

5.0 REFERENCES

BAAM (2009). 'Flora and Fauna Management Plan – Fitzgibbon ULD – Precinct 4.' Unpublished report prepared for ULDA.

BAAM (2008). 'Flora and Fauna Habitat Assessment – Fitzgibbon Urban Development Area.' Unpublished report prepared for ULDA.

Appendix A

Stage Specific Edge Rehabilitation

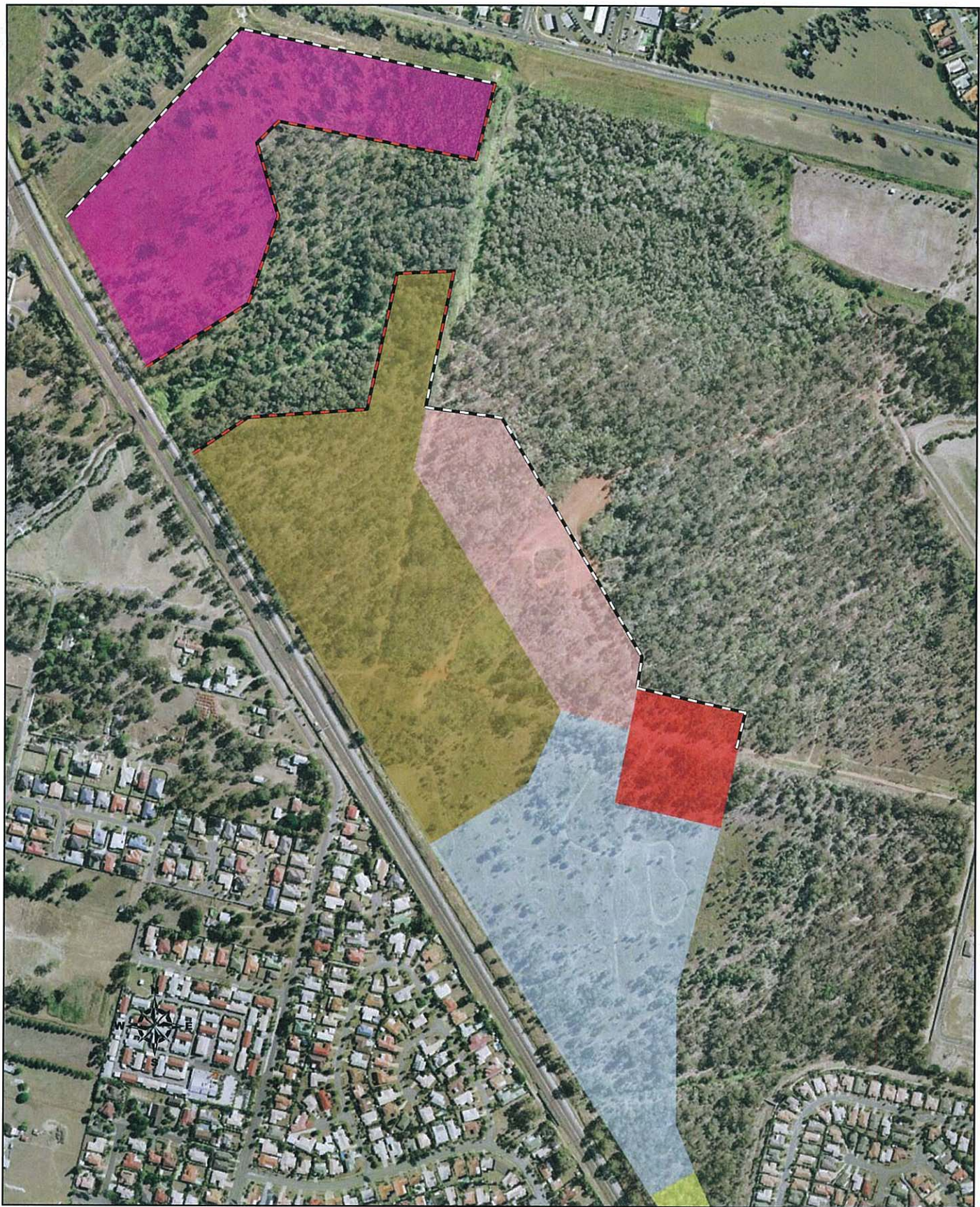
APPENDIX A: STAGE SPECIFIC EDGE REHABILITATION

Development Stage E

It is understood that Stage E is the next area to be developed and development will occur in two stages. This area currently supports a mixture of remnant and non-remnant vegetation and abuts areas that currently contain Melaleuca Open Forest, Melaleuca regrowth and Grassy Areas with scattered Trees. However, the proposed climax communities of bushland that will be adjacent to this stage will ultimately consist of Eucalypt derived communities and Melaleuca derived communities. In addition, management area 2 (see the below table and **Plate A**) is subject to prolonged periods of waterlogged soils. As such the species selection provided below complements the surrounding climax communities and environmental conditions. Species have been selected to provide maximum potential forage for squirrel gliders.

Management Strategies and Actions for Stage E.

Rehabilitation Intent	Management Area (see Plate A)	Implementation Strategy	Species Selection	Planting Density	Estimated Costings
To minimise weed intrusion, stabilise soil, reduce incidents of erosion and provide food for native species.	1	Control Exotic species as outlined within Appendix C and D and revegetate a 10m area between the impact zone and the bushland and open space area to provide a vegetated buffer to vegetation contained within the bushland and open space area. Revegetation to be as directed in Table 4 .	<i>Themeda triandra</i> (kangaroo Grass)	1m centre	Weed management (incl. labour): Herbicide - \$7.00/L (Glyphosate), Spraying / brush-cutting and labour - \$200/ha
			<i>Cymbopogon refractus</i> (Barb-wire Grass)	1m centre	Revegetation: Tube stock - \$1.50/ea, Labour - \$800/ha
			<i>Imperata cylindrica</i> (Blady Grass)	1m centre	Mulching: Free (sourced from site)
			<i>Acacia fimbriata</i> (Brisbane Golden Wattle)	1m centre	Monitoring & Maintenance: \$200/ha over a 12 month period
			<i>Dodonaea triquetra</i> (Hop Bush)	2m centre	
			<i>Acacia leiocalyx</i> (Black Wattle)	2m centre	
			<i>Eucalyptus racemosa</i> (Scribbly Gum)	2m centre	
	2	Control Exotic species as outlined within Appendix C and D and revegetate a 10m area between impact zone and the bushland and open space area to provide a vegetated buffer to vegetation contained within bushland and open space area. Revegetation to be as directed in Table 4 .	<i>Callistemon salignus</i> (Bottlebrush)	1m centre	Weed management (incl. labour): Herbicide - \$7.00/L (Glyphosate), Spraying / brush-cutting and labour - \$200/ha
			<i>Acacia fimbriata</i> (Brisbane Golden Wattle)	1m centre	Revegetation: Tube stock - \$1.50/ea, Labour - \$800/ha
			<i>Lomandra longifolia</i> (Mat Rush)	1m centre	Mulching: Free (sourced from site)
			<i>Imperata cylindrica</i> (Blady Grass)	1m centre	Monitoring & Maintenance: \$200/ha over a 12 month period
			<i>Lophostemon suaveolens</i> (Swamp Box)	4m centre	
			<i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark)	4m centre	



Legend

Rehabilitation Area

Area 1

Area 2

Phase

Phase B

Phase C

Phase D

Phase E

Phase F

Phase G

0 40 80 160 240 320 Meters



**Biodiversity
Assessment**
AND MANAGEMENT PTY LTD

Plate A Edge Rehabilitation Areas

Rehabilitation Plan-Precinct 4,
Fitzgibbon Urban Development Area

APPENDIX A: STAGE SPECIFIC EDGE REHABILITATION

Development Stage F

The eastern boundary of Stage F forms the western boundary of the Precinct 4 bushland and open space area. The proposed climax communities for areas adjacent to Stage F are dominated by Eucalypt forest species. Therefore the species selection provided below will complement this community. Species have been selected to provide maximum potential forage for squirrel gliders.

Rehabilitation Intent	Management Area (see Plate A)	Implementation Strategy	Species Selection	Planting Density	Estimated Costings
To minimise weed intrusion, stabilise soil, reduce incidents of erosion and provide food for native species.	1	Control Exotic species as outlined within Appendix C and D and revegetate a 10m area between the impact zone and the bushland and open space area to provide a vegetated buffer to vegetation contained within the bushland and open space area. Revegetation is to be as directed in Table 4 .	<i>Themeda triandra</i> (kangaroo Grass) <i>Cymbopogon refractus</i> (Barb-wire Grass) <i>Imperata cylindrica</i> (Blady Grass) <i>Acacia fimbriata</i> (Brisbane Golden Wattle) <i>Dodonaea triquetra</i> (Hop Bush) <i>Acacia leiocalyx</i> (Black Wattle) <i>Eucalyptus racemosa</i> (Scribbly Gum)	1m centre 1m centre 1m centre 1m centre 2m centre 2m centre 2m centre	<i>Weed management (incl. labour):</i> Herbicide - \$7.00/L (Glyphosate), Spraying / brush-cutting and labour - \$200/ha <i>Revegetation:</i> Tube stock - \$1.50/ea, Labour - \$800/ha <i>Mulching:</i> Free (sourced from site) <i>Monitoring & Maintenance:</i> \$200/ha over a 12 month period

APPENDIX A: STAGE SPECIFIC EDGE REHABILITATION

Development Stage G

The southern boundary of Stage G adjoins the western portion of the Precinct 4 Bushland and open space area. The investigation area supports a mixture of regrowth and mature Melaleuca trees that provide important feeding resources for Squirrel Gliders, Grey-headed Flying-Fox and to a lesser extent, Koala.

The proposed climax communities of bushland that will be adjacent to this stage will ultimately consist of Eucalypt derived communities and Melaleuca derived communities. In addition, management area 2 (see the below table and **Plate A**) is subject to prolonged periods of waterlogged soils. As such the species selection provided below complements the surrounding climax communities and environmental conditions. Species have been selected to provide maximum potential forage for squirrel gliders.

Rehabilitation Intent	Management Area (see Plate A)	Implementation Strategy	Species Selection	Planting Density	Estimated Costings
To minimise weed intrusion, stabilise soil, reduce incidents of erosion and provide food for native species.	1	Control Exotic species as outlined within Appendix C and D and revegetate a 10m area between the impact zone and the bushland and open space area to provide a vegetated buffer to vegetation contained within the bushland and open space area. Revegetation is to be as directed in Table 4 .	<i>Themeda triandra</i> (kangaroo Grass)	1m centre	Weed management (incl. labour): Herbicide - \$7.00/L (Glyphosate), Spraying / brush-cutting and labour - \$200/ha
			<i>Cymbopogon refractus</i> (Barb-wire Grass)	1m centre	
			<i>Imperata cylindrica</i> (Blady Grass)	1m centre	Revegetation: Tube stock - \$1.50/ea, Labour - \$800/ha
			<i>Acacia fimbriata</i> (Brisbane Golden Wattle)	1m centre	Mulching: Free (sourced from site)
			<i>Dodonaea triquetra</i> (Hop Bush)	2m centre	Monitoring & Maintenance: \$200/ha over a 12 month period
			<i>Acacia leiocalyx</i> (Black Wattle)	2m centre	
			<i>Eucalyptus racemosa</i> (Scribbly Gum)	2m centre	
	2	Control Exotic species as outlined within Appendix C and D and revegetate a 10m area between the impact zone and the bushland and open space area to provide a vegetated buffer to vegetation contained within the bushland and open space area. Revegetation is to be as directed in Table 4 .	<i>Callistemon salignus</i> (Bottlebrush)	1m centre	Weed management (incl. labour): Herbicide - \$7.00/L (Glyphosate), Spraying / brush-cutting and labour - \$200/ha
			<i>Acacia fimbriata</i> (Brisbane Golden Wattle)	1m centre	Revegetation: Tube stock - \$1.50/ea, Labour - \$800/ha
			<i>Lomandra longifolia</i> (Mat Rush)	1m centre	Mulching: Free (sourced from site)
			<i>Imperata cylindrica</i> (Blady Grass)	1m centre	Monitoring & Maintenance: \$200/ha over a 12 month period
			<i>Lophostemon suaveolens</i> (Swamp Box)	4m centre	
			<i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark)	4m centre	

APPENDIX A: STAGE SPECIFIC EDGE REHABILITATION

Development Stage D

The northern boundary of Stage D forms the southern boundary of the Precinct 4 bushland and open space area. The proposed climax communities for areas adjacent to Stage D are dominated by Eucalypt forest species. Therefore the species selection provided below will complement this community. Species have been selected to provide maximum potential forage for squirrel gliders.

Rehabilitation Intent	Management Area (see Plate A)	Implementation Strategy	Species Selection	Planting Density	Estimated Costings
To minimise weed intrusion, stabilise soil, reduce incidents of erosion and provide food for native species.	1	Control Exotic species as outlined within Appendix C and D and revegetate a 10m area between the impact zone and the bushland and open space area to provide a vegetated buffer to vegetation contained within the bushland and open space area. Revegetation is to be as directed in Table 4 .	<i>Themeda triandra</i> (kangaroo Grass) <i>Cymbopogon refractus</i> (Barb-wire Grass) <i>Imperata cylindrica</i> (Blady Grass) <i>Acacia fimbriata</i> (Brisbane Golden Wattle) <i>Dodonaea triquetra</i> (Hop Bush) <i>Acacia leiocalyx</i> (Black Wattle) <i>Eucalyptus racemosa</i> (Scribbly Gum)	1m centre 1m centre 1m centre 1m centre 2m centre 2m centre 2m centre	<i>Weed management (incl. labour):</i> Herbicide - \$7.00/L (Glyphosate), Spraying / brush-cutting and labour - \$200/ha <i>Revegetation:</i> Tube stock - \$1.50/ea, Labour - \$800/ha <i>Mulching:</i> Free (sourced from site) <i>Monitoring & Maintenance:</i> \$200/ha over a 12 month period

APPENDIX A: STAGE SPECIFIC EDGE REHABILITATION

Development Stages B and C

Fauna habitats within Stages B and C have been highly degraded as a result of previous land clearing, and now consist of a patch of wattle regrowth, open grassy areas with some scattered trees and weeds. No rehabilitation of this area is proposed within this Management Plan.

APPENDIX A: STAGE SPECIFIC EDGE REHABILITATION

Tracks and Access Trails Requiring Revegetation

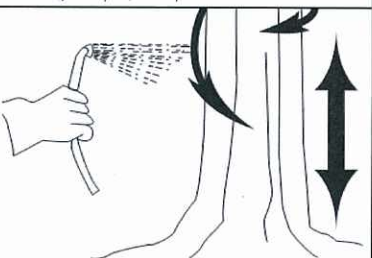
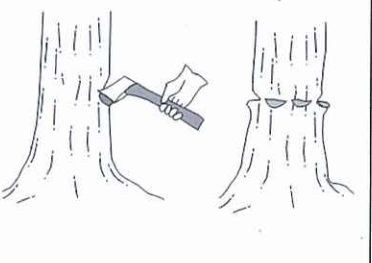
Numerous tracks and trails exist within the Bushland and open space areas located within Precinct 4. The species recommended for Revegetation activities (see table below) will complement suite of species that are predicted to have naturally occurred within the disturbance area. In addition, the recommended species will provide food and habitat resources for native fauna species. Species have been selected to provide maximum potential forage for squirrel gliders.

Rehabilitation Intent	Target Climax Communities (see Figure 2.1)	Implementation Strategy	Species Selection	Planting Density	Estimated Costings
To minimise weed intrusion, stabilise soil, reduce incidents of erosion and provide food for native species.	Melaleuca Open Forest	Control Exotic species as outlined within Appendix C and D and revegetate a 10m area between the impact zone and the bushland and open space area to provide a vegetated buffer to vegetation contained within the bushland and open space area. Revegetation is to be as directed in Table 4 .	<i>Themeda triandra</i> (kangaroo Grass)	1m centre	<i>Weed management (incl. labour):</i> Herbicide - \$7.00/L (Glyphosate), Spraying / brush-cutting and labour - \$200/ha
			<i>Cymbopogon refractus</i> (Barb-wire Grass)	1m centre	<i>Revegetation:</i> Tube stock - \$1.50/ea, Labour - \$800/ha
			<i>Imperata cylindrica</i> (Blady Grass)	1m centre	<i>Mulching:</i> Free (sourced from site)
			<i>Acacia fimbriata</i> (Brisbane Golden Wattle)	1m centre	<i>Monitoring & Maintenance:</i> \$200/ha over a 12 month period
			<i>Dodonaea triquetra</i> (Hop Bush)	2m centre	
			<i>Acacia leiocalyx</i> (Black Wattle)	2m centre	
	Queensland Blue Gum Open Forest; Queensland Blue Gum Open Forest; and Woodland with native grassy understorey	Control Exotic species as outlined within Appendix C and D and revegetate a 10m area between the impact zone and the bushland and open space area to provide a vegetated buffer to vegetation contained within the bushland and open space area. Revegetation is to be as directed in Table 4 .	<i>Callistemon salignus</i> (Bottlebrush)	1m centre	<i>Weed management (incl. labour):</i> Herbicide - \$7.00/L (Glyphosate), Spraying / brush-cutting and labour - \$200/ha
			<i>Acacia fimbriata</i> (Brisbane Golden Wattle)	1m centre	<i>Revegetation:</i> Tube stock - \$1.50/ea, Labour - \$800/ha
			<i>Lomandra longifolia</i> (Mat Rush)	1m centre	<i>Mulching:</i> Free (sourced from site)
			<i>Imperata cylindrica</i> (Blady Grass)	1m centre	<i>Monitoring & Maintenance:</i> \$200/ha over a 12 month period
			<i>Lophostemon suaveolens</i> (Swamp Box)	4m centre	
			<i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark)	4m centre	

Appendix B

Weed Control Techniques

Weed Control Techniques

Hand Weeding - Hand-pulling is a relatively gentle control method for seedlings, herbs and grasses. - Hand-pulling is best carried out when the soil is damp, when the root systems are more easily dislodged and less damage is done to the soil structure. - A number of weeds can be easily hand-weeded from the bush, particularly young plants that have not developed an extensive root system. - This method of control can be very effective when dealing with small populations of environmental weeds. - Attempt to prevent seed dispersal whilst hand weeding - Plants with the potential to regrow from discarded material should be carefully bagged and removed.	
Dig out plants with tougher root systems: This technique is useful for species that grow from a solid central crown below ground level: - Insert a long knife or narrow trowel into the soil outside the root system. - Gently loosen the soil, work around the roots and then work the plant out gently. - Plants without seed that will not resprout can be left to rot. - Attempt to prevent seed dispersal whilst hand digging out weeds - Plants with the potential to regrow from discarded material should be carefully bagged and removed.	
Spraying Foliar spraying is the use of herbicide diluted with water or diesel at a specific rate, and sprayed over the foliage to the point of runoff (until every leaf is wetted but not dripping). This method is most suited to shrubs, grasses and dense vines less than 6 m. Advantages include quickness and economy. Disadvantages include the potential for spray drift and off-target damage. Boom or Blanket spraying: using a boom spray from a tractor or 4-wheel drive vehicle can be used to treat large areas completely infested with weeds, especially with selective herbicides. Indicating the location of areas to avoid before spraying may decrease the chance of overspray. Spot spraying: Smaller infestations can be sprayed using a backpack/knapsack spray unit or quad mounted spraypack. This technique can target individual plants and is useful for on-going or follow-up maintenance.	
Stump Spray Basal bark spraying is suitable for thin-barked woody weeds and undesirable trees. Basal bark spraying is also an effective way to treat saplings, regrowth and multi-stemmed shrubs and trees. This method involves mixing an oil soluble herbicide in diesel and spraying the full circumference of the trunk or stem of the plant. It is important to cover the entire circumference of the trunk on every stem arising from the ground to a height of around 30 cm.	
Chipping method Useful for killing trees and shrubs to be left <i>in situ</i> to naturally decay: - Shallow cuts are made just under the bark into the living tissue below the lowest branch; - Herbicide applied with a squeeze bottle immediately (within 30 seconds) into the exposed cut surface; - Continue cuts around the trunk at the same level, with 5cm gaps between each cut. - Generally 1 part Glyphosate to 1.5 parts of water is suitable to achieve a kill with most species	

Tree Spearing

Tree spearing uses a specifically designed tree spear and technique. Useful for killing trees and shrubs to be left *in situ* to naturally decay

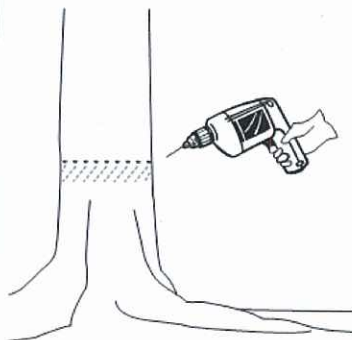
- The spear is thrust into the tree at an angle of 30° to 40° from the vertical,
- Apply the appropriate herbicide amount into the cut.
- Repeat the process, forming a row of cut approximately 50 mm apart.



Tree injection

Useful for killing trees and shrubs >5cm in circumference to be left *in situ* to naturally decay:

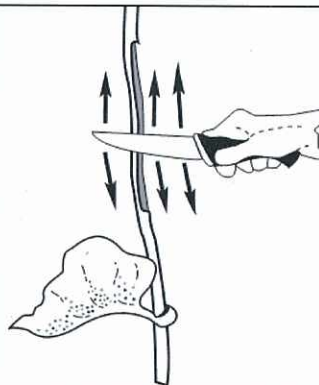
- holes are drilled at a downward angle into the tree's sapwood at 5cm spaces;
- if a "Side Winder" or similar device is not employed herbicide is then applied immediately (within 30 seconds) into each hole small with a squeeze bottle.
- drill to make downward-angled holes into the sapwood approximately 5 cm apart.
- The placement of herbicide into the hole is usually made using a backpack reservoir and syringe that can deliver measured doses of herbicide solution.
- Best results are achieved with plants, which are actively growing.
- Generally 1 part Glyphosate to 1.5 parts of water is suitable to achieve a kill with most species.



Scraping the stem method

This method is used for plants with aerial tubers:

- a sharp knife is employed to lightly scrape a section of stem (approximately 10-30 cm) removing bark and exposing the living tissue;
- Apply herbicide immediately (within 30 seconds) to the exposed soft underlying green tissue with a small squeeze bottle.
- With some woody weeds you can peel away the bark surface and paint the exposed wood or spray it with herbicide.
- Generally 1 part Glyphosate to 1.5 parts of water is suitable to achieve a kill with most species



Cut stump method

This method is ideal for woody plants and vines without aerial tubers:

- cut the stem close to the ground, if possible below the lowest branch;
- apply herbicide immediately (< 10seconds for water-based and 1 minute for diesel soluble herbicides) using a small squeeze bottle or spray pack to the cut surface.
- Generally 1 part Glyphosate to 1.5 parts of water is suitable to achieve a kill with most species
- Two operators working as a team can use this method effectively
- It is a good idea to use a brightly coloured dye in the solution to mark the stumps that have been treated



This method has the appeal of removing the weed immediately, and is used mainly for trees and woody weeds. Warning: Many species will sucker if treated by this method.

Line Drawings by Lyn Skillings, QLD Natural Resources and Mines.

Appendix C

Pest Fact Sheets

Annual ragweed

Ambrosia, horseweed or asthma plant

Ambrosia artemisiifolia



Annual ragweed (also called ambrosia, horseweed or asthma plant) is a fast-growing plant introduced from North America.

It can invade and suppress weak and overgrazed pastures, reducing productivity. The pollen of this plant can cause health problems such as hay fever and can aggravate asthma.

Declaration details

Annual ragweed is a declared Class 2 plant under the *Land Protection (Pest and Stock Route Management) Act 2002*. Declaration requires landholders to control declared pests on the land and waters under their control. A local government may serve a notice upon a landholder requiring control of declared pests.



Queensland Government



Description and general information

Annual ragweed is an erect plant, 1–2 m high with slightly rough, fern-like leaves. The leaves are deeply divided with hairy undersides. Flowers are not conspicuous. They are small, greenish and in spikes up to 20 cm long in the upper part of the plant. Flower spikes appear yellow when mature because of pollen production. Male flowers are at the top of the spike and females at the base. Seeds are black, small, top-shaped and rough.

Life cycle

As the name suggests the plant establishes each year, normally germinating from spring through to summer. Germination can occur at other times of the year if conditions are suitable. Flowering usually occurs from mid to late March, after which plants die. Late-germinating plants may survive over winter until the following autumn.

Habitat and distribution

Annual ragweed is a native of eastern North America and is now naturalised in south-eastern Queensland and northern New South Wales. Infestations also occur near Stanthorpe, Inglewood, Gympie, Gin Gin and Atherton.

Annual ragweed often colonises bare areas on roadsides and banks of watercourses. It may invade pasture from these areas. Seed may be spread by floodwater, be introduced with stock or arrive as a contaminant in fodder or topsoil from infested areas. Horse paddocks are often infested in coastal areas.

Control

Prevention of annual ragweed is more effective than control. Infestations can be minimised by maintaining healthy, dense pastures that suppress ragweed germination and growth.

Where possible, check the source of hay and other stockfeed before purchase. Also check the origin of stock (particularly horses, which are often associated with annual ragweed and its spread in coastal areas). Also check the origin of topsoil, which is a major source of seed.

Infestations can be controlled with biological, mechanical and herbicide controls, and pasture management.

Biological control

A leaf-eating beetle and a stem-galling moth have been introduced into Queensland and have reduced the size and vigour of annual ragweed. Despite this biological control, annual ragweed is still a significant problem and other control methods are necessary.

Mechanical control

Where feasible, plants can be pulled by hand; however, if anyone is prone to allergies, contact with flowering plants and pollen should be avoided.

Plants may be slashed or mown prior to setting seed (i.e. at the early flowering stage or immediately prior to flowering). Checks should be carried out to ensure flowering is prevented in any regrowth that occurs. Regrowth may occur from soil seed banks and these plants must also be controlled.

Herbicide control

Details of registered herbicides and application rates are listed in Table 1. Before using any herbicide always read the label carefully. All herbicides must be applied strictly in accordance with the directions on the label. These herbicides may damage legume species.

Pasture management

Although cattle will eat annual ragweed to a small extent, they prefer other pasture species.

Overgrazing will result in the loss of grass cover and a population explosion of annual ragweed and other weeds. Stock will only occasionally eat ragweed when it has set seed, and will subsequently pass the seed.

Most improved pasture grasses will suppress annual ragweed, provided a dense, healthy ground cover is maintained.

For heavy infestations, opportunistic burning can be a useful tool in controlling annual ragweed if paddocks have not been overgrazed. Burning needs to be done when adequate soil moisture will allow good grass cover to grow back. Follow-up herbicide treatment is essential.



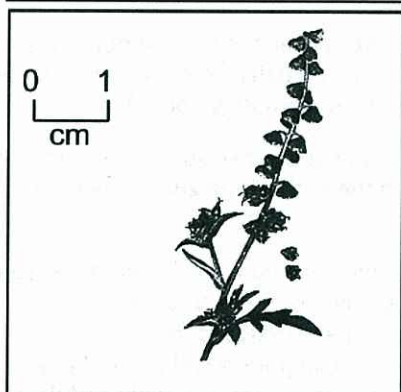
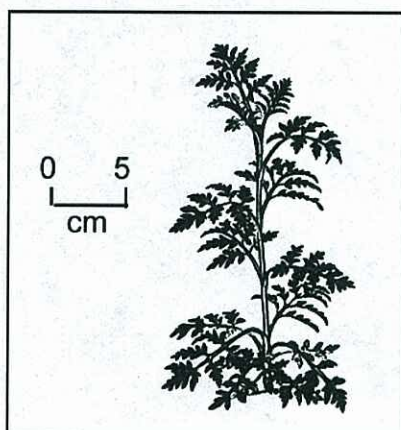
Further information

Further information is available from your local government office, or from your local primary industries and fisheries biosecurity officer: contact details available through 13 25 23.

Table 1 Herbicides registered for the control of annual ragweed

Situation	Herbicide	Rate ¹	Comments ²
Boom spray Spot spray Knapsack	Dicamba (e.g. Banvel 200®)	22 L/ha 1.5 L/100 L 330 ml/10–15 L/150 m ²	For commercial and industrial land, and right-of-way areas
Boom spray	Bromacil 800 g/kg (e.g. Hyvar X®)	3.5–6.5 kg/ha	For commercial and industrial land, and right-of-way areas
Boom spray	Bromacil + diuron (e.g. Kromac®)	4.5–6.5 kg/ha	For commercial and industrial land, and right-of-way areas

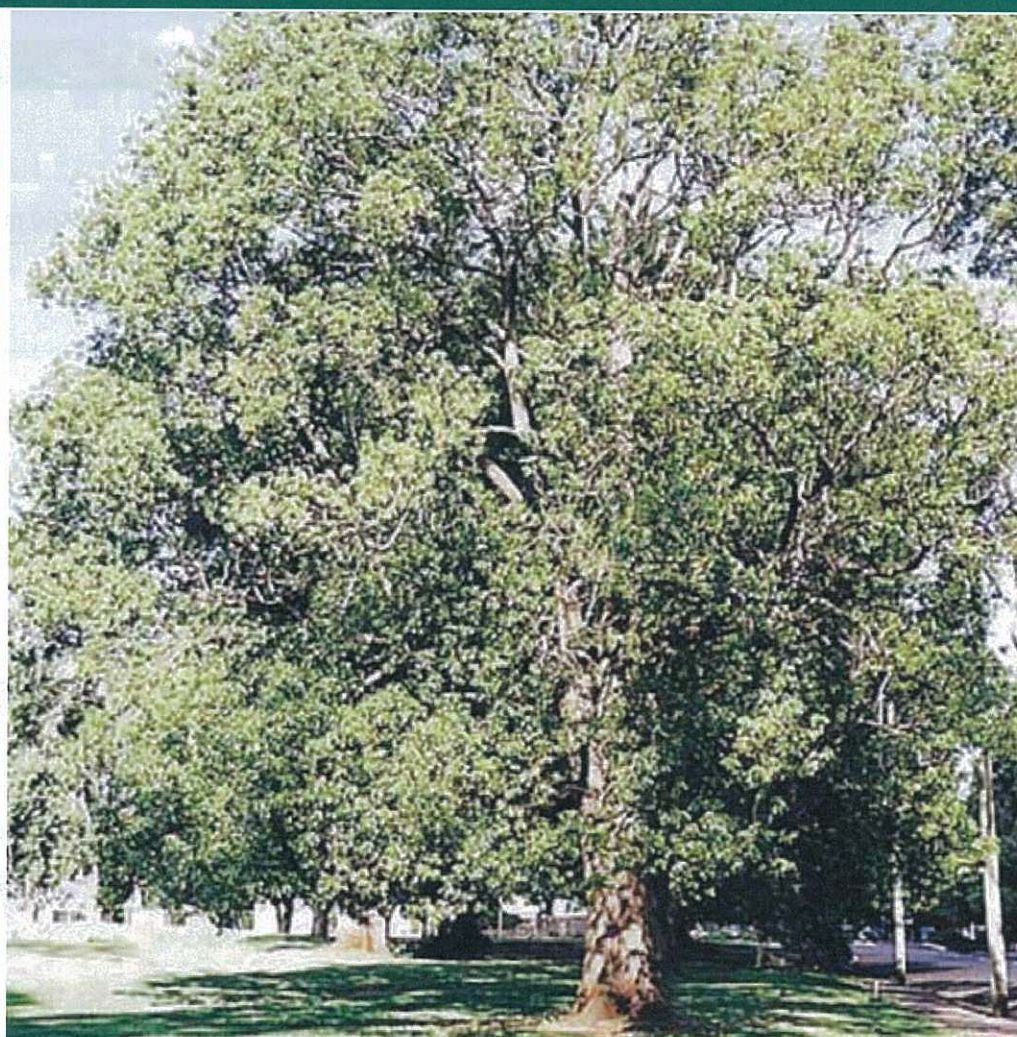
1. The registered rates are for non-crop uses. Consult label for in-crop recommendations.
2. Spray plants when young, before flowering (i.e. before the end of December). These herbicides are not selective against legumes and damage to legume species may result.



Fact sheets are available from Queensland Primary Industries and Fisheries service centres and the Queensland Primary Industries and Fisheries Business Information Centre (telephone 13 25 23). Check our website at www.dpi.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this pest fact should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, Queensland Primary Industries and Fisheries does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

Camphor laurel

Cinnamomum camphora



Camphor laurel was introduced into Australia from Asia in 1822. It has been promoted and planted as a garden ornamental throughout Queensland.

Camphor laurel is an attractive shade tree, but can be very destructive—it aggressively replaces native vegetation. The long-term consequences of its spread may result in the loss of native wildlife and agricultural productivity over large areas of south-east Queensland.

Camphor laurel invades pastures and disturbed riparian systems. It tends to germinate under fences and power lines (wherever birds rest and deposit the seed). As a

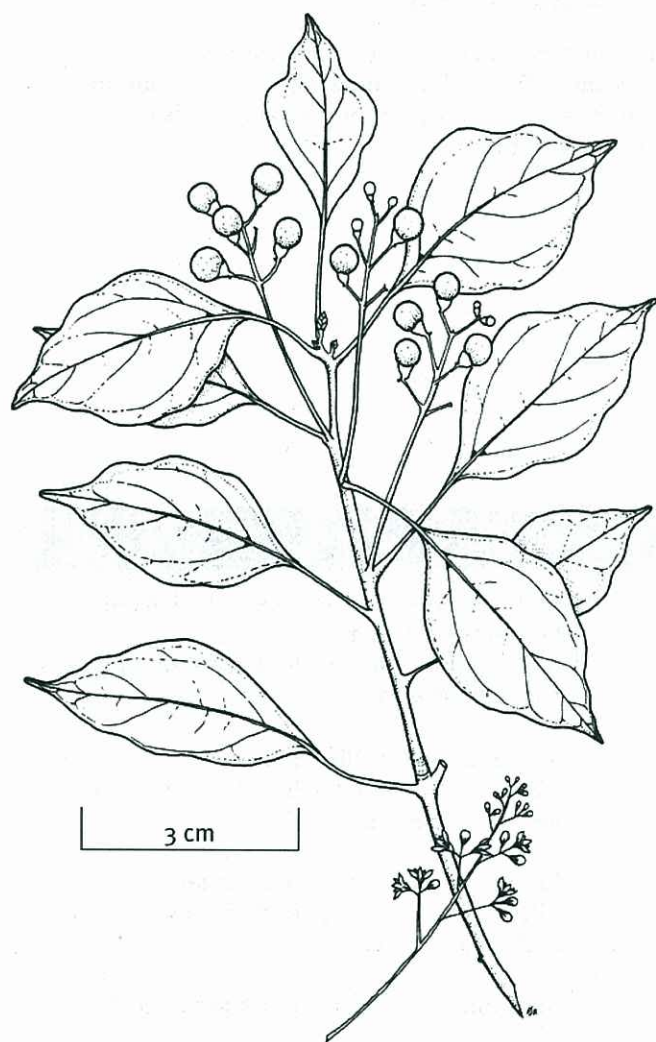
result, it can push fences over and disrupt power facilities. It is a troublesome weed on dairy farms throughout south-east Queensland and northern New South Wales.

Along the waterways of south-east Queensland, camphor laurels are replacing the native blue gums threatening koala populations.

Old camphor laurel trees develop a massive root system that can block drains and crack concrete structures. The average suburban backyard is far too small to accommodate a mature camphor laurel without problems. Removal of a mature tree can cost hundreds of dollars.



Queensland Government



Declaration details

Camphor laurel is a declared Class 3 plant under the *Land Protection (Pest and Stock Route Management) Act 2002*. Class 3 plants cannot be sold in Queensland and their removal in Queensland is recommended. Landholders can be required to remove Class 3 plants if they live next to environmentally significant areas such as national parks or reserves.

Description and general information

Camphor laurel is a large evergreen tree, growing up to 20 m tall. The leaves have a glossy, waxy appearance and smell of camphor when crushed. In spring it produces lush, bright-green foliage and masses of small white flowers. The spherical fruits are green (changing to black when ripe) and 10 mm in diameter.

Habitat and distribution

Camphor laurel is native to Taiwan, Japan and some parts of China. Since it was introduced in 1822, it has spread along eastern Australia from the Atherton Tablelands down to Victoria. It is particularly common along watercourses and in soil types that once supported rainforest.

In south-east Queensland, it has the potential to develop dense infestations similar to older infestations that exist in northern New South Wales.

A large camphor laurel tree may produce over 100 000 seeds every year. The seeds are readily spread by a few species of birds.

Control

Mechanical control

Removal of newly established or isolated seedlings by hand pulling or grubbing is effective.

Bulldozing is only suitable for young trees that can be removed crowns and all. Failure to remove roots of mature trees will result in regrowth.

Fire kills plant tops but produces regrowth from the base.

Herbicide control

Selection of a suitable method depends on the size of the target tree and its situation. A standing tree that has been treated may be a serious hazard to human safety or other structures when it falls. Removal of the bulk of the tree before treating the stump is preferred in such situations.

Table 1 details the herbicides registered for camphor laurel control. Before using any herbicide always read the label carefully. All herbicides must be applied strictly in accordance with the label.

Foliar spray

Foliar sprays can be used for young trees up to 3 m tall.

Basal bark spray

Trees up to 6 m tall with a basal stem diameter up to 30 cm and no multi-stems can be treated using basal bark or cut stump methods, although basal bark is the preferred method.

When using the basal bark method, spray from ground level up to a height of 30 cm or higher than where multi-stems branch.

Stem injection

For trees taller than 6 m, stem injection using a modified axe is the most practical method—leave no more than 2 cm between cuts.

Axe cuts for stem injection of herbicides should be made at regular intervals all around the stem (or stems). Care should be taken to ensure the axe leaves a 'pocket' in the stem, into which the chemical is immediately injected. Cuts should penetrate the sapwood (just under the bark), but not the hard central wood. Cuts made too shallow into the bark or too deep into the stem will result in regrowth. The practice of drilling holes in the stem prior to herbicide application is not recommended.

Further information

Further information is available from your local government office, or from your local primary industries and fisheries biosecurity officer: contact details are available through 13 25 23.

Table 1 Herbicides registered for the control of camphor laurel

Situation	Herbicide	Rate	Comments
Foliar spray	Triclopyr-butotyl + picloram (e.g. Grazon DS®)	350–500 ml/100 L water	High-volume spray for trees up to 3 m tall; higher rate for > 2 m tall (For pasture, non-crop, forestry, right-of-way and aquatic areas)
Foliar spray	Triclopyr-butotyl + picloram (e.g. Grazon DS®)	2.5 L/100 L water	Air blast/mister; foliar spray (For pasture, non-crop, forestry, right-of-way and aquatic areas)
Foliar spray	Triclopyr-butotyl + picloram (e.g. Grazon DS®)	1:20 water	Gas gun or sprinkler sprayer; foliar spray (For pasture, non-crop, forestry, right-of-way and aquatic areas)
Foliar spray	Triclopyr-butotyl (e.g. Garlon ^{600®})	170 ml/100 L water	High-volume foliar spray for trees up to 3 m tall (For pasture, non-crop, forestry, right-of-way and aquatic areas)
Basal bark spray	Triclopyr-butotyl (e.g. Garlon ^{600®})	1 L in 60 L diesel	Basal bark for trees up to 6 m tall and 30 cm stem diameter or cut stump (For pasture, non-crop, forestry, right-of-way and aquatic areas)
Stem injection	Glyphosate-IPA	2 ml of 1:1 mix with water	Stem injection for trees up to 25 cm in diameter (For pasture, non-crop, forestry, right-of-way and aquatic areas)
Stem injection	Glyphosate-IPA	2 ml undiluted	Stem injection for trees 25–60 cm in diameter (For pasture, non-crop, forestry, right-of-way and aquatic areas)

Fact sheets are available from Queensland Primary Industries and Fisheries service centres and the Queensland Primary Industries and Fisheries Business Information Centre (telephone 13 25 23). Check our website at www.dpi.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this pest fact should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, Queensland Primary Industries and Fisheries does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.