

# FORESTRY: GUIDE TO MANAGING RISKS OF GENERAL HAZARDS IN FORESTRY OPERATIONS

This Guide includes information on the more common hazards of forestry operations and practical examples of ways you can control the risks associated with them. It is part of a series of forestry industry material and should be read and used together with the *General guide for managing risks in forestry operations* and specific guidance material for:

- [growing and managing forests](#)
- [cable logging](#)
- [coupe and harvesting site access and preparation](#)
- [timber harvesting operations](#)
- [log landings](#)
- [log extraction](#)
- [loading, transporting and unloading logs](#)
- [infield processing of forest products, and](#)
- [plant and equipment for forestry operations.](#)

These guides are available on the Safe Work Australia website.



## (Other) common hazards in forestry operations

There are other hazards common to forestry operations which can have immediate or long term health consequences. These hazards can also increase the risks during the operations set out in the forestry guides listed above.

### Hazardous manual tasks

The risks of sustaining a musculoskeletal disorder as a result of performing hazardous manual tasks must be managed.

Manual handling includes lifting, pushing, pulling, grabbing, holding, reaching for or carrying objects.

**High risk forestry activity**

**Hazardous manual tasks**

**Table 1** Common hazards and risks associated with hazardous manual tasks

Hazards and risks
<ul style="list-style-type: none"><li>■ posture</li><li>■ movement</li><li>■ force</li><li>■ length and frequency of the task, and</li><li>■ environmental conditions including heat, cold and vibration.</li></ul>

**Table 2** Control measures and processes for hazardous manual tasks

Control measures
<p><b>1. Ensure manufacturers and suppliers meet ergonomic standards.</b></p> <p>When buying equipment ensure an ergonomic check is done. Use a checklist which considers:</p> <ul style="list-style-type: none"> <li>■ cab access</li> <li>■ working posture</li> <li>■ cab visibility, and</li> <li>■ operator’s seat.</li> </ul>
<p><b>2. Hooking and unhooking logs.</b></p> <ul style="list-style-type: none"> <li>■ Where possible use a grapple.</li> <li>■ The skidder operator should ensure the ends of logs where the winch rope is to be attached or detached are raised and set up on materials to improve body posture by reducing forward bending of the back.</li> <li>■ The choker setter pulling out chokers from motorised carriage should minimise twisting and pulling by facing the carriage directly when pulling out chokers.</li> </ul>
<p><b>3. Using a chainsaw to crosscut logs.</b></p> <ul style="list-style-type: none"> <li>■ Support saw on thighs, keep back straight and bend knees to work at a lower level.</li> <li>■ Use correct starting technique, for example as described in clause 4.3.2 of AS 2727-1997: <i>Chainsaws - Guide to safe working practices</i>.</li> <li>■ Use procedures outlined in clause 2.3.4 of AS 2727-1997: <i>Chainsaws - Guide to safe working practices</i>.</li> </ul>
<p><b>4. Climbing in and out of operating cabin or onto back of machine.</b></p> <ul style="list-style-type: none"> <li>■ Keep handrails, steps and non-slip surfaces maintained and record problems using a pre-operational checklist.</li> <li>■ Keep steps and the cabin clean and regularly remove mud and other debris.</li> <li>■ Ensure you have three points of your body in contact with the machine when you climb in and out.</li> </ul>



Further information on managing the risks of musculoskeletal disorders due to manual tasks is in the [Code of Practice: Hazardous manual tasks](#).

### Vibration

Vibration can be transferred from tools or machinery to the operator. Exposure to sustained hand-arm vibration can occur in chainsaw use and operating loaders, skidders, harvesters and log trucks may involve sustained whole-body vibration. When selecting machinery consider machinery that operates with minimal vibration.

Hazards and risks associated with vibration in forest machinery and vibration control measures that should be considered when selecting forest machinery are in Table 3.

**Table 3** Specific hazards, risks and control measures for vibration in forest machinery <sup>1</sup>

High risk	Reduced risk solution	Preferred solution
Cab has no suspension, damping or other method of reducing vibration.	Cab has at least one method of reducing vibration.	The cab is suspended with special damping or other solution for minimising vibrations.
Wheels and tracks have no special arrangements to minimise vibrations.	There is some reduction of vibration by some of the arrangements as in the green column.	Vibrations are minimised by bogies or oscillating axles, lenient tracks and wide tyres or central tyre inflation.
Very little possibility for varying sitting posture by adjusting the seat.	Some possibilities to change sitting posture by adjusting the seat.	The operator can easily change the sitting posture, straighten the body and stretch the legs by adjusting the seat.

## Noise

Noise levels in forestry operations are often hazardous. The risk of hearing loss as a result of exposure to excessive noise must be managed.

Audiometric testing must be provided to those workers that are frequently required to wear PPE to protect themselves against the risk of hearing loss.

Suppliers of machinery must provide their customers with information on the noise emission values of the machinery they are supplying.

**Table 4** Control measures for exposure to noise

Control measures
<ul style="list-style-type: none"> <li>■ Noise levels of plant should be considered before using.</li> <li>■ Noise levels can be minimised by regular maintenance of plant, sound proofing cabins where possible, scheduling noisy work and rotating tasks and rest breaks.</li> <li>■ Hearing protection should be used by workers carrying out forestry operations.</li> </ul>



Further information on the management of noise in the workplace is in the [Code of Practice: Managing noise and preventing hearing loss at work](#).

## Solar ultraviolet radiation

Exposure to ultraviolet radiation (UVR) from sunlight can cause sunburn, eye damage, keratoses or sunspots and skin cancers. Solar UVR exposure is well established as the major cause of skin cancer in Australia.

It is the UVR component of sunlight which is harmful. The level of solar UVR is not directly related to the temperature or brightness of sunlight. This means harm can still occur on cool or cloudy days during the peak solar UVR periods of the year.

Solar UVR is greatest between 10.00 am and 2.00 pm although dangerous levels of solar UVR can still occur outside these hours. Forest workers may be exposed to the sun for long periods so their risk of developing skin cancer or other solar UVR-related illness is increased unless control measures are used.

A combination of control measures should be used to gain the maximum level of protection.

<sup>1</sup>Adapted from the Ergonomic Checklist for Forest Machines, ErgoWood, European Commission, 2006.

**Table 5** Control measures for exposure to solar UVR

Control measures
<p>Minimise the risk of solar UVR exposure, so far as is reasonably practicable, by:</p> <ul style="list-style-type: none"> <li>■ using PPE including long-sleeve lightweight protective clothing with a UPF rating of 50+, a hard hat fitted with an 8 cm brim where possible, sunscreen and sunglasses</li> <li>■ working in the shade—natural or artificial</li> <li>■ rotating workers and their tasks, and</li> <li>■ rescheduling or reorganising work to early morning or late afternoon when solar UVR intensity is lower.</li> </ul>



Further information on protecting workers from exposure to solar UVR is in the *Guide on exposure to solar ultraviolet radiation (UVR)*.

## Fatigue

Fatigue is an acute or ongoing state of tiredness requiring sleep or rest for recovery.

Fatigue is a health and safety risk in the workplace as it affects the physical and mental capacities required to perform work. This can potentially increase workplace incidents. As sleep debt builds up fatigue can cause errors in judgement which may lead to injury or death.

Work-related fatigue puts at risk the health and safety of everyone on-site. Everyone in the supply chain of timber harvesting and haulage has a role in ensuring the risk of fatigue for forest workers is minimised. Physical and mental fatigue can create risks to health and safety due to a reduced ability to carry out tasks.

Physical tasks like operating a chainsaw for long periods and mental tasks like hazard assessment and following safe working procedures are examples of activities which can be affected by fatigue.

Mental fatigue can be described as a loss of alertness ending in sleep and is associated with, but not limited to, the following factors:

- lack of sleep
- time of day—the natural body clock determines when people are sleepy, and
- work demands e.g. the length of time spent on a task.

**Table 6** Control measures for fatigue

Control measures
<p><b>Physical fatigue</b></p> <p>Physical fatigue can be managed by:</p> <ul style="list-style-type: none"> <li>■ using equipment designed to reduce physical effort required to perform a task</li> <li>■ taking regular scheduled breaks</li> <li>■ adopting work practices which reduce unnecessary muscular effort and strain, and</li> <li>■ replacing fluids and eating nutritious food.</li> </ul>

Control measures
<p><b>Mental fatigue</b></p> <p>Mental fatigue can be managed by:</p> <ul style="list-style-type: none"> <li>■ taking regular rest breaks during the working day, and</li> <li>■ scheduling work to                             <ul style="list-style-type: none"> <li>■ allow 7-8 hours of continuous, undisturbed night sleep for forest operators on a daily and weekly basis</li> <li>■ minimise driving at night following long working days.</li> </ul> </li> </ul>

### Working alone

Working alone means to work at a worksite where, because of the location, time or nature of the work, you cannot get easy access to help if you are injured, ill or there is an emergency.

Working alone can increase risks for work that is already hazardous. A process to assess the risks associated with working alone should be developed and followed.

Ideally workers should not work in a position or location so isolated they are not in visual or audible signal contact with another person. Exceptions to this requirement may be made for workers who are provided with and have been trained to use an effective means of communication, for example two-way radios or mobile telephones.

There may be circumstances where working alone is low risk, for example walking the coupe or harvesting site for marking purposes. Other circumstances where working alone is high risk should be minimised where possible.

Hazards from working alone must be identified. Many of these are covered earlier in this Guide. The focus should be on the person carrying out the work. Consider the following questions:

- Can the risks of the job be controlled by one person?
- Is there a safe way to enter and exit the coupe or harvesting site for one person?
- Can the machinery involved in the work be safely handled by one person?
- Does the work involve lifting objects too big or heavy for one person?
- Is more than one person needed to use essential controls to operate the machinery?

As a result of this assessment the primary risk control should be to prohibit the activities creating high risk, for example manual felling, and to apply specific control measures to the activities where working alone may be justifiable.

**Table 7** Control measures for working alone

Control measures
<ul style="list-style-type: none"> <li>■ Organise work arrangements so people are not working alone.</li> <li>■ Ensure:                             <ul style="list-style-type: none"> <li>■ first aid and emergency communication suitable for lone workers is available, and</li> <li>■ regular contact e.g. every 2 hours between the lone worker and supervisor by either telephone, two-way radio or an agreed 'check in' procedure.</li> </ul> </li> <li>■ Check a lone worker has returned to their base or home on completion of a task.</li> <li>■ Use devices designed to raise the alarm in an emergency which are operated manually or automatically by the absence of activity e.g. 'dead man' switches.</li> </ul>

Arrangements for working alone should be agreed in consultation with contractors, health and safety representatives and workers. Training and information should be provided to ensure procedures are understood.

### Working at night

As well as following the working alone procedures above, artificial lighting should be suitable to conduct operations safely.

Artificial lighting should be provided for the immediate work area for workers to operate outside daylight hours or in poor light.

**Table 8** Control measures for working at night

Control measures
<ul style="list-style-type: none"> <li>■ The whole side of the log truck and the top of the pins should be visible.</li> <li>■ Designated areas for workers working outside a protective canopy should be lit and visible to other machine operators, for example by using reflective tape, marker or flashing lights.</li> <li>■ Log stacks should be fully visible while placing and removing logs.</li> <li>■ The arc through which the trees and logs are felled or swung should be visible in advance of them being swung or felled and checked for hazards before starting operations.</li> </ul>

### Slips, trips and falls

The risk of a person falling from one level to another must be managed.

Falls from height can occur when checking machinery. Simple precautions that should be taken include keeping metal surfaces clean of spilled fuel or oil, using the engine cover as a barrier and, where access above 2 metres in height or in hard to reach places is needed, using a temporary work platform. This could be the back of a utility with a non-slip surface, for example a rubber mat or a secured ladder.

Slips and trips that result in a fall due to uneven ground, forest debris and other obstructions are a common hazard in most forestry activities.

**Table 9** Control measures for slips, trips and falls

Control measures
<ul style="list-style-type: none"> <li>■ Owners and suppliers should ensure the design of the equipment allows the operator to climb down from the machine facing forwards. The steps should be no less than 24 cm in depth and have a uniform rise of 20 to 30 cm. The distance from the ground to the first step should be no more than 40 cm.</li> <li>■ Machinery should have:             <ul style="list-style-type: none"> <li>■ a handrail or handle with comfortable grip and hand clearance no more than 85 to 130 cm from the ground</li> <li>■ a main door opening at least 170 cm in height, at least 65 cm width in the centre and at least 45 cm width at the bottom</li> <li>■ a main door that is easy to handle and will remain open when the machine is tilted or is in wind, and</li> <li>■ two functional emergency exits in addition to the main cabin entrance.</li> </ul> </li> <li>■ Manual fellers should ensure the area around the tree and the escape route is cleared before felling the tree.</li> </ul>

### Control measures

- Operators should ensure they maintain three points of contact with steps or handrails when exiting or entering the machinery.
- Skidder operators must ensure, so far as is reasonably practicable, the area where snigs are to be hooked up or unhooked is clear of hazards that may cause slips, trips and falls.
- Excavators and loader operators should ensure the landing area is kept free of debris which may cause slips, trips and falls.
- Operators of other machines like harvesters, forwarders and feller bunchers should ensure the area around their machine is free of debris which may cause slips, trips or falls before leaving their cabin.



Further information on managing the risks of falls at a workplace is in the [Code of Practice: \*Managing the risk of falls at workplaces\*](#).

### Extreme weather conditions

The effects of heat and cold on the body depend on the way several things interact including environmental factors like:

- air temperature—how hot or cold the surrounding air is
- humidity—the moisture content in the air—higher humidity will increase the effects of high air temperature
- radiant heat—from the sun or from the plant or a work process
- rain—a combination of weather conditions may contribute to reduced core body temperature causing hypothermia, and
- air movement—air or wind speed and air circulation can reduce the effect of high air temperature.

When combined with the physical condition and capability of the worker, the physical effort required by the worker and the clothing including PPE which the worker is required to wear, may lead to conditions like heat stress or hypothermia.

**Table 10** Common hazards and risks associated with extreme weather conditions

### Hazards and risks

- exertion when the temperature exceeds 35°C
- heat stress
- dehydration from lack of readily available fluids or drinking water, and
- cold, wet and windy conditions.

There are many ways of eliminating or minimising these hazards and risks. The control measures to suit the circumstances should be determined by a risk assessment taking into account the nature of the work and the duration of time for which a worker is exposed to these conditions.

**Table 11** Control measures for extreme weather conditions

Control measures
<p><b>Extreme heat</b></p> <ul style="list-style-type: none"> <li>■ Provide:                             <ul style="list-style-type: none"> <li>■ operators with air-conditioned cabins</li> <li>■ shade where possible—at least for rest periods</li> <li>■ frequent rest breaks to allow workers to cool down, and</li> <li>■ water and making sure workers drink enough water to offset body fluid lost through sweating—one litre per hour may be required in hot and arduous work situations.</li> </ul> </li> <li>■ Schedule heavy work and tasks requiring PPE for cooler times of day.</li> <li>■ Reduce workload by doing less heavy work or redesigning the task.</li> <li>■ Allow workers time to acclimatise to working in heat.</li> <li>■ Wear lighter work clothes where possible.</li> <li>■ Stop work if conditions become unsafe or uncomfortable to continue.</li> <li>■ Tell and train workers to recognise the symptoms of heat-related illness.</li> </ul>
<p><b>Cold or wet conditions</b></p> <ul style="list-style-type: none"> <li>■ Provide:                             <ul style="list-style-type: none"> <li>■ operators with enclosed heated cabins</li> <li>■ protection from wind and rain e.g. a shelter like a hut or the cabin of a vehicle with heating will offer relief from extreme conditions</li> <li>■ water and making sure workers drink enough to offset body fluid lost through sweating and breathing, and</li> <li>■ warm clothing—clothing should be worn in light, loose-fitting layers and a water-proof outer layer will provide protection from rain.</li> </ul> </li> <li>■ Cease work if conditions become too wet or cold to continue safely.</li> </ul>

### Working near overhead or underground electric lines

Electric lines pose significant risks including electrocution for people involved in forestry operations. Contact with energised overhead or underground electric lines can be fatal, whether they are carrying a voltage as high as 400 000 V or as low as 230 V. It is not necessary to touch an overhead electric line to be electrocuted. A ‘flashover’ or ‘arc’ can electrocute you when you are close to a line conductor.

The following should be considered:

- Are workers or plant likely to go near electric lines? If so, how high are the lines and machinery?
- Lines may be hard to see in the sky or hidden by trees.
- Is there a safety observer in place to watch machinery when it is moving and is likely to come close to electric lines?
- The relevant electricity supply authority should be contacted for information about specific requirements when working near electric lines including the qualifications required for people working near electric lines.
- Emergency rescue procedures should include calling the electricity supply authority to isolate the electricity supply before trying to rescue a person receiving an electric shock.



Most risks can be addressed by observing safe working distances for people and plant working near electric lines. Safe working distances will depend on the type of work being carried out and the voltage of the electric lines. You should contact the relevant electricity supply authority to determine the type of control measures needed. This may include isolating the line.

As a general precaution tree felling operations should not be carried out within two dominant tree lengths of an overhead or underground electric line without approval from the relevant electricity supply authority.



Further information about electrical safety is in the *General guide for working in the vicinity of overhead and underground electric lines* and the electricity regulator.

### Fire hazards

There is always a risk of fire in a forest but this risk is particularly high during long periods of hot or dry weather. Before starting forestry operations it is important to assess and minimise the risk of fire.

The following control measures can be used to help minimise, so far as is reasonably practicable, the risk of fire.

**Table 12** Control measures for fire hazards in forestry operations

Control measures
<ul style="list-style-type: none"> <li>■ Develop a fire management plan.</li> <li>■ Check current and forecast weather conditions regularly so work can be scheduled to minimise the risk of fire danger.</li> <li>■ Where possible use vehicles which generate minimal sparks or heat. Metal tracks on mobile plant and sparks and heat from engines and exhaust systems are a potential source of ignition.</li> <li>■ Equip vehicles where possible with firefighting equipment like fire extinguishers or portable, hand-operated, water-containing firefighting pumps.</li> <li>■ Remove combustible materials like leaves and wood from mobile plant and areas where flammable materials may be stored regularly.</li> <li>■ Keep firebreaks, roads and tracks free from flammable or combustible materials.</li> <li>■ Store flammable chemicals like fuels and solvents in fire-proof storage areas where possible and out of direct sunlight.</li> <li>■ Prohibit smoking in areas where flammable and combustible materials are stored.</li> <li>■ Consider prescribed burning to reduce fuel loads and minimise the risk of bush fires—burning should only be conducted by those who are competent and experienced in doing so.</li> <li>■ Consider using grazing animals to reduce fuel loads.</li> <li>■ Regularly prune or trim plantations to allow easy access for emergency vehicles and fire-fighting equipment if a fire breaks out.</li> <li>■ Stop operations if the risk of fire cannot be minimised to allow work to continue safely.</li> </ul>



### Further information

Codes of practice, guidance material and other resources are on the [Safe Work Australia](http://www.swa.gov.au) website (www.swa.gov.au).