Bushcare Boosters Module 1

Working Safely and Weed Control Techniques

Participant's Workbook

Disclaimer

The information in this training module is from a range of sources and considered to be good practice. However there may be differences depending on the location of sites, the scale of the on-ground works and changes in methodology that are developed with ongoing research and monitoring.

Legislation on native species, weeds, occupational health and safety and herbicide use may vary across Australia. It is imperative that trainers and organisations using this training module check their legal obligations under Local, State and Australian Government laws and regulations.

All liability arising directly or indirectly from the use of or any omissions in the information in this manual is expressly disclaimed. Further professional advice should be sought when required.

Acknowledgements

Workshop materials developed by:
Frank Gasparre
Bushland Management Solutions
PO Box 476 Eastwood NSW 2122
Phone: 9858 2727
Email: hillsbush@bigpond.com

Editing by Nicola Dixon, Judy Christie and Rosanna Luca.

Steering Committee: Leanne Bunn (Randwick Council), Sue Stevens (Waverley Council), Robert Stevenson (City of Canada Bay).

Thanks to Randwick Council for hosting the pilot workshop for this module.

Thanks to The National Trust of Australia (NSW) for permission to use the photograph on the front cover and all illustrations (by Virginia Bear).

Published by Sydney Metropolitan Catchment Management Authority, PO Box 3720, Parramatta NSW 2124. (02) 9895 6207 www.sydney.cma.nsw.gov.au

This project has been assisted by the New South Wales Government through its Environmental Trust

NSW GOVERNMENT | Catchment Management Authority Sydney Metropolitan

NSW GOVERNMENT | NSW Environmental TRUST

Contents – Participant's Workbook

About the Bushcare Boosters training modules **1**

About Module 1 ..... **1**

Learning Outcomes for this workshop (Module 1) **2**

1. All about weeds **3**

1.1. Where do weeds come from 3

1.2. Why do weeds grow so well 4

1.3. Weed characteristics 5

1.4. Why are weeds so harmful 5

2. Working safely on a Bushcare site **6**

2.1. Duty of care 7

2.2. Hazards at your Bushcare site 7

2.3. Emergency procedures 8

3. Controlling weeds **9**

3.1.The law on chemical use 9

3.2. Weed control techniques 10

Resources: Publications and Websites **16**

Appendix 1: Site Risk Assessment Template **18**

Appendix 2: Risk Assessment Matrix recommended by WorkCover NSW **19**

About the Bushcare Boosters training modules

This module is part of the **Bushcare Boosters** workshop program developed by the Sydney Metropolitan Catchment Management Authority as support training material for Bushcare volunteers. Boosters workshops aim to help volunteers value and understand their Bushcare and other on-ground work as part of the big picture of biodiversity restoration across Australia. The program encourages recognition of the interconnectedness of work across all sites, big or small and its contribution to habitat health and landscape change.

The series includes:

Module 1 – Working safely and weed control techniques
Module 2 – Bushcare and the 'Big Picture'
Module 3 – The birds and the bees of bushcare

The modules do not need to be completed in numerical order or in their totality. The series has been designed to support a flexible delivery approach that can be tailored to meet the individual needs of each training group. Each workshop in the Bushcare Boosters program can be delivered as a stand alone training event or combined with other modules and field sessions. There are specific learning outcomes for each workshop.

About Module 1

Module 1 covers weed characteristics, basic weed control techniques, and general safe work practices and methodology.

The content is of an introductory level and is most suitable for volunteers who have some practical experience in the field and who wish to participate in a short refresher course to develop a better understanding of environmental restoration techniques and safe work practices. It is not aimed at volunteers who have obtained accredited training in environmental restoration.

Learning outcomes for this workshop (Module 1)

This workshop has been designed to help you to:

- Understand where weeds come from, why they are so successful, the characteristics of weeds and why they are harmful to our environment.
- Gain an introductory knowledge of the basic weed control techniques you will use at your Bushcare site.
- Be aware of the rights and responsibilities you have with regard to introductory 'workplace' health and safety when you are volunteering on-site.
- Undertake risk assessment at your site and develop strategies to reduce those risks.

ACTIVITY 1: GETTING TO KNOW THE GROUP

To get to know your fellow volunteers in the group, please introduce yourself and tell them the following:

- **Your name and the site(s) where you volunteer.**
- **What you would like to get out of today's session.**

1. All about weeds

1.1. Where do weeds come from?

There are many ways that weeds become introduced into new areas. This can include deliberate and accidental introductions such as:

- landscaping – e.g. lantana
- erosion control – e.g. bitou bush
- cultural – e.g. alligator weed
- medicinal uses – e.g. horsetail
- horticulture - ornamental flowering plants, e.g. morning glory
- agriculture - introduced pasture grasses, e.g. whisky grass
- incidental introductions – e.g. contaminated seed
- acclimatisation societies - early colonists
- animal feed – e.g. karoo thorn was brought out to feed the Rhinos at Western Plains Zoo
- Internet seed purchases – too many to name…

Many weeds are exotic, meaning that they come from other parts of the world. They often thrive here due to the similar conditions to their home ranges such as climate, soils and or geology. However, native Australian plants can also become weeds when introduced into areas of Australia where they did not previously grow. For example, the cootamundra wattle (*Acacia baileyana*) was originally found only in the broad region it is named after, but has become a popular garden planting across Australia. It is now spreading from some of these garden plantings into natural areas. Because of this, some councils in the Sydney region consider this plant a weed, although it is an Australian native.

TIP:
Understanding why the weeds are there and the conditions they like is the first step to getting rid of them!

ACTIVITY 2:
PICK A WEED THAT IS GROWING AT YOUR BUSHCARE SITE.

a. How do you think it got into Australia?

b. How do you think it became established at your site?

c. Why is it thriving now?

1.2. Why do weeds grow so well?

Some people mistakenly assume that our native plants must be inferior to introduced plants, and that being taken over by weeds is somehow part of nature. This is not true. Many Australian plants have become major problem weeds overseas, such as the Melaleuca quinquinervia (paperbark) that is a major problem in the Florida Everglades.

Weeds can become a problem for the following reasons:

- Land degradation - allows weeds to get established
- Disturbances – increases in soil moisture and nutrients – e.g. privet, camphor laurel
- Construction - disturbs soils allowing weeds a chance to germinate – e.g. whisky grass, parramatta grass
- No natural pests and diseases - the reason rabbits and cane toads are so prevalent
- They are vigorous fast growers that like conditions created by humans - e.g. Cats Claw Creeper
- They are prolific seeders – lots of seed and efficient seed dispersal - e.g. Ludwigia
- Their seeds may last for many years – e.g. Senna can last for decades.

The reasons are as varied as the weeds themselves.

Weeds thrive when introduced into favourable environments and often benefit from human changes to the environment. Many of our natural areas will be permanently affected if weeds are allowed to spread unchecked - not to mention the economic and social damage that many weeds can cause. It has been estimated that the cost of weeds to agriculture and the environment in Australia is around $4 billion dollars annually.

ACTIVITY 3: WEED CHARACTERISTICS

Choose the weed you most love to hate. Explain the characteristics that have made it a problem at your site or another site that you know.

1.3. Weed Characteristics

Life Cycle	Description
Annual	Plants that come up quickly, set seed and die with a very short lifecycle. These weeds need to be controlled very quickly at the right time or can become a problem.
Biennial	These are plants that grow fast but over a longer period of time. Be aware of when they flower and set seed. Aim to time your work so that you can prevent them from seeding.
Perennial	Perennial plants live for several years or more and so can sometimes be tolerated for a while, but over time they might become very hard to remove. Have a plan of attack and chip away at them to gradually reduce their numbers. Think about where you start and finish, and what can be retained in the short-term as useful habitat for native fauna.

1.4. Why are weeds harmful?

There are many ways that weeds can harm the environment, the economy and society. For example:

- Agricultural weeds can cause large productivity losses (e.g. serrated tussock)
- Aquatic weeds can cause problems with water quality or transport (e.g. salvinia, water hyacinth)
- Some weeds can cause severe human health reactions (e.g. asthma weed)
- Introduced grasses in the Northern Territory are changing the burning characteristics of local vegetation
- Weeds can compete with local native vegetation (e.g. privet, camphor laurel).

The impacts of weeds on biodiversity can be enormous. With a bit of help from human land management practices, weeds can sometimes displace whole native ecosystems, having a dramatic effect on species diversity - both plant and animal diversity.

African daisy

Balloon vine

Morning glory

Alligator weed

Source: SMCMA

2. Working safely on a Bushcare site

Before we brush up on weed control techniques and skills, let's talk about working safely and avoiding injuries. There are laws in place that require a safe workplace. Believe it or not, even though most Bushcare volunteers are not being paid, your Bushcare site is a "workplace" under the law.

Occupational Health and Safety laws are a complex area of legislation. All attempts have been made to provide a reasonable summary of the requirements as they apply to Bushcare volunteers generally, however we ask that you make your own enquiries with your local agency as to the policies that might affect your volunteer site or program.

The main responsibilities of councils and organisations that support volunteers:

Your council/sponsoring organisation is responsible for making sure that working on your Bushcare site is as safe as possible.

This means that you need to:

- Be aware of the safety policies and procedures of the organisation
- Follow these policies and procedures
- Provide information to your council/organisation if required
- Notify them of any safety concerns
- Notify them if you need more training to do your Bushcare work
- Current workplace safety laws also make it a requirement for workers to be safe – yes, this means you and your fellow Bushcarers.

The main responsibilities of Bushcarers:

- Work safely at all times
- Take reasonable care for the health and safety of your co-workers who may be affected by your actions
- Co-operate with your council/sponsoring organisation in anything that they do or require, in order to ensure a safe workplace
- Ensure that your actions do not put yourself and others at risk
- Use and maintain machinery and equipment properly
- Ensure that your work area is free of hazards.

2.1. Duty of Care

Duty of care requires everything reasonably possible to be done to protect the health and safety of others at the workplace. This duty is placed on:

- All employers
- Their employees
- Any others who have an influence on the hazards in a workplace.

2.2. Hazards at your Bushcare site

Appendix 1 shows a standard risk assessment template that you can follow to explore the risks at your Bushcare work days.

Very important questions so ask before you commence a work day:

- If you work without supervision, does anyone know that you are working on site today?
- Do you have mobile phone reception, in case there is an emergency?
- Where is the best pick up point with easy access for emergency services in the event of an incident?
- Is your equipment in safe working order?
- Does anyone have first aid training?

Safety for other park and reserve users

When you are working on your Bushcare site, you should also care for other people's safety.

For example:

- Leave paths and tracks clear for other visitors and people using the area
- Don't leave herbicide unattended
- Don't leave sharp tools unattended
- Have people on lookout, or cordon off the area if you are felling large shrubs and small trees onto paths.

2.3. Emergency Procedures

If an emergency occurs on your Bushcare work day:

- Have at least one or two people attend to the injured person to the best of their ability.
- Ring for help on **000**. These calls are free, phone credit is not needed.
- Sometimes the signal of the carrier for your mobile phone may be weak or unavailable. Ring **112** as all carriers receive this number regardless of whether the phone has a sim card or credit. This number greatly increases your chances of getting help.
- You will be asked to provide the following information:
  - Service required: fire, police or ambulance
  - Your phone number
  - Location and nearest cross street
  - Type of incident e.g.:
    - **Ambulance**, number & condition of injured
    - **Police**, type of incident, danger level
    - **Fire**, type of fire, bush, dangerous chemicals
- You may need to go for help if all mobile phones are out of range or there are no phones present. If this occurs send two people if you can (a person in a hurry may trip over and not reach help, **two** people together can look out for each other while they are looking for help).
- You may need to meet the emergency service at an obvious location - have this location ready in your mind when you ring.
- Neighbours may be able to help – raise their attention if you need help.

Reporting incidents

Report all incidents of accident or injury on site to your council/supporting organisation. There is normally an accident and injury form provided by the local council that should be completed as soon as possible after the incident occurs.

For information, advice or assistance from WorkCover call **13 10 50**.

To order a WorkCover publication, call **1300 799 003**.

3. Controlling weeds

This section will run through the basic weed control techniques that you need as a Bushcarer.

- Cut and paint
- Hand weeding
- Stem scraping
- Stem injection
- Spraying (not recommended for beginner Bushcarers)
- Mechanical control

See also the "**Noxious and Environmental Weed Control Handbook**" for more information about the weed control techniques used (NSW Department of Primary Industries publication)

TIP:
Your Bushcare trainer/supervisor should demonstrate the correct use of these techniques.

3.1. The law on chemical use

The laws for the use of chemicals in Australia are very strict.

Before using any herbicide you must read the label of the herbicide and use it strictly in accordance with the label conditions. If your herbicide comes in a dispenser other than the original container, you must read a copy of the label or Material Safety Data Sheet before using the chemical.

In NSW there are laws about the qualifications of people using herbicide in the workplace. People using chemicals in the paid workforce must have approved qualifications.

You do not need to be qualified if you only use small quantities of household pesticides and herbicides as part of your work, provided that you do all of the following:

- You only apply pesticides that are ordinarily used for domestic purposes (e.g. in the home or garden), and
- You apply the pesticide by hand or by using hand-held equipment, and
- (if using the pesticide outdoors) You use no more than 5 litres/5 kilograms of concentrate or 20 litres/20 kilograms of ready-to-use product.

These household pesticides are widely available to the general public at retail outlets such as supermarkets and hardware stores.

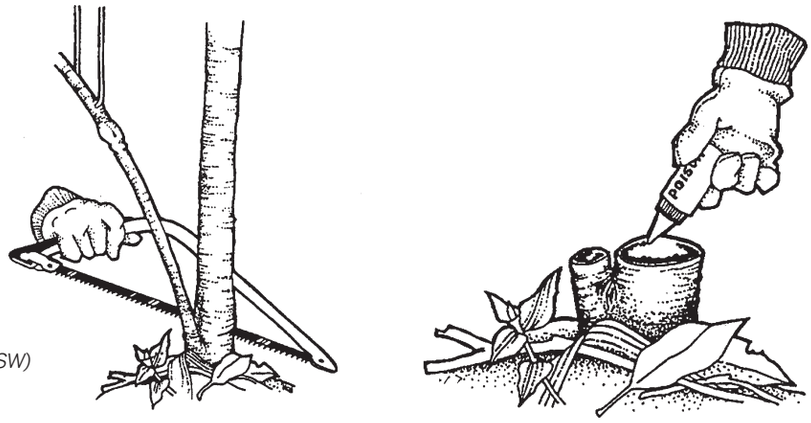
3.2. Weed control techniques

3.2.a. Cut and paint

The cut and paint technique is used on a variety of woody weeds of all sizes. It involves cutting of the plant stem (as low to the ground as possible for safety reasons), and "pasting" or "painting" of herbicide on the cut stem around the outside edge as quickly as possible (apply herbicide within 15 to 20 seconds before the cut 'scabs over').

CAUTION: The person applying herbicide must wear chemical resistant gloves. Herbicide applicator bottles are normally provided by your council or supporting organisation.

Steps
1. Make sure that the woody plant you want to remove is a weed!
2. Clear leaf litter and debris around the base of the woody weed, watch for spiders and insects.
3. Cut the stem flat and as close to the ground as possible. Sharp loppers or secateurs give the cleanest cut. High or angled stems can create a dangerous trip hazard!
4. Apply herbicide to the cut stem. Apply to the outer margins of the stem (around the cambium ring) within 15 seconds of making the cut.
5. Apply herbicide to the final cut as soon as possible after the cut is made.
Important Note: The person using the herbicide product must read the product label and apply it in accordance with the label requirements.



Cutting and painting woody-stemmed weeds
Source: National Trust of Australia (NSW)

3.2.b. Hand weeding

The techniques of crowning, hand pulling, and trowel use are common tools in weed control.

Crowning

Crowning is the main hand weeding technique use in bush regeneration. Crowning involves using a sharp implement (a boning knife in most instances) to cut out the growing point of species that grow from a crown (a central growth point). This can be successful for most tussock grasses (e.g. pampas grass, paspalum, african love grass) and some ferns such as asparagus fern (not those species with tubers).

The knife cut is inserted at around a 45^0 angle, and a cut made around the crown using an angle cutting stroke. **Note:** do not try and lever with the knife, use only a straight cutting motion in line with the angle of cut.

CAUTION: Crowning knives can be dangerous. Only try this technique after you have received careful instruction. Practice on small plants and do not use excessive force.

Crown removal

Source: National Trust of Australia (NSW)

Hand Pulling

Steps
1. Position yourself in such a way that when you pull the weed out, your body will not twist. Squatting or kneeling is best.
2. Hold the weed tightly at the base of the stem.
3. Pull to check resistance.
4. Pull with body weight distributed on both sides of the weed.
5. When hand pulling vines, take care not to let pieces of the plant break off as they are likely to regrow.

CAUTION: Be careful to use your knees to provide strength. Do not pull using your lower back muscles. Bend the knees, not the back, bend the knees, not the back!!

Hand-pulling a shallow-rooted herbaceous weed

Source: National Trust of Australia (NSW)

Digging Out

Some plants have organs below the ground that will regrow unless the whole organ is removed. Examples are turkey rhubarb/*Acetosa* (tuber) and wild ginger (Rhizome). There are sometimes chemical control options for these plants but many Bushcarers choose to remove them manually.

Steps
1. Trace the stem to the root at the ground surface.
2. Start digging using the appropriate tools. Hand trowels (cast ones are the best) are useful. Larger tools such as mattocks can be used for bigger rhizomes.
3. Dig along the root system. Some tuberous roots have weak, very easily broken root systems above the tuber. Try to dig gently and trace the roots down to the deeper tuber.
4. Push a narrow trowel into the soil next to the plant and loosen the soil. Repeat around the reproductive organ. Carefully remove the entire root or tuber and bag it for later removal.
5. Plants with adventitious roots (e.g. Honeysuckle) can sometimes be assisted out through teasing of roots using the knife or trowel.

Digging out a thick fibrous tap root

Source: National Trust of Australia (NSW)

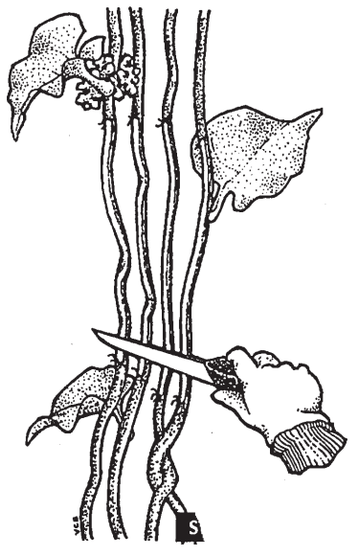
3.2.c. Stem Scraping

Stem scraping involves the use of a sharp tool, usually a bush regenerator's knife or hatchet, to scrape the stem and expose the green conducting parts of the plant. This technique is usually used on woody shrubs with large tap roots and on vines.

The stem scrape method allows the application of herbicide to a larger surface area than the cut and paint method. This is necessary for some species such as ochna and cestrum, and also for vines that have narrow stems relative to plant size such as madeira vine and balloon vine.

CAUTION: Some native vines such as pandorea or clematis can look very similar to weedy ones from the stem alone. Always check other identifiers such as foliage and fruit. If in doubt, don't!

Steps
1. Make sure that the stem you are scraping is the plant that you want to kill, especially with vines. Give the stem a gentle tug and see which leaves shake overhead.
2. With your knife, scrape a 15cm+ section of the outer surface of the stem until the green outer cambium is exposed. Apply the herbicide to the scrape straight away.
3. Avoid ring barking the stem as you want the plant to remain active and pump the herbicide through.
4. Make sure that each of the main stems is scraped. This may sometimes mean exposing the surface roots of the stem to apply a stem scrape.



Stem scraping madeira vine

Source: National Trust of Australia (NSW)

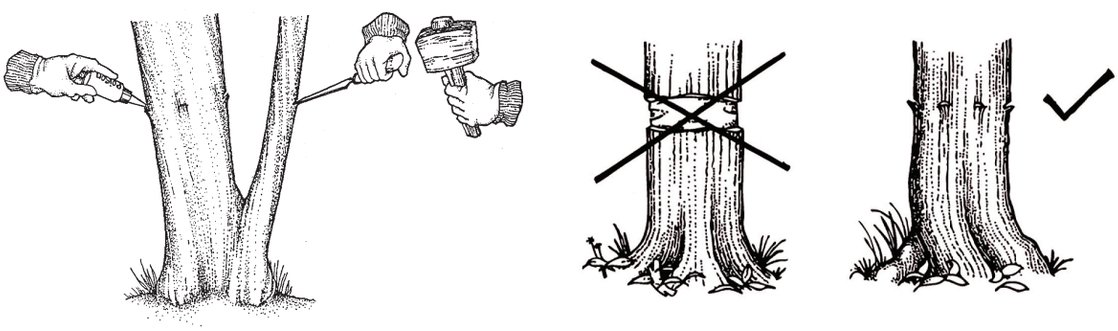
3.2.d. Stem Injection

This technique can be used to kill woody weeds such as privet, lantana and camphor laurel.

Always consult with your council before using this technique.

CAUTION: This technique can be dangerous if used in high pedestrian traffic areas or areas where people regularly pass. Avoid using it for large trees that might cause damage to an asset if they fall after dying.

Steps
1. Confirm that the plant you are about to drill is a weed - many woody stems look alike at ground layer (many Bushcarers have accidently killed the wrong plant). Give the trunk a gentle push and check which leaves move.
2. Select the appropriate herbicide.
3. Make an incision into the cambium layer deep enough for the herbicide to sit and be drawn in. This can be a shallow drill hole, a hatchet incision, or a chisel incision.
4. Do not go too deep into the woody dead tissue as the herbicide will not work there. Do not ring bark the target plant.
5. Ensure that all branching off shoots are also injected or parts of the plant may not die.



Stem injection

Source: National Trust of Australia (NSW)

Resources: Publications

TIP:
Your Council Bushcare Officer or supervisor may know of other publication with more local information.

Australian Native Plants – propagation, cultivation & use in landscaping
John W Wrigley & Murray Fagg , 1996, New Holland Publishers.

Bringing Back the Bush
Joan Bradley, 1988 (Available from CSIRO Publishing).

Bush Invaders of South-East Australia
Adam Muyt, 2001, R.G. & F.J.Richardson, Victoria.

Bush Regenerators' Handbook 3rd edition
The National Trust of Australia (NSW), 2010.

Bush Regeneration, Recovering Australian Landscapes
Robin Buchanan, 1989, TAFE Student Learning Publications.

Environmental Weeds-A Field Guide for SE Australia
Kate Blood, 2001, CRC for Weed Management Systems.

Field Guide to the Native Plants of Sydney
Les Robinson, 1991, Kangaroo Press, NSW.

Native Plants of the Sydney Region
Alan Fairley & Phillip Moore, 2010, Allen & Unwin.

Restoring Natural Areas in Australia
Robin Buchanan 2010, available through the Australian Association of Bush Regenerators

Weeds of the south-east – An identification guide for Australia.
F.J. Richardson, 2011, R.G. Richardson and R.C.H Shepherd.

Websites

Australian Pesticides and Veterinary Medicines Authority
www.apvma.gov.au

Australian Association of Bush Regenerators
www.aabr.org.au

Bushcare
A new site for the Bushcare network across the Greater Sydney region
www.bushcare.org.au

Industry and Investment NSW – Noxious weeds profiles and fact sheets
www.industry.nsw.gov.au

NSW Department of Primary Industries
www.dpi.nsw.gov.au
Look under "W" to find the Weeds information page.

Sydney Weeds Committee
www.sydneyweeds.org.au

Sydney Metropolitan Catchment Management Authority
www.sydney.cma.nsw.gov.au
For information or to order a publication email sydney@cma.nsw.gov.au

Weeds Australia
www.weeds.org.au

Workcover New South Wales
www.workcover.com.au

Work Health and Safety Act NSW
www.legislation.nsw.gov.au

Appendix 1: Site Risk Assessment Template

Day: *(circle)*	Mon	Tue	Wed	Thu	Fri	Sat	Sun	**Date:**	
Bushcare Group:						**Site:**			
Site Supervisor:						**Council Area:**			
People on site: *(Use back if needed)*									

Site Hazard Assessment			**Tasks** *(refer to Safe Work Method Statements)*		
Hazard	Tick if present and identified in site briefing – leave blank if not relevant		**Task**	Tick if relevant	Additional site constraints
Entry and Exit	Entry point identified		Hand Weeding		
	Exit points identified		Spraying (high vol)		
	Emergency meeting point		Spraying (backpack)		
Animal hazards	Snakes, Spiders, Ticks, Other		Brush Cutting		
Environment	Bushfire		Mulching		
	Flood/high flows		Hose Watering		
	Heat		Waste Disposal		
	Solar radiation		Cut and Paint		
	Uneven surfaces		Scrape and Paint		
	Rain		Chainsaw		
	Wind		Jute Matting		
	Deep water		Construction		
	Isolation		Pruning		
	Other workers and tools		Planting		
	Height/steep drops		Hand Watering		
Human Hazards	Needles		Tank Watering		
	Glass		Erosion Control		
	Overhead wires		Others:		
	Chemicals				
	Asbestos		**Additional Risk Management Measures Taken**		
	Other				
Waste					
Other site hazards					

Personal Protective Equipment Required			
· Gloves · Long Trousers	· Long sleeved shirt · Sun Hats / Sun screen	· Sturdy footwear with good sole grip	Other:
Has everyone been instructed on what to do and how to do it?		Yes / No	If no, what action was taken
Nearest Hospital Address:		**Emergency pick up point:**	
		Emergency Phone Contact Person:	
Has agency been informed of presence on site?	Yes / No	Time:	Text / phone call / pre-arranged

Appendix 2: Risk Assessment Matrix as recommended by Workcover

Assessing the Risk

For each hazard you have identified you could rank it according to the likelihood that it will occur and how serious the results could be. Thus an event that is very likely to occur and could kill or seriously injure someone would be a top (#1) priority. It should be addressed first. One that is unlikely to happen, and would only need minor first aid treatment if it did happen, would be a low (#6) priority, and could be taken care of after more serious risks have been addressed.

How severly could it hurt someone?	How likely is it to hurt someone?			
	Very likely could happen any time	**Likely** could happen sometime	**Unlikely** could happen, but very rarely	**Very unlikely** could happen, but probably never will
Kill or disable	1	1	2	3
Serious injury or long term illness	1	2	3	4
Medical treatment and several days off work	2	3	4	5
Minor first aid treatment	3	4	5	6

Call Workcover on **13 10 50** for more information about risk assessments.

To order a WorkCover publication, call **1300 799 003**.