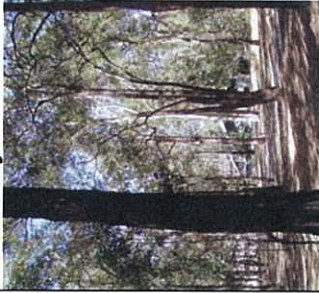


Management Section (Figure 1)	Existing Vegetation Communities	Current Condition Summary	General Management Requirements and Potential Threats	Recommended Species schedule	Monitoring and Maintenance	Desired Outcomes and Performance Indicators
4. Area north of existing Building E 	Remnant vegetation (12.5.3) 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 <i>Melaleuca</i> and <i>Acacia</i> 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 <i>Melaleuca</i> and <i>Acacia</i> 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 <i>Melaleuca</i> and <i>Acacia</i> 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
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 <i>Alpinia zerumbet</i> .	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.
			Continue current maintenance program within retained areas.			- No weed infestations.

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.
E. Management Section 7	Supports some canopy species reflective of	The canopy appeared in good health. The shrub and ground	Extensive weed removal required to restore this community to pre-	Table 3 provides the recommended	Monitoring and maintenance schedule for	Shrub and ground layer species are reflective of

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
	RE12.5.2/12/5/ 3.	layers are dominated by weeds and exotic garden plantings. Much of the area is dominated by wild ginger <i>Hedychium sp</i>	disturbance quality. Ginger plants are highly invasive and should be a priority for removal.	planting schedule	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.	RE12.5.2 communities. - No evidence of dieback of canopy species. - All weeds and exotic plants removed.

Table 3 – Species Planting Schedule * A schematic indicating spacing is provided in Plate 1

Rehabilitation Area / Stratum / Species	Common Name	Density*	Notes	
A (Open eucalypt forest with grassy understorey and moderately dense shrub layer (12.5.3))				
Tree layer – NA intact canopy in rehabilitation areas				
Shrub layer				
Acacia disparima subsp. disparima	Hickory Wattle	2m centres	In general, this community does not require revegetation. However, where exotic grasses and weeds have been removed, supplementary plantings may be required to prevent re-invasion.	
Alphitonia excelsa	Red Ash	2m centres		
Acacia fimbriata	Brisbane Golden Wattle	2m centres		
Jagera pseudorhus var. pseudorhus	Foambark	2m centres		
Breyeria oblongifolia	Breyeria	2m centres		
Dodonaea triquetra	Hop Bush	2 m centres		
Ground Layer				
Lomandra longifolia	Matrush	1m centres		
Hardenbergia violacea	Native Sarsaparilla	1m centres		
Ottoschloa gracillima	Ottoschloa	1m centres		
Themeda triandra	Kangaroo grass	1m centres		
Dianella caerulea	Blue Flax Lily	1m centres		
B and C (Open Eucalypt Forest with a moderately dense shrub layer and grassy ground layer (RE 12.3.11))				
Tree layer				
Eucalyptus terebinthifolia	Queensland Blue-gum	2m centres	Generally the eastern section of this community does not require revegetation. Once exotic grasses and weeds have been removed from edges, natural recruitment of native species should occur.	
Eucalyptus racemosa	Scribbly Gum	2m centres		
Eucalyptus microcorys	Tallowwood	2m centres		
Eucalyptus siderophloia	Broad-leaved Grey Ironbark	2m centres		
Corymbia intermedia	Pink Bloodwood	2m centres		
Sub-canopy				
Lophostemon suaveolens	Swamp Box	2m centres		
Allocasuarina littoralis	She-oak	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Melaleuca quinquenervia	Broad-leaved Paperbark	2m centres		
Shrub Layer				
Acacia disparima subsp. disparima	Hickory Wattle	2m centres	However, areas towards Dorsett Rd are heavily weed infested and require extensive weed removal and replanting of the shrub and ground layer	
Acacia leiocalyx	Black Wattle	2m centres		
Acacia fimbriata	Brisbane Golden Wattle	2m centres		
Jagera pseudorhus var. pseudorhus	Foambark	2m centres		
Pittosporum revolutum	Yellow pittosporum	2m centres		
Glochidion ferdinandi	Cheese Tree	2m centres		
Ground Layer				
Ottoschloa gracillima	Ottoschloa	1m centres		
Lomandra longifolia	Matrush	1m centres		
Hardenbergia violacea	Native Sarsaparilla	1m centres		
Dianella caerulea	Blue Flax Lily	1m centres		
D Cabbage Tree Creek Riparian Open Forest (RE12.3.7)				
Tree layer				
Eucalyptus racemosa	Scribbly Gum	2m centres	Generally the canopy is intact and no revegetation is required. However, where weeds are eradicated supplementary plantings may be required to prevent re-invasion when canopy gaps exceed 50m (measured from the drip zone).	
Eucalyptus terebinthifolia	Queensland Blue-gum	2m centres		
Corymbia intermedia	Pink Bloodwood	2m centres		
Lophostemon suaveolens	Swamp Box	2m centres		
Sub-canopy				
Lophostemon suaveolens	Swamp Box	2m centres		
Lophostemon suaveolens	Swamp Box	2m centres		
Eucalyptus excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Melaleuca linariifolia	Snow-in Summer	2m centres		
Shrub Layer				
Alphitonia excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		
Alphitonia excelsa	Red Ash	2m centres		

Rehabilitation Area / Stratum / Species	Common Name	Density*	Notes
<i>Acacia disparrima</i> subsp. <i>disparrima</i>		2m centres	locally endemic flora species.
<i>Acacia fimbriata</i>		2m centres	
<i>Acacia irrorata</i>		2m centres	
Ground Layer			
<i>Ottochloa gracillima</i>	Ottochloa	1m centres	
<i>Parsonsia straminea</i>	Monkey Rope Vine	1m centres	
<i>Lomandra hystrix</i>		1m centres	
E (Open eucalypt forest with planted exotics)			
Tree layer – NA intact canopy			The canopy is fairly sparse. In most areas the shrub layer consists of exotic planted species that have the potential to invade retained bushland sites. Complete removal of exotic species and replanting with endemic native species is required to return this area to a community that reflects the adjacent remnant vegetation.
Shrub layer			
<i>Acacia disparrima</i> subsp. <i>disparrima</i>	Hickory Wattle	2m centres	
<i>Acacia fimbriata</i>	Brisbane Golden Wattle	2m centres	
<i>Jagera pseudorhus</i> var. <i>pseudorhus</i>	Foambark	2m centres	
<i>Breynia oblongifolia</i>	Breynia	2m centres	
<i>Dodonaea triquetra</i>	Hop Bush	2 m centres	
Ground Layer			
<i>Lomandra longifolia</i>	Matrush	1m centres	
<i>Hardenbergia violacea</i>	Native Sarsaparilla	1m centres	
<i>Ottochloa gracillima</i>	Ottochloa	1m centres	
<i>Themeda triandra</i>	Kangaroo grass	1m centres	
<i>Dianella caerulea</i>	Blue Flax Lily	1m centres	

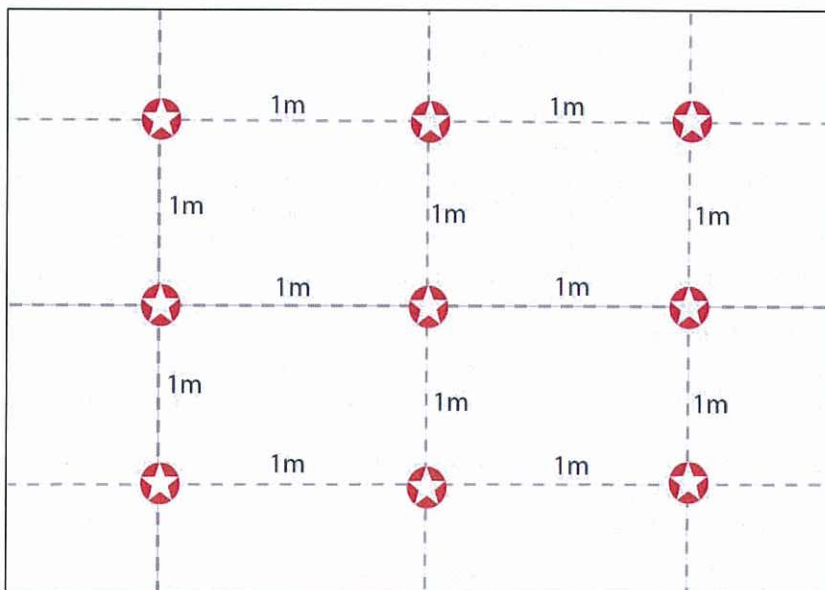


Plate 1: Schematic indicating the planting arrangement for planting at 1m centres (location of plants is indicated by stars encircled by red).

Table 4: Rehabilitation Methodology

Task	Recommendations
Delineate Rehabilitation Areas	Rehabilitation areas are to be clearly delineated on the ground with fencing where necessary.
Weed and Exotic Plant Removal and Control	Priority and environmental weeds are listed in Table 5 and control methods for grassy, herbaceous and woody weed species are illustrated in Appendices A and B Hand removal is the preferred method of weed control near creeks and waterways, however, where this is ineffective Round-Up Bioactive [®] , or a similar product suitable for use near waterways, may be used. Particular care must be taken to avoid poisoning native species, particularly young saplings, native grasses and herbaceous species. Exotic grasses are to be treated (by spraying) 2-3 weeks prior to planting – particular care must be taken to avoid spraying native grasses. Woody and herbaceous species are also to be treated prior to planting. Two weeks following spraying of rank exotic grasses these are to be knocked down by brushcutting – particular care must be taken to avoid slashing native species. For specific control requirements for priority weeds see Appendices A and B
Site Preparation	Any rubbish will need to be collected and disposed of offsite at a Council approved location or rubbish disposal depot. No ripping is required.
Mulch	Mulching will be undertaken across the rehabilitation areas. A weed free mulch is to be applied to a depth of 100mm across the rehabilitation area.
Plant Supply	Seedlings shall be sourced from local provenance stock (where possible). Species and numbers are scheduled in Table 3 . Planting stock shall be provided in forestry tubes with a minimum plant height of 20cm and a well developed root system. Seedlings are to be healthy and displaying signs of active growth – any plants displaying yellowing, disease, root curling or are root bound are not to be planted, nor are any plants with weeds growing in the pot.
Tubestock Planting	Plant in a slight shallow twice the size of the tube container, ensuring rootball is just below soil surface. Fertiliser tablet to be placed adjacent to, but not touching, the rootball. Soil to be backfilled to the same level as when the plant was in the container Mulch to a depth of 100mm to surround plant, but not touch the stem. Seedlings are to be randomly arranged at the minimum densities identified in Table 3 . Seedlings must be moist at time of planting, if necessary water stock prior to planting.
Watering	Seedlings are to be watered with a minimum of 5 – 10 litres of water each at the time of planting and then watered as part of general maintenance requirements.
Habitat Features	For all Rehabilitation Areas, habitat features such as rocks, fallen branches and dead trees and shrubs in all zones are to be retained in situ unless they pose a safety risk.
Maintenance and Monitoring	Plantings will be maintained for a period of 24 months during the rehabilitation phase. Subsequent management will then be as per Table 2 . In order to reduce an increase in the mosquito population, fill or drain any areas of standing water within rehabilitation areas that may act as mosquito breeding sites.

4.5 WEED MANAGEMENT

Of the 24 invasive weed species identified or within Precinct 1 (**Table 5**), seven species are declared as Class 3 pests under the LP Act.

Specific management requirements for declared plant species are provided within **Appendices A and B**

Table 5: Invasive Weed Species on the Site

Family	Scientific Name	Common Name	Status* (LP Act)	Recommended Control Techniques **
Asparagaceae	<i>Asparagus aethiopicus</i>	Asparagus Fern	Class 3	Appendices A and B
Asteraceae	<i>Sphagneticola trilobata</i> *	Singapore Daisy	Class 3	Appendices A and B
Fabaceae	<i>Crotalaria lanceolata</i>	Rattlepod	Environmental weed	DEEDI website
Fabaceae	<i>Neonotonia wightii</i>	White Glycine	Environmental weed	DEEDI website
Lauraceae	<i>Cinnamomum camphora</i>	Camphor Laurel	Class 3	Appendices A and B
Ochnaceae	<i>Ochna serrulata</i>	Ochna	Environmental weed	DEEDI website
Passifloraceae	<i>Passiflora suberosa</i>	Corky Passion Flower	Environmental weed	DEEDI website
Passifloraceae	<i>Passiflora subpeltata</i>	White Passion Flower	Environmental weed	DEEDI website
Poaceae	<i>Axonopus compressus</i>		Environmental weed	Chemical spray
Poaceae	<i>Cynodon dactylon</i>	Couch Grass	Environmental weed	DEEDI website
Poaceae	<i>Megathyrsus maximus</i>	Green Panic	Environmental weed	DEEDI website
Poaceae	<i>Melinis repens</i>	Red natal grass	Environmental weed	DEEDI website
Poaceae	<i>Phalaris canariensis</i>	Canary Grass	Environmental weed	DEEDI website
Poaceae	<i>Paspalum conjugatum</i>	Sourgrass	Environmental weed	DEEDI website
Poaceae	<i>Setaria sphacelata</i>	Pigeon Grass	Environmental weed	DEEDI website
Poaceae	<i>Sorghum halepense</i>	Johnson grass	Environmental weed	Chemical spray
Poaceae	<i>Urochloa mutica</i>	Signal Grass	Environmental weed	DEEDI website
Solanaceae	<i>Datura stramonium</i>	Common Thornapple	Environmental weed	DEEDI website
Solanaceae	<i>Solanum mauritianum</i>	Wild tobacco	Environmental weed	DEEDI website
Ulmaceae	<i>Celtis sinensis</i> *	Chinese Elm	Class 3	Appendices A and B
Verbenaceae	<i>Lantana camara</i> *	Lantana	Class 3	Appendices A and B
Verbenaceae	<i>Lantana montevidensis</i> *	Creeping Lantana	Class 3	As for Lantana
Verbenaceae	<i>Stachytarpheta</i> sp.		Environmental weed	DEEDI website

*Status under LP Act

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

4.6 MAINTENANCE
The maintenance plan provided in **Table 6** is applicable for a total of five years following commencement of rehabilitation.

Table 6: Maintenance Plan for Rehabilitation Works

Recommended Action	
Timing	
First three months after planting	Control weeds – Check for weeds monthly and control by hand removal, spot spraying e.g. of grasses, taking care not to damage planted and regenerating native species, including grasses and forbs. Watering – Water each seedling with a minimum of 8 – 10 litres of water weekly during the first month depending upon prevailing weather conditions and then monthly or as necessary until seedlings are established (approximately 3 – 6 months). General Site Maintenance – e.g. Remove any rubbish dumped on site; check for signs of erosion; replace mulch as required. Fill or drain any areas of standing water within the rehabilitation areas that may increase the incidence of mosquitoes. Replacement Planting – Replace dead or senescent plants according to the methods detailed in Table 4. Monitoring – Undertake regular monitoring.
3-24 months after planting	Control weeds – Continue monthly weed checks and control as specified for first three months. Watering – Continue to water each seedling as necessary until seedlings are established (approximately 3 – 6 months). Any replacement seedlings should be watered weekly during the first month following planting, then water as necessary until seedlings are established (approximately 3 – 6 months after planting). Replacement Planting – Replace dead or senescent plants according to the methods detailed in Table 4; and continue replacement planting until 95% survival rate achieved. Mulching – If mulch is depleted thereby allowing significant weed growth, replace mulch around affected plants with coarse forest mulch or sugar cane to a depth of 100mm and diameter of 1m, ensuring mulch does not contact any stems/trunks of native species. General Site Maintenance – e.g. Remove any rubbish dumped on site; check for signs of erosion; replace mulch as required. Fill or drain any areas of standing water within the rehabilitation areas that may increase the incidence of mosquitoes. Monitoring – Undertake regular site monitoring tasks and photos.

5.0 REFERENCES

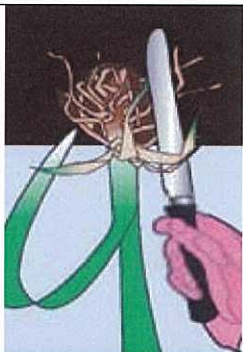
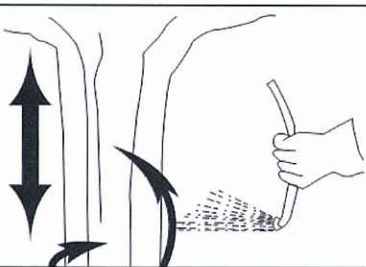
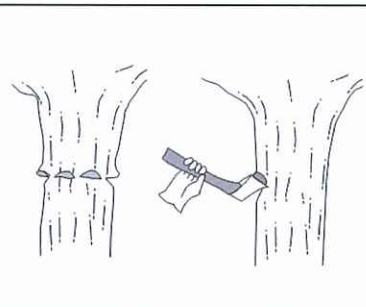
BAAM (2011). 'Flora and Fauna Management Plan – Precinct 1 Fitzgibbon ULD' Unpublished report prepared for Department of Public Works

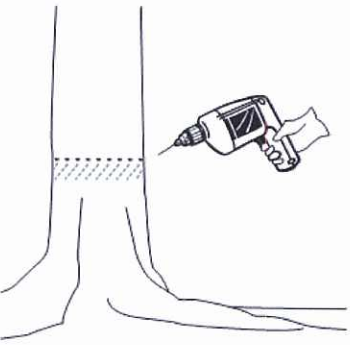
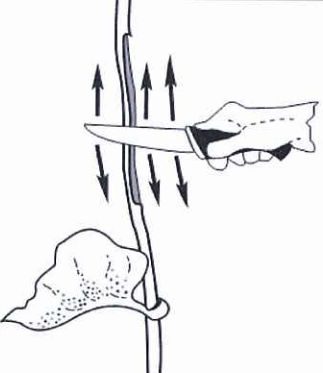
Bushland Protection Systems (2011). *Bushfire Management Plan – Carseldine Office Project.* Unpublished report prepared for Department of Public Works.

Appendix A

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 had 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 had 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 spraysack. 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 <i>in situ</i> 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 <i>in situ</i> 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 B

Pest Fact Sheets



Basket or ground asparagus fern

Asparagus aethiopicus cv. *Sprengeri*

DECLARED CLASS 3



The problem

Basket asparagus is one of the most significant garden escapes invading the coastline. It survives well on sand dunes, shallow-soiled headlands and in rainforest understorey. In some places it has become the dominant ground cover displacing native plants, even in undisturbed systems. A problem along the entire coast, it is also known as ground asparagus or simply asparagus fern. It was introduced from Africa.

Description

Basket asparagus has long, arching, prickly stems up to 2 m long. The slender leaves are light green. It produces clusters of small, creamy flowers and fruits up to 8 mm in diameter. Fruits ripen to bright red and each contains a single, black, round seed. Tubers bearing starch and water are present, but these do not regrow or reproduce.

Management strategies

This plant need not be a problem if it is kept in a pot or hanging basket in a location that can not be accessed by birds. Birds eating the berries disperse this plant. Unwanted plants should be dug out and disposed of at the appropriate Council landfill site. Take care to remove the entire crown or underground stem of the plant, to reduce the chance of regrowth.

Further information

Further information is available from the vegetation management/weed control/environmental staff at your local government.

TABLE 1 – HERBICIDES REGISTERED FOR THE CONTROL OF BASKET OR GROUND ASPARAGUS FERN

Method	Herbicide	Rate	Registration status	Comments
Spot spray	metisulfuron-methyl (600 g/L)	10 g per 100 L water plus wetting agent or 100 g/ha plus wetting agent	PERMIT 7485	Do not use on coastal dunes or near the root zone of casuarinas or pandanus trees.
Cut stump, spot spray	Diesel	Apply neat	PERMIT 7485	Trials suggest spraying the entire central crown to the point of runoff. This does not require cutting or disturbing the target plant or other surrounding vegetation.
Sport spray	dicamba (500 g/L)	200 mL on mature to 1 L on regrowth per 100 L water, or 2 L/ha	PERMIT 7485	Only for short-term knockdown.

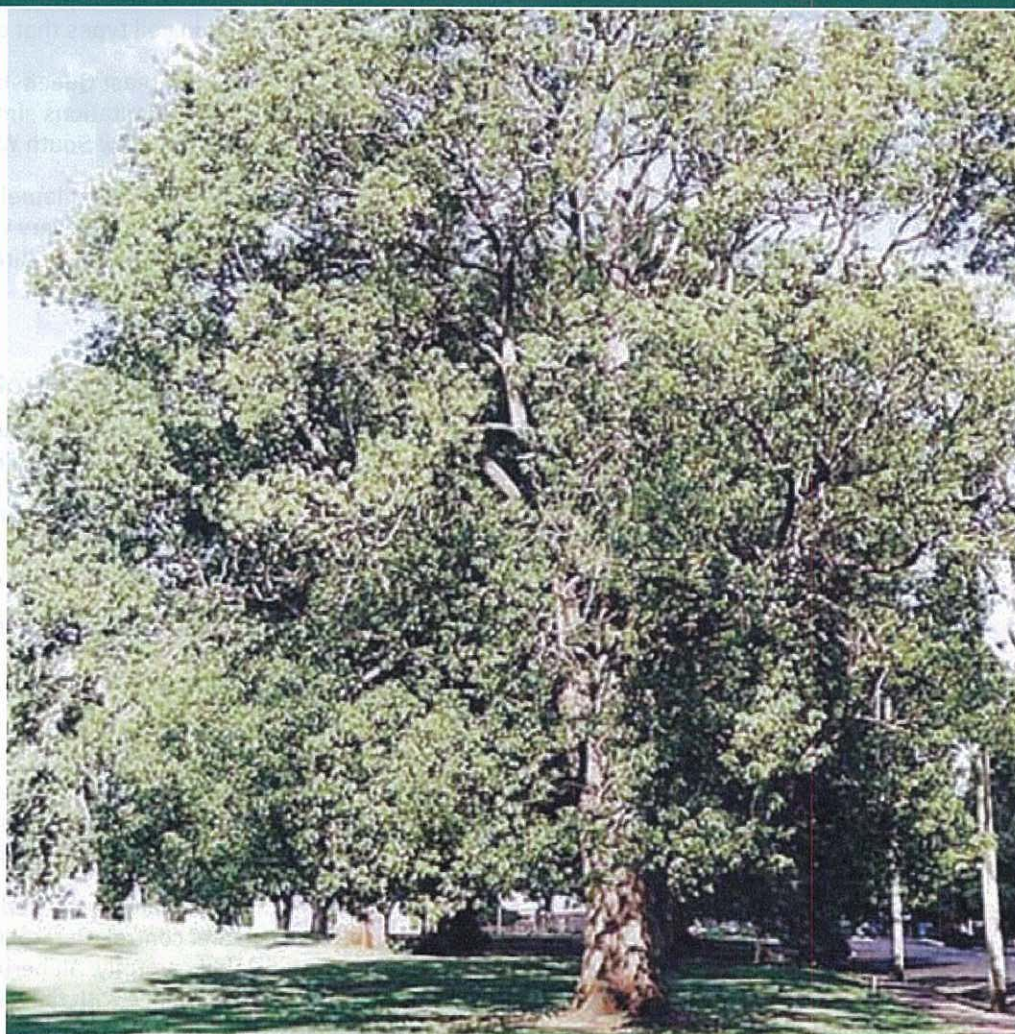
Read the label carefully before use and always use the herbicide in accordance with the directions on the label. It is a requirement that all persons using the products covered by this off-label permit comply with the details and conditions listed in the permit. In addition, read the herbicide label carefully before use and always use the herbicide in accordance with label directions. The above permit can be used by pest control operations, members of environmental groups such as Bushcare, Catchment Care, Coast Care and people employed as or working under supervision of local and state government officers.

Fact sheets are available from DPI&F service centres and the DPI&F Information Centre phone (13 25 23). Check our web site <www.dpi.qld.gov.au> to ensure you have the latest version of this fact sheet. The control methods referred to in this Fact sheet 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 utilisation 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, the Department of Primary Industries and Fisheries does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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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

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.

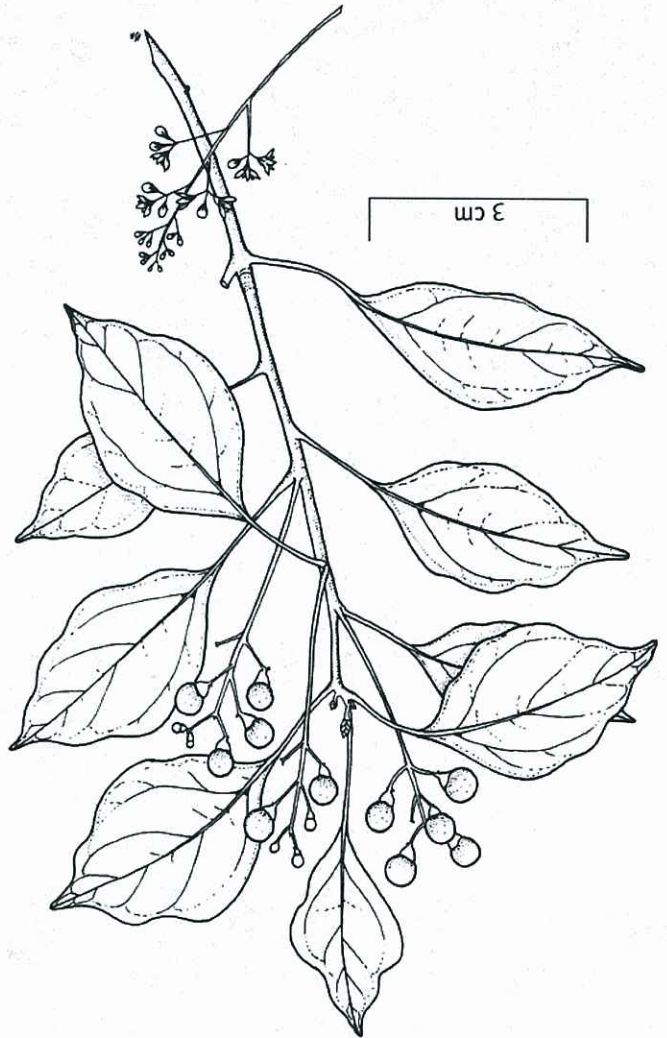
Foliar spray

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.



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.

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.

Chinese celtis

Celtis sinensis



DECLARED CLASS 3



The problem

Chinese celtis is an Asian tree that is naturalised throughout most of south-east Queensland. This fast growing species forms dense infestations along creek banks and prevents regeneration of native riparian vegetation. It also sucks up water and has the potential to affect populations of native animals through habitat destruction. Celtis is very common in and around Brisbane, due to its cultivation as a shade tree and garden plant. Celtis seeds are spread by birds, flying foxes and water.

Description

This deciduous tree grows up to about 12 m tall and flowers in spring. Leaves are quite glossy, with a paler underside and pronounced veins. Thousands of small, orange berries are produced and are dispersed when eaten by birds. Celtis often grows in clay soils associated with alluvial creek flats and gullies. It is an invader of riparian habitats and seems particularly successful in areas where the original vegetation has been disturbed or fenced off from grazing stock.

Management strategies

Prevention is the key and celtis should be removed before it has the chance to grow into a problem. Small seedlings can be hand pulled or dug out. Pre-plan your revegetation so other weeds do not invade the disturbed area. Dozing and burning dense infestations with controlled grazing gives best control. Herbicides may be necessary for killing larger specimens.

Further information

Further information is available from the vegetation management/weed control/environmental staff at your local government.

Declaration details

Chinese celtis is a declared Class 3 plant under the *Land Protection (Pest and Stock Route Management) Act 2002*. The Act prohibits the supply or sale of Class 3 plants and may require their removal from environmentally significant areas.

TABLE 1 – HERBICIDES REGISTERED FOR THE CONTROL OF CHINESE CELTIS

Method	Herbicide	Rate	Registration status	Comments
Basal bark	fluroxypyr (200 g/L)	35 mL per 1 L diesel or kerosene	Registered	Young plants up to 2 m high and 20 cm basal diameter
Stem injection	picoloram (100 g/L) + triclopyr (200 g/L)	1 L per 4 L water	PERMIT 7485	
Cut stump	picoloram (100 g/L) + triclopyr (200 g/L)	50 mL per 1 L water	PERMIT 7485	Cut stumps to less than 10 cm above the ground and immediately paint stump after cutting.
Stem injection	glyphosate (360 g/L)	Undiluted at 1 mL per 2 cm of hole or cut	PERMIT 7485	Plants up to 30 cm basal diameter.
Cut stump	glyphosate (360 g/L)	1 L to 12 L water	PERMIT 7485	
Spot spray	fluroxypyr (200 g/L)	500 mL per 100 L water	PERMIT 7485	Overall spray on young plants less than 2 m high.
Foliar spray	2,4-D acid (300 g/L)	1 L per 100 L water	Registered	Overall spray on young seedlings.

Read the label carefully before use and always use the herbicide in accordance with the directions on the label.

It is a requirement of a permit that all persons using the products covered by this off-label permit comply with the details and conditions listed in the permit. In addition, read the herbicide label carefully before use and always use the herbicide in accordance with label directions. The above permit can be used by pest control operations, members of environmental groups such as Bushcare, Catchment Care, Coast Care and people employed as or working under supervision of local and state government officers.

Lantana

Lantana camara



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.

Declaration details

All lantana species are declared Class 3 plants under the *Land Protection (Pest and Stock Route Management) Act 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.

Description and general information

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.

Landholders may be required to control these plants if they pose a threat to an environmentally significant area.



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.

Habitat and distribution

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 *Vegetation Management Act 1999*. Further information should be sought from the Department of Environment and Resource Management before works commence.

Mechanical control

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 and seeded
- 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 control

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. Splat 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 *Agricultural Chemicals Distribution Control Act 1966*.

Biological control

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:

- **sap-sucking bug (*Teleonemia scrupulosa*)**
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.
- **leaf-mining beetle (*Uropelta girardi*)**
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.
- **leaf-mining beetle (*Ocotoma scabripennis*)**
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.
- **seed-feeding fly (*Ophiomyia lantanae*)**
Found from Cape Tribulation to Eden in New South Wales and also around Darwin and Perth. *Ophiomyia* is a small 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 *Aconophora compressa* (a stem-sucking bug) and *Leptodyrsa decora* (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

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

Table 1. Herbicides for control of lantana

Method of application: active ingredient (trade name) ^a	Rate	Optimum time ^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® 360, 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
2,4-D amine (Amicide® 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® 600)	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 (Tounce®)	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® 600)	2 g/L water	March to May	As above
Aerial			
Picloram + triclopyr + 2,4-D (Grazon® DS + 2,4-D amine 625 g/L)	1.5 L + 6 L/ha 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.

Fact sheets are available from Department of Employment, Economic Development and Innovation (DEEDI) service centres and our Business Information Centre (telephone 13 25 23). Check our website at www.deedi.qld.gov.au <file://www.deedi.qld.gov.au> to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet 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, DEEDI does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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Singapore daisy

Sphagneticola trilobata

DECLARED CLASS 3



The problem

Singapore daisy spreads rapidly and smothers seedling, ferns and shrubs and will out-compete them for survival. It is invading all different environmental areas, even living in sand. Singapore daisy is difficult to control.

Description

Singapore daisy is a vigorous ground cover with lush glossy green leaves. The leaves are usually 3 lobed and in pairs up the stem. It produces yellow to orange-yellow daisy flowers about 2 cm across all year round. The flowers are held above the leaves on short stalks. Singapore daisy is a garden escapee and native of tropical America.

Management strategies

Singapore daisy produces variable amounts of seeds but is mainly spread by cuttings via slashing and pruning. Revegetation of the cleared area should be pre planned to ensure that other weeds do not gain a foothold in the disturbed area, include mulching to keep weeds down.

Take care when mowing or slashing around areas planted with Singapore daisy, so as not to transfer the problem elsewhere.

Hand pull and dig up runners. The plant will regrow from the smallest cutting so dispose of waste carefully. Either burn waste or put into a black plastic bag and leave in the sun for a few days before putting into the refuse bin. Repeat hand pulling will need to be done as new regrowth appears.

Declaration details

Singapore daisy is a declared Class 3 plant under the *Land Protection (Pest and Stock Route Management) Act 2002*. The Act prohibits the supply or sale of Class 3 plants and may require their removal from environmentally significant areas.

Further information

Further information is available from the vegetation management/weed control/environmental staff at your local government.

TABLE 1 – HERBICIDES REGISTERED FOR THE CONTROL OF SINGAPORE DAISY

Method	Herbicide	Rate	Registration status	Comments
Foliar spray	metsulfuron-methyl (600 g/L)	10 g per 100 L water plus wetting agent	DPI Board approval	Spray thoroughly to wet all foliage, but not to cause run-off. Minimise contact with desirable species.

Read the label carefully before use and always use the herbicide in accordance with the directions on the label.

ADDENDUM 1

Rehabilitation Requirements for North/South

Access Road Option

Table A1. Clearing that will be undertaken within each Management Section 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	0.524
1	Remnant 12.5.3 (minus formed roads)	0.010	0.020
2	Remnant 12.5.2	0.006	0.012
2	Remnant 12.5.3	0.182	0.364
3	Remnant 12.5.3	0.042	0.0826
4	Remnant 12.5.3	0.250	0.500
5	Remnant 12.5.3	0.4204	0.841
6	Remnant 12.5.3	0.149	0.298
7	Remnant 12.5.2	0.032	0.064
7	Remnant 12.5.3	0.013	0.0258
Total Rehabilitation Requirement			2.731ha

Table A2. Significant Vegetation requiring removal

Management Area	Tree No.	GPS Location	Species/Comment	Canopy Width (m)
1	5	S27.34873 E153.02237	<i>Eucalyptus microcorys</i>	15.1
1	6	S27.34877 E153.02202	<i>Eucalyptus tereticornis</i>	20
1	7	S27.34834 E153.02212	<i>Eucalyptus microcorys</i>	15.5
1	8	S27.34861 E153.02250	<i>Eucalyptus tereticornis</i>	19.1
1	48	S27.34839 E153.02320	<i>Eucalyptus microcorys</i>	12
1	49	S27.34858 E153.02291	<i>Eucalyptus microcorys</i>	11
1	50	S27.34872 E153.02277	<i>Eucalyptus racemosa</i>	12
2	4	S27.34939 E153.02308	<i>Eucalyptus microcorys</i>	9.1
2	74	S27.34941 E153.02286	<i>Eucalyptus microcorys</i>	20
2	75	S27.34930 E153.02290	<i>Eucalyptus siderophloia</i>	15
2	79	S27.34910 E153.02266	<i>Eucalyptus propinqua</i>	10
2	80	S27.34897 E153.02260	<i>Corymbia intermedia</i>	20
2	81	S27.34886 E153.02260	<i>Eucalyptus microcorys</i>	15
3	53	S27.35000 E153.02353	<i>Corymbia intermedia</i> - Hollows	11
3	52	S27.34994 E153.02354	<i>Corymbia intermedia</i>	8
4	16	S27.34972 E153.02489	<i>Eucalyptus tereticornis</i>	17
4	17	S27.34997 E153.02478	<i>Eucalyptus racemosa</i>	16
4	54	S27.34944 E153.02411	<i>Eucalyptus racemosa</i> Potential Hollows in Canopy	12
4	55	S27.34952 E153.02423	<i>Eucalyptus racemosa</i> - Hollows	6
4	56	S27.34965 E153.02419	<i>Eucalyptus carnea</i> – Hollows	10
4	57	S27.34980 E153.02438	<i>Eucalyptus carnea</i>	10
4	58	S27.34984 E153.02440	<i>Eucalyptus microcorys</i> - Hollows	6
5	18	S27.35020 E153.02398	<i>Eucalyptus racemosa</i>	10
5	19	S27.34945 E153.02473	<i>Corymbia intermedia</i> (<i>Ficus</i> sp. attached)	13
5	20	S27.34957 E153.02500	<i>Corymbia intermedia</i>	14

Management Area	Tree No.	GPS Location	Species/Comment	Canopy Width (m)
5	21	S27.34942 E153.02499	<i>Corymbia intermedia</i>	12
5	22	S27.34929 E153.02501	<i>Eucalyptus racemosa</i>	19
5	23	S27.34919 E153.02487	<i>Corymbia intermedia</i>	13
5	62	S27.34892 153.02496	<i>Corymbia intermedia</i>	12
5	63	S27.34891 153.02484	<i>Eucalyptus racemosa</i> - Hollows	15
5	64	S27.34861 153.02477	<i>Eucalyptus microcorys</i> - Hollows	12
5	65	S27.34852 153.02466	<i>Eucalyptus carnea</i>	15
5	68	S27.34848 153.0248	<i>Corymbia intermedia</i>	18
6	59	S27.34946 E153.02444	<i>Eucalyptus microcorys</i> - Hollows	10
6	60	S27.34897 E153.02469	<i>Eucalyptus microcorys</i> - Hollows	20.5
6	14	S27.34909 E153.02458	<i>Eucalyptus microcorys</i> (Lonikeets observed in hollow) - Hollows	15.5
6	12	S27.34903 E153.02463	<i>Eucalyptus sideropholia</i>	13.5
Total Number of Trees to be replanted				
114				

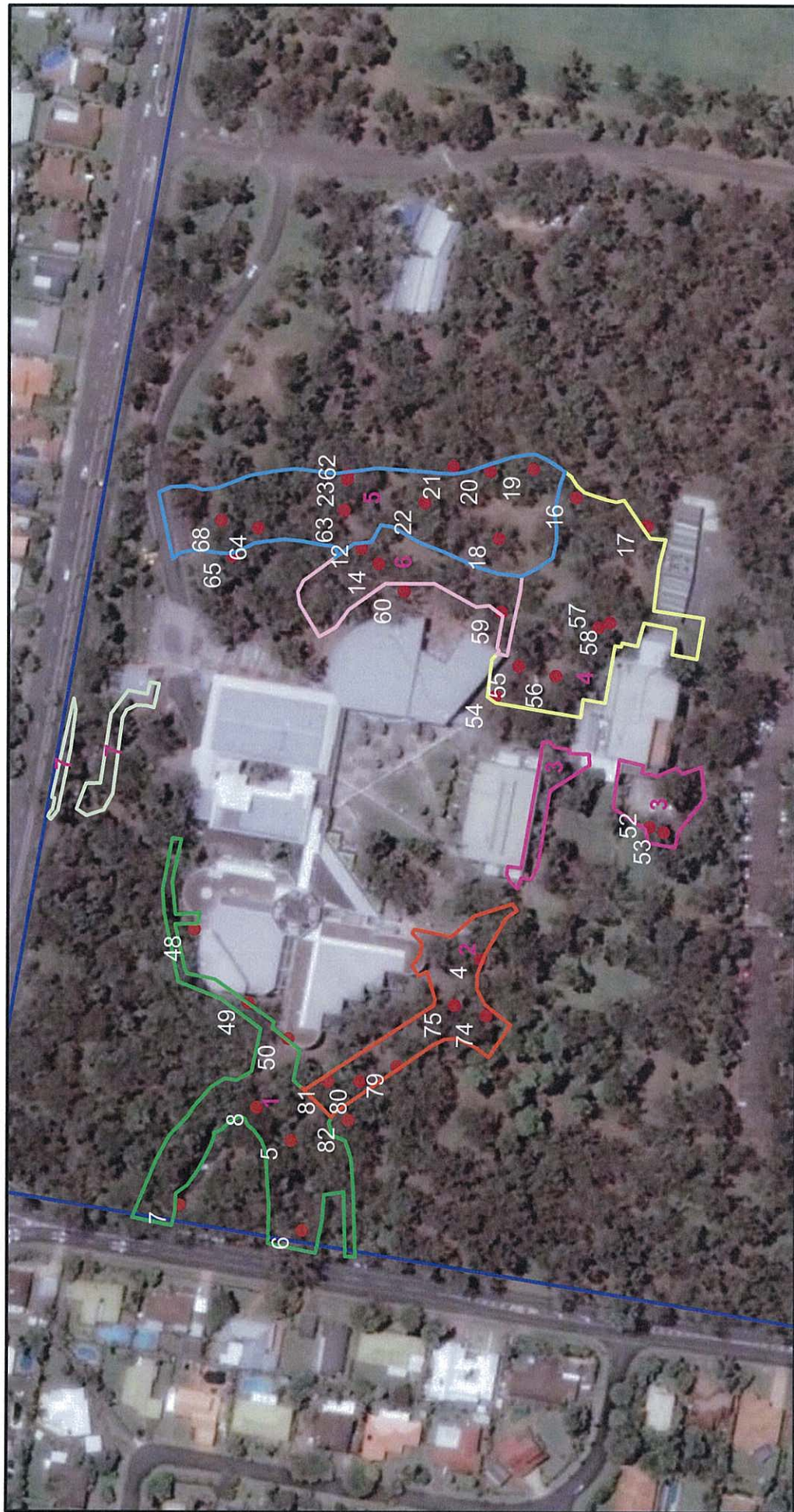


Figure A1

Location of Significant Vegetation

Flora and Fauna Management Plan
Carseldine Government Office Project



Legend

Significant Vegetation

Boundary of Precinct 1

Management Areas



Datum: GDA94
Projection: MGA94 Zone 56

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Basemap courtesy of Nearmap 2011

