

- where the operator's manuals are kept
- the daily pre-start checklist
- what safety devices are fitted, how they operate and how they are to be maintained
- the lockout procedures for the machine
- how to de-energise the plant.

19.4.4 Do not allow workers to get on or off a moving plant.

19.4.5 Do not allow workers to ride in mobile plant unless it has proper seating and seat restraints for that person – this applies particularly to carrying passengers.

19.4.6 Make sure that if the mobile plant is left unattended with the engine running or shut down:

- the brakes are applied
- any blades, attachments or accessories are rested on the ground.

DAILY PRE-START CHECKS

19.4.7 Make sure all mobile plant has a pre-start check in accordance with manufacturer's recommendations, as well as worksite procedures. This is both for the mechanical safety of the mobile plant and the safety of the operator.

19.4.8 Check (as relevant):

- the fluid levels
- the cooling system (including coolant levels)
- the hydraulic hose condition
- the tyre and track condition
- the condition and security of machine guarding, access ladders and handrails
- the operator protective structures
- the fire suppression system
- for debris in the engine compartment
- the appropriate equipment is in operator's cab.

19.4.9 Make sure the operator checks daily:

- the mobile plant's controls and safety devices
- that all objects in the cab are secured
- that any repairs or due maintenance are noted and reported.

Safe procedures for maintaining and repairing mobile plant

19.4.10 Service and maintain all mobile plant in keeping with the manufacturer's recommendations. This includes daily pre-start checks and regular audits.

19.4.11 Note and repair all machine faults.

19.4.12 Remove the mobile plant from use if the fault puts the safety of the mobile plant and operator at risk. Do not use the mobile plant until it is repaired.

19.4.13 Make sure tagout or lockout tag is attached.

19.4.14 Make sure your procedures for maintaining plant in the field are followed.

19.4.15 If you engage a service provider:

- make sure they have knowledge and experience in repairing or maintaining the plant type
- complete a handover of the plant including the current lockout, de-energisation state and any other lockout points required
- inform the service provider of risks (this includes for any felling heads)
- agree on how the risks are managed at the site.

19.4.16 This is an example of how you might manage the risks while maintaining and repairing mobile plant:

1. Think about what could go wrong.
2. Have a plan and make sure that everyone knows what is going on and who will be doing what.
3. Have a designated area for repairs (if possible):
   - Cone the area off.
   - Make sure that everybody knows that any machine in there is not to be operated.
4. Before starting repairs or maintenance make sure all attachments are on the ground.
5. Isolate the plant. Engine off, take the keys out of the ignition, isolator on (if it has one).
6. Turn the computer off.
7. Put in any locking pins for booms, heads and anything else that requires them.
8. Remove residual hydraulic pressure in the operating lines. As an extra precaution, if working on hydraulic hoses, 'crack' the hose by a turn, stand back and give the hose a wiggle just in case there is residual pressure.
9. Put 'Do not operate' tags on the machine. Make sure that they are large and easily seen. Put them in critical places such as the cab door and inside where the operator's controls are.
10. If working on fuel lines, get expert advice. Do not touch them unless the engine has been switched off for at least 10 minutes.
11. If putting the machine on blocks, do not allow any body part between the top of the block and the frame of the machine.
12. Chock wheels to prevent any vehicle movement.
13. At every step, always think 'What if?'

19.5 Safe site

Managing worker/mobile plant separation

19.5.1 Make sure mobile plant operators are aware of who is in their work site, and where they are.

19.5.2 Stop work if there is any risk that a worker is in the vicinity of plant, and any worker who is not accounted for, or cannot be seen by the operator. Do not restart work until the operator knows where that worker is.

19.5.3 Make sure no workers approach mobile plant without:

- contacting the operator saying that they want to approach
- receiving clear approval to approach from the operator
- the machine being in the at-rest position.

19.5.4 More information about the separation distances for specific activities can be found in the relevant sections.

19.6 Using LUVs and quad bikes to move people or things

19.6.1 Other vehicles like LUVs and quad bikes are used in many forestry operations, particularly silviculture. While small compared with most forestry mobile plant, they still pose considerable risk, particularly from rollover.

19.6.2 Choose the right vehicle for the job – take into account the work, the terrain, the capability of the vehicle and its safety features.

19.6.3 If such vehicles are used, make sure:

- the vehicle has appropriate operator protection against the risk of rollover or tipping
- that operators have a communication system
- passengers are not carried unless the vehicle has been designed for carrying passengers
- equipment carried in vehicles or on attached trailers is safely secured
- appropriate helmets are provided and kept with the vehicle for the number of people it is permitted to carry
- the operator and any passengers wear the seatbelts and helmets provided.

20.0 Managing the risks – mechanised felling

IN THIS SECTION:

20.1 Introduction

20.1.1 Mechanised harvesting is where machines are used for felling and delimbing.

20.1.2 For further information on safe working practices, look at industry guidance, see Resources webpage

20.2 PPE and other equipment

Personal protective equipment (PPE)

20.2.1 It is industry best practice for the following PPE to be used:

- high-vis shirt, vest or jacket with day-night for added visibility
- high-vis helmet, when working outside a protected cab
- safety footwear
- hearing protection
- gloves (when working with wire ropes and chains).

20.2.2 Other useful equipment includes a small personal first aid kit.

20.2.3 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

20.2.4 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

20.3 Safe site

Managing worker/machine separation

20.3.1 Before planning any mechanised felling operation, think about:

- where the operation is taking place
- what other activities are happening nearby
- who else may be in the area.

20.3.2 Once you have this information, determine the hazard zone(s) considering the following.

MAKE SURE WORKERS ON FOOT DO NOT ENTER WITHIN TWO TREE-LENGTHS OF A WORKING FELLING MACHINE

20.3.3 This is the minimum zone to protect workers from sailers or breakage from the felled or nearby trees (Figure 17). There may be circumstances when a larger zone is needed.

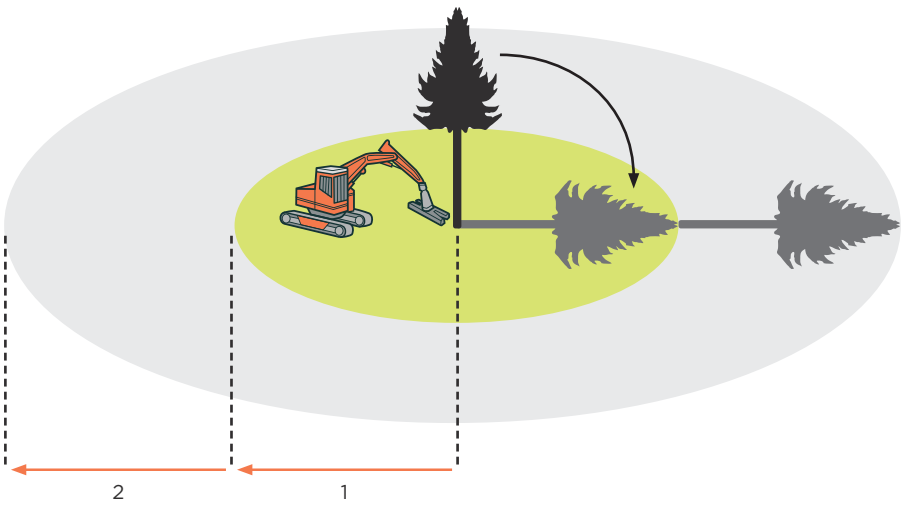


FIGURE 17: Danger zone for workers around working felling machines

MAKE SURE WORKERS STAY OUT OF AREAS WHERE STEM MOVEMENT COULD OCCUR AFTER FELLING, PARTICULARLY IF FELLING DOWNSLOPE OF THE MACHINE

20.3.4 Figure 18 shows the danger zone.

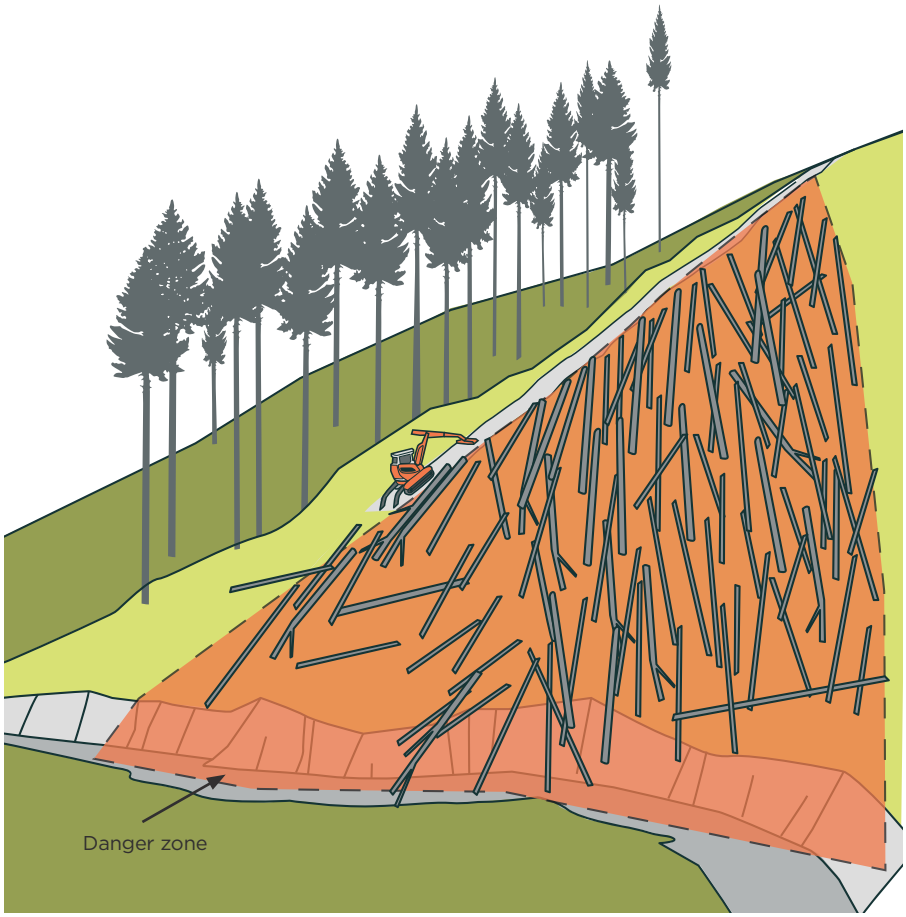


FIGURE 18:
Danger zone from stem movement downslope

MACHINE SEPARATION

20.3.5 Make sure other machines maintain a safe distance unless the risk is well managed.

WORKERS APPROACHING A MACHINE

20.3.6 Make sure workers on foot:

- do not approach a machine without first contacting the machine operator and letting them know their intentions
- only approach when they have permission.

20.3.7 Before machine operators give permission to workers to approach (or get out of the cab), make sure the operator:

- stops the task they are doing
- lowers any raised implements
- locks out the hydraulic system
- applies the brakes.

CHAIN SHOT

20.3.8 Make sure workers are at least 70m away from the cutting direction of the saw chain. This is due to the risk of chain shot from the chain breaking (Figure 19).

20.3.9 If there is a natural or man-made barrier between the saw chain and workers, this distance could be reduced once a risk assessment is carried out.

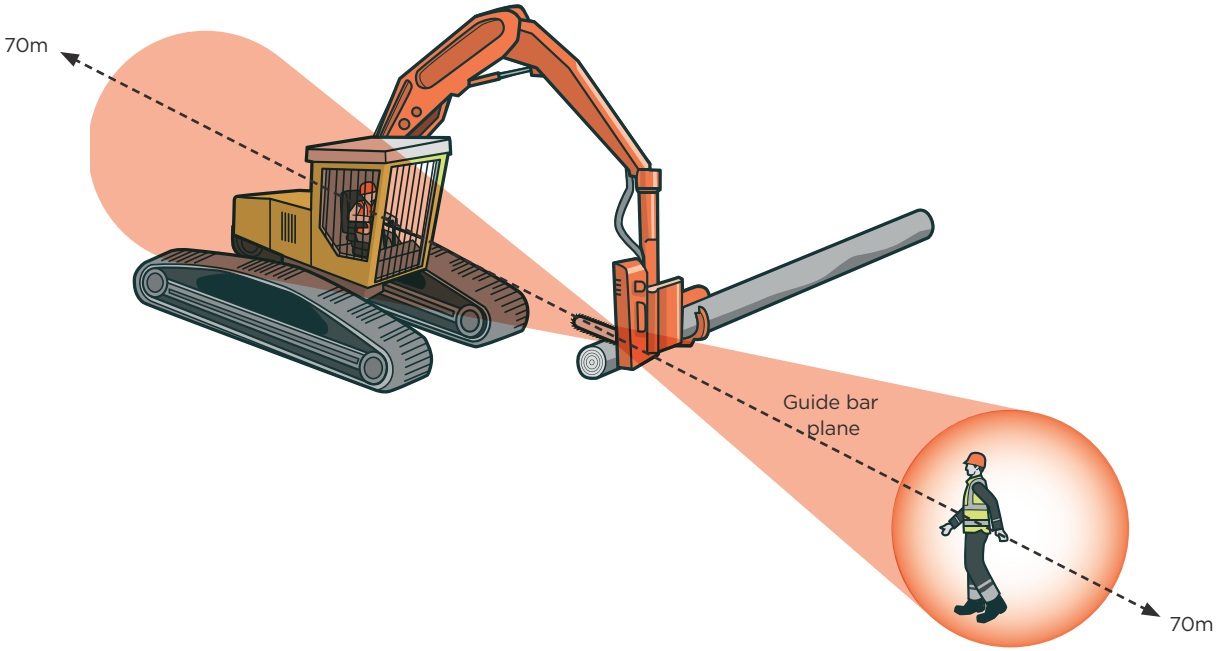


FIGURE 19: Minimum 70m exclusion zone to protect against chain shot injury[3]

20.3.10 Have a sign warning about entering a chain shot zone at the entrance to all working skid sites with processing machines working.

Managing terrain

20.3.11 Each machine make has its own unique features that will determine the exact slope limits for the machine.

20.3.12 When planning the work activity, carry out a risk assessment considering:

- the machine(s) to be used. Are they designed to be used on slopes? Will you use a winch?
- surface condition including slope and soil type, and soil moisture content
- operator experience
- any changes expected during the day.

20.3.13 To assess those limits, Safetree's Steep Slope Risk Assessment tool may be useful.

[3] Adapted from OSHA Oregon's Hazard alert Chain Shot Logging Hazard

20.4 Safe practice

20.4.1 A PCBU who manages or controls plant at a workplace **must**, so far as is reasonably practicable, ensure that the plant is without risks to the health and safety of any person.

20.4.2 PCBUs **must** ensure, so far as is reasonably practicable, the provision and maintenance of safe plant and the safe use, handling, and storage of plant.

20.4.3 Table 18 shows examples of sources of harm from mechanised felling and possible control measures to consider when managing risk.

20.4.4 There may be hazards that are not identified in this table. You will need to identify and assess health and safety risks arising from your own work.

SOURCE OF HARM	POSSIBLE CONTROL MEASURES
Unexpected tree movement	– Make sure the machine has appropriate protective structures. – Do not exceed machine/operator capabilities. – Make sure operators: - assess tree characteristics and fall direction - use proper felling cuts - keep cab door closed - fell uphill (unless on a winch-assist or tether) making sure the swath width is matched to the slope.
Working too closely to ground workers	– Make sure operators: - keep workers beyond two tree-lengths - make sure felling is stopped if distances are breached.
Unplanned machine or component movement	– Make sure operators: - position machine stably - stay within machine/slope capabilities - control slew speed to suit load size.
Working too closely to other machines	– Make sure operators: - avoid close proximity to other machines unless planned and the risk is managed (for example, used to avoid using a manual faller). - maintain communication with the other machine.
Machine instability resulting in machines overturning	– Make sure operators: - stay within slope capabilities for the ground conditions - keep weight of machine and boom over front of machine on slopes (unless on winch-assist or tether) - choose travel paths that avoid side slopes, slumps and soft ground - wear a seatbelt or harness when operating the machine - use caution when slewing downhill.
Broken saw chain resulting in chain shot	– Make sure: - unprotected workers are kept at least 70m away - machines have the appropriate protective structures and glass.
Difficult terrain and micro-slope conditions resulting in machines overturning	– Identify hazards beforehand. – Make sure operators: - stay within machine capabilities - choose safe travel paths - fell uphill when possible - wear a seatbelt or harness when operating the machine.
Overhead hazards (trees, sailors, broken heads) falling on workers	– Make sure operators: - check harvest plan for known hazards and risks - check for overhead hazards before exiting cab - wear PPE (helmet and high-vis) outside cab - check for ropes/guylines in cable logging operations.

SOURCE OF HARM	POSSIBLE CONTROL MEASURES
Contacting overhead power lines – electric shock	– Make sure operators follow procedures for work near power lines including having the appropriate permits. – Add signs to warn of powerlines. – Have a planned and marked area to cross underneath powerlines.
Slipping when exiting the main cab	– Make sure operators: - check surroundings before exit - climb off machine – do not jump - wear the correct PPE (for example, non-slip footwear) - maintain 3-point contact when descending steps.
Poorly maintained or defective safety equipment	– Maintain protective structures to required standards. – Make sure operators do not operate defective equipment until the problem has been fixed. – Have qualified engineers assess any damage.
Hydraulic equipment failing	– Make sure operators: - never work under raised equipment. Make sure equipment is lowered to the ground and chocked and stable before entering danger zone - wear full PPE (gloves, protective clothing, approved eye protection) for work on live or pressurised systems - turn off machine and reduce hydraulic pressure before work.
Harm during maintenance of the felling head	– Make sure operators: - use a lockout-tagout system when repairing, maintaining and servicing any mobile plant - turn off and de-energise machines before starting any maintenance on the head - lower all equipment to level ground - do not move, modify or remove any safety devices - use a locking pin to secure the head - follow proper lifting procedures when removing any heavy components - wrap sharp items for protection - use hydraulic lock-out to immobilise the machine - turn off the computer.

TABLE 18: Sources of harm from mechanised felling and possible control measures

20.5 Winch-assisted harvesting systems

20.5.1 Winch-assisted harvesting is a system that uses wire rope(s) attached to a harvester that is safely anchored uphill allowing operation on steep slopes.

20.5.2 These machines are used to provide winch assistance for a range of uses including:

- harvesters felling trees
- knuckle boom loaders/excavators engaged in shovel-logging stems
- skidders or bulldozers used for stem extraction
- standard excavators for land preparation
- forwarders moving up and down slopes
- assisting mobile plant to relocate.

20.5.3 For industry guidance, see Resources webpage

Winch-assist anchoring systems

20.5.4 The PCBU operating the plant needs to make sure:

- the winch braking system is designed and tested to ensure the machine holds if traction or stability is lost on the slope the machine is operating on
- it has Original Equipment Manufacturer (OEM) certification or a Chartered Professional Engineer (CPEng) has certified the winch-assisted steep slope harvesting system as designed, tested and demonstrated to be safe. This includes an assessment of:
  - fail-to-safe design features
  - safe operating procedures
  - inspection and maintenance schedules
  - a list of all rigging components and their breaking loads
- if a machine is significantly modified after the manufacturer's original certification, a CPEng has certified the modification is safe (for example, an excavator being re-purposed by attaching a winch for steep slopes)
- the tension on the wire rope is not greater than 33% of its breaking load at all times
- the maximum operating weight of the mobile plant does not exceed the rated breaking load of the wire rope. This applies to all rigging components. The maximum operating weight is the weight when fully loaded
- an emergency back-up system is incorporated into the operation to ensure the stability of the mobile plant if the winch, wire rope or anchor fails.

20.5.5 Make sure all winch-assist operations and mobile tailholds have a movement alarm to warn if the anchor moves and immediately alert the winch-assist machine operator.

Winch-assist systems safe practice

20.5.6 Carry out regular reviews to make sure new risks are identified and existing control measures are working effectively.

20.5.7 Include the following in the documented safe work practice as a minimum:

- hazard identification and risk management
- machine and wire rope inspection and maintenance routines (see Section 20.5.4), and who is competent to carry these out
- operator fatigue plans
- working alone procedures
- an emergency plan
- a map indicating slope and terrain features and areas of exclusion
- slope/soil condition operating guidance
- safe operating procedures
- training requirements
- daily prestart checks
- competency standards for operators and those responsible for safety checks and maintenance.

Safe winch systems

A COMPETENT PERSON SETS UP AND CHECKS WINCH SYSTEMS

20.5.8 Make sure a competent person sets up the winch system.

20.5.9 Make sure anchors and their locations are:

- selected and constructed by a competent person
- checked daily.

20.5.10 Make sure independent winch systems are positioned and anchored securely by a competent person.

TAKE CARE WITH WIRE ROPES

20.5.11 Do not use joining splices to join broken or damaged winch ropes.

20.5.12 Visually inspect wire ropes regularly.

20.5.13 Check rigging daily.

20.5.14 Keep a record of inspections with the plant.

20.5.15 Do not re-use wire ropes used for winch-assisted harvesting for other purposes.

MAKE SURE WINCH SYSTEMS HAVE APPROPRIATE INSPECTIONS

20.5.16 Make sure mobile plant and winch systems have engineering and mechanical inspections appropriate to their age and use (see Section 20.5.4).

20.5.17 Make sure second-hand plant has a full engineering and mechanical inspection before it is deployed (see Section 20.5.4).

20.5.18 Make sure inspections are carried out by a competent person.

20.5.19 Keep a record of inspections with the plant.

21.0 Managing the risks – manual tree felling

IN THIS SECTION:

21.1 Introduction

21.1.1 This section of the guidance looks at how to best manage the risks of manual felling.

21.1.2 Manual felling is one of the most hazardous tasks in forest harvesting. You **must** eliminate risks from manual felling so far as is reasonably practicable (for example, by using another harvesting method like mechanised felling). If you cannot eliminate the risks, you must minimise them so far as is reasonably practicable.

21.1.3 Fell all dangerous or wind-affected/damaged trees by machine where practicable.

21.2 Safe system

21.2.1 Before manual felling is carried out, the harvest contractor:

- establishes and documents the reason for using manual felling. This may include carrying out manual felling in a specified area to maintain a faller's competency.
- works with the felling crew to identify and assess significant hazards and risks and develop a management plan for each risk, including the need for an observer.
- checks that the manual felling plan meets the requirements of the documented health and safety system. This includes making sure that:
  - the faller has the appropriate qualifications, training and experience (see Section 21.3)
  - there is a system to audit competence on a regular basis
  - there is a designated, competent observer on site
  - there is a documented process to deal with a hung-up tree
  - there is a documented process to deal with tree driving
  - there is a documented process to deal with an unsuccessful tree drive, including stopping the work until an observer is available
  - there is a documented process to stop tree felling due to high winds or other extremes of weather
  - there is a documented process to establish the two tree-length zone and communicate the boundaries of the zone to all affected parties
  - these processes are known to and followed by the faller and any observer
  - buddy cutting (two fallers cutting within two tree-lengths) is not carried out
  - the faller has the high level of fitness required for the job
  - for remote or isolated work (see Section 3.4), PCBUs **must** provide a system of work that includes effective communication with the worker.

21.3 Qualifications and training

Training and qualifications

21.3.1 Make sure fallers hold the appropriate skill/unit standard (Appendix 7) and have been deemed competent.

21.3.2 Consider industry-recognised certification (for example, Safetree).

21.3.3 However, if a faller does not hold that skill/unit standard, make sure they are working towards achieving it. If they do not have adequate knowledge and experience, they **must** be supervised by someone with that knowledge and experience.

21.3.4 Make sure fallers are physically capable to do the work and keep their skills up to date.

21.4 PPE and other equipment

Personal protective equipment (PPE)

21.4.1 It is industry best practice for the following PPE to be used:

- high-vis shirt, vest or coat with day-night for added visibility
- high-vis helmet that meets recognised industry standards
- hearing protection with RT capability
- protective legwear, chainsaw chaps or trousers
- eye protection
- safety footwear that provides ankle support and good grip
- lone worker (man-down) device or digital radio equivalent.

21.4.2 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

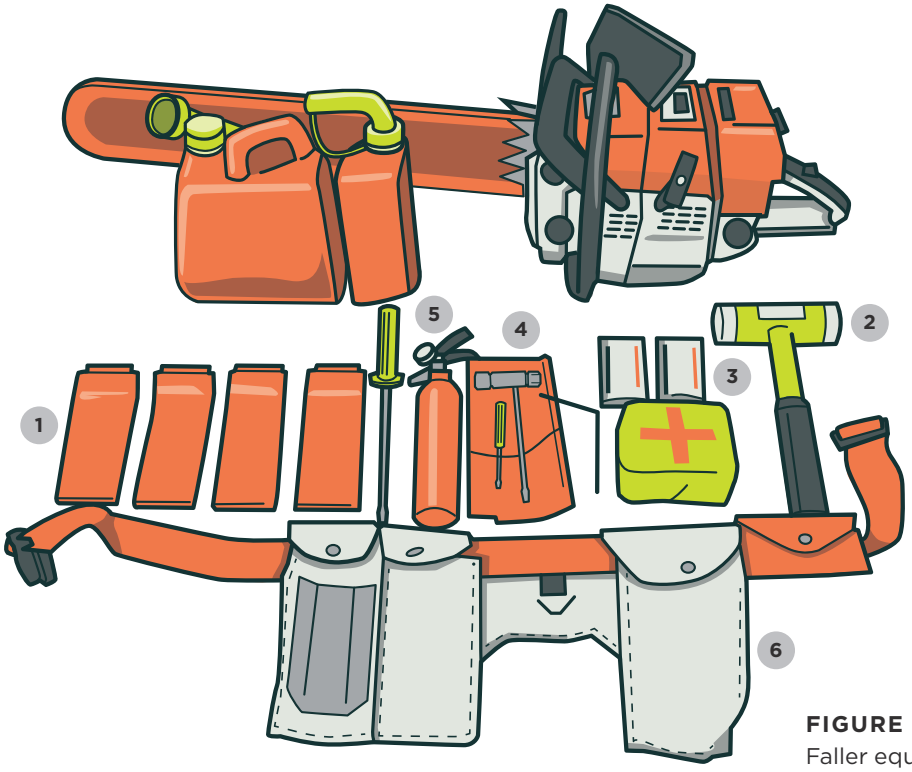
21.4.3 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

21.4.4 Figure 20 shows the PPE fallers carry or are equipped with.

FIGURE 20: Faller wearing PPE and equipment

Equipment essentials

21.4.5 Make sure fallers have the right equipment for the job, including the minimum number of wedges to be carried (Figure 21).



1. Wedges (at least 4)
2. Driving tool
3. First aid kit with (at least) 2 large sterile wound dressings
4. Files and maintenance tools
5. Fire extinguisher
6. Equipment belt

FIGURE 21:
Faller equipment[4]

Chainsaws

21.4.6 Make sure chainsaws are in safe working order and include safety features such as:

- a safety mitt
- an inertia chain brake
- a chain catcher
- a rear handguard
- anti-vibration mounts
- a throttle lock-out
- an on-off switch
- a muffler and spark arrestor.

Communication

21.4.7 It is industry best practice that all fallers and any observers carry RT.

21.4.8 Have RT-enabled hearing protection or hearing protection that can fit earpieces for immediate and direct communication.

21.4.9 Make sure fallers and any observers check-in regularly (for example, every 30 minutes or after tank refuelling).

[4] Adapted from Safe Work Australia's guidance: Forestry: Guide to managing risks of timber harvesting operations (2014)

21.5 Observers

21.5.1 Observers work with the fallers to provide advice or decide when it is too risky to fell the tree. Particular attention should be given to windthrow or trees leaning into the hill.

21.5.2 Make sure observers are skilled in recognising and managing risk.

21.5.3 Make sure an observer is available on site and used when a faller is uncertain or in a higher risk situation.

21.5.4 Consider the use of observers when planning how the work is going to be carried out.

21.5.5 Make sure observers have an effective means of communicating with the faller. It is industry best practice to have a two-way RT with an earpiece in the earmuffs.

21.6 Seven key causes of harm

21.6.1 There are seven key causes of harm in manual tree felling that need to be planned for:

- fallers working too close to other people or plant
- incorrect or poor felling technique
- broken tree limbs or top hitting the faller
- hung-up trees left standing, or not felled using correct methods
- stem movement/rebound and butt swing
- felling dead trees or spars
- the faller being struck from behind by an object or tree.

21.6.2 The five-step tree felling plan is discussed next. Further guidance on managing the risks from the seven key causes of harm are discussed from Section 21.8 onwards.

21.7 The five-step tree felling plan

21.7.1 Make sure all fallers, and any observers, follow this five-step tree felling plan:

- Step 1: Site assessment
- Step 2: Individual tree assessment
- Step 3: Preparation of the work area and escape route
- Step 4: Fell the tree using safe felling techniques
- Step 5: Retreat and observe

21.7.2 These steps are explained below.

21.7.3 Before starting, make sure each faller is physically and mentally prepared for the task.

21.7.4 **Step 1: Site assessment:**

- Assess the stand for hazards relating to the trees, terrain, other operations, and power lines.
- Assess the strength and direction of the wind and whether it will affect safety.

21.7.5 **Step 2: Individual tree assessment:**

- Look for tree defects, decay, heavy lean, or any other characteristics of the tree that may affect the felling plan.
- Note the ground condition and soil moisture.
- Check the surrounding trees for interlocked branches, dead tops or branches that may fall into the work area.
- Determine if the tree can be safely felled and plan the felling cuts.
- Decide on the felling direction. This will help determine which side of the tree will be the safest for the escape route.
- Decide on retreat distance based on the assessment.

21.7.6 **Step 3: Preparation of the work area and escape route:**

- Clear vegetation and obstacles from around the base of the tree.
- Always think about the escape route before starting any felling cuts. Where possible, make sure the escape route is at a 45-degree angle opposite the felling direction (Figure 22).

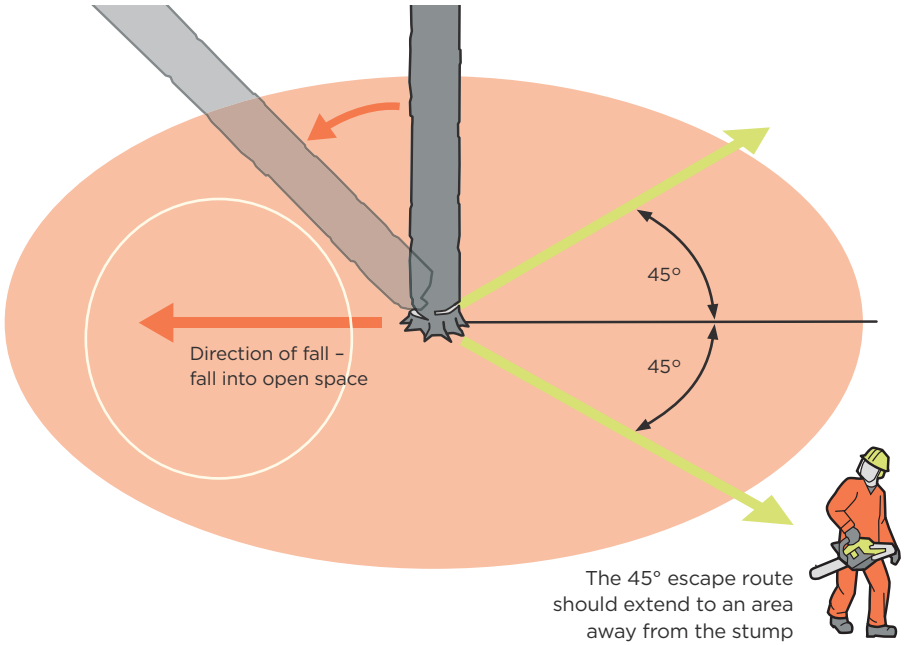


FIGURE 22: Escape route positioning[5]

- Be sure the escape route is clear of obstacles or hazards before beginning.

21.7.7 **Step 4: Fell the tree using safe felling techniques:**

- Good felling technique is critical to safe, accurate, and consistent results.
- Fell trees over 200mm at the stump using a scarf and back cut.
- The degree of forward, back or side lean and the weight distribution will determine the type of back cut used and whether wedges, tree felling jacks or machine assistance will be required.

[5] Adapted from Safe Work Australia's guidance: Forestry: Guide to managing risks of timber harvesting operations (2014)

21.7.8 **Step 5: Retreat and observe:**

- Finish the felling cut on the safe side of the tree. Use the escape route as soon as the tree begins to fall.
- Watch for falling material and be far enough from the base of the tree to avoid a kick back, butt swing, or bounce.
- Avoid walking directly behind the tree.

21.7.9 Managing the risks from the seven key causes of harm are discussed next.

21.8 Managing the risks of fallers working too close to other people or plant

21.8.1 The danger zone of a felled tree is a circle from the stump that stretches out twice the height of the felled tree (Figure 23).

21.8.2 This danger zone allows for the chance that the falling tree may bring down another standing tree. If working on slopes, a greater distance may be required.

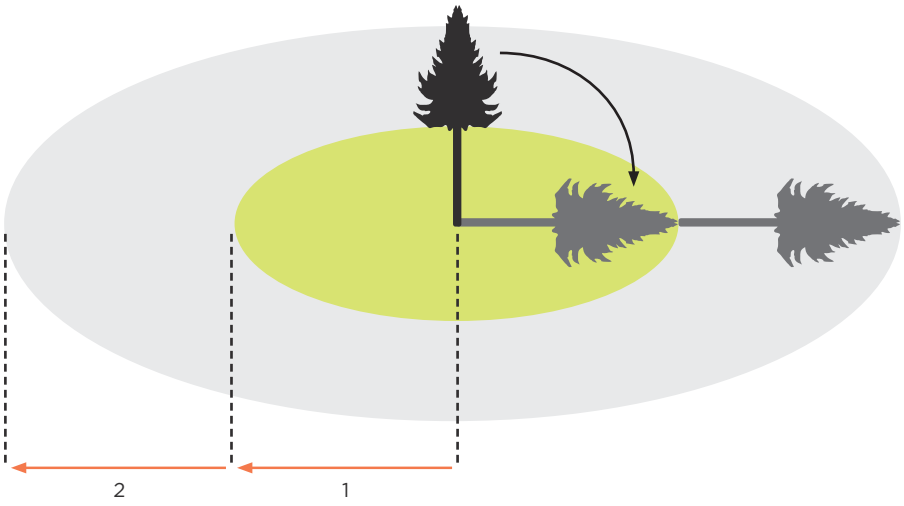


FIGURE 23:
The two tree length danger zone

21.8.3 Make sure the only people present within those two tree-lengths are:

- the faller and any observer assisting the faller
- anybody being trained and the person supervising them
- an auditor or supervisor.

21.8.4 Anyone who is within two tree-lengths of a tree being felled is under the direct control of the faller. Make sure people within two tree-lengths of a tree being felled:

- can communicate with the faller, using clear, prearranged procedures, techniques, and signals using RT, earpiece, or other established method
- let the faller know when they are coming and when they arrive
- are positioned up the escape route in full view of the faller (Figure 22)
- can see the top of the tree being felled from a safe position.

21.8.5 For guidance on working near machines, see Section 20.

21.9 Managing the risks of broken limbs or tree top hitting the faller

21.9.1 Assessing a tree and its surroundings is the first step in felling. At this time the faller may be able to identify broken limbs or top.

21.9.2 If the limbs or top fall while the faller is working at the base, the danger zone is the width of the crown of the tree being felled.

21.9.3 If a felled tree falls into or brushes past another, the danger zone extends some distance behind the felled tree as the top or limb could rebound backwards. This means the recommended escape route (Figure 21) could be in the danger zone.

21.9.4 Use an observer if the faller cannot see the top of the tree.

21.9.5 If the faller is concerned about felling the tree safely, consider:

- using a felling assistant/observer
- using a machine to fell the tree or
- driving the tree (only where necessary).

21.10 Managing the risks of hung-up trees left standing, or not felled using correct methods

21.10.1 A hung-up tree is one that is caught up or lodged against another tree and is prevented from falling. This could be:

- a cut-up tree (where felling cuts have been made but the tree remains standing)
- a wind-affected/damaged tree
- a pushed tree.

21.10.2 Figure 24 shows the danger area when felling a hung-up tree.

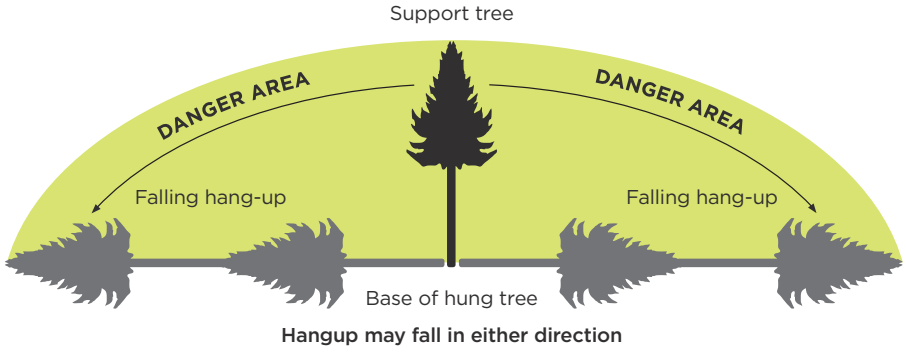


FIGURE 24: Danger area when felling a hung-up tree

21.10.3 Make sure all crew members are warned immediately if a faller creates or identifies a hang-up.

21.10.4 Make sure no one works or is within two tree-lengths of the likely direction of fall.

21.10.5 Then:

- do not allow work under a hang-up
- do not leave hung-up trees unattended
- bring down hung-up trees immediately or isolate the area from other activities and workers
- use a machine to pull down the hang-up if possible.

21.10.6 See Section 21.12 for guidance on using tree driving to bring down hang-ups.

21.11 Managing the risks from stem movement/rebound and butt swing

21.11.1 Stem movement back into the work area after felling can be caused by a number of factors. These include:

- uphill felling
- falling into standing trees
- the tree striking an obstacle as it falls (for example, a rock, another stem, other terrain features).

21.11.2 If a felled tree falls into or brushes against another, the butt of the tree can rebound and strike the faller. Spars are most likely to rebound.

21.11.3 A tree that is felled uphill may also slide back down the hill and strike the faller, so it is important to move further along your escape route.

21.11.4 Tree-to-tree contact can also snap off branches or tops of trees, which ricochet backwards.

21.11.5 Any of these situations may compromise the escape route. Where a hung-up tree kicks back off the stump, the danger zone extends back behind it (Figure 25).

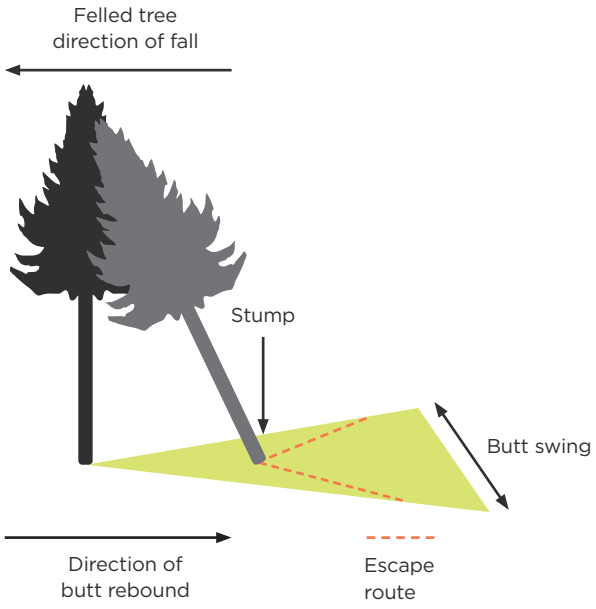


FIGURE 25: Danger zone extending back into the escape route where a felled tree hits another and causes a rebound

21.11.6 To minimise the risk of stem rebound, make sure:

- there is an escape route cleared at a 45-degree angle opposite the felling direction where possible (Figure 22)
- the felling cut is finished on the safest side of the tree
- the faller (and observer if being used) keeps their eyes on the tree as it falls
- the faller moves away from the stump as the tree falls
- trees are not felled uphill where possible.

21.12 Managing the risks of tree driving

21.12.1 Tree driving is where a tree is pushed over by felling another tree onto it.

21.12.2 Tree driving may be used to fell trees:

- to manage risk (for example, remove overhead hazards)
- that are leaning against the intended direction of fall and cannot be safely felled using wedges
- that are hung-up, cut-up or broken
- where conventional felling methods have failed.

21.12.3 Make sure tree driving does not exceed one-onto-two trees.

21.12.4 Make sure tree fallers driving more than one-onto-one hold the appropriate unit standard for tree felling and have demonstrated competence.

Planning the drive

21.12.5 Make sure fallers call up the supervisor (or designated competent person) when a tree drive is to be attempted, and tell them if it is one-onto-one or one-onto-two.

21.12.6 Make sure an observer is called up if there is any doubt about the proposed drive to:

- provide a second opinion
- watch out for falling hazards that could be dislodged as the drive proceeds.

21.12.7 Plan the drive using the five-step felling plan with these additional points:

- the two tree-length zone applies to both the driving tree and the tree being driven
- both trees can sway forward and then back into the felling zone.

21.12.8 When the drive is successfully completed, make sure the supervisor/ competent person is called to let them know of the completion.

21.12.9 For industry guidance, see Resources webpage

21.13 Managing the risks of felling dead trees

21.13.1 Dead trees (includes broken and rotted trees) are particularly hazardous. A dead tree can fall in any direction at any time without warning.

21.13.2 The danger zone associated with a dead tree consists of a circle with the centre at the base of the dead tree and with a radius of two tree-lengths. (Figure 23).

21.13.3 Identify dead trees before the faller begins working in the area, assess the risk they pose and manage appropriately:

- If dead trees are left standing, manage the risk from these to other work.
- If the dead tree is to be felled, consider the escape routes required and the risks of tree breakage and butt rebound.

21.13.4 Machine felling is the best way to fell a dead tree. Always consider this option first. If machine felling is not an option and manual felling is used, driving a dead tree may be the safest option for the faller.

21.13.5 Driving dead trees can also pose dangers as the dead tree may break, with the upper stem falling backwards towards the faller. Make sure the faller carries out a risk assessment appropriate to their situation. For more information, see 21.12 Managing the risks of tree driving.

21.13.6 Make sure the faller carries out their call-out procedure before and after felling the dead tree.

21.14 Managing the risks of windthrow or wind-damaged trees

21.14.1 Machine felling is the best way to fell a wind-damaged tree. Always consider this option first.

21.14.2 Make sure only workers with the appropriate windthrow skill/unit qualifications, experience and competence fell windthrow.

21.14.3 For industry guidance, see Resources webpage

21.15 Managing the risks of the faller being struck from behind by an object or tree

21.15.1 Sometimes a tree or limb can fall from a tree behind both the faller and the tree they are felling.

21.15.2 One cause can be intertwined branches or vines connecting the crowns of two trees. Occasionally the vibration from a large tree hitting the ground is enough to fell a dead or unstable tree.

21.15.3 When assessing trees to be felled include assessing the surrounding trees for damage and structural weakness. Look for branches interlocking with vines or branches of other trees.

21.15.4 The danger zone in this hazard extends from the felled tree to the tree behind with a width equal to the width of the tree behind (Figure 26). This hazard is relative to the direction of fall. This emphasises the importance of directional felling techniques and proper use of scarf and back cuts.

21.15.5 Make sure vegetation is cleared around the tree, and the escape route is clear.

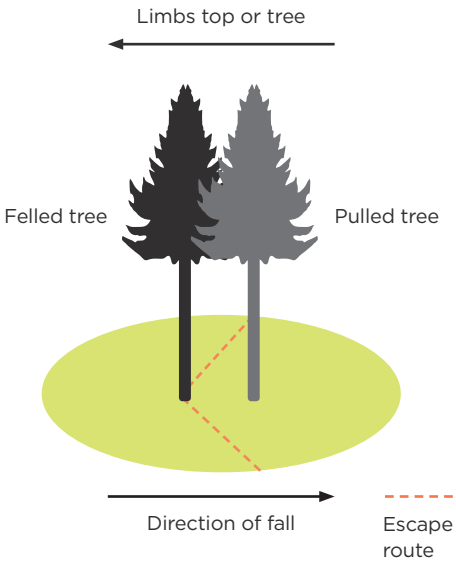


FIGURE 26: Danger area where the felled tree pulls another with it as it falls

21.16 Managing the risks of machine-assisted felling

21.16.1 Machine-assisted felling is used to manage the risks of manual felling. The two most common forms of machine-assisted felling are:

- using a machine to push the tree over
- using the winch on a machine to pull the tree over, or 'back-pulling'.

21.16.2 Whichever system is used, there are some basic principles that need to be followed.

- Make sure the machine is of sufficient size, capacity and traction that it can carry out the job.
- Make sure knuckle-boom loaders have a minimum weight of 20t.
- Make sure a wedge is inserted in the back-cut of any tree to be felled with machine assistance.
- Make sure the faller is in an agreed safe position before signalling for the machine to push or pull the tree over.
- Make sure the faller controls the operation.

Make sure the machine is suitable

21.16.3 A PCBU who manages or controls plant at a workplace **must**, so far as is reasonably practicable, ensure that the plant is without risks to the health and safety of any person.

21.16.4 Before committing to a machine-assisted felling plan, check that it is appropriate for the area to be felled. Some slopes are too steep for machine-assisted felling unless the machine is specifically designed for that terrain and anchored safely.

21.16.5 Other factors to consider in whether machine-assist is appropriate include:

- the size, lean and type of trees in the stand
- the environmental conditions
- the work method that best ensures the safety of the workers.

21.16.6 Make sure machines used to assist felling are:

- of adequate size and engine capacity
- appropriate to the terrain
- fitted with certified protective structures; OPS, ROPS, FOPS, COPS, and side-intrusion guarding.

Develop a risk management plan

21.16.7 Before starting machine-assisted felling, develop a risk management plan to manage the risks associated with this type of felling. Identify and assess the risks and put in place effective control measures to ensure the safety of all workers.

21.16.8 When developing the risk management plan, involve the crew manager, machine operators, and fallers. If the operation is close to roads or powerlines, also involve the powerline owners and road owners if required.

Clear and effective communication is essential. RT communication between faller and machine operator and the use of earpieces is strongly recommended. Do not use or rely on hand signals.

Do not conduct machine-assisted tree felling operations if the communication system is not effective.

21.16.9 In the risk management plan, include:

- plant management, including regular checking and maintenance by competent persons
- worker competency, including training and assessment
- the communication systems to be used
- standard operating procedures, including detailed descriptions of the machines and safe work methods used
- assessment of the area to be felled, including:
  - ground debris and undergrowth around the tree
  - escape routes that can be cleared by the grapple machine or blade
- removal of unstable branches and overhead hazards that can be reached with the grapple
- proximity to powerlines, roads, rail, and walking tracks
- slope and soil conditions, and how they affect the ability of the machine to move and apply force to the trees requiring machine assistance
- stand characteristics, including wind or snow damage, overhead hazards, vines, and undergrowth
- environmental conditions, including prevailing and expected weather such as wind and rain.

21.16.10 Document the risk management plan.

21.16.11 Review the risk management plan's effectiveness daily so long as machine-assisted tree felling is being used.

The faller and machine operator work together to safely fell trees

21.16.12 To plan the order trees will be machine-assist felled, make sure the machine operator and faller assess how each tree is going to be felled. This will minimise falling trees brushing standing trees in front of and to the side of them.

21.16.13 This means assessing each tree's characteristics, including:

- size
- lean
- double or multi leaders
- overhead hazards
- undergrowth.

21.16.14 Make sure the machine operator and faller discuss these factors and agree on:

- the appropriate felling method and direction
- how to position the machine
- the escape route to be used
- the length of the escape route required based on the characteristics of the tree
- how they will communicate.

21.16.15 While the felling approach for each tree is to be decided between the machine operator and the faller, make it clear:

- the faller controls the operation
- the machine operator is responsible for machine stability and control.

Machine assistance to push a tree over

21.16.16 This form of machine-assisted felling uses an excavator to control and push it in the desired direction.

21.16.17 Make sure the implement used to push the tree can stop the tree from sliding sideways.

21.16.18 The most common method of machine assisting is to hold the tree with a grapple.

21.16.19 Make sure the faller controls the operation. The machine operator is responsible for machine stability and control. The instruction to apply force to the tree can only come from the faller and when the faller is in a safe position.

21.16.20 The faller:

- checks that all equipment is fit for use, including personal protective equipment (PPE), first aid kit, chainsaw, wedges, and hammer
- uses the five-step tree felling procedure (see Section 21.7)
- retreats to a safe position clear of the tree while the grapple is being positioned
- completes the back cut
- directs where, when and how much force is applied to the tree
- retreats to the end of the escape route before signalling the machine operator to push the tree over
- directs the machine operator to apply force to fell the tree.

21.16.21 Once the scarf is cut, the faller can move between the tree and the machine to complete the back cutting.

21.16.22 Do not allow the faller to work directly under the raised boom. Back cut or cuts can be made from the side of the tree with the grapple positioned around the tree.

21.16.23 The machine operator:

- conducts prestart checks to ensure the machine is suitable and in a safe condition for use
- follows safe operating practices and procedures
- ensures the safety and stability of the machine
- discusses with the faller on the best machine position
- ensures there is no potential for the grapple to slip off the tree
- ensures effective communication is maintained
- ensures the faller is not positioned directly under the raised boom
- follows direction from the faller
- applies force to the tree only when directed by the faller.

21.16.24 For industry guidance, see Resources webpage

Machine assistance to pull trees over

21.16.25 A skidder, bulldozer or hauler with a winch can be used to back-pull trees. A line is attached to the tree being felled and cuts are placed in the tree by the faller.

21.16.26 The requirements for the machine are covered in Section 21.16.6. Make sure the machine also has a winch rope and a strop strong and long enough to pull the tree over safely.

21.16.27 Make sure the strop is attached as high as possible, which may require a ladder or climbing equipment.

21.16.28 To meet their duties under HSWA, PCBUs **must**, so far as is reasonably practicable, manage the risks of falling from any height. This applies to all work, including pruning from a ladder.

As well as these duties under HSWA, there are also specific requirements under regulations.

21.16.29 Where workers could fall more than 3m (measured from the person's feet above the ground), employers **must**, so far as is reasonably practicable, ensure that suitable means are provided to prevent them from falling.

These means could include a suitable fall restraint device or other suitable fall protection.

If this is not reasonably practicable, PCBUs will need to consider other ways to manage the risk.

21.16.30 Another person will be required to help getting the rope up the tree. This person can also act as an observer.

21.16.31 The faller controls the operation. The faller:

- checks that all required equipment is available and fit for use
- checks that the communications system with the machine operator is working
- selects a safe position and clears the escape route to the safe position
- positions the strop (or supervises the positioning of the strop)
- moves to the safe position and supervises the positioning of the machine
- instructs the operator to apply enough tension to pull the tree slightly forward
- moves from the safe position to put in the scarf and back-cut, and at least one wedge
- moves back to the safe position and instructs the machine operator to pull the tree over.

21.16.32 The machine operator:

- conducts prestart checks to ensure the machine is suitable and in a safe condition for use
- ensures the safety and stability of the machine
- discusses with the faller on the best machine position
- make sure effective communication is maintained
- follows direction from the faller
- applies force when directed by the faller.

21.16.33 For industry guidance, see Resources webpage

22.0 Managing the risks – cable logging

IN THIS SECTION:

22.1 What is cable logging or cable harvesting?

22.1.1 Cable logging is a method of moving stems from a felling site to a landing area. It uses a stationary machine with powered drums/winches, booms or towers, blocks, wire ropes and butt rigging/head gear. Harvested stems may be fully or partly suspended for all or part of the yarding distance.

22.1.2 Cable logging is mainly used to harvest timber from steep slopes where conventional retrieval methods are unsuitable due to the risk of mobile plant rolling over. It can also be used in broken terrain, where the ground is wet or soft, or where logs need to be lifted over environmentally sensitive areas.

22.1.3 There are many different types of cable logging machines and rigging systems. To find out more about the different systems and the specifics of their rigging, see industry guidance, see Resources webpage

22.1.4 Breaking out is a key part of the cable harvesting process. For the breakers-out, it involves stopping and positioning the rigging, hooking on the drag (the stems to be extracted), and after retreating to a safe position, signalling for the break-out of the drag by the yarder and then watching it until it reaches the landing.

22.1.5 Manual breaking out is one of the most hazardous tasks in forest harvesting. You **must** eliminate risks from manual breaking out so far as is reasonably practicable (for example, by using another harvesting method). If you cannot eliminate the risks, you **must** minimise them so far as is reasonably practicable

22.1.6 This section is split into five parts:

- general principles of cable logging
- setting up the yarder
- PPE
- communication
- safe breaking out.

22.2 General safety principles

22.2.1 To protect workers, the basic safety principles are to:

- stop operating if cable logging becomes dangerous because of bad weather conditions such as high wind or poor visibility
- keep everyone in a safe area away from moving lines, rigging, loads until the rigging or loads have completely stopped (safe retreat positions)
- keep everyone outside the bight of tensioned running lines at all times
- run lines in a straight line and ensure they are not obstructed or binding on anything
- be aware of chain shot if a mechanised faller is being used (see Section 20.3.8)
- make sure tree-felling activities are at least two tree-lengths from yarding lines and breakers-out unless fully mechanised with no workers at risk
- make sure all static ropes are marked (see Section 15.7).

22.2.2 Every person entering an operational area:

- notifies the supervisor or foreman before entering the operational area
- wears the appropriate PPE as required by the PCBU
- only enters the operational area when they have been acknowledged or signalled that it is okay to enter
- takes care when approaching workers engaged in any operation
- stays aware that workers wearing hearing protection may not hear them.

22.2.3 When on the landing, make sure workers stay in the designated safe area and clear of:

- all working machinery
- swinging or suspended logs or stems
- trucks and trailers being loaded or unloaded (see Part F).

22.2.4 Before moving into another work area, make sure the affected machine operators are contacted, and that permission is signalled back.

22.3 Setting up a safe yarder

22.3.1 A PCBU who manages or controls plant at a workplace **must**, so far as is reasonably practicable, ensure that the plant is without risks to the health and safety of any person.

22.3.2 PCBUs **must** ensure, so far as is reasonably practicable, the provision and maintenance of safe plant and the safe use, handling, and storage of plant.

General safety principles for yarders

22.3.3 Take the following actions:

- Rig all cable logging installations in accordance with the manufacturer's specifications or industry-specified requirements, whichever is the higher standard.
- Make sure all yarders are securely anchored before yarding operations start. Complete an anchor plan.
- Put the yarder on solid, level ground and protect from pooling rainwater. Make sure outriggers and levelling pads have a stable base.

22.3.4 Make sure guylines used to stabilise the yarder are at least the size, strength and number recommended by the machine manufacturer. Follow industry best practice in the placement and angles of guylines. For industry guidance, see Resources webpage

- Have certified falling object protective structures (FOPS) and operator protective structures (OPS) on yarder cabs, and chain shot protection if required. An exception can be made where cable yarders are remotely operated, and the operator is not located on the yarder.
- Securely guard or totally enclose transmission, machinery and hazardous moving parts on yarders. For industry guidance, see Resources webpage

- Maintain control levers, pedals, brakes and other equipment on yarders so they are in safe working order. Make sure yarder consoles have a safety lock-out system for when workers are working around ropes and rigging.
- Have non-slip pad surfaces on foot-operated mechanisms such as brakes.
- Securely fix ropes to the winch drum. Have ropes long enough to ensure that there are four or more complete wraps of rope on the drum in every working position.
- Use lagged drums, a guide pulley, tool, iron bar or other mechanical or manual means to guide ropes onto drums. Make sure that no part of a worker's body is in direct contact with the rope.
- When moving a yarder with an integral tower, lower or support the tower according to the manufacturer's guidelines so the machine remains stable. Assess the access for hazards before moving and have a qualified person guide the yarder operator when moving.
- Do not move yarders until everyone is in a safe area.

Guylines

22.3.5 When setting up guylines:

- Position and use the guylines used with yarding equipment according to the plant manufacturer's specifications.
- Make sure the number of guylines attached to integral steel towers are at least the minimum recommended by the equipment manufacturer.
- Do not splice guylines together. When they are connected to extensions or anchors, use one of the following:
  - spliced or swaged eyes with shackle connectors with all splices tucked at least three times on each side
  - white metal babbitted or swaged ferrules with double-ended chokers between extensions.
- Make sure guyline connections have at least 1.5 times the breaking strength of the guylines themselves.
- Make sure load bearing guyline angles are 45 degrees or less when measured vertically. If suitable anchors are unavailable, or the terrain is so steep that the guyline angle exceeds 45 degrees, rig an extra guyline to oppose the load.
- Make sure guylines are securely tightened and locked in position while the tower is in use and adjusted to share the load as equally as possible.
- Make sure shackles used in the rigging are rated appropriately and the pins are secured.

Anchors

22.3.6 Securely anchor all skylines, guylines and tailrope blocks to one of the following:

- suitable-sized stumps or combinations of stumps capable of resisting the forces applied to the stump, for example:

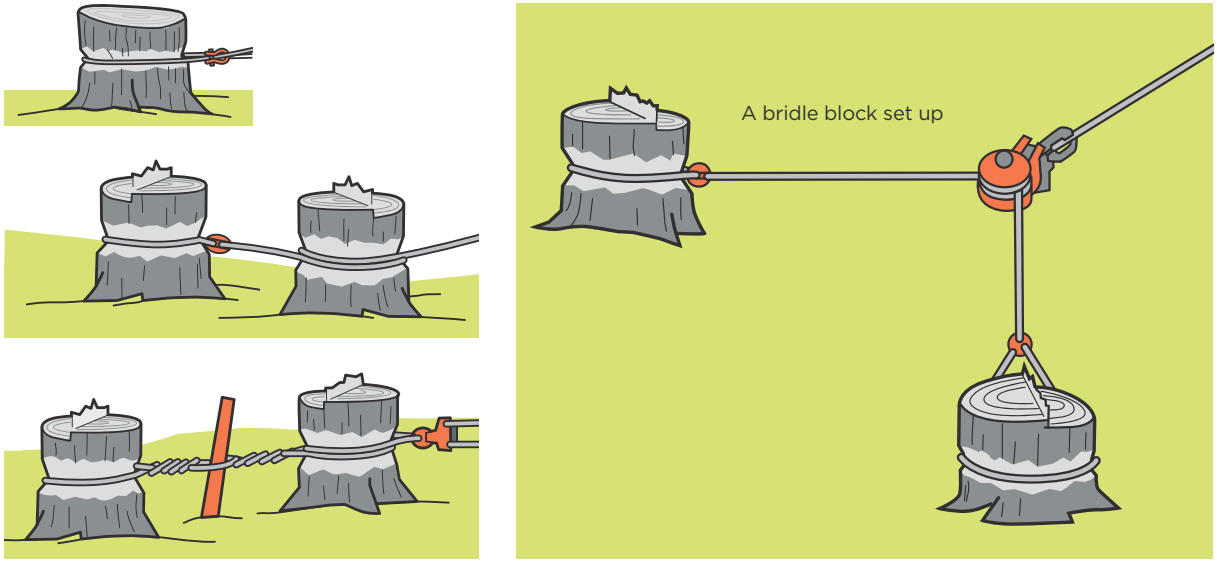


FIGURE 27: Suitable stumps or combinations of stumps[6]

- deadman anchors of sufficient size and buried to an adequate depth, for example:

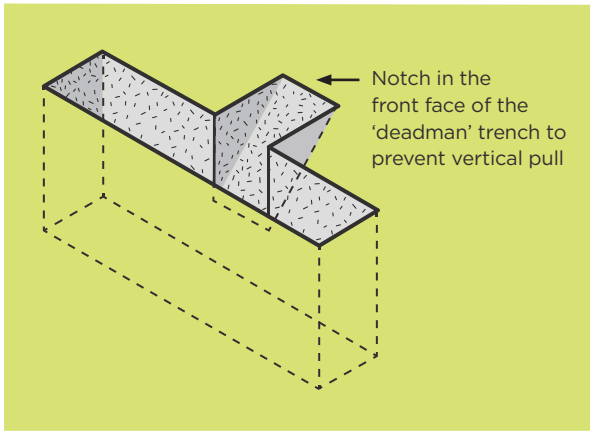


FIGURE 28: Example of a deadman trench[7]

[6] Adapted from Safe Work Australia's guidance: Forestry: Guide to managing risks in cable harvesting (2013)

[7] Adapted from Safe Work Australia's guidance: Forestry: Guide to managing risks in cable harvesting (2013)

- suitable mobile plant anchors that are of sufficient size and correctly braced, for example:

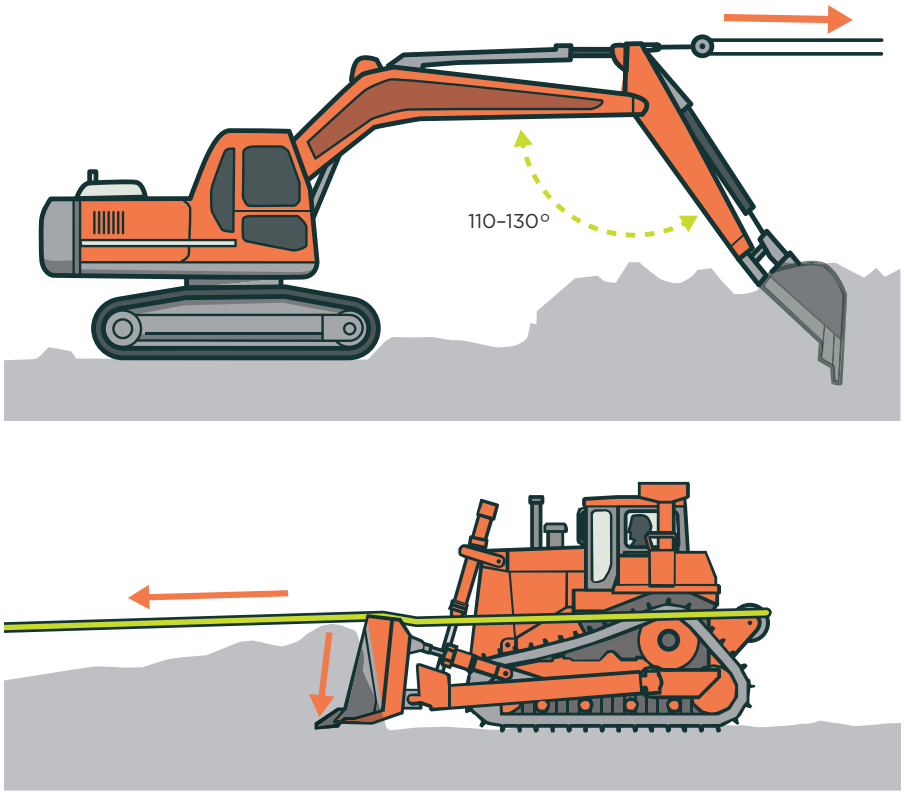


FIGURE 29:
Example of using mobile plant as anchors[8]

- correctly installed artificial anchors providing sufficient strength.

22.3.7 Make sure the guyline anchor locations meet the manufacturer's specifications for yarder set-up.

22.3.8 Make sure that no worker goes within 15m of a live anchor stump once an anchor is rigged, unless they are in communications with the hauler operator.

22.3.9 Do not use standing trees as anchor points unless a risk assessment has been carried out and it is safe to do so.

Selecting stump anchors

22.3.10 A stump anchor is the stump of a felled tree which has been selected as suitable to use as an anchor.

22.3.11 They may be used for:

- hauler guylines
- skyline anchors
- tailspar and intermediate support guylines
- block anchors
- anchoring other machines and equipment.

22.3.12 It is hard to predict what holding power a stump has, but this general guidance applies.

[8] Adapted from Safetree Best Practice Guidelines for Cable Logging (2005)

WHAT TO LOOK FOR IN A 'GOOD' STUMP

22.3.13 Pick a stump that:

- is freshly cut (less than 6 months old)
- is in deep and firm soil
- has a sufficient height of solid wood above the planned notch (for example, at least 30cm)
- has a larger diameter stump (for example, a 60cm diameter stump may hold approximately four times as much as a 30cm stump).

WHAT TO AVOID IN A STUMP

22.3.14 Always assess the risk when choosing stumps. In general, do not use stumps that:

- have been damaged or disturbed during road or landing construction
- are in wet swampy areas, water tables and water sumps. Stump (and soil) strength decreases as a soil gets wetter
- are located in subsidence areas, shallow, loose, or friable soil. In particular, where there is only a thin soil overlying rock
- have started to rot. The root systems in stumps over 6 months old have started to rot, and their strength may have reduced
- have been previously used as anchors. These may be in a weakened state despite looking sound
- come from wind-damaged or heavily leaning trees
- have been cut too low to allow adequate holding wood above the attachment point
- have been partially pulled out of the slope
- are in a steep face, facing the hauler.

NOTCHING A STUMP

22.3.15 When notching the stump:

- notch all stump anchors so that the rope is held around the anchor
- make sure notches are cut to a suitable depth and shape (for example, 2 times the rope diameter in width and 1.5 times the rope diameter in depth)
- make sure the notch is as close to the ground as possible – do not cut off the roots
- make sure there is at least 30cm of solid wood above the notch
- make sure the notch is cut on the same angle as the guyline under tension.

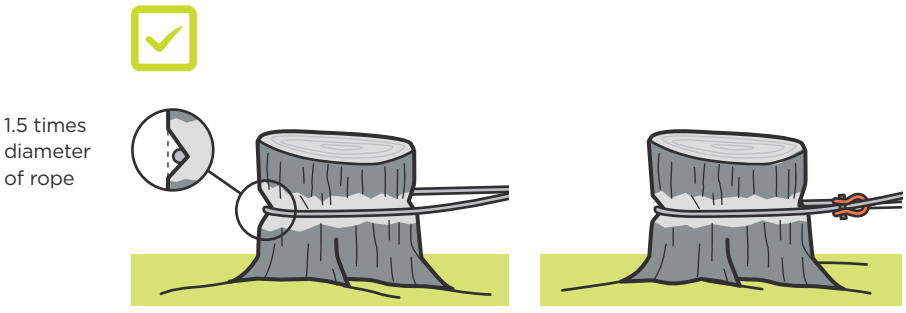


FIGURE 30:
Correct notching[9]

[9] Adapted from Safe Work Australia's guidance: Forestry: Guide to managing risks in cable harvesting (2013)

DEADMAN ANCHORS

22.3.16 Deadman anchors are logs buried in the ground to provide an anchor point when suitable stumps are not available.

22.3.17 If using a deadman anchor, make sure:

- the logs are properly installed and of a strength, length and diameter to withstand the load to be imposed
- the log size and design of the installation takes into account the:
  - soil conditions
  - slope and angle of the ground
  - angle of pull on the guyline
  - size of the yarder
  - rigging system being used
- trenches for deadman anchors are at right angles to the line of pull and have a vertical front wall
- the strop connecting the rope to the deadman anchor:
  - passes around the deadman and has both ends evenly protruding from the ground
  - is positioned so that the ends share the load equally
  - is at least the strength of the rope that it is being attached to
  - has both eyes of the strop attached to the rope with a shackle
  - the deadmen are checked to make sure they have been installed properly.

Rigging gear

22.3.18 When setting up rigging consider the following:

- make sure all shackles are made of high-tensile fitted with high-tensile pins and are certified
- make sure that all shackles are rated equal to, or higher than, the rigging gear (ropes) they are connected to
- secure the pins of hanging shackles with a molle grommet or split pin
- make sure guyline shackles have their pins on the yarders side of the connection unless they are on mobile plant used as a tailhold, where the shackles are reversed
- only use hammerlocks in place of shackles when they have an equivalent or greater safe working load than the shackle they are replacing
- make sure all shackles, rigging screws and turnbuckles:
  - are tested and marked with their safe working load
  - have a breaking strength at least equal to the rope to which they are rigged
- fit yarder towers with a strop or other safety device which can contain the fall of operating ropes and tackle if a failure of the lead block, blocks or securing tackle occurs
- only undertake tower maintenance when the tower is down

- if climbing the tower is ever required, assess and manage the risk of fall from heights:
  - To meet their duties under HSWA, PCBUs **must**, so far as is reasonably practicable, manage the risks of falling from any height. This applies to all work, including pruning from a ladder.
  - As well as these duties under HSWA, there are also specific requirements under regulations.
  - Where workers could fall more than 3m (measured from the person's feet above the ground), employers must, so far as is reasonably practicable, ensure that suitable means are provided to prevent them from falling.

    These means could include a suitable fall restraint device or other suitable fall protection.
  - If this is not reasonably practicable, PCBUs will need to consider other ways to manage the risk.
- Train workers to safely work at height and to use an approved fall restraint harness, a free- fall arrest system and a rope with a minimum rating of at least 22kN (kilonewtons).
- Make sure there is a competent person on site trained in the use of fall restraint harness and who is capable of carrying out a rescue.

Mobile anchors

22.3.19 When setting up mobile anchors:

- securely position mobile anchors before extraction work starts. For industry guidance, see Resources webpage
- connect skyline and tailrope to suitably engineered attachment points on the mobile plant
- make sure attachment points are inspected periodically by a competent person to confirm their structural integrity
- apply a handbrake or locking device to prevent unplanned movement
- have a monitoring system to detect unplanned machine movements.

MOBILE ANCHORS DURING OPERATIONS

22.3.20 When using a mobile anchor, consider the following:

- make sure no worker is in the mobile anchor or near the mobile anchor while logs are being extracted
- when shifting the mobile anchor:
  - contact the hauler operator to lower the ropes before getting in the mobile anchor cab
  - make sure the operator wears a seat belt while repositioning
  - after the line shift and repositioning, make sure the operator is off the machine before signalling and full tension is applied.

CARRY OUT REGULAR CHECKS

22.3.21 Consider the following:

- Make sure the yarder is inspected regularly so that it remains stable.
- Make sure yarders are checked daily by a suitably competent person to ensure the guyline anchors and rigging are secure when under load.
- Make sure guyline anchors and rigging are inspected when the working ropes have been subjected to any shock loading or failure. Do not operate the yarder until this inspection is done.

- Document guyline anchor and rigging checks. Documentation may include photographic evidence with a date and time stamp. Securely store electronic files and ensure they can be viewed on request.
- Document guyline replacement dates.

Certification and inspection

22.3.22 Make sure yarders and yarder towers are properly certified and inspected:

- Permanently attach an identification plate to each yarder tower's base with the following information:
  - name and address of the manufacturer and the yarder model number
  - maximum breaking strength and size of the mainline for which the tower is designed
  - maximum breaking strength and size of tail rope (haulback) for which the tower is designed
  - maximum and minimum inclination at which the tower is designed to be operated
  - number, breaking strength and size of guylines needed
  - maximum breaking strength and size of skyline, mainline and tail rope which can be used on a tower designed for a skyline or slackline system.
- Make sure all yarders and yarder towers are inspected annually by a Certification Board for Inspection Personnel (CBIP) certified Yarder Engineering Safety Inspector and tagged as certified. The information on the plate includes:
  - the owner of the plant
  - make, model and serial number
  - inspection expiry
  - certifier number.
- Make sure the yarder is reinspected by a Chartered Professional Engineer (CPEng) with knowledge of such plant if there is a tower tip-over or if a part is damaged, or damage is suspected. Do not operate the yarder until this inspection is done.
- Make sure critical components of the yarder tower are visually inspected by a competent person each time the tower is lowered to the ground.
- Only make structural changes to towers under the direction of the manufacturer, or a CPEng. When modifying towers, do not reduce the overall safety factor of the equipment.

22.4 PPE and other equipment

Personal protective equipment (PPE) and other equipment

22.4.1 It is industry best practice for the following PPE to be used:

- high-vis shirt, vest or jacket with day-night for added visibility
- high-vis helmet, particularly when working outside a protected cab
- hearing protection
- safety footwear suitable for the terrain
- gloves for handling wire rope and rigging. Heavy cotton gloves are preferred because any puncture wounds are less severe
- protective eyewear.

22.4.2 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

22.4.3 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

22.4.4 Other useful equipment can include:

- a small personal first aid kit
- a hydration system such as a camelback or water bottle
- sunscreen
- a raincoat and warm clothing for cold and wet days.

BOOTS FOR BREAKERS-OUT AND SPOTTERS

22.4.5 Make sure safety footwear provide good ankle support and are suitable for the terrain and traction requirements.

22.4.6 Spiked boots are recommended for breaking out unless the ground is rocky. However, spiked boots do have their risks:

- they can wear out which can cause a slipping hazard
- they need checking to make sure spikes are not missing
- extreme caution needs to be used when climbing on or off a mobile tailhold machine. In addition, use rubber mats or wooden pads on the floors or pedals to avoid slipping.

HELMETS FOR BREAKER-OUTS

22.4.7 Provide helmets with chin straps for breaker-outs.

IDENTIFYING THE HEAD BREAKER-OUT

22.4.8 It is becoming common practice for the head breaker-out to wear a different colour high-vis and helmet to the other breaker-outs. This not only identifies the head breaker-out but is also a good visual guide as to where the breaker-outs are standing during an extraction.

22.4.9 Make sure breaker-outs always stand behind the head breaker-out when the 'go ahead' is given.

22.5 Communications

22.5.1 For remote or isolated work (see Section 3.4), PCBUs **must** provide a system of work that includes effective communication with the worker.

22.5.2 It is crucial for the breaker-out and the cable yarder operator to be able to communicate quickly and effectively. It makes sure that:

- ropes and rigging are positioned correctly before the breaker-outs move in to strop the stems
- break out does not start until all the breaker-outs are in a safe retreat position
- the cable yarder can be told of any stropping issues such as a gut hook
- an emergency can be signalled immediately
- breakers-out do not approach the safe return position until the out haul signal has been given by the yarder operator.

22.5.3 Make sure all workers are familiar with the communication system and commands used in their workplace.

22.5.4 Stop all hauling if communication becomes inaudible or not clearly understood. Do not restart until communications are fully restored.

22.5.5 Have at least two forms of effective communication, particularly for manual breaking out. The common ways of communicating are:

- RT
- tooter signals.

Radio communication

22.5.6 An RT is an important tool for clear and fast communication between the hauler operator, breaker-outs and spotter.

22.5.7 Make sure the head breaker-out and spotter has RT communication. For example, an earpiece in the helmet earmuff and a lapel microphone for fast hands-free communication.

22.5.8 Other breaker-outs need to also carry signalling equipment in case of an emergency.

22.5.9 Make sure the breaker-out:

- holds the RT during break out and in haul to allow quick communication in the event of a fouled drag or other issue
- uses approved crew commands on the RT, for example, 'go ahead', 'stop', 'raise the rigging'.

22.5.10 Test RTs daily before work starts to make sure they are on the right channel and fully charged.

Tooter signals

22.5.11 Audible (tooter) signals need to be clearly heard by all workers in the vicinity of a rope that is about to be hauled.

22.5.12 Test tooters daily before work commences.

22.5.13 All workers need to know the signals for 'emergency', and for 'stop the rope'.

SIGNAL FOR:	TOOTER	RADIO
Emergency	One long continuous blast on the tooter or horn	'Emergency, emergency, emergency'
Stop the rope	One short blast	'Stop'

TABLE 19: Signals for 'emergency' and 'stop the rope' for cable logging

22.6 Use of spotters

22.6.1 Spotters are mainly used by swing yarder operations and mechanical grapples to position the grapple over the stem.

22.6.2 Spotters need to be competent, experienced and trained. Make sure they hold the appropriate unit standard.

22.6.3 If they are used for hooking on logs, make sure they are trained and hold the appropriate qualification for this activity.

22.6.4 Make sure they are familiar with the safe retreat position (see Section 22.7.6).

22.7 Safe breaking out

The head breaker-out

22.7.1 The head breaker-out controls the break-out operation and the safety of the breaker-outs.

22.7.2 Head breaker-outs are in control of the break-out face at all times. They determine the location of the backline and backline anchors and manage the lineshifts.

22.7.3 The head breaker-out needs to be competent, experienced and trained. Make sure they hold the appropriate skill/unit standard for head breaker-outs – see Appendix 7. Consider industry certification (for example, Safetree).

22.7.4 Due to the importance of the head breaker-out position, consider first aid training.

Breaker-outs

22.7.5 All breaker-outs need to be competent and trained for their task. Make sure they hold the appropriate skill/unit standard.

The safe retreat position process

22.7.6 One of the most critical jobs in manual cable yarding is pre-determining and getting agreement on the safe retreat position.

22.7.7 The safe retreat position is where a breaker-out stands to be clear of moving ropes, rigging or stems or any hazard that might happen during a drag.

PLANNING – PRINCIPAL AND CONTRACTOR

22.7.8 The principal:

- develops a harvesting plan or job prescription before harvesting starts detailing the known hazards in the harvest area (such as danger triangle, mean tree height, traffic management needs, ecological and wāhi tapu sites)
- gives the plan to the contractor
- confirms that the contractor has a system to determine safe retreat positions on the block being harvested.

CONTRACTOR AND EXTRACTION TEAM

22.7.9 The contractor and/or crew foreman then works with the extraction team (the head breaker-out, breaker-outs and yarder operator) to determine the safe retreat position.

22.7.10 Document the safe retreat position process. Make sure the process is clearly understood, agreed and carried out by the extraction crew.

22.7.11 Mark the high-risk (red), medium-risk (orange) and low-risk (green) zones on the safe retreat plan with a description of the safe retreat distance in each zone. Detail the distance in metres (if using a rangefinder) or tree lengths.

22.7.12 Make sure all breaker-outs know and understand these safe retreat positions at the start of each session's work.

22.7.13 Hold a daily meeting to determine the breaking out plan and agree on safe retreat positions for the setting or day's work.

DETERMINING THE SAFE RETREAT POSITION

22.7.14 When determining the safe retreat position take into account:

- the risk of a swinging or upending log or stem
- the mean tree height
- the terrain
- obstacles that may restrict movement or obscure vision
- material likely to be dislodged during extraction
- overhead hazards that may fall into the work area
- any rope bight
- the risk of logs or stems being dislodged from the landing and sliding downhill
- the risk of chain shot from any felling operation.

MEASURING THE SAFE RETREAT POSITION

22.7.15 The head breaker-out needs to:

- make sure that all breaker-outs are at the pre-determined safe retreat position behind the head breaker-out before signalling the break-out.
- have a method of accurately measuring this distance.

22.7.16 The method to measure distance could include using:

- rangefinders
- GPS monitoring.

CHANGING THE SAFE RETREAT POSITION DURING THE DAY

22.7.17 Make sure you have processes for changing the safe retreat position during the day as hazards or risks change.

22.7.18 Communicate any changes to the plan to the hauler operator or crew manager. Document any changes.

22.7.19 The head breaker-out can decide if the safe retreat position needs to be moved further away from the ropes.

22.7.20 Get the approval of the crew manager before moving the safe retreat position closer to the ropes.

USING THE DEFAULT PROCESS

22.7.21 Have a documented process for determining the safe retreat position.

22.7.22 If for any reason there is no documented process, the default process is that the safe retreat position is a distance of at least 1.5 tree lengths (based on the mean tree height) at right angles and horizontal to the drag.

22.7.23 With the default process, clearly mark the safe retreat position with flags or other visible markers.

Stay away positions at all time

22.7.24 Make sure breaker-outs do not move or are positioned underneath:

- any moving rope
- a mechanical slack-pulling carriage feeding slack
- any carriage or butt rigging being raised or lowered during break out
- a tensioned skyline during outhaul or inhaul
- operating ropes being shifted by a mobile tailhold.

During outhaul

22.7.25 During outhaul, make sure all breaker-outs are a minimum of 15m from any moving rope or twice the length of the longest strop, whichever is greater.

Before hooking-on

22.7.26 Make sure breaker-outs stay out of the hook-on area until:

- the 'Stop' signal has been given and the head breaker-out gives verbal clearance
- the carriage or rigging has stopped moving
- the swinging strops can be safely controlled.

Hook-on

22.7.27 Make sure breaker-outs never stand directly under ropes or rigging when slack is being fed out or ropes are being lowered.

22.7.28 Breaker-outs may stand to the side of the rigging, holding onto their strop as it is lowered, provided they:

- have been warned that the lowering is happening
- are watching from a safe position.

HOOK-ON WITH BUTT-PULLED STEM

22.7.29 Attach strops to butt-pulled stems within 3m of the butt-end of the stem.

HOOK-ON WITH HEAD-PULLED STEM

22.7.30 Attach strops to head-pulled stems within 5m from the top end of the stem.

GUT-HOOKED OR LONG-STROPPED STEMS

22.7.31 If any drag is long-stropped or gut-hooked, the head breaker-out:

- immediately communicates to the yarder operator so that others can be warned of the hazard, or
- stops after the break-out so the stems can be re-hooked.

Signalling the break-out

22.7.32 Before signalling the break-out, the head breaker-out needs to make sure that all breaker-outs are in the safe retreat position and behind the head breaker-out. Make sure all breaker-outs face and watch the drag.

The drag

22.7.33 The head breaker-out needs to watch the lines and the drag until either:

- the drag is out of sight
- the yarder operator takes over control, or
- another competent breaker-out is assigned to monitor the lines and the drag.

A fouled drag

22.7.34 If a drag becomes fouled, make sure the breaker-out signals to stop the drag immediately.

22.7.35 Before any attempt is made to release strops or cut any stem with a chainsaw, slacken the mainrope, tailrope and slack-pulling rope (if appropriate) to release tension. Make sure breaker-outs do not leave the safe retreat position while the ropes in a fouled drag are under tension.

22.7.36 Only the head breaker-out can:

- move out of the safe retreat position to access the fouled drag
- call in other breaker-outs to assist.

22.7.37 Once the drag is clear, make sure all breaker-outs retreat to the predetermined safe position behind the head breaker-out before any signal is given for the drag to resume.

Clearing the chute

22.7.38 The head breaker-out confirms that all breaker-outs are in a pre-determined safe position before clearing stems from the chute.

Line shifts

22.7.39 When any line-shift operation is taking place, make sure all breaker-outs and other operators are in a designated safe area and clear of any rope movement.

Strawline retrieval

22.7.40 Make sure that the risks for retrieving strawlines are assessed and that procedures are put in place to manage the risks.

22.7.41 Make sure that there is a procedure for clearing an obstruction and agreed practices for the release of tension on lines to avoid recoil.

22.7.42 Make sure that the breaker-outs and hauler driver are familiar with the procedures.

22.7.43 Once the obstruction is cleared make sure that the breaker-outs are in the safe retreat position before the signal is given to apply tension to the ropes.

Stems on the landing

22.7.44 The poleman is one of the most hazardous tasks on a landing site. You **must** eliminate risks from unhooking stems so far as is reasonably practicable (for example, by using electronic chokers). If you cannot eliminate the risks, you **must** minimise them so far as is reasonably practicable.

THE POLEMAN

22.7.45 The poleman works on the cable logging landing site. They unhook landed stems and monitor the condition of the carriage, ropes, rigging and strops during unhooking.

- Make sure the poleman has a designated safe area away from the yarder and remains in this area whenever working ropes are operating.
- Make sure the poleman has an RT to communicate with the operator.

- Make sure all ropes are stopped and locked before the yarder operator signals the poleman that it is safe to unhook. Make sure that all rope movement remains stopped until the poleman is back in the designated safe area.
- Do not allow unhooking to start until the poleman and yarder operator make sure the drag/stems are stable and not likely to shift.
- Do not allow workers to work under a suspended stem or log or go in to unhook stems/logs before the drag is landed.
- Do not allow workers to stand more than 1m off the ground when unhooking stems or logs.
- Make sure all rope movements are signalled before movement.

PART F

Work on landings and loading and unloading log trucks

IN THIS PART:

TERM OR SYMBOL	MEANING IN THIS DOCUMENT
Must	A mandatory legal requirement under HSWA or regulations.
Other wording including 'check', 'make sure', 'design', 'do not'	How WorkSafe expects certain health and safety risks to be managed. This is not mandatory to follow – you may adopt other practices, as long as these practices provide a level of health and safety as good as or better than the standard in this code.
You/your	Refers to the PCBU involved in forestry and harvesting operations.

23.0
Introduction to Part F

IN THIS SECTION:

23.1 What does this Part cover?

23.1.1 This Part looks at managing the risks around working on landings and loading and unloading log trucks.

23.1.2 It includes information on:

- landing design and layout
- mobile plant on landings
- mechanised processing on landings
- loading and unloading log trucks
- wood residual and biomass processing.

23.2 What are the common risks faced by workers?

23.2.1 Table 20 gives examples of how workers can be harmed.

23.2.2 There may be hazards that are not identified in this table. You will need to identify and assess health and safety risks arising from your own work.

WHAT COULD GO WRONG?	POSSIBLE CAUSES
Worker being struck by mobile plant or vehicles	– Distraction or inattention. – Ground workers being unsighted by machine operators.
Worker being struck by logs being slewed, falling or rolling	– Ground workers in machine zone. – Unstable log stacks.
Worker being struck by ropes, chains or cables	– Machine operator or worker inattention.
Impaired or distracted workers making mistakes resulting in injuries	– Fatigue from long work hours, working at night or long travel times to worksite. – Dehydration. – Being under the influence of drugs or alcohol. – Distracted by cellphones, work pressures, home pressures.
Workers being harmed by poor or extreme weather conditions	– UV exposure. – Hot or cold temperature extremes. – Heavy rain, flooding. – Strong winds.
Workers being injured carrying out manual tasks	– Repetitive physical action while tree planting. – Carrying excessive weight.
Workers being exposed to harmful fumes, excessive noise or vibration while using plant	– Poorly maintained plant.
Workers being injured by slipping, tripping or falling	– Working on slippery or unstable surfaces. – Distraction or inattention.
Worker being harmed by chainsaw use	– Distraction or inattention.

TABLE 20: Examples of what could go wrong – work on landing

23.2.3 The following guidance provides good practice on how to manage these risks. To manage the health risks, see Section 3.5.

23.2.4 Guidance that is common to activities (for example, on requirements for worker training) has been placed in Part B.

23.2.5 See Appendix 6 for an approach to manage health and safety risks.

24.0 Managing the risks of work on landings and loading and unloading

IN THIS SECTION:

24.1 PPE

24.1.1 It is industry best practice for the following PPE to be used:

- high-vis helmet (including machine operators when outside of their machines)
- high-vis shirt, vest or jacket with day-night for added visibility
- hearing protection (see Section 3.5)
- lace-up safety footwear (or equivalent) providing good grip and ankle support
- protective legwear, chainsaw chaps or trousers – if cutting logs
- gloves – leather or thick cotton
- protective eyewear.

24.1.2 Section 10 explains the requirements you **must** meet if you are using PPE to minimise risks.

24.1.3 Appendix 7 contains relevant standards for PPE. Look for the mark/stamp on the PPE to check it is compliant with the relevant standard.

24.2 Safe practice

Entering the site

24.2.1 Make sure workers on the landing site understand the hazards and risks of the site particularly with mobile plant and the movement of logs and stems.

24.2.2 Every person entering an operational area:

- notifies the supervisor or foreman before entering the operational area
- wears the appropriate PPE as required by the PCBU
- only enters the operational area when they have been acknowledged or signalled that it is okay to enter
- takes care when approaching workers engaged in any operation
- stays aware that workers wearing hearing protection may not hear them.

24.2.3 Make sure workers stay in the designated safe area and clear of:

- all working machinery
- swinging or suspended logs or stems
- trucks and trailers being loaded or unloaded.

24.2.4 Before moving into another work area, make sure the affected machine operators are contacted, and that permission is signalled back.

Establish safe work areas

24.2.5 Establish exclusion zones and safe work areas:

- Put warning signs up at the entry to the site.
- Consider (where practicable) a physical barrier between machines and ground workers (for example, a log stack or another machine).
- While a machine is handling logs, manage the risks to any ground workers.
- Make sure there are no ground workers in the intended path of skidders or forwarders or any swinging logs.
- Do not swing logs above or within the reach of ground workers.

- If a mechanised processor is operating, make sure that there is at least a 70m exclusion zone to protect against chain shot injury (Figure 31). Consider the angling and placement of the mechanised processor to manage risk.
- Make sure ground workers always face operating machines.

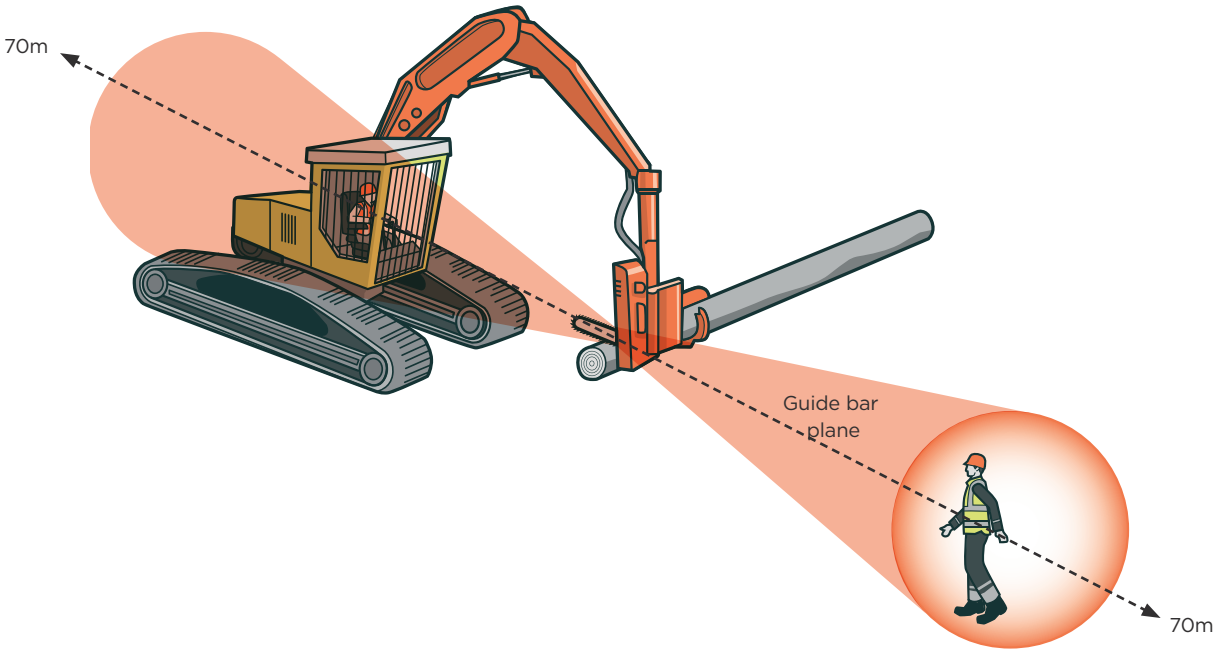


FIGURE 31: Minimum 70m exclusion zone to protect against chain shot injury

Communications

24.2.6 Make sure all ground workers have effective and reliable communication with machine operators.

24.2.7 Make sure:

- mobile plant operators on the landing communicate when they are shifting on the landing, and skidders and forwarders radio in before entering the area. Make sure they do not enter unless they have received permission to do so
- operators of skidders and forwarders communicate with landing workers and reduce speed when entering the landing. Make sure that logs are fully grounded and stabilised before unhooking.

Mobile plant on landings

24.2.8 Mobile plant working within its designated area has the right-of-way.

24.2.9 If the mobile plant is moving to another area, the operator needs to let other workers – and other machine operators – know about the movement. Do not shift the mobile plant until the mobile plant operator has received acknowledgement from the workers.

24.2.10 Make sure:

- no load or logs are swung above or close to any worker on the landing
- the operator checks there is good clearance around the machine with both boom and tail
- ground workers only approach logs when they have been completely landed and, if necessary, stabilised

- when the mobile plant is parked, the machine's implements are rested on the ground
- workers do not walk under any implement that is supported only by the machine's hydraulics.

Manual processing on landings

24.2.11 When logs are being prepared, measured and cut at the landing site, ground workers are at risk from being hit or crushed.

24.2.12 It is important that precautions are put in place to ensure the safety of the ground workers, such as:

- the loader operator is aware of where the ground workers are at all times
- when laying logs out for manual processing, the loader operator makes sure that there is sufficient space between the stems or logs to allow for safe access and manual processing
- logs are stable and secure before cutting
- when a stem is being cut to length, no other person works on that stem at the same time
- when using a chainsaw, make sure no other worker is within 2m of the person using the chainsaw. If a worker's saw gets stuck and needs to be cut out, manage the risks when removing the stuck saw
- only use a chainsaw on logs and stems laid out for processing. Make sure no worker uses a chainsaw while standing on stockpiled, heaped or stacked stems or logs.

Machine processing on landings

24.2.13 Logs can be cut to length with custom-built processors or with excavators fitted with processing head. To manage the risks of these machines:

- have a defined working area for mechanical processors
- have defined separation distances to protect ground workers from chain shot injury. Have a minimum 70m exclusion zone unless effective protective barriers are used (Figure 31)
- make sure the mechanical processor has operator protective structures (OPS), approved chain shot guards and appropriate polycarbonate protective windshields as required
- make sure the processor operator is in communication with other workers and operators on the landing site
- make sure no worker approaches the processor without first contacting the operator to let them know of their intention. The worker only approaches when they have permission and the machine head is at rest.

Log stacks

24.2.14 To manage the risk when stacking logs:

- keep log stacks to a safe height on level ground and angled to ensure stability
- make sure the log stacks are not higher than the capacity of the log handling equipment
- place logs on bearer logs, where applicable, to avoid rocks and other contamination being loaded onto log trucks

- where possible, make sure the stacks are positioned end-on to the loading zone to stop logs rolling in the direction of the truck
- make sure there is enough separation between stacks and machines to minimise the risk of stacked logs being disturbed and falling
- avoid working at the base or downhill from a log stack
- avoid working in front of, climbing onto or working on logs placed in log stacks or dumps unless the risk is managed.

24.3 Loading and unloading

24.3.1 Loading and unloading is a high-risk activity. Before loading or unloading starts, coordination is needed between:

- the forest manager
- the harvesting contractor
- the haulage contractor.

24.3.2 This is to make sure that the loading process, and the entry/exit from the site are carried out as safely as possible.

Communication

24.3.3 Make sure the truck driver and the loader operator are in constant communication from when the truck arrives at the landing site.

24.3.4 If communication is lost, or not able to be established between the driver and loader operator at any point during the loading process, stop loading until communication resumes.

24.3.5 When loading and unloading, communication needs to be clear and concise and understood by all parties. A standard set of hand signals has been developed which will help with this. These signals can be found in the Loading and Unloading section of the *Log Transport Safety Council Manual*.

Responsibilities

24.3.6 The truck driver and loader operator work together to plan the load to maximise the load and vehicle stability.

24.3.7 The loader operator is responsible for:

- carrying out the loading/unloading in a safe manner
- making sure that the truck driver is safe and in a safe location
- making sure the logs are placed within the bolsters according to the driver's instructions and requirements
- adjusting the load if requested by the truck driver
- stopping if the truck driver's location is unknown or unsafe
- making sure that the immediate vicinity is clear of all people.

24.3.8 The truck driver is responsible for:

- accepting and approving the load in accordance with the *Log Transport Safety Council manual*
- making sure the logs are loaded and stowed safely
- following any instructions given by the loader operator
- staying in safe loading zones
- letting the loader operator know if they are moving to an alternative safe area such as a crew shelter.

Trailer lifting

24.3.9 Make sure that trailer lifting is only carried out by machines that are suitable for this purpose. The acceptable methods for lifting a trailer are:

- placing the load ring onto a hook on the lifting machine
- grabbing the load ring or chain
- using non-chain alternatives such as cross beams that can be gripped by the grapple, or forklift pockets built into the trailer.

24.3.10 Make sure no person is under a raised trailer.

24.3.11 Make sure the driver is standing on the opposite side of the drawbar from the loader operator while connecting.

24.3.12 When turning the drawbar, suspend the trailer with the drawbar at the driver's chest height for ease of control.

24.3.13 For industry guidance, see Resources webpage

Safe loading zones

24.3.14 All truck drivers (and any passengers) need to be in a designated safe area while loading takes place. Do not start loading until they are in the safe area.

24.3.15 Stop loading if the truck driver/passengers leave the safe area or cannot be contacted.

24.3.16 The designated safe areas are:

- inside the truck cab
- outside the cab, but only if at least 6m from the front of the cab and visible to the loader operator
- an alternative safe area such as a crew shelter or smoko room.

24.3.17 Make sure designated safe areas are understood and agreed between the loader operator and the truck driver.

24.3.18 The loading zone where all persons on the ground are excluded from is shown in red (Figure 32). The loading zone is considered to be a minimum of 6m around the truck cab and trailer and log stack.
If long logs are being loaded, this zone may need to be increased.

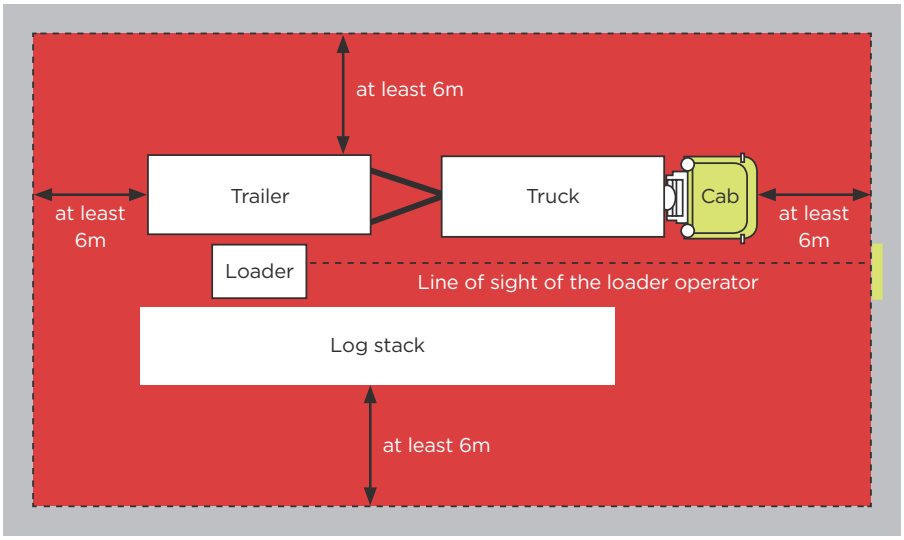


FIGURE 32: Safe loading zone (red shows exclusion zone, green shows certain safe areas

24.3.19 Do not load if there is anybody on the ground inside the loading zone.

24.3.20 The truck driver may direct the setting of bed logs on the trailer and to make adjustments to the final log positions only if:

- the loader operator has given permission to approach
- no logs are being suspended by the loader operator at the time.

24.3.21 If anyone needs to go into the loading zone, they need to first get the loader operator's approval.

24.3.22 Loading then stops and the grapple/forks are lowered to the ground. Loading only restarts when the person has moved out of the loading zone.

24.3.23 Make sure the loader never moves into or swings logs over the truck driver safe zone or cab.

Loading in the dark

24.3.24 When log loading takes place during the hours of darkness, extra precautions need to be taken:

- make sure drivers, loader operators and anyone else working on the landing wear day-night high-vis vests and helmets
- make sure loading is carried out in adequately illuminated areas. Lighting could be provided by:
  - loading lights of the truck
  - additional lighting fitted to the log loader over and above the driving lights to provide lateral as well as forward-facing illumination
  - lighting systems on the log landing.

Load placement

24.3.25 Construct the load under the driver's direction so that:

- the load can be restrained effectively
- the load does not destabilise the vehicle
- the load remains stable when applying and removing lashings
- the load is not contaminated with items that can fall from the vehicle in transit.

24.3.26 Make sure no more than one-third of the end diameter of any log is above the top of a cab guard, headboard, tailboard, or stanchion pin (Figure 33).

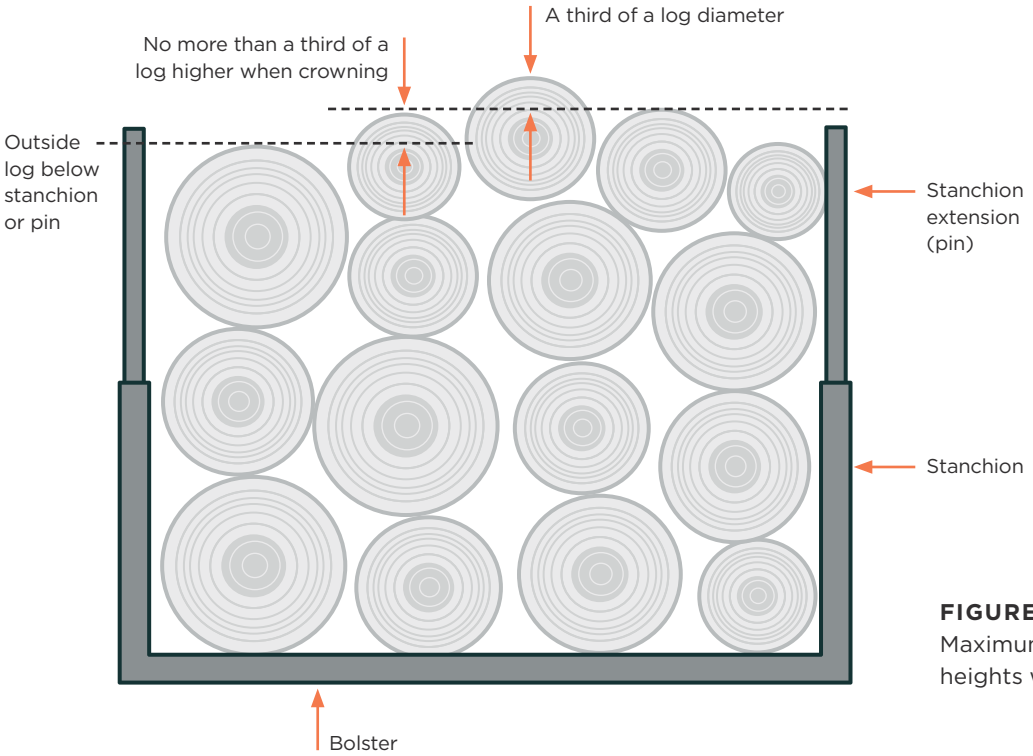


FIGURE 33:
Maximum permitted log heights with crowning

24.3.27 Make sure no part of outside logs (logs that are in contact with the stanchion) are above the height of the stanchion.

24.3.28 Crown all loads of logs to ensure load security. When crowning the load, make sure no log is more than 1/3 of a log diameter above the log it is adjacent to.

24.3.29 Make sure the outer ends of the outside logs extend the correct distance in accordance with the *Log Transport Safety Council manual*.

24.3.30 Secure all logs by at least two load restraints, either directly by contact with the stanchion or lashing, or indirectly, if bound by surrounding logs.

24.3.31 Drivers make sure that:

- logs are secured, from a safe position
- lashings are regularly checked during transit to correct the tensions (if needed)
- loose bark is identified and removed
- if necessary, adjustment to loading configuration is undertaken by suitable log handling equipment.

24.3.32 For more information on log placement and securing, see Resources webpage

Chaining up and exiting the skid

24.3.33 Drivers need to make sure that the load is restrained safely and in accordance with the *Log Transport Safety Council manual*.

24.3.34 Drivers can move up to 100m to a safe area away from the landing before securing the load.

24.3.35 Make sure restraints are checked before entering the public highway system and re-tensioned if required.

Self-loading trucks

24.3.36 Make sure self-loading trucks are fitted with outriggers and stabilisers that firmly stabilise the unit while loading.

24.3.37 Make sure the booms are designed so that the free fall of the boom is prevented if there is a malfunction.

24.3.38 Make sure all controls for the operation of a self-loading unit are 'detent' operation type.

24.3.39 Make sure drivers of self-loading trucks have established work-alone procedures and have an effective means of getting help in the event of an emergency.

25.0 Managing the risks of wood residual and biomass processing

IN THIS SECTION:

25.1 Managing the risks of wood residual and biomass processing

25.1.1 Wood residual and biomass processing can be broken into two categories:

- the collection and processing of post-harvest wood residual (slash and waste) from an existing harvest site
- the planting, managing, processing and regeneration of forests for biomass production.

Managing slash on landings

25.1.2 There are several options for managing slash on landings. These include:

- permanent slash storage
- temporary slash storage
- slash benches
- carting away or storing off-site
- mulching and chipping
- burning.

25.1.3 For more information on these options and any risks they carry, see the New Zealand Forest Service *Slash risk management handbook*.

Post-harvest wood residual collection and processing

25.1.4 You **must** consult, cooperate and coordinate activities with other PCBUs you have overlapping duties with (see Section 3.3).

25.1.5 Work with the forest owner or manager, and harvest contractor around site access and working around any current harvest operation.

25.1.6 For managing any risk from their activities, refer to the relevant sections of this guidance.

25.1.7 Make sure you have 'work alone' procedures if there are no other PCBUs or workers on site. See Section 3.4 for the requirements for remote and isolated work.

Biomass forest production, management and harvest

25.1.8 You **must** consult, cooperate and coordinate activities with other PCBUs you have overlapping duties with (see Section 3.3).

Refer to the sections of this guidance that are relevant to your harvest system (for example, steep slope harvesting, cable yarding, mechanised processing).

Appendices

IN THIS SECTION:

Appendix 1: Glossary

TERM	EXPLANATION
ACOP/ Approved code of practice	Sets out WorkSafe's expectations about how to comply with legal duties imposed by HSWA and regulations. Other practices can be used to achieve compliance as long as the level of health and safety is equivalent to, or higher, to that in an ACOP.
AS/NZS – Australian/ New Zealand Standard	A reference to an Australian/New Zealand Standard, described by numerals and a title.
ATV/all-terrain vehicle	A smaller vehicle that has been designed for off-road use and includes quad bikes, side-by-sides and other purpose-built off-road utility vehicles. They may also be called a light utility vehicle (LUV)
Business or undertaking	The usual meanings are: – business: an activity usually carried out with the intention of making a profit or gain – undertaking: an activity that is non-commercial in nature (for example, certain activities of a local authority or a not-for-profit group).
CPEng	A Chartered Professional Engineer (often written as CPEng) is an experienced engineer who has been assessed as meeting a quality mark of competence.
Chain shot	The high-speed ejection of a piece of chain when a chain used in mechanised harvesting breaks.
Chute	The area on a hauler landing where stems are landed during extraction.
Close supervision	Direct and constant one-on-one supervision.
Competent person	Someone who can consistently demonstrate the skill and knowledge derived from experience and/or training for the type of work the person is tasked to do.
Contracting PCBU/Principal	A PCBU that engages another PCBU to do work for them (other than as an employee, apprentice, trainee or volunteer.
Contractor	A PCBU that has been engaged to do work by another PCBU (other than as an employee, apprentice, trainee or volunteer). Contractors and their employees are classed as workers of the contracting PCBU/principal.
Control measure	A way of eliminating or minimising risks to health and safety.
Danger triangle	The area below the chute in a cable logging operation.
Detent	Detent is a type of switch that uses a mechanism to hold it in a specific position until a force is applied to release it.
Driving trees	To fell a tree into one or more trees to bring those trees down.
Duty	A legal obligation to act responsibly according to the law.
Duty holder	A person who has a duty under HSWA. There are four types of duty holders – PCBUs, officers, workers and other persons at workplaces.
Eliminate	To remove the sources of harm (for example, equipment, substances or work processes).
Emergency	An uncontrolled event that has caused, or could cause: – loss of life – injury – serious property damage. It can include declarations of civil defence emergencies, catastrophic weather events, bushfires, or other significant incidents.
Exclusion zone	A designated area in which others, apart from the operator, are excluded. An exclusion zone is established by separation distances (usually two tree-lengths), physical barriers, or by scheduling activities at different times.

TERM	EXPLANATION
Exposure monitoring	Measures and evaluates what your workers are being exposed to while they are at work. This can be: – personal exposure monitoring (workers wearing a device while whey work) or – biological exposure monitoring (where blood or urine samples are taken to test for a substance workers are working with).
Extraction	The pulling, carrying (forwarding), shovelling, or hauling of logs from the felling point to a landing by machinery.
Fall restraint device	A device used to prevent a person falling while working at height. This is usually made up of a harness and lanyard system.
Fatigue	A physiological state where someone is unable to mentally and physically function as they usually would. This is caused by four main factors: – missing out on sleep – being awake for too long – working and sleeping in the wrong parts of the body clock cycle – workload (mental and physical).
Falling object protective structures (FOPS)	A structure meeting an ISO standard designed to be attached to, or form part of, mobile equipment for the purpose of reducing the possibility that an operator seated beneath the structure in the driving position being harmed if the FOPS receive a blow from a falling object.
Faller (feller)	The person who cuts or chops a standing tree or part of a standing tree to bring down that tree.
Fell (felling)	To cut, chop, push, or pull down a standing tree or part of a standing tree.
Forestry operations	All activities involved in establishing, maintaining, harvesting, and processing of wood products on a forestry site.
Gut-hooked	A stem that has had a strop attached towards the middle of the stem which could cause the stem to swing or end-for-end during extraction.
Hazard	Anything that can cause harm. Under HSWA, hazard is defined as 'includes a person's behaviour where that behaviour has the potential to cause death, injury, or illness to a person (whether or not that behaviour results from physical or mental fatigue, drugs, alcohol, traumatic shock, or another temporary condition that affects a person's behaviour'.
Hazardous substances	Any product or chemical that has properties that are explosive, flammable, oxidising, toxic, corrosive or toxic to the environment.
Health	A person's physical and psychological health.
Health and Safety at Work Act 2015 (HSWA)	The key work health and safety legislation in New Zealand. HSWA applies to all work and workplaces unless specifically excluded. You can find the full text of the Act on the New Zealand Legislation website.
Health monitoring	Looks at whether a worker's health is being harmed because of what they are being exposed to while at work (for example, hearing tests).
Hung-up tree	A cut tree caught in or lodged against another preventing it from falling to the ground.
Impairment	A reduction of a person's ability to think or act as the result of drug or alcohol use, mental fatigue, stress, health conditions, or traumatic shock.
Industry qualifications	Skill/unit standards registered with the New Zealand Qualifications Authority where assessment has been carried out and competence verified.
ISO	The International Organisation for Standardisation – an organisation that develops and publishes international standards that ensure quality and safety in products and services.
Manual felling	The felling of a tree by a method that requires the faller to stand at the base of a tree to carry out the tree felling operation.

TERM	EXPLANATION
Mobile plant	Mobile plant is plant that is powered or self-propelled, such as vehicles and equipment. Examples include bulldozers, quad bikes, mobile cranes, forklifts, elevating work platforms, tractors, and vehicles like cars, vans and trucks used for work.
Minimise	To take steps that protect the health and safety of people by reducing the likelihood of an event occurring, reducing the level of harm to people if it does occur, or both.
Must	Indicates a legal requirement that must be complied with.
Officer	A person who has the ability to significantly influence the management of a PCBU. This includes, for example, company directors and chief executives. Officers must exercise due diligence to ensure the PCBU meets its health and safety obligations.
Operator	A worker who operates some form of machinery.
Overlapping duties	When a PCBU shares duties with other PCBUs in relation to the same matter. When two or more PCBUs' duties overlap, the PCBUs must consult, co-operate and co-ordinate with each other.
Other persons at the workplace	Includes workplace visitors and casual volunteers (who are not volunteer workers). These people have their own health and safety duties to take reasonable care to keep themselves safe and to not harm others at a workplace.
PCBU	Person conducting a business or undertaking (PCBU). In most cases a PCBU will be a business entity, such as a company. However, an individual carrying out business as a sole trader or self-employed person is also a PCBU. A PCBU does not include workers or officers of a PCBU, volunteer associations with no employees, or home occupiers that employ or engage a tradesperson to carry out residential work.
Plant	Includes: – any machinery, vehicle, vessel, aircraft, equipment (including PPE), appliance, container, implement, or tool; and – any component of any of those things, and – anything fitted or connected to any of those things.
Personal protective equipment (PPE)	Anything used or worn by a person (including clothing) to minimise risks to the person's health and safety. This may include – but is not limited to: – respiratory protective equipment – protective helmets – protective eyewear – protective boots – protective gloves – hearing protection – high-vis clothing – sunhats – sunscreen and lip protection – safety harness systems.
Principal	See Contracting PCBU.
RCA **Road controlling authority**	For public roads, the RCA is usually a local council (for local roads) or NZTA (for state highways).
Risks	Arise from people being exposed to a hazard (a source of harm).
Rollover protective structure (ROPS)	A structure meeting an ISO standard, designed to be attached to or form part of mobile plant for the purpose of reducing the possibility of an operator (when also wearing a seatbelt) from being injured if the machine rolls over.
RT	Radio telephone

TERM	EXPLANATION
Sailer	A piece of broken wood (branch or top) resting in the canopy of a tree which may become dislodged.
Subcontractor	PCBUs hired by a contractor to work or provide services on their behalf. Sometimes subcontractors are referred to as suppliers.
Worker	An individual who carries out work in any capacity for a PCBU. A worker may be an employee, a contractor or sub-contractor, an employee of a contractor or sub-contractor, an employee of a labour hire company, an outworker (including a homeworker), an apprentice or a trainee, a person gaining work experience or on a work trial, or a volunteer worker. Workers can be at any level (for example, managers are workers too). A PCBU is also a worker if the PCBU is an individual who carries out work in that business or undertaking.
Workplace	Any place where a worker goes or is likely to be while at work, or where work is being carried out or is customarily carried out. Most duties under HSWA relate to the conduct of work. However, some duties are linked to workplaces.
Upstream PCBUs	PCBUs who design, manufacture, import or supply plant, substances or structures, or who install, construct or commission plant or structures. 'Design' includes the: – design of part of the plant, substance, or structure, and – redesign or modification of a design.

Appendix 2: So far as is reasonably practicable

(Section 22 of HSWA)

Certain PCBU duties must be carried out 'so far as is reasonably practicable'.

What to consider when deciding what is 'reasonably practicable'

Just because something is possible to do, does not mean it is reasonably practicable in the circumstances.

Consider:

- What possible actions can be taken to ensure health and safety?
- Of these possible actions, at a particular time, what is reasonable to do?

Think about the following questions.

WHAT IS KNOWN ABOUT THE RISK?

- How likely is the risk to occur?
- How severe is the illness or injury that might occur if something goes wrong?
- What is known, or should reasonably be known, about the risk?

WHAT IS KNOWN ABOUT POSSIBLE CONTROL MEASURES?

- What is known, or should reasonably be known, about the ways (control measures) to eliminate or minimise the risk?
- What control measures are available?
- How appropriate (suitable) are the control measures to manage the risk?
- What are the costs of these control measures?
- Are the costs grossly disproportionate to the risk? Cost must only be used as a reason to not do something when that cost is grossly out of proportion to the risk.

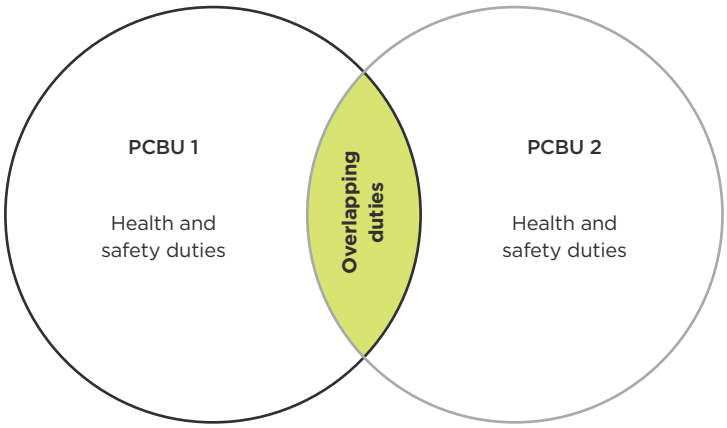
> While PCBUs should check if there are widely used control measures for that risk (such as industry standards), they should always keep their specific circumstances in mind. A common industry practice might not be the most effective or appropriate control measure to use.
>
> If PCBUs are not sure what control measures are appropriate, WorkSafe recommends getting advice from a suitably qualified and experienced health and safety professional.

For more information, see our guidance in the Resources webpage

Appendix 3: Working with other PCBUs – overlapping duties

(Section 34 of HSWA)

More than one PCBU can have a duty in relation to the same matter. These PCBUs have overlapping duties – this means that the duties are shared between them.



Duties regularly overlap:

- in a shared workplace (for example, a building site or a port) where more than one business has control and influence over the work on site.
- in a contracting chain, where contractors and subcontractors provide services to a head contractor or client and do not necessarily share the same workplace.

A PCBU must, so far as is reasonably practicable, consult, cooperate and coordinate activities with all other PCBUs they share duties with so that all PCBUs can meet their joint responsibilities.

A PCBU cannot transfer or contract out of their duties, or pass liability to another person.

However a PCBU can make an agreement with another PCBU to fulfil specific duties. Even if this occurs, all PCBUs are still responsible for meeting their legal duties.

Example

A local hotel contracts out housekeeping services to an agency. The hotel and agency both have a duty to ensure the health and safety of the housekeeping workers, so far as is reasonably practicable. This includes the duty to provide first aid facilities.

The agency reaches an agreement with the hotel – if their workers need first aid while working at the hotel they can use the hotel's first aid facilities.

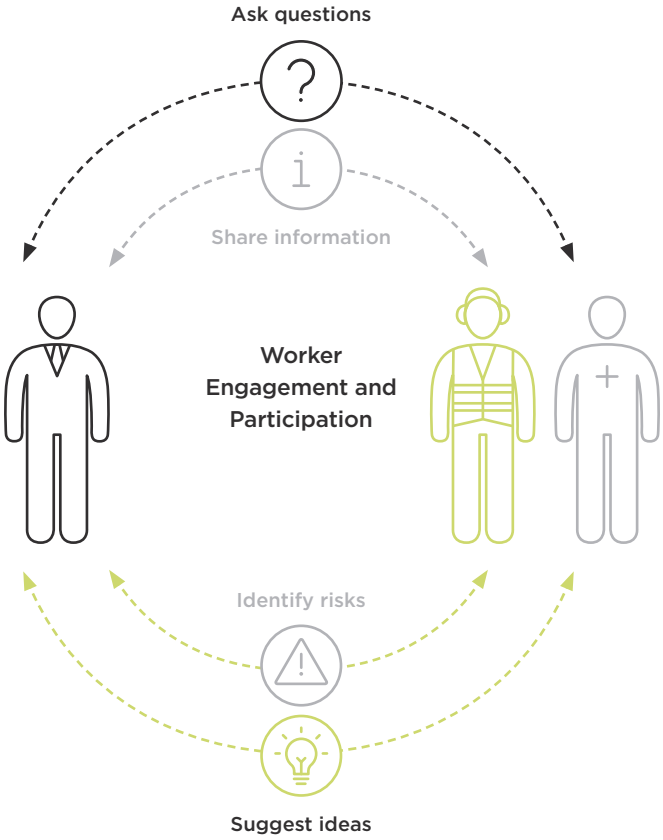
For more information, see our guidance in the Resources webpage

Appendix 4: Worker engagement, participation and representation (Part 3 of HSWA)

Engage with workers and enable their participation

A PCBU has two main duties related to worker engagement and participation:

- to engage with workers on health and safety matters that affect or are likely to affect workers, so far as is reasonably practicable, and
- to have practices that give workers reasonable opportunities to participate effectively in the ongoing improvement of work health and safety.



A PCBU can engage with workers by:

- sharing information about health and safety matters so that workers are well-informed, know what is going on and can contribute to decision-making
- giving workers reasonable opportunities to have a say about health and safety matters
- listening to and considering what workers have to say at each step of the risk management process
- considering workers' views when health and safety decisions are being made
- updating workers about what decisions have been made.

A PCBU must engage with workers during specified times, including when identifying hazards and assessing risks.

A PCBU must have clear, effective, and ongoing ways for workers to suggest improvements or raise concerns.

Worker representation

Workers can be represented by a Health and Safety Representative (HSR), a union representing workers, or a person that workers authorise to represent them (for example, a community or church leader, or another trusted member of the community).

HSRs and Health and Safety Committees (HSCs) are two well-established methods of participation and representation. If workers are represented by an HSR, worker engagement must also involve that representative.

For more information on the following, see the Resources webpage

WORKSAFE GUIDANCE

Good practice guidelines

Worker engagement, participation and representation

Interpretive guidelines

Worker representation through Health and Safety Representatives and Health and Safety Committees

Pamphlets

Worker representation

Health and Safety Committees

Health and Safety Representatives

Appendix 5: Upstream duties (Sections 39–43 of HSWA)

A PCBU in the supply chain (upstream) also has a duty to ensure, so far as is reasonably practicable, that the work they do or the things they provide to other workplaces do not create health and safety risks.

An upstream PCBU is a business that:

- designs plant, substances, or structures
- manufactures plant, substances, or structures
- imports plant, substances, or structures
- supplies plant, substances, or structures
- installs, constructs or commissions plant or structures.

Upstream businesses are in a strong position to eliminate or minimise risk. They can influence and sometimes eliminate health and safety risks through designing, manufacturing, importing or supplying products that are safe for the end user.

Example

A worker using a badly designed or poorly manufactured saw may be at risk of injury. This risk should have been eliminated or minimised, so far as was reasonably practicable, by the designer or manufacturer.

Upstream duties for designers (Section 39 of HSWA)

A designer creates or modifies a design for plant, substances or structures that are to be used or operated, or could be used or operated, in a workplace.

A designer has a duty, so far as is reasonably practicable:

- to make sure the products they design do not create health and safety risks for the people that use them and those nearby
- to make sure the products they design have been tested so they are safe for use in a workplace
- to give the following information to those who will use the designed products:
  - the design's purpose or intended use
  - the results of any calculations or tests
  - any general and current relevant information about how to safely use, handle, store, construct, inspect, clean, maintain, repair, or otherwise work near the designed products.

These requirements apply across the product's entire lifecycle – from manufacture and construction, through to everyday use, decommissioning and disposal.

For more information, see our guidance: Health and safety duties for businesses that design products for workplaces

Upstream duties for manufacturers section 40 of HSWA

A manufacturer makes plant, substances or structures that are to be used, or could be used or operated, in a workplace.

A manufacturer has a duty, so far as is reasonably practicable:

- to make sure the products they manufacture do not create health and safety risks for the people that use them and those nearby
- to make sure the products they manufacture have been tested so they are safe for use in a workplace

- to give the following information to those that will use the manufactured products:
  - the purpose or intended use of each product
  - the results of any calculations and tests
  - any general and current relevant information about how to safely use, handle, store, construct, inspect, clean, maintain, repair, or otherwise work near the manufactured products.

These requirements apply across the product's entire lifecycle – from manufacture and construction, through to everyday use, decommissioning and disposal.

For more information on the following, see the Resources webpage

Upstream duties for importers (Section 41 of HSWA)

An importer imports plant, substances or structures that are to be used, or could be used or operated, in a workplace.

An importer is a business:

- that goods are imported **by**, or
- that goods are imported **for**.

Importation is another word for importing. Importation refers to the **arrival of goods** in New Zealand from a point outside New Zealand. These goods can arrive in any manner.

An importer has a duty, so far as is reasonably practicable:

- to make sure the products they import do not create health and safety risks for the people that use them and those nearby
- to make sure the products they import have been tested so they are safe for use in a workplace
- to give the following information to those who will use the imported products:
  - the purpose or intended use of each product
  - the results of any calculations and tests
  - any general and current relevant information about how to safely use, handle, store, construct, inspect, clean, maintain, repair, or otherwise work near the imported products.

These requirements apply across the product's entire lifecycle – from construction or assembly, through to everyday use, decommissioning and disposal.

Imported products must also meet all New Zealand regulatory requirements relevant to that product.

For more information on the following, see the Resources webpage

Upstream duties for suppliers (Section 42 of HSWA)

A supplier supplies plant, structures or substances that may be used in a workplace.

A supplier has a duty, so far as is reasonably practicable:

- to make sure the products they supply do not create health and safety risks for the people that use them and those nearby
- to make sure the products they supply have been tested so they are safe for use in a workplace

- to give the following information to those who will use the supplied products:
  - the purpose or intended use of each product
  - the results of any calculations and tests
  - any general and current relevant information about how to safely use, handle, store, construct, inspect, clean, maintain, repair, or otherwise work near the supplied products.

These duties do not extend to the sale of second-hand plant sold 'as is'.

These requirements apply across the product's entire lifecycle – from construction or assembly, through to everyday use, decommissioning and disposal.

For more information on the following, see the Resources webpage

Upstream duties for installers, constructors or commissioners of plant or structures (Section 43 of HSWA)

An installer/constructor builds and/or assembles and installs plant and structures that may be used at a workplace. A commissioner performs adjustments, tests and inspections on plant and structures before they are used for the first time in a workplace.

An installer, constructor or commissioner has a duty, so far as is reasonably practicable, to make sure that the way the plant or structure is installed, constructed or commissioned does not create health and safety risks to the people that come into contact with it across the product's entire lifecycle – from construction or assembly, through to everyday use, decommissioning and disposal.

For more information on the following, see the Resources webpage

Appendix 6: Approach to managing risk

Managing risk across a system

If you are new to managing risk, read this Appendix.

The following section looks at the principles of risk management. Most of them will be familiar to you but they are worthwhile repeating.

Think about how you will manage risk across the whole system. This applies equally if you are a principal or a contractor.

If you are a forest manager, for example, think about the whole project, from establishment and planting, through roading and landings, to harvesting, and replanting.

If you are a harvesting contractor, think about all the parts and processes and actions that go into the job over the duration of the contract.

Think about the risks and the control measures that you might apply but also think about what those control measures could do further down the line. If they create potential risks, then you need to weigh those up and look for a solution that provides the least total risk for all parties.

Forestry operations involve different businesses working on the same site operating at different times in a forestry cycle that is measured in years.

It is complex.

All PCBUs involved in the forestry and harvesting contracting chain have health and safety responsibilities.

MANAGING RISK IN DYNAMIC ENVIRONMENTS

Things change and sometimes they can change fast.

Take into account the dynamic nature of your work and work environment when identifying hazards, assessing risks and deciding what control measures to use.

Train workers to recognise unanticipated risks and what control measures to use. For example:

- What do they do if they are manual felling and the wind comes up, or it changes direction? At what point are they to stop work and reassess the risks?
- What do they do if there is an electrical storm?

Workers need to be able to recognise when a situation has become unsafe, and stop work until the risks can be adequately managed.

Approach to managing risk

STEP 1: IDENTIFYING THE HAZARDS

The first step is to consider all the things in your work and workplace that could cause injury or harm. These could be physical objects, foreseeable actions or particular situations; or less tangible things such as fatigue, weather events, and 'wild-cards' like unexpected worker actions.

There is a number of ways that you can do this.

- Talk with your workers. Get them to think about what they do and what hazards they see.
- Follow a worker through a task. Look for where things might go wrong.
- Think about the step-by-step process of a particular activity. What actually happens when a task is done?
- Walk around the workplace. Look for hazards. Think about what could go wrong and how you might prevent that.
- Talk with other forestry operators and the industry body about any incidents, accidents or near misses that you could learn from.
- Search online for any incidents that have happened internationally and show what could happen in a similar situation for your business.
- Always ask yourself, 'What could go wrong?'

Why you must talk with your workers about health and safety

- It is compulsory. Under HSWA (the Health and Safety at Work Act) you **must**, so far as is reasonably practicable, engage with your workers and their representatives when identifying hazards.

- It is good practice. Your workers know about things that you may not. They know how they do their jobs, and they know when things can be done better. They also know the short-cuts and workarounds. This is work as it is in real life rather than work as you might think it should be.
- It is the workers who are at risk of being hurt or being killed. They have a very real interest in making sure that they are not hurt or killed.

Examples of things that could go wrong

The table below gives examples of common hazards for forestry workers and operations. They are by no means a complete list. Use them as a starting point for developing your own list of hazards.

Something to think about. When you are identifying hazards, think about the length of a contract and, also, the lifespan of a forest. Think about risks that might come up in the future or things that might increase risk such as severe weather and storms.

HOW COULD PEOPLE BE HARMED?	EXAMPLES
Difficult landscape or terrain could result in workers being injured through slips, trips or falls	– steep slopes and drop-offs – rough terrain – rivers, creeks and water channels – existing forest – unstumped land
Poor or extreme weather conditions could expose workers to physical harm	– hot or cold temperature extremes – heavy rain, flooding – strong winds – UV exposure
Using plant that exposes workers to harmful fumes, excessive noise or vibration, cutting edges for example	– plant that produces excessive fumes, vibration or noise – cutting tools – chainsaws and brushcutters – plant that is reliant on cables or rigging systems
Poorly built tracks and forestry roads or poor traffic management could expose road users to harm	– narrow tracks and drop-offs – poor visibility – inadequate traffic management
Poor landing layout resulting in congestion and vehicles/people working closely together	– people working near machinery and mobile plant
Workers exposed to harmful substances while working	– hazardous substances being used such as herbicides, petrol and diesel – hazardous substances being stored on site or transported to and from site – chemical and fuel spills – battery storage and recharging – burst hydraulic hoses – vehicle and plant emissions (carbon monoxide and diesel particulate matter) – dust disturbed during digging, excavation or mobile plant movement – wood dust
Workers contacting overhead power lines and services resulting in electric shock	– working with machinery near overhead lines – damaged lines resulting from a crash or weather event
Workers falling while working at height	– working on ladders and height-access equipment – working on mobile plant and machinery
Workers being hit by falling objects	– broken branches sitting in the canopy – dead trees – windthrow
Workers working excessive hours/shift work resulting in fatigue/impairment	– long travel times to site – working at night – excessive overtime and long working hours
Workers being injured carrying out manual tasks	– lifting or handling heavy objects – repetitive tasks
Workers in isolated or remote locations not having access to immediate help if injured	– lone workers
Unauthorised persons at worksites being hurt by plant or harvesting activities.	– public entering forest sites without permission
Workers who are impaired or distracted making mistakes	– impairment of workers through drugs, medication, alcohol, stress or fatigue – worker distractions such as cellphones, work pressures, home pressures
Workers being harmed by poor work relationships	– bullying – harassment – violence

STEP 2: ASSESSING THE RISKS

Once you have identified the hazards, you will need to work out what risks they present.

You **must**, so far as is reasonably practicable, engage with your workers when assessing risks.

With every hazard that you have identified, think about:

- What is the likelihood of the risk? (Is it reasonable to expect that it will eventually happen if the task/activity is repeated numbers of times?)
- What harm could happen? How serious is the harm and what is the worst-case scenario?
- How many people are likely to be exposed to the risk? Do their skill or experience levels influence the likelihood of the harm occurring?

All risks need to be managed. Risks that have the potential for causing serious injury or death, or chronic ill-health have priority. Just because a risk has lower likelihood of occurring or lower potential for harm does not mean that it can be ignored.

An example. The likelihood of someone being struck by falling branches during manual felling is high. The potential consequences are likely to be severe – in the worst case, death. Every worker involved in manual felling is exposed to that risk. Manual felling is high-risk/high consequence, so you would give priority to managing the risks.

STEP 3: MANAGING THE RISK

The essential rules of risk management are:

1. You **must** eliminate risks so far as reasonably practicable.
2. If you cannot eliminate the risk, you **must** minimise it so far as is reasonably practicable.

The extent of the duty to manage risk depends on the ability of each PCBU to influence and control the matter.

You **must**, so far as is reasonably practicable, engage workers when making decisions about ways to eliminate or minimise those risks.

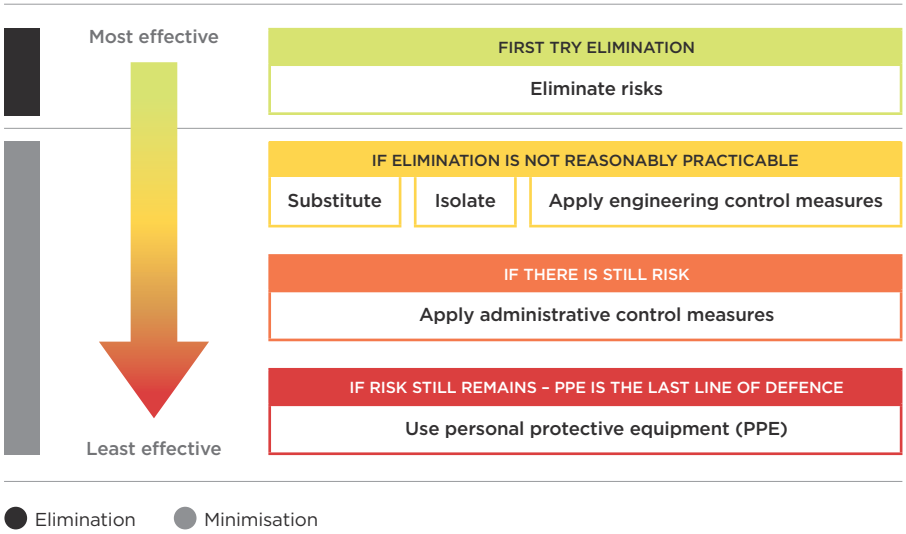
There are certain risks that must be dealt with in a certain way. These are specified in the health and safety regulations.

Certain risks require you to use the prescribed risk management process (including the hierarchy of controls) to manage them. For example, remote or isolated work, falling objects and working under raised objects.

If the risk is not specified in regulations, you decide how to manage the risk.

For more information, see Resources webpage

Use the hierarchy of control measures to minimise risk. These operate from the highest level of protection and reliability to the lowest.



THINK ABOUT IT LIKE THIS

Eliminate (get rid of the hazard)

Change or redesign the way you do a job so that the hazard is removed or eliminated. For example, the risk of felling on steep slopes can be eliminated at the establishment stage by not planting those slopes.

Substitute (replace)

Replace a process or a material with a less hazardous one. For example, replacing manual felling with mechanised felling or using mechanised grapples for breaking out.

Isolate (prevent access)

Use physical control measures or equipment to keep people away from the hazard.

Apply engineering control measures

Change the physical components of plant, structure or work area to reduce or eliminate exposure to hazards.

This could include such things such as enclosing or guarding dangerous items of machinery and equipment. Another example of an engineering control would be using chain catchers and chain shot guards on harvesting heads and installing thick polycarbonate windshields on harvesters.

Administrative control measures (organise)

Put in place procedures to make sure that the work can be done safely.

Examples are:

- using job rotation to reduce the time workers are exposed to hazards
- prohibiting the use of cellphones when involved in hazardous work
- having daily toolbox talks.

Standard Operating Procedures (SOPs) are an administrative control. They do not eliminate or minimise risks but once risks have been eliminated or minimised, they can be used to manage the remaining risk.

PPE

Personal protective equipment (PPE) is the last line of defence. PPE is only used when other control measures alone cannot adequately manage the risk.

PUTTING THE CONTROL MEASURES IN PLACE

Once you have worked out what the most effective control measures are, put them in place as soon as possible.

Engage with your workers. Make sure that they understand:

- the risks that you have identified together
- the control measures that have been chosen and put in place
- how to apply the control measures (what they have to do)
- why it is important to use the control measures.

MONITORING THE CONTROL MEASURES

Control measures are not 'set and forget'. Situations change, as will your business and processes. It is important that you monitor how your control measures are working, to make sure that they remain fit-for-purpose, they are suitable for the work, and that workers are using them correctly.

If you are required to use the hierarchy of controls, then you **must** make sure the control measures remain effective and review the control measures.

Engage with your workers and their representatives to see if the control measures are eliminating or minimising work risks.

Check incident reports and near miss reports (and encourage your workers to report incidents and near misses).

Carry out inspections of the work and the site(s), paying particular attention to known risks and risk control measures.

Monitor regularly. Make sure all policies, processes and systems have a scheduled date for a review or audit to check that they are being followed and are still fit-for-purpose.

ACTING ON LESSONS LEARNT

If you find that your control measures are not working effectively, or if your workers have suggestions for improving them, take action.

If there is an incident or near-miss, investigate. Find out what caused it and what needs to change to make sure it does not happen again. If need be, go through the risk management steps again and look at how and where you might adapt or improve control measures.

Look outside your own business. Observe what is happening in the industry from the industry association and other forestry operations. Look internationally, too. There are always things that you can learn and improve to make for better health and safety.

A quick summary of risk assessment.

Follow these steps:

- identify what could go wrong
- identify who might be affected and how they might be harmed
- identify controls that are needed to stop it going wrong
- show that any remaining risk after all reasonable controls are in place is low enough to be acceptable
- record all of your findings and keep these records
- tell everyone what they need to know and do
- make sure it all gets done
- ensure that if anything changes, you check you have got the right things in place. If not, stop the activity and review what is needed.

Appendix 7: Standards and qualifications

Standards

The following standards are referred to in *Safe practice for forestry and harvesting operations* (up to date at the time of publication). The standards listed are the minimum requirement. Other standards that give equal or better outcomes for safety, can also be used.

For PPE, look for the mark/stamp to check it is compliant with the relevant standard. You are not expected to obtain copies of these standards.

TOPIC	STANDARD
High-visibility clothing	– AS/NZS 4602 (Class D,D/N,N) or AS/NZS 1906 (Class 1,2,3) or – *New Zealand Forestry Guidelines for High-Visibility Clothing*
Leg protection for workers using a chainsaw	– *AS/NZS 4453.3:1997 Protective clothing for users of hand-held chainsaws, Part 3, Protective Legwear* or – any other Standard that has the same or more stringent criteria
Protective toe caps for footwear	– *AS/NZS 2210.1:2009 Safety, protective and occupational footwear Part 1* or – any other Standard embodying the same or more stringent criteria
Safety helmets	– *AS/NZS 1801:1997 Occupational protective helmets* or – *ATV–NZS 8600:2002* or – any other Standard embodying the same or more stringent criteria such as EN 397
Hearing protectors	– *AS/NZS 1270:2002 Hearing protectors* or – any other Standard embodying the same or more stringent criteria
Eye protection (not forestry-type mesh visors)	– *AS/NZS 1337:2010 Eye protectors for industrial applications, Amendment 1 Sept 1994: Amendment 2 Oct 1997* or – any other Standard embodying the same or more stringent criteria
Gloves	– *NZS 5812:1982 Industrial protective gloves Reconfirmed:1989* or – any other Standard embodying the same or more stringent criteria
Respiratory protective devices	– *AS/NZS 1715:2009 Selection, use and maintenance of protective respiratory devices and 1716:1994 Respiratory protective devices, Amendment 1 Feb 1996* or – any other Standard embodying the same or more stringent criteria
Seat belts and seat harnesses	– *ISO 6683:2005 Earth-moving machinery – Seat belts and seat belt anchorages Performance requirements and tests* – SAEJ386: 2022 *Occupant restraint system for off-road work machines*
Safety harnesses, belts and lanyards used in silviculture, harvesting and seed collection	– *AS/NZS 1891.1:2007: Industrial fall-arrest systems and devices – Harnesses and ancillary equipment* and *AS/NZS 1891.4:2009: Industrial fall-arrest systems and devices – Selection, use and maintenance* or – any other Standard embodying the same or more stringent criteria
Helmets for ATVs (for all persons operating, or riding as a passenger)	– *NZS 8600:2002 All-terrain vehicle helmets*
Roll-over protective structures (ROPS)	– *ISO 8082.1:2009:Self-propelled machinery for forestry – laboratory tests and performance requirements for roll-over protective structures. Part 1* – *ISO 8082.2:2011 Self-propelled machinery for forestry – laboratory tests and performance requirements for roll-over protective structures. Part 2* – *AS/NZS 4024 (series) for machine guarding* – *AS 5327:2022 for safe access or AS/NZS 1657 for fixed platforms, walkways, stairways and ladders*
Falling object protective structures (FOPS)	– *ISO 8083:2006 Machinery for forestry, falling object protective structures, laboratory tests and performance requirements* – *ISO 3449:2005 Earth-moving machinery – Falling-object protective structures – Laboratory tests and performance requirements*
Operator protective structures (OPS)	– *ISO 8084:2003 Machinery for forestry, operator protective structures, laboratory tests and performance requirements*

TOPIC	STANDARD
All load-bearing wire rope used in forest harvesting work should have an independent wire rope core or a wire strand core	– *BS/NZS 302: Part 5:1987 Specification for ropes for hauling purposes* or – any other Standard embodying the same or more stringent criteria
Traction aid winches	– *ISO 19472.2:2022 Machinery for forestry – Winches – Part 2: Traction aid winches*
Cranes, hoists and winches	– *AS/NZS 1418 – Cranes, hoists, and winches*
Steel wire rope	– *AS 2759:2004 – Steel wire rope – Safe use, operation and maintenance*
Ladders	– *AS/NZS 1892.1:1996 Portable ladders* – any other Standard embodying the same or more stringent criteria
Petrol containers	– *AS/NZS 2906:2001 Fuel containers – Portable – Plastics and metal* – *ASTM F-852-99e1 Standard specification for portable gasoline containers for consumer use*

Qualifications

Where forestry qualifications are referred to in the guidance, the following are those recognised by the New Zealand Qualifications Authority:

Forestry Skill/unit Standards – Muka Tangata

Notes

Disclaimer

This publication provides general guidance. It is not possible for WorkSafe to address every situation that could occur in every workplace. This means that you will need to think about this guidance and how to apply it to your particular circumstances.

WorkSafe regularly reviews and revises guidance to ensure that it is up-to-date. If you are reading a printed copy of this guidance, please check worksafe.govt.nz to confirm that your copy is the current version.

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