Table 2a: Management and Maintenance Recommendations of Management Sections within Development Footprint

Management Section (Figure 1)	Existing Vegetation Communities	Current Condition Summary	General Management Requirements and Potential Threats	Recommended Species schedule	Monitoring and Maintenance	Desired Outcomes and Performance Indicators
1.Dorsett Rd 	Area consists of formal roadways and car parking facilities surrounding intact remnant vegetation (RE12.5.2).	Generally in good condition but supports a number of weeds and planted exotic species. Weeds present include umbrella tree Cocos palm, fishbone fern, asparagus fern, golden cane and Brazilian cherry.	Four significant trees are present along the boundaries of the existing road which may be impacted from road upgrade. Implement initial weed eradication and control.	Squirrel Glider feed trees, such as *Melaleuca* and *Acacia* species. Refer to **Table 3** for planting schedule.	Monitoring and maintenance schedule for revegetated areas: - Bi-annually for 3 years; and - Annually there-after.	Improve vegetation community condition. Performance indicators include: - No evidence of dieback of canopy species. - No weed infestations.
2.Southern access road 	Roadway traverses remnant vegetation (12.5.3) with a mowed understorey.	The canopy trees appear to be in excellent health. There are no shrub or ground layers due to continued mowing.	Three significant trees are present along the boundaries of the proposed road which may require clearing. Continue current maintenance program.	No revegetation requirements for this area.	Monitoring and maintenance schedule for revegetated areas: - Bi-annually for 3 years; and - Annually there-after.	Maintain vegetation community condition. Performance indicators include: - No evidence of dieback of canopy species. - No weed infestations.
3. South of existing Building D 	Area supports a mixture of remnant vegetation (12.5.3) with a mowed understorey.	The canopy trees appear to be in excellent health. There are no shrub or ground layers due to continued mowing.	Up to six significant trees are present within this area. As access to the area was blocked, it is unsure how many of these six will require clearing. Continue current maintenance program. Remove camphor laurel	Squirrel Glider feed trees, such as *Melaleuca* and *Acacia* species.	Monitoring and maintenance schedule for revegetated areas: - Bi-annually for 3 years; and - Annually there-after.	Maintain vegetation community condition. Performance indicators include: - No evidence of dieback of canopy species. - No weed infestations.

Management Section (Figure 1)	Existing Vegetation Communities	Current Condition Summary	General Management Requirements and Potential Threats	Recommended Species schedule	Monitoring and Maintenance	Desired Outcomes and Performance Indicators
			Cinnamomum camphora.			
4. Area north of existing Building E 	Remnant vegetation (12.5.3) with a mowed understorey.	The canopy trees appear to be in excellent health. There are no shrub or ground layers due to continued mowing.	Up to four significant trees are present within this area. Wherever practical significant trees should be retained and the root zones of retained trees should be protected. Continue current maintenance program within retained areas.	Squirrel Glider feed trees, such as *Melaleuca* and *Acacia* species.	Monitoring and maintenance schedule for revegetated areas: - Bi-annually for 3 years; and - Annually there-after.	Maintain vegetation community condition. Performance indicators include: - No evidence of dieback of canopy species. No weed infestations.
5. Eastern access roadway 	Roadway traverses a mixture of remnant (12.5.3) and non-remnant vegetation.	The canopy trees appear to be in excellent health. There are no shrub or ground layers due to continued mowing.	Up to 12 significant trees may require clearing for the construction of the road. Wherever practical significant trees should be retained and the root zones of retained trees should be protected. Continue current maintenance program within retained areas.	Squirrel Glider feed trees, such as *Melaleuca* and *Acacia* species.	Monitoring and maintenance schedule for revegetated areas: - Bi-annually for 3 years; and - Annually there-after.	Maintain vegetation community condition. Performance indicators include: - No evidence of dieback of canopy species. - No weed infestations.
6. Area adjacent to Building A 	Contains a mixture of remnant (RE12.5.3), and cleared areas.	The canopy trees appear to be in excellent health. There are no shrub or ground layers due to continued mowing.	Up to 4 significant trees may require clearing for construction of a car park facility. Wherever practical significant trees should be retained and the root zones of retained trees should be protected.	Squirrel Glider feed trees, such as *Melaleuca* and *Acacia* species in any replanting.	Monitoring and maintenance schedule for revegetated areas: - Bi-annually for 3 years; and Annually there-after.	Maintain vegetation community condition. Performance indicators include: - No evidence of dieback of canopy species.

Management Section (Figure 1)	Existing Vegetation Communities	Current Condition Summary	General Management Requirements and Potential Threats	Recommended Species schedule	Monitoring and Maintenance	Desired Outcomes and Performance Indicators
			Continue current maintenance program within retained areas.			- No weed infestations.
7. Area north of existing Building B 	Supports some canopy species reflective of RE12.5.2.	The canopy appeared in good health. The shrub and ground layers are dominated by weeds and exotic garden plantings. Much of the area is dominated by shell ginger *Alpinia zerumbet.*	Extensive weed removal required to restore this community to pre-disturbance quality. Ginger plants can be highly invasive (a large clump of this species is currently growing within the riparian corridor of Cabbage Tree Creek) and should be a priority for removal.	**Table 3** provides the recommended planting schedule	Monitoring and maintenance schedule for revegetated areas: - Monthly for the first 12 months; - Every three months for the second 12 months; - Bi-annually for following three years; and - Annually thereafter.	Shrub and ground layer species are reflective of RE12.5.2 communities. - No evidence of dieback of canopy species. - All weeds and exotic plants removed.

Table 2b: Management and Maintenance Requirements for designated Rehabilitation Areas outside of Development Footprint

Rehabilitation Area (Figure 2)	Existing Vegetation Communities	Current Condition Summary	General Management Requirements and Potential Threats	Species schedule	Monitoring and Maintenance	Desired Outcomes and Performance Indicators
A. Bushland south of eastern roadway	Remnant (12.5.3) with a mixture of native and exotic understorey.	The canopy appears in good health. The ground layer is dominated by rank exotic grasses with the occasional weedy shrub present.	The dense cover of exotic grasses causes an increased fire risk. Rehabilitation works should focus on removing the exotic grasses and weeds along the edges of the entire patch (i.e. north, south, east and western edges) and densely planting edges with native grasses and shrubs.	Rehabilitation to focus on edges. See Table 3 for planting schedule.	Monitoring and maintenance schedule for revegetated areas: - Bi-annually for 3 years; and - Annually there-after.	All edges of this community are clear of rank grasses. - No evidence of dieback of canopy species. - All weeds and exotic plants removed. - No further weed infestations evident.
B. Retained bushland south of existing carpark area	Non-remnant RE 12.3.11 with rank exotic grasses dominating the edges.	Generally clear of weeds except around the edges. The shrub layer is fairly sparse.	The dense cover of exotic grasses causes an increased fire risk. Rehabilitation works should focus on removing the exotic grasses and weeds along the edges and densely planting edges with native grasses and shrubs. Monitoring should look for an increase in understorey diversity and eucalypt recruitment.	Rehabilitation should focus on edges. See Table 3 for planting schedule.	Monitoring and maintenance schedule for revegetated areas: - Bi-annually for 3 years; and Annually there-after.	All edges of this community are clear of rank grasses. - No evidence of dieback of canopy species. - All weeds and exotic plants removed. - No further weed infestations evident.

Rehabilitation Area (Figure 2)	Existing Vegetation Communities	Current Condition Summary	General Management Requirements and Potential Threats	Species schedule	Monitoring and Maintenance	Desired Outcomes and Performance Indicators
C. Remnant 12.3.11 adjacent to area B	Canopy consists of remnant vegetation (RE12.3.11) .	The shrub and ground cover is dominated by weeds. In some locations weed infestations intrude to a distance of >30m south of the existing walking track. Weeds present include lantana, wild tobacco Singapore daisy, camphor laurel and a number of exotic grass species.	Extensive weed removal is required throughout this area, south of the existing walking track. The presence of dense rank grasses creates an increased fire risk.	Rehabilitation should focus on weed removal with some supplementary plantings of canopy species. See Table 3 for planting schedule.	Monitoring and maintenance schedule for revegetated areas: - Monthly for the first 12 months; - Every three months for the second 12 months; - Bi-annually for following three years; and Annually thereafter.	All areas of this community are clear of weeds. - No evidence of dieback of canopy species. - All weeds and exotic plants removed. - No further weed infestations evident.
D. Cabbage Tree Creek	Canopy consists of remnant vegetation (RE12.3.7) .	Weeds and exotic grasses dominate the edges along the entire length of Cabbage Tree Creek.	Extensive weed removal is required throughout the edges of this area. The presence of dense rank grasses creates an increased fire risk.	Rehabilitation should focus on weed removal along the edges, with some supplementary plantings of canopy species. See Table 3 for planting schedule.	Monitoring and maintenance schedule for revegetated areas: - Monthly for the first 12 months; - Every three months for the second 12 months; - Bi-annually for following three years; and Annually thereafter.	All edges of this community are clear of weeds. - No evidence of dieback of canopy species. - All weeds and exotic plants removed. - No further weed infestations evident.

Rehabilitation Area (Figure 2)	Existing Vegetation Communities	Current Condition Summary	General Management Requirements and Potential Threats	Species schedule	Monitoring and Maintenance	Desired Outcomes and Performance Indicators
E. Remnant 12.3.11 adjacent to Area B	Canopy consists of remnant vegetation (RE 12.3.11)	The canopy is intact, but the ground layer is dominated by rank grasses.	Weed removal in the ground layer is required. The presence of rank grasses creates an increased fire risk.	Rehabilitation should focus on removing weeds and exotic grasses with some supplementary plantings of shrubs. See Table 3. For planting schedule.	Monitoring and maintenance schedule for revegetation areas: - Monthly for the first 12 months; - Every three months for the second 12 months; - Bi-annually for the following three years; and - annually thereafter.	All areas of this community are clear of weeds. - No evidence of dieback of canopy species. - All weeds and exotic plants removed. - No further weed infestation evident.

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Rehabilitation Area / Stratum / Species	Common Name	Density*	Notes
Acacia disparrima subsp. disparrima		2m centres	locally endemic flora species.
Acacia fimbriata		2m centres	
Acacia irrorata		2m centres	
Ground Layer			
Ottochloa gracillima	Ottochloa	1m centres	
Parsonsia straminea	Monkey Rope Vine	Im centres	
Lomandra hystrix			
Area E (Open Eucalypt Forest with moderately dense shrub layer and grassy ground layer (RE 12.3.11)			
Tree Layer			Generally the canopy is intact. Once exotic grasses and weeds have been removed from the edges, natural recruitment of native species should occur.
Eucalyptus tereticornis	Queensland Blue Gum	2m centres	
Eucalyptus racemosa	Scribbly Gum	2m centres	
Eucalyptus microcorys	Tallowwood	2m centres	
Corymbia intermedia		2m centres	
Sub-canopy			
Lophostemon suaveolens	Swamp Box	2m centres	
Allocasuarina litoralis	She-oak	2m centres	
Alphitonia excelsa	Red Ash	2m centres	
Melaleuca quinquenervia	Broad-leaved Paperbark	2m centres	
Shrub Layer			
Acacia disparrima subsp.	Hickory Wattle	2m centres	
Acacia fimbriata	Brisbane Golden Wattle	2m centres	
Jagerapseudorhus var. pseudorhus	Foambark	2m centres	
Glochidion ferdinandi	Breynia	2m centres	
Dodonaea triquetra	Hop Bush	2 m centres	
Ground Layer			
Lomandra longifolia	Matrush	1lm centres	
Hardenbergia violacea	Native Sarsaparilla	1m centres	
Dianella caerulea	Blue Flax Lily	1m centres	

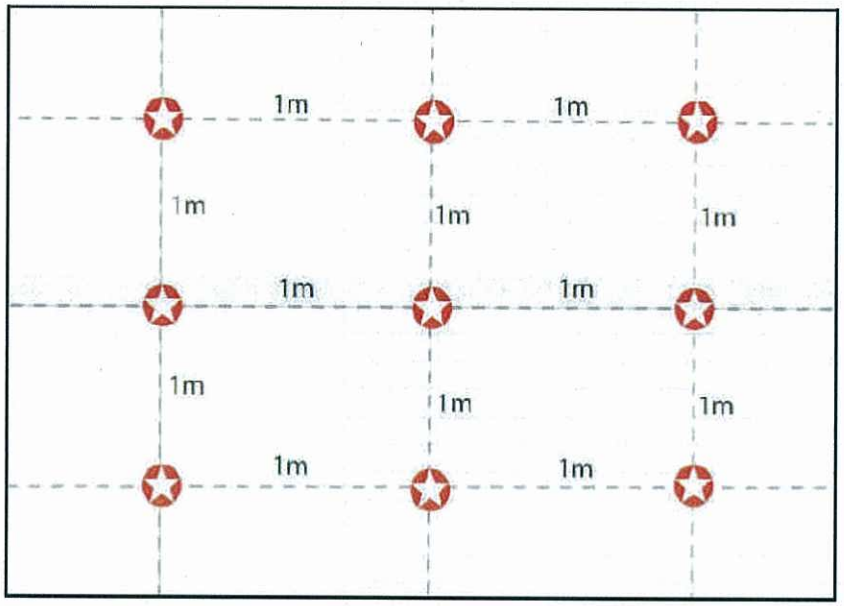

Plate 1: Schematic indicating the planting arrangement for planting at Im centres (location of plants is indicated by stars encircled by red).

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EED MANAGEMENT

and

Fabaceae				
Fabaceae			Environmental	
Lauraceae				
			Environmental	
			Environmental	
		Sourgrass	Environmental	

http://www.dpi.qld.gov.au/4790_8331.htm

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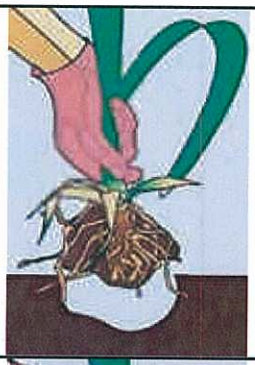
Timing	
	Watering Monitoring
	Mulching Monitoring

• • • • • •	
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	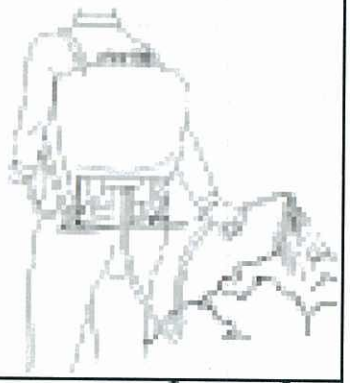
	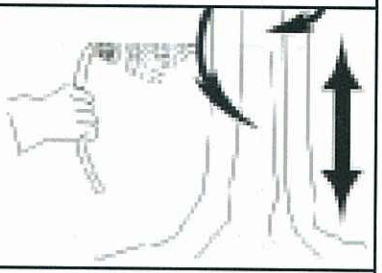
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- The spear is thrust into the tree at an angle of 30° to 40° from the vertical,
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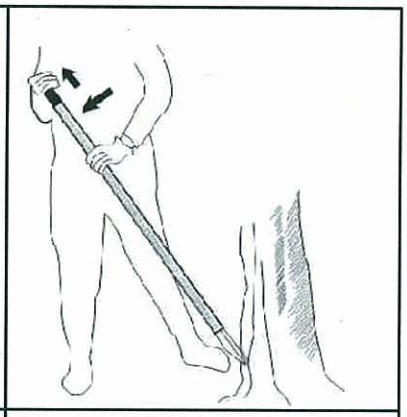

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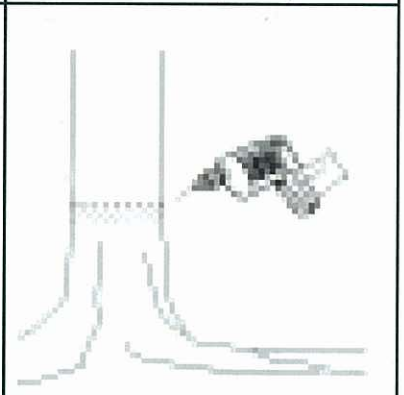

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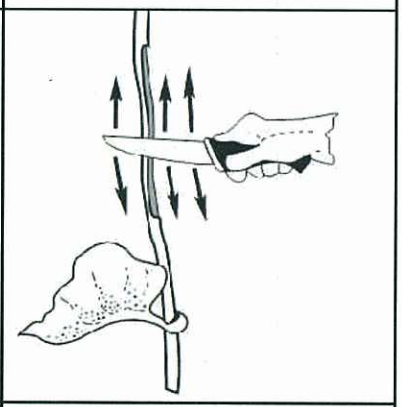

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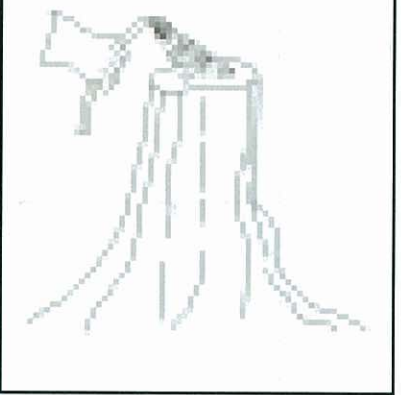
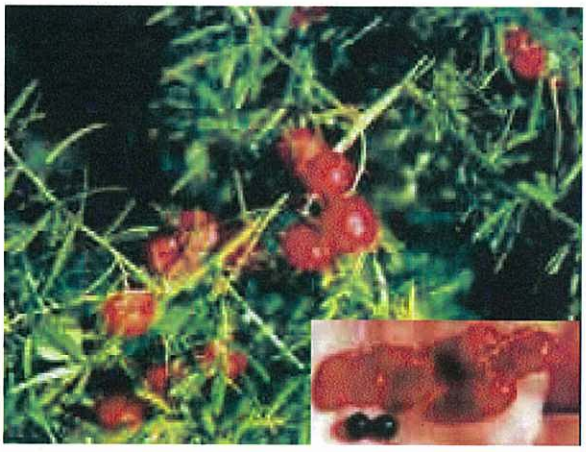


Line Drawings by Lyn Skillings, QLD Natural Resources and Mines.

Basket or ground asparagus fern

DECLARED CLASS 3



The problem

Description

Queensland Government
Department of Primary Industries and Fisheries

Management strategies

Declaration details

Further information

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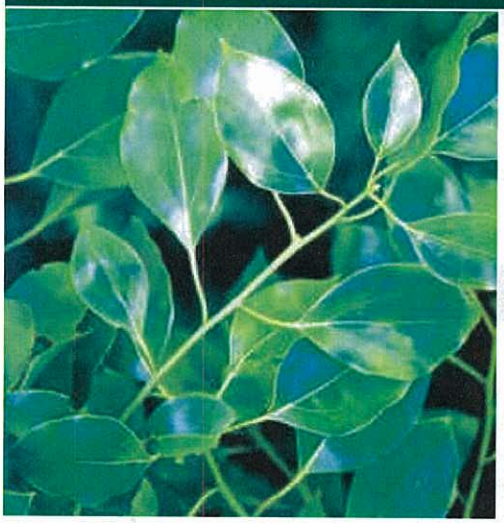
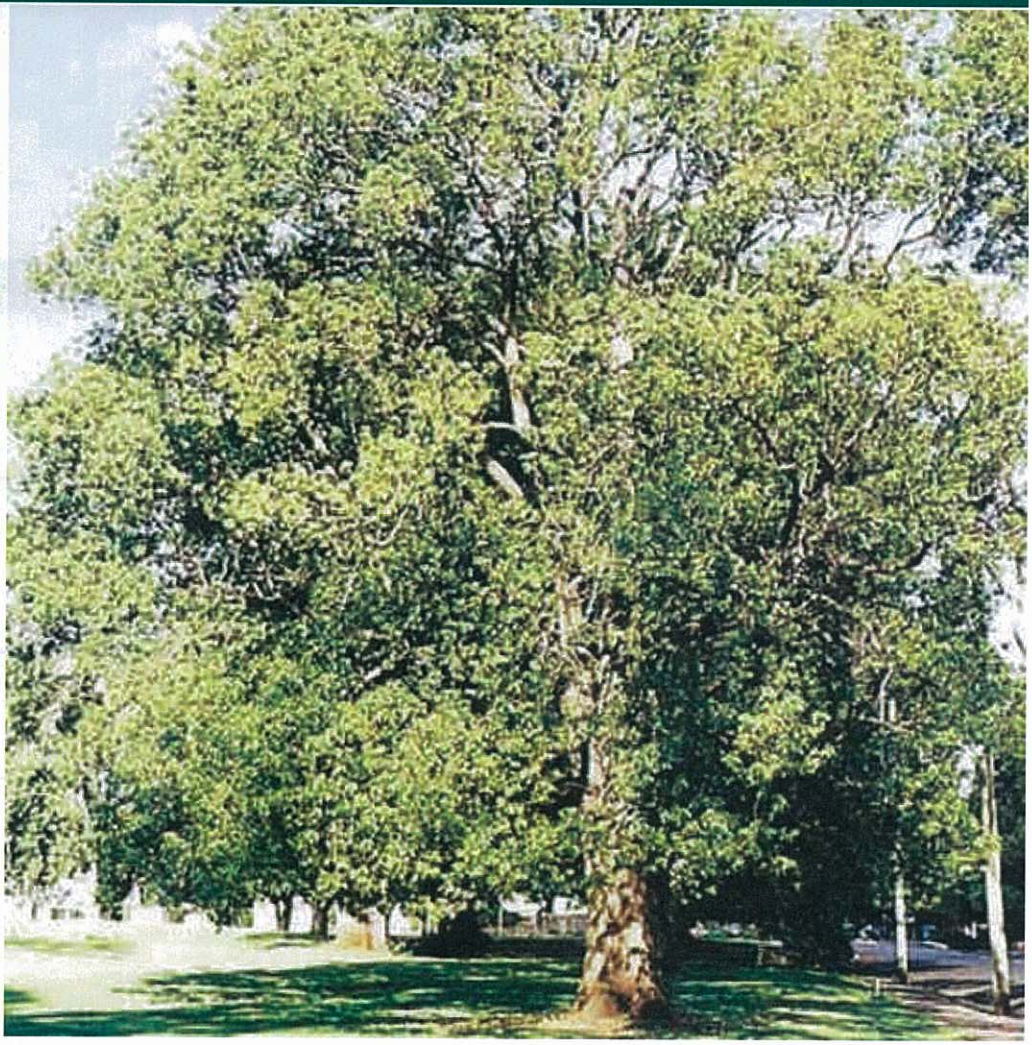




Camphor laurel was introduced into Australia from Asia in 1822. It has been promoted and planted as a garden ornamental throughout Queensland.

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.

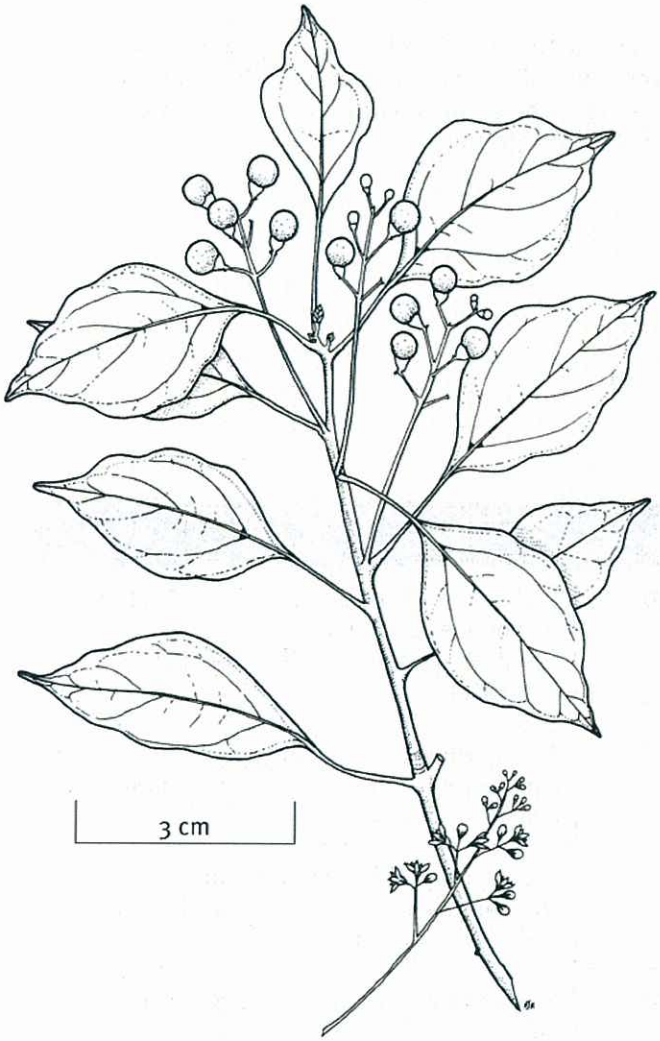
Along the waterways of south-east Queensland, camphor laurels are replacing the native blue gums threatening koala populations.

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.

WEEDBUSTERS

Queensland Government

PP46 September 2009



Camphor laurel is a declared Class 3 plant under the

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.

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.

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

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.

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

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.

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.

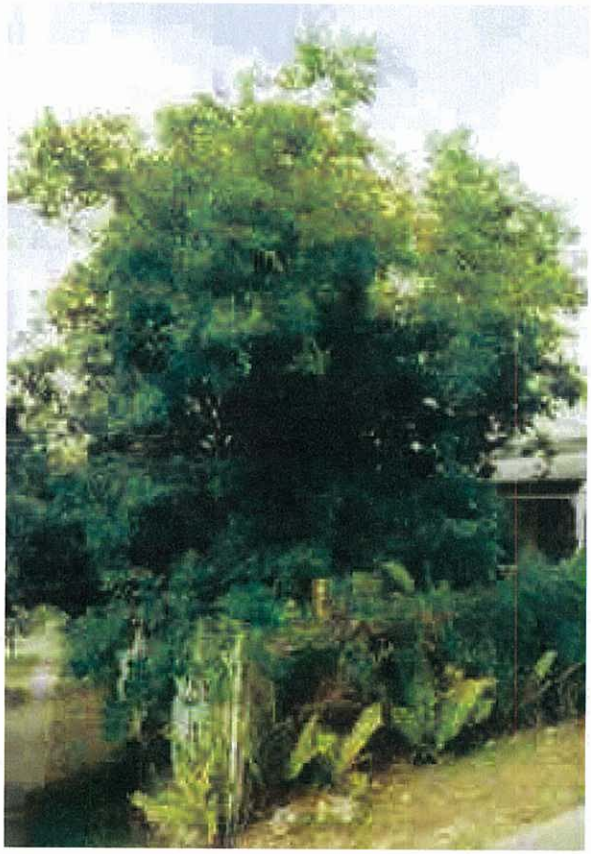
Further information is available from your local government office, or from your local primary industries and fisheries biosecurity officer: contact details are available through 13 25 23.

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)

PR09_4282

Chinese celtis

DECLARED CLASS 3



The problem

Description

Queensland Government
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Lantana

Currently, lantana covers more than 5 million ha of the east coast from southern New South Wales to Far North Queensland. Small infestations of lantana have also been found in central west Queensland, the Northern Territory, Western Australia, South Australia and Victoria. Efforts are under way to control these.

Lantana is mainly spread by people (as ornamental plants) and fruit-eating birds. It forms dense thickets that smother and kill native vegetation and are impenetrable to animals, people and vehicles.

Research indicates more than 1400 native species are negatively affected by lantana invasion, including many endangered and threatened species. As lantana is a woody shrub that has thin, combustible canes, its presence can also create hotter bushfires.

All lantana species are declared Class 3 plants under the

2002. Lantana species cannot be sold or distributed and landholders may be required to control these plants if they pose a threat to an environmentally significant area.

Lantana is a heavily branched shrub that can grow in compact clumps, dense thickets or as a climbing vine.

The stems are square in cross section, with small, recurved prickles. Most leaves are about 6 cm long and are covered in fine hairs. They are bright green above, paler beneath and have round-toothed edges. Leaves grow opposite one another along the stem. When crushed the leaves produce a distinctive odour.

Flowers appear throughout most of the year in clustered, compact heads about 2.5 cm in diameter. Flower colours vary from pale cream to yellow, white, pink, orange and red. Lantana produces round, berry-like fruit that turn from glossy green to purplish-black when ripe.

For rural producers, lantana poses problems of stock poisoning and invasion of desirable pasture. An economic impact assessment indicated lantana costs the Queensland grazing sector in excess of $70 million (2005–06 values) per year.

PP34 March 2010

Queensland Government

It is now illegal to sell or distribute any variety of lantana in Queensland. However, garden plantings are still common in many areas and have the potential to cause problems of their own.

Despite being sold and marketed as 'sterile' plants, research indicates some ornamental lantana varieties have the ability to set seed and can spread vegetatively. They also produce some viable pollen and have the potential to cross-pollinate with wild forms, creating new varieties that could naturalise in the environment.

If the number of naturalised varieties increases due to genetic drift from ornamental varieties it will make finding effective biological control agents even more difficult, and potentially extend the climatic tolerances and range of the weed's spread.

Lantana is native to the tropical and subtropical regions of Central and South America.

It is found throughout most coastal and subcoastal areas of eastern Australia, from Far North Queensland to southern New South Wales. It grows in a wide variety of habitats, from exposed dry hillsides to wet, heavily shaded gullies.

Toxicity

Many lantana varieties are poisonous to stock. It is difficult to tell which varieties are toxic so it is better to treat all forms as potentially poisonous. The toxins in lantana include the triterpene acids, lantadene A (rehmannic acid), lantadene B, and their reduced forms.

Most cases of lantana poisoning occur when new stock are introduced into lantana-infested areas. Stock bred on lantana-infested country avoid lantana unless forced to eat it due to lack of other fodder. Young animals introduced to lantana areas are most at risk.

Symptoms of lantana poisoning depend on the quantity and type of lantana consumed and, under some circumstances, the intensity of light to which the animals are exposed.

Early symptoms of depression are noticeable, with head swaying, loss of appetite, constipation and frequent urination. After a day or two the eyes and the skin of the nose and mouth start yellowing with jaundice, and the muzzle becomes dry and warm. The eyes may become inflamed and have a slight discharge. The animal also becomes increasingly sensitive to light. Finally, the muzzle becomes inflamed, moist and very painful ('pink nose'). Areas of skin may peel and slough off. Death commonly occurs 1–4 weeks after symptoms occur. Death from acute poisoning can occur 3–4 days after eating the plant.

If animals show any of the early symptoms, they should be moved to lantana-free areas, kept in the shade and monitored. Veterinary treatment should be sought immediately. Some remedies may include intravenous fluids, treating skin damage with antibiotics, or drenching with an activated charcoal slurry.

Care should be taken when introducing new or young animals into a paddock if lantana is present. Ensure they have enough fodder to stop them eating lantana in quantities sufficient to result in poisoning. During drought, animals should not be placed in lantana-infested areas without alternative food.

Control

Using a mix (integration) of control methods gives the best results. Size, density and geographic location of infestations are important considerations for choosing which control methods to use. A general principle is to commence control programs in areas of light infestations and work towards the denser infestations.

For large lantana infestations, treatment with herbicides by foliar spraying is usually not economically feasible. However, fire, dozing/stick raking, slashing/cutting, aerial helicopter spraying can reduce dense infestations, making follow-up spot treatments with chemicals more economically viable.

Lantana seed banks remain viable for at *least* four years, so follow-up control to kill seedlings before they mature is vital to ensure initial management efforts to control the parent bush are not wasted.

Appropriate fire regimes may become part of a management program to ensure lantana invasiveness is reduced and pasture is maintained.

Removal of lantana within areas of remnant vegetation may require a permit under the . Further information should be sought from the Department of Environment and Resource Management before works commence.

Stick raking or ploughing can be effective in removing standing plants. However, regrowth from stumps and/or increased seedling germination in disturbed soil is common and the site will require follow-up treatment.

Grubbing of small infestations—for example, along fence lines—can be a useful and effective method of removing plants, though this is time consuming.

Repeated slashing can also reduce the vigour of lantana, exhausting its stored resources and reducing its likelihood of re-shooting.

Some locations—for example, very steep inclines or gullies—are not suitable for mechanical control options because of the danger of overturning machinery and soil erosion.

Fire

Regular burning will reduce the capacity of plants to survive; however, initial kill rates are variable.

The effectiveness of this method will depend on the suitability of available fuel loads, fire intensity, temperature, relative humidity, soil moisture and season. Pasture re-establishment can then provide competition to inhibit lantana seed germination.

Fire is not recommended in non–fire tolerant vegetated areas such as rainforest, or wooded or plantation areas.

A typical control program for fire may include:

exclude stock to establish a pasture fuel load

burning (may require a permit)

sow improved pastures—consult your local Biosecurity Queensland officer for advice

continue to exclude stock until pasture has established

burn again in summer before rain and spot spray lantana regrowth when > 0.5 m high and when it is actively growing (see Table 1).

Herbicide recommendations for lantana are shown in Table 1. Users of herbicides have a legal obligation to read herbicide labels and use only the registered rates. Always use herbicides responsibly; adhere to legislation and safety requirements.

Variation in results can be a result of inconsistent application methods, mix rates or seasonal variation. Red-flowered and pink-edged red-flowered lantana are often considered the most difficult to control because their leaves are often smaller and tougher. However, herbicides can kill these varieties if you carefully follow application procedures.

For single-stemmed lantana, basal bark spraying and cut stump methods also give good results at any time of year (but best when the plant is actively growing). On multi-stemmed varieties, you will obtain best results by carefully applying herbicide to each stem.

When treating actively growing plants less than 2 m high, overall spraying of foliage to the point of run-off is recommended. Splatter gun techniques are also effective and particularly useful in hard-to-access areas. This is best done in autumn—when sap flows draw the poison down into the root stock, but before night temperatures get too cold.

Remove grazing animals from spray areas during and soon after treatment. Stress can cause increased sugar levels in the leaves of lantana plants, making them more palatable.

Landholders and contractors should check if the property is situated in a hazardous area. This prevents the use of some chemicals, as defined in the

Since 1914, 31 biological control agents have been introduced into Australia in an attempt to control lantana. Seventeen have established, of which several insect species cause seasonal damage, reducing the vigour and competitiveness of lantana in some areas.

Biosecurity Queensland research programs continue to investigate agents suitable for release in Australia, and test the viability of these agents in an effort to identify more effective biological control agents.

It is important to remember that biological control alone should not be relied upon for managing lantana infestations. Consideration should be given to other available control techniques.

The four most important biological control agents are:

)

Found in dry areas from Cooktown to Wollongong, this small, mottled, bug feeds on the underside of leaves, growing tips and flower buds, causing the leaves to drop early and stopping the plant from flowering.

)

Found in most lantana infestations from Cape Tribulation to Sydney as well as around Darwin, except in very dry or high altitude areas. The adult beetles are dark brown. They shelter in curled leaves and feed on the upper leaf surfaces. Larvae feed in leaves causing blotches to spread across the leaf. This beetle reduces plant vigour and can suppress flowering.

)

Found in most lantana infestations from Atherton to Wollongong. Adults of this species feed on the upper leaf surface, while larvae feed and mine the centre of the leaf and cause blotches. This activity reduces plant vigour and can suppress flowering.

)

Found from Cape Tribulation to Eden in New South Wales and also around Darwin and Perth. *Ophiomyia* black fly that feeds on flowers and lays eggs on the green fruits. The maggots of the fly eat the seed and make the fruit unattractive to birds, reducing seed spread.

Other agents such as (a stem-sucking bug) and (a sap-sucking bug) have caused some damage in specific geographic areas.

Note: Landholders are advised not to consume their time collecting established insects for distribution. Due to their own ability to disperse, these insects will be periodically/seasonally present in areas that are climatically suitable for them.

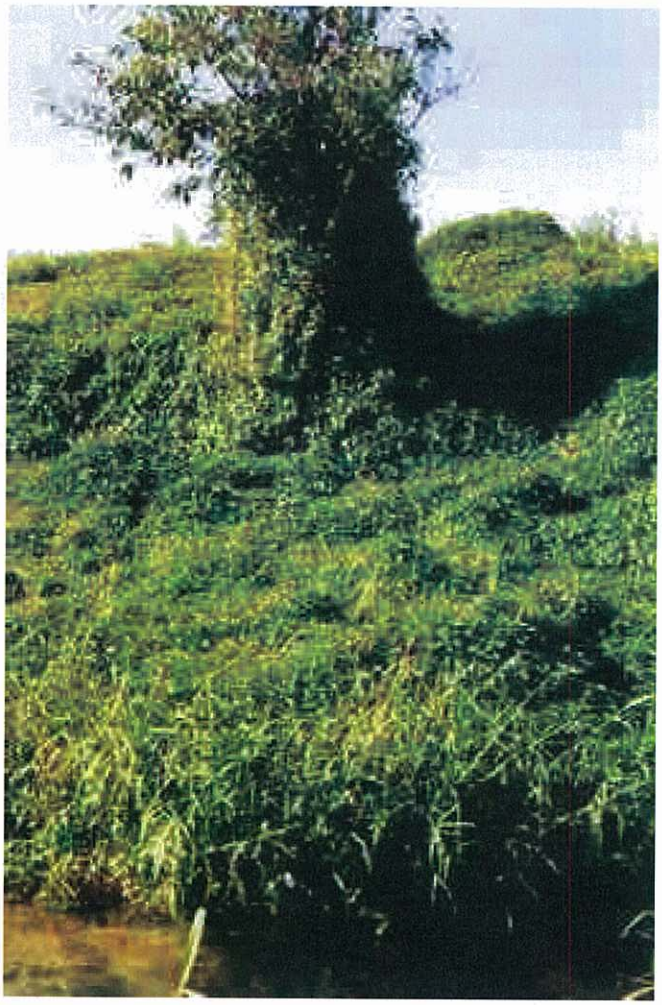
Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.deedi.qld.gov.au).

[a]		[b]	Remarks
Foliar (overall) spray			
Fluroxypyr (Starane® 200)	0.5 L to 1 L/100 L water	December to April	Thorough wetting of plants is required, higher rate should be used for larger plants
Glyphosate (Roundup® Glyphosate 360®)	1 L/100 L water	October to April	Wet plant thoroughly. Glyphosate affects any green plant it comes into contact with. Glyphosate is available in a range of strengths
Picloram + 2,4-D (Tordon® 75-D)	0.65 L/100 L water	February to April	Wet plant thoroughly. Legumes are affected if sprayed
Dichlorprop (Lantana® 600)	0.5 L/100 L water	December to April	Must thoroughly wet all leaves. Please refer to product label for situation details
Picloram + triclopyr + aminopyralid (Grazon Extra®)	0.35 L to 0.5 L/100 L water	February to April	Wet plant thoroughly. Use the higher rate on larger plants. Legumes may be affected if sprayed
® 625)	0.32 L/100 L water	March to May	Red-flowered lantanas are more resistant to 2,4-D. Will kill young legumes
Metsulfuron methyl, (Brush-off®, Brushkiller® 600,Lynx®	10 g/100 L water[b]	March to May	Results variable. Not found effective in tropics. Follow-up sprays are necessary
Metsulfuron methyl + glyphosate (Cutout®)	95 g/100 L water	March to May	Apply to bushes up to 2 m tall. Spray to thoroughly wet all foliage and stems. Spray to penetrate throughout the bush
Metsulfuron methyl + glyphosate (Trounce®)	173 g/100 L water	March to May	Apply when actively growing. Do not apply during periods of stress
Aminopyralid + fluroxypyr (Hotshot®)	0.5 L to 0.7 L/100 L water	October to April	Spray all foliage, including stems, to the point of run-off
(i) Basal bark (ii) Cut stump			
Triclopyr (Garlon 600®)	1 L/60 L diesel	Any time. Best results when actively growing	(i) Apply to lower 40 cm of every stem. Must ensure complete coverage around stem (ii) Cut close to ground level. Immediately apply herbicide
2,4-D ester (AF Rubber Vine Spray®)	2.5 L/100 L diesel	Any time. Best results when actively growing	As above
Picloram + Triclopyr (Access®)	1 L/60 L diesel	Any time. Best results when actively growing	As above
Picloram (Vigilant® Herbicide Gel)	3 mm to 5 mm gel	Any time. Best results when actively growing	(ii) If diameter of stump is › 20 mm, use a minimum of 5 mm gel thickness
Glyphosate (Roundup® Weedmaster Duo®)	Neat	Any time. Best results when actively growing	Off-label permit
Splatter gun			
Glyphosate (Roundup® 360)	1:9 glyphosate +water	October to April	2 x 2 ml dose per 0.5 m height of lantana
Metsulfuron methyl (Brushkiller® 600, Lynx®	2 g/L water	March to May	As above
Aerial			
Picloram + triclopyr + 2,4-D (Grazon®	or 10 L/ha (Grazon®)	When plant actively growing	Helicopter only. Minimum of 200 L water per hectare. Follow-up re-spray will be required. Do not burn within six months of treatment
Dichlorprop(Lantana® 600)	6 L to 8 L L/ha	When plant actively growing	As above

a Only some common trade names provided.
b Optimum times are only a guide. Lantana must be actively growing for the herbicide to work.
® = Registered trade name.
Labels often recommend the additional use of a wetting agent or surfactant within the mix. Herbicides types vary in their selectivity against other species and soil residual.

Singapore daisy

DECLARED CLASS 3



The problem

Description

Queensland Government
Department of Primary Industries and Fisheries

Management strategies

Declaration details

Further information

–

		agent		

ADDENDUM 1
Rehabilitation Requirements for North/South Access Road Option and Services

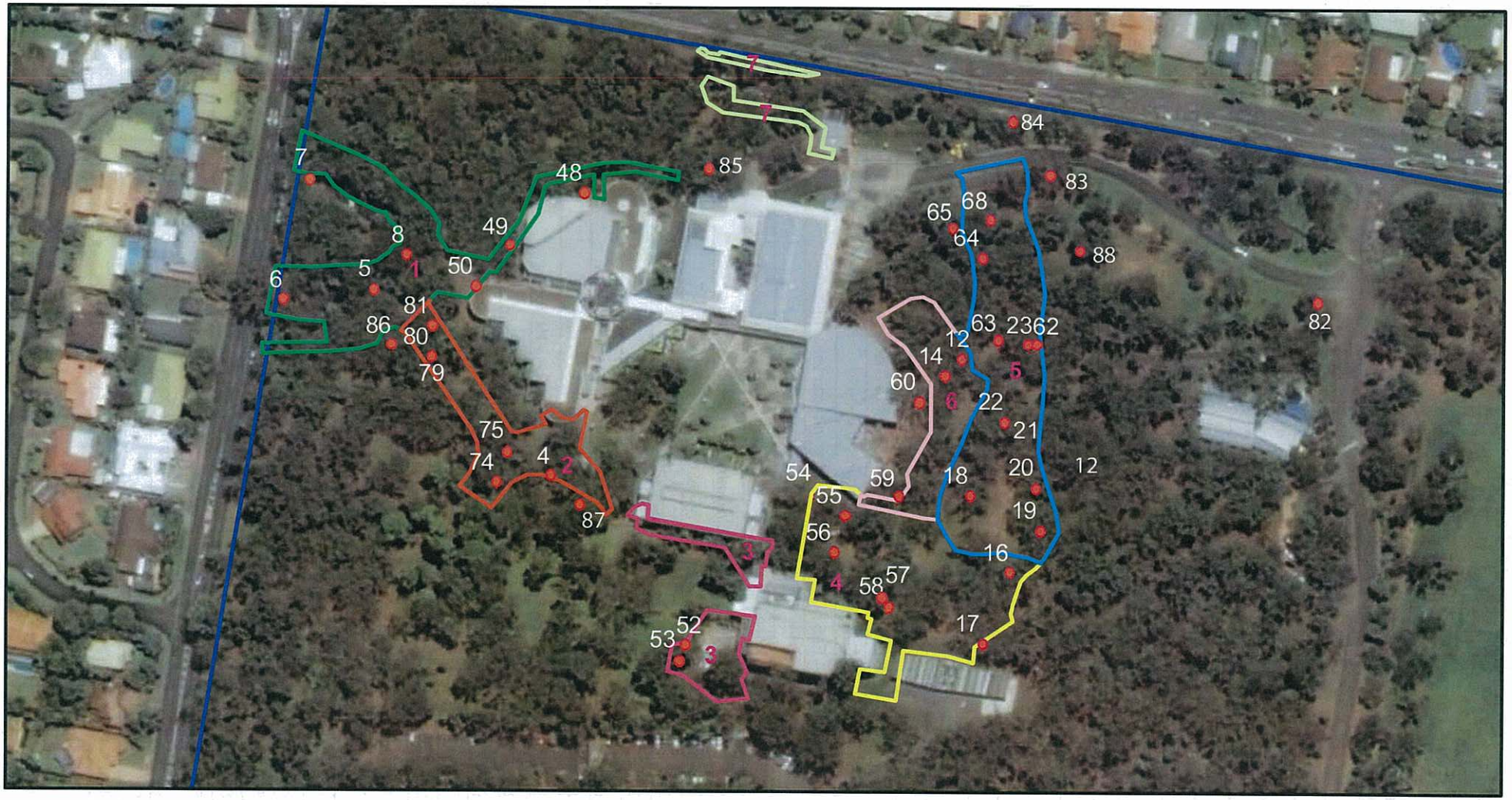
Table A1. Clearing that will be undertaken within each Management Section (refer to Figure A2 for locations) and rehabilitation requirement. Note: Calculations for Area lost do not include existing cleared areas.

Section	Vegetation Type (RE)	Area lost (ha)	Rehabilitation Requirement (ha)
1	Remnant 12.5.2	0.262	0.5240
1	Remnant 12.5.3 (minus formed roads)	0.01	0.0200
1	Non-remnant	0.012	
2	Remnant 12.5.2	0.006	0.0120
2	Remnant 12.5.3	0.182	0.3640
2	Non-remnant	0.001	
3	Remnant 12.5.3	0.042	0.0840
3	Non-remnant	0.083	
4	Remnant 12.5.3	0.25	0.5000
4	Non-remnant	0.14	
5	Remnant 12.5.3	0.4204	0.8408
6	Remnant 12.5.3	0.149	0.2980
6	Non-remnant	0.016	
7	Remnant 12.5.2	0.032	0.0640
7	Remnant 12.5.3	0.013	0.0260
7	Non-remnant	0.003	
8a	Non-Remnant	0.111	
8b	Non-Remnant	0.203	
8c	Remnant 12.5.3	0.014	0.0272
8d	Non-Remnant	0.008	
9a	Non-Remnant	0.036	
9b	Non-Remnant	0.049	
10a	Non-remnant	0.061	
10b	Remnant 12.5.3	0.007	0.0148
11a	Non-Remnant	0.022	
11b	Non-Remnant	0.017	
12a	Non-remnant	0.017	
12b	Non-remnant	0.013	
13a	Remnant 12.5.3	0.023	0.0464
13b	Remnant 12.5.3	0.013	0.0256
13c	Remnant 12.5.3	0.120	0.2394
13d	Remnant 12.5.3	0.003	0.0063
13e	Remnant 12.5.3	0.002	0.0038
13f	Remnant 12.5.3	0.009	0.019
13a	Non-Remnant	0.111	0.0272
Total Rehabilitation Requirement			**3.1005ha**

Table A2. Significant Vegetation requiring removal

Management Area	Tree No.	GPS Location	Species/Comment	Canopy Width (m)
1	5	S27.34873 E153.02237	*Eucalyptus microcorys*	15.1
1	6	S27.34877 E153.02202	*Eucalyptus tereticornis*	20
1	7	S27.34834 E153.02212	*Eucalyptus microcorys*	15.5
1	8	S27.34861 E153.02250	*Eucalyptus tereticornis*	19.1
1	48	S27.34839 E153.02320	*Eucalyptus microcorys*	12

Management Area	Tree No.	GPS Location	Species/Comment	Canopy Width (m)
1	49	S27.34858 E153.02291	*Eucalyptus microcorys*	11
1	50	S27.34872 E153.02277	*Eucalyptus racemosa*	12
2	4	S27.34939 E153.02308	*Eucalyptus microcorys*	9.1
2	74	S27.34941 E153.02286	*Eucalyptus microcorys*	20
2	75	S27.34930 E153.02290	*Eucalyptus siderophloia*	15
2	79	S27.34910 E153.02266	*Eucalyptus propinqua*	10
2	80	S27.34897 E153.02260	*Corymbia intermedia*	20
2	81	S27.34886 E153.02260	*Eucalyptus microcorys*	15
3	53	S27.35000 E153.02353	*Corymbia intermedia* - **Hollows**	11
3	52	S27.34994 E153.02354	*Corymbia intermedia*	8
4	16	S27.34972 E153.02489	*Eucalyptus tereticornis*	17
4	17	S27.34997 E153.02478	*Eucalyptus racemosa*	16
4	54	S27.34944 E153.02411	*Eucalyptus racemosa* Potential Hollows in Canopy	12
4	55	S27.34952 E153.02423	*Eucalyptus racemosa* - **Hollows**	6
4	56	S27.34965 E153.02419	*Eucalyptus carnea* – **Hollows**	10
4	57	S27.34980 E153.02438	*Eucalyptus carnea*	10
4	58	S27.34984 E153.02440	*Eucalyptus microcorys* - **Hollows**	6
5	18	S27.35020 E153.02398	*Eucalyptus racemosa*	10
5	19	S27.34945 E153.02473	*Corymbia intermedia* (*Ficus* sp. attached)	13
5	20	S27.34957 E153.02500	*Corymbia intermedia*	14
5	21	S27.34942 E153.02499	*Corymbia intermedia*	12
5	22	S27.34929 E153.02501	*Eucalyptus racemosa*	19
5	23	S27.34919 E153.02487	*Corymbia intermedia*	13
5	62	S27.34892 153.02496	*Corymbia intermedia*	12
5	63	S27.34891 153.02484	*Eucalyptus racemosa* - **Hollows**	15
5	64	S27.34861 153.02477	*Eucalyptus microcorys* - **Hollows**	12
5	65	S27.34852 153.02466	*Eucalyptus carnea*	15
5	68	S27.34848 153.0248	*Corymbia intermedia*	18
6	59	S27.34946 E153.02444	*Eucalyptus microcorys* - **Hollows**	10
6	60	S27.34897 E153.02469	*Eucalyptus microcorys* - **Hollows**	20.5
6	14	S27.34909 E153.02458	*Eucalyptus microcorys* (Lorikeets observed in hollow)- - **Hollows**	15.5
6	12	S27.34903 E153.02463	*Eucalyptus siderophloia*	13.5
8b	82	S27.34888 E153.02612	*Eucalyptus tereticornis*	12
8b	83	S27.34844 E153.02503	*Corymbia intermedia*	8.7
8a	84	S27.34816 E153.02491	*Eucalyptus tereticornis*	8
8c	88		*Corymbia intermedia*	
13b	85	S27.34829 E153.02369	*Eucalyptus tereticornis*	12
10a	86	S27.34895 E153.02242	*Eucalyptus microcorys*	11
13c	87	S27.34949 E153.02314	*Eucalyptus tereticornis* - **Hollows**	
Total Number of Trees to be replanted				**120**



Basemapcourtesy of Nearmap 2011

Legend

- Significant Vegetation
- Boundary of Precinct 1
- Management Areas (1)

N

0 20 40 60 80 100

Meters

Datum: GDA94
Projection: MGA94 Zone 56

Figure A1

Location of Significant Vegetation

Flora and Fauna Management Plan
Carseldine Government Office Project

Biodiversity Assessment and Management Pty Ltd

Job # 0303-001
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