# Plant Survey

# Lucinda Drain – Fisherman Islands



April (summer) 2005 Plant Survey



Here for the future

May 2005

## 1. Executive Summary

This Plant Assessment Report is the ninth report prepared following an assessment of plants occurring along the banks of the Lucinda Drain, Fisherman Islands. The Lucinda Drain is located along the eastern Islands side of Fisherman and is approximately 2.5 kilometres in length. The drain provides tidal, stormwater and wash-drainage from all hardstands and roof water runoff for the majority of facilities and roads along the eastern section of Fisherman Islands.

Rob Friend & Associates Pty Ltd (RF&A) was commissioned to undertake this and the previous eight plant surveys of Lucinda Drain.

#### Summary of findings

The following point summaries the findings of the March 2005 plant survey of Lucinda Drain.

- 1. A new plant species Stinking Roger (*Tagetes minuta*) was recorded from a wet area within the western bank of the drain. This plant is relatively common within the Brisbane Area and it is not declared in the *Land Protection (Pest and Stock Route Management) Regulation* 2003 (LPR 2003)
- the following weed species have been recorded previously however due to poor specimen material they have not been identified previously. They include: -
  - Hairy pigweed (*Portulaca pilosa*). This plant is common throughout both banks of the Lucinda Drain
  - Caustic weed (*Chamaesyce maculata*), common on the eastern bank
  - Creeping cinderella weed (*Calyptocarpus vialis*). This weed occurs on both banks

- Creeping phyllantus (*Phyllantus virgatus*). This plant grows on both banks
- 3. Balloon vine (*Cardiospermum halicacabum*) was found to be growing strongly on the western bank over vegetation within a landscape bed. This vine should be brought under control
- 4. Singapore daisy (*Sphagneticola trilobata*) was not observed in the locality where it was recorded during the October 2004 survey
- 5. No individuals of Groundsel (*Baccharis halimifolia*) or Broad-leafed peppertree (*Schinus terebinthifolia*) were recorded during the survey
- 6. Green panic (*Panicum maximum*) Rhodes grass (*Chloris gayana*), feathertop Rhodes grass (*C. virgata*), red Natal grass (*Melinis repens*), and Siratrio (*Macroptilium atropurpureum*) were the dominant plant species along the eastern bank of the drain
- 7. 50 plant species were recorded. This consisted of 17 native/planted species and 33 environmental weed species

No target weed species identified by Australian Quarantine and Inspection Service (AQIS) (see Appendix III) were located during the plant survey. Additionally, no other exotic plant species new to the site or in the general Brisbane area were recorded during the plant survey.

All environmental weed species that have been identified following the implementation of the plants surveys are being managed in accordance with a land management schedule. No unusual plant species or potential exotic plant incursions were identified during this and the previous plant surveys.

Recommendations regarding the long-term management of environmental weeds within the Lucinda Drain area are provided in Section 6 of this report.

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Cover photo Stinking roger (Tagetes minuta) on the wester side of the Lucinda Drain.

#### 2. Introduction

This report is the ninth of in a series of reports detailing the findings from surveys of plant species along the Lucinda Drain, Fisherman Islands. The previous reports were prepared from surveys undertaken in:

- February (summer) 2001;
- October December (spring) 2001;
- February (summer) 2002;
- November (spring) 2002;
- March (summer) 2003;
- November (spring) 2003
- March (summer) 2004 and
- October (spring) 2004

These plant surveys have been implemented in a response to a request from the Australian Quarantine and Inspection Service (AQIS) to increase surveillance relating to potential pest incursions. The surveys, commissioned by the Port of Brisbane Corporation (PBC), represents a long-term monitoring program at the port to survey for, and identify, exotic plant species which may enter the country on containers or other materials shipped and unloaded at the Fisherman Islands facility.

The biannual plant survey is undertaken on a six monthly interval, during (summer) February and (spring) October of each year. The current survey was undertaken in April 2005.

As there has been little rainfall within the Fisherman Islands area in the period since the last plant survey (March 2004) (see rainfall chart pg 10)

#### 2.1. Site description

The plant surveys focus on the Lucinda Drain area at Fisherman Islands. The Lucinda Drain is located along the eastern side of Fisherman Islands and provides drainage for stormwater run-off from the hardstand areas adjacent to the drain.

The Lucinda Drain is a constructed drainage channel using concrete filled geo-textile sandwich construction some 2.5 kilometres in length. The berms of the channel consist of sand above the geo-textile sandwich.

The channel currently has a regular maintenance schedule that provides for the west bank of the drain, adjacent to Lucinda Drive, to be mowed and sprayed for noxious weeds.

#### 3. Methodology

This plant survey of the Lucinda Drain was undertaken on the 28<sup>th</sup> April 2005

The survey consisted of one transect on eastern side of the Lucinda Drain.

This technique was trailed during the November 2003 survey of the Lucinda Drain. Results did not differ in terms of species presence or absence from recorded during previous surveys.

As visual access to the western bank overall is better from the eastern bank regular inspections were made of this bank during the transect along the eastern bank.

The data sheet developed during previous surveys to record observations was used during the current works. This tool, along with the new survey technique, has improved the timeliness of the survey.

All plant species observed during the survey were recorded on the survey tool (see appendix V). GPS locations were recorded of the location of plant species which are listed in Schedule 2 of the Land Protection (Pest and Stock Route Management) Regulations 2003 (LPR, 2003).

The east bank of the drain has an irregular maintenance program with some time between maintenance events. The west bank has a high maintenance schedule resulting in the mowing and spraying with herbicides of all areas apart from the landscaping on that bank.

#### AQIS Target Weeds List

The Australian Quarantine and Inspection Service (AQIS) has prepared a list of weed species identified as presenting a threat to natural and agriculture systems. This list is contained in Appendix III.

None of the target weed species identified by AQIS was located during this plant survey. No additional exotic plant species, which has not previously been recorded within the site or in the general Brisbane area, were recorded during the plant survey.

#### 4. Findings

Appendix I contains a list of plant species recorded from the first survey to date. Appendix II contains a schedule of all plant species recorded within the survey sites as well as those recorded incidentally during all surveys.

With respect to this plant survey, the findings are:

- 1. 50 plant species were recorded. This consisted of 17 native/planted species and 33 environmental weed species
- 2. A new plant species Stinking Roger (*Tagetes minuta*) was recorded from a wet area within the western bank of the drain. This plant is relatively common within the Brisbane Area and it is not declared in the *Land Protection (Pest and Stock Route Management) Regulation* 2003 (LPR 2003)
- The following weed species have been observed on previous surveys however, due to poor specimen material they have not been identified previously. These species include: -

- Hairy pigweed (*Portulaca pilosa*). This plant is common throughout both banks of the Lucinda Drain
- Caustic weed (*Chamaesyce maculata*), common on the eastern bank
- Creeping cinderella weed (*Calyptocarpus vialis*). This weed occurs on both banks
- Creeping phyllantus (*Phyllantus virgatus*). This plant grows on both banks
- 4. Balloon vine (*Cardiospermum* halicacabum) was found to be growing strongly on the western bank over vegetation within a landscape bed. This vine should be brought under control
- 5. Singapore daisy (*Sphagneticola trilobata*) was not observed in the locality where it was recorded during the October 2004 survey
- 6. No individuals of Groundsel (*Baccharis halimifolia*) or Broad-leafed peppertree (*Schinus terebinthifolia*) were recorded during the survey
- 7. Green panic (*Panicum maximum*) Rhodes grass (*Chloris gayana*), feathertop Rhodes grass (*C. virgata*), red Natal grass (*Melinis repens*), and Siratrio (*Macroptilium atropurpureum*) were the dominant plant species along the eastern bank of the drain
- 8. No other significant environmental weeds were recorded on either bank of the Lucinda Drain.



#### Figure 1 - Site map - Lucinda Drain, Fisherman Islands

Source: Mapview (DNR, 2004).

#### 5. Discussion

#### 5.1. Weediness of plants observed

This ninth survey of plants occurring along the banks of Lucinda Drain has identified a total number 46 plant species, of these 29 are considered weeds.

The following weeds have been listed as declared weeds in the *Land Protection (Pest and Stock Route Management) Regulation* 2003 (LPR 2003). In addition, these plants are identified as noxious plants within the Brisbane City Council Local Laws:

- No Class 1 pest species were recorded within the Lucinda Drain area;
- No Class 2 recorded within the Lucinda Drain include
- Class 3 Pest species recorded within the Lucinda Drain include
- i. Lantana (Lantana camara).
  - This species occurs in several locations along the right and left banks of the drain;
  - This species does not present a significant threat to the local environment.
- ii. Balloon vine (*Cardiospermum halicacabum*)
  - The Balloon vine was identified on the western bank.
  - o *C. halicacabum* is not listed however, *C. grandifolium* is listed as a Class 3 weed.
  - This vine may degraded the landscape amenity if not controlled in the near future

#### 5.2. General comments

The long-term management of these environmental weed species should be integrated into a program of habitat management, including actions such as:

- 1. Shading through the development of a canopy and understorey
- Increase the understorey diversity to increase competition for resources with the potential decrease in weediness and weed plant diversity and

3. Targeted herbicide application.

#### 5.3. Comparisons between surveys

The list of species recorded using the survey method for this survey in compassion with previous surveys indicates that there is little variation in the number of plant species recorded.

The following table (table 2) highlights the numbers of weed plants identified in the previous seven surveys of Lucinda Drain.

Table '	1 -	No.	of	weeds	recorded	per
survey						

Survey	No. of weeds
	recorded
February 01	37
October 01	35
February 02	27
November 02	35
May 03	27
November 03	36
March 04	27
October 04	29
April 05	33

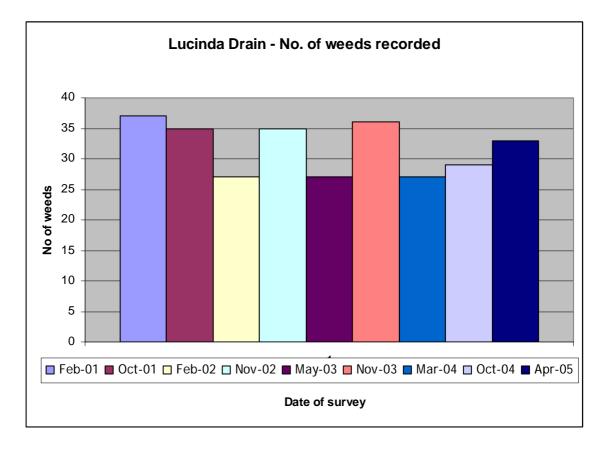
Table 2 - No of weed s	species by family	
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Family	No. of species.
Poaceae	12
Asteraceae	6
Fabaceae	4
Malvaceae	3
Euphorbiaceae	2

The above tables 2 and 3 indicates:

- The is a relatively consistent trend of the number of weed species along the banks of Lucinda Drain in the post summer and post winter surveys (see figure 1)
- The graph contained in Figure 2 identifies the survey outcome trend that surveys taken early in the calendar year provides less plant weed species than those conducted in the later half of the calendar year.

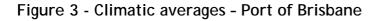
- The number of plants identified in this survey is approximately 13.4% less than the average number of plants recorded (33.4 over the four winter surveys;
- Grasses continue to be the dominant family along the drain followed by plant species within the family Asteraceae;
- the trend of less plants following the drier periods of the year leading up to the summer survey than the period following the summer months; and
- Influences such as dry years cannot be interpreted from the short data collection period for the Lucinda Drain site.

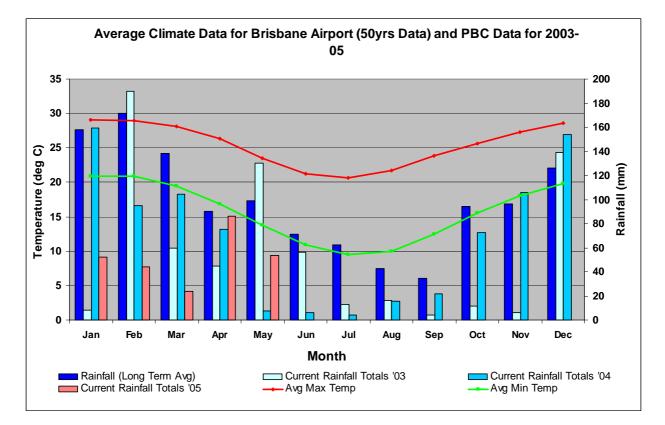


#### Figure 2 - Species number vs survey date

#### 5.4. Weather conditions

The following graph portrays the rainfall recorded at the Port of Brisbane as well as the rainfall and temperature average





The following can be derived from this data with respect to the plant growth around the Lucinda Drain.

- There was near average rainfall leading up to January 2005
- The rainfall between January 2005 to May 2005 was significantly below average and well below to preceding year (2004) with the exception of April (86.2mm verses 90.4mm)
- Plant cover throughout the eastern portion of the drain was greater than 70 % within those areas which had not been slashed

As can be seen (Figure 3), rainfall in the months preceding the current survey have been more reflective of average conditions.

Rainfall throughout 2003 and early 2004 was much lower than average.

The reasonable levels of rainfall experienced prior to the survey are more likely to have provided suitable conditions for introduced plant species to germinate than the pervious year's drought conditions. As such, the non-detection of additional introduced or known weed species is encouraging.

climatic records from the Port Office for

the last 50 years.

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#### 6. Recommendations

Recommendations relating to the management of the banks of the Lucinda Drain and of the inflow of stormwater into the drain which may transport and introduce exotic plant material to the drain have been made in previous reports.

It is assumed that either these recommendations have been adopted and are being implemented or they are yet to be implemented.

Therefore, as there has been no significant alteration in the environmental weed status and the management of the banks of the Lucinda Drain the following recommendations are made.

- 1. Maintain all existing weed management programs along both banks of the Lucinda Drain and
- 2. Continue programmed monitoring of the diversity and status of plant species along the banks of the Lucinda Drain through twice-yearly plant surveys.

## 7. Bibliography

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# Appendix I - Survey analysis

Species	Common name	LPR class	March 05	Oct 04	March 04	May 03
Aizoaceae						
Carpobrotus glaucescens	Pigface*	-	Х	Х	Х	Х
Sesuvium portulacastrum	Sea purslane*	-	Х	Х	Х	Х
Amaranthaceae						
Alternanthera pungens	Khaki weed	-	Х			Х
Amaranthus viridis	Green amaranths	-	Х			
Anacardiaceae						
Schinus terebinthifolius	Broad-leaved Peppertree	3		Х	Х	
Asclepiadaceae						
Gomphocarpus physocarpus	Balloon cotton bush	-				
Asteraceae						
Ageratum houstonianum	Blue billy-goat	-				Х
Ambrosia artemisiifolia	Annual ragweed	2		Х	Х	
Baccharis halimifolia	Groundsel bush	2		Х	Х	Х
Bidens pilosa	Cobblers pegs	-	Х	Х	Х	Х
Calyptocarpus vialis	Creeping cinderella weed	-	Х			
Cirsium vulgare	Spear thistle	-		Х		
Conyza bonariensis	Faxleaf fleabane	-	Х			Х
Conyza pusilla	Canadian fleabane	_				
Crassocephalum crepidioides	Thickhead	-	Х	Х		Х
Hypochaeris radicata	Flatweed	-		X		X
Parthenium hysterophorus	Parthenium weed	2		~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Sonchus oleraceus	Rough sow thistle	-	Х			
Sphagneticola trilobata	Singapore daisy	3		Х	Х	Х
Tagetes minuta	Stinking Roger	-	Х	X		~
Avicenniaceae						
Avicennia marina	Grey mangrove*	_	Х	Х		
Boraginaceae				X		
Heliotropium amplexicaule	Blue heliotrope	-				
Cactaceae						
Opuntia sp	Prickly pear					
Casuarinaceae						
Casuarina equisetifolia	Coastal shooak*		Х	Х	Х	
Casuarina littoralis	Coastal sheoak* Black sheoak*	-	X	X X	X	
Caesalpiniaceae			X	X		
Crotalaria paniculata	Poor mans gold					
Senna pendula var glabrifolia	Easter cassia	_				
Convolvulaceae						
Cuscuta campestris	Dodder	-	Х			
Convolves arvensis	European bindweed	-				
Ipomoea so (alba)	White ipomoea	-			1	
Ipomoea cairica	Mile-a-minute	-		Х		х
Ipomoea pes-caprae	Goats foot convolvus	-	Х	<u>х</u>	Х	X
Cyperaceae				Λ		~
Cyperus sp.	A sodra				Х	
Cyperus sp. Cyperus rotundus	A sedge	_				
Euphorbiaceae	Nut grass	-				
Chamaesyce maculata	Caustic weed		Х			

Euphorbia hiriaAstma plantNXNEuphorbia sp.SpurgeXXXXMacarangaXXXXXPhyllantus WirgatusCreeping phyllantus-XXXXFabaceaeXXXXXXCrotalaria pailidaRattle pod-XXXXXDesmodium uncinatumSilver leafed desmodium-XXXXXMacargnitium artopupuroumSiratro-XXXXXMelifolus indicusSweet melliotusXXXXSebahai annabiaSesbania pea-XXXXXItauraceaeXXXXImanomum camphoraCamphora laurel3XXXXMinosaceaeXXXXMidola carolinanred flowr mallowSida conrifollaFlannel weed-XXXXMutaceaeXXX-Sida conrifollaFlannel weed-XXXXSida conrifollaFlannel weed-XXXSida conrifollaCommon sida-XXX-Laphostemon confertusBrush box-	Species	Common name	LPR class	March 05	Oct 04	March 04	May 03
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Hemarthria uncinata     Mat grass     -     Imperata cylindrica       Blady grass     -     Imperata cylindrica	-			X			
Imperata cylindrica Blady grass -		*					
	Melinis repens	Red Natal grass	-	Х	Х	Х	Х

Species	Common name	LPR class	March 05	Oct 04	March 04	May 03
Melinis minutiflora	Molasses grass					
Poa annua	Winter grass	-				
Panicum effusum	Hairy panic	-	Х		Х	
Panicum maximum	Green panic	-	Х	Х	Х	Х
Paspalum dilatatum	Paspalum	-			Х	Х
Phragmites australis	Common reed	-	Х	Х	Х	Х
Sorghum halepense	Johnson grass	-	Х	Х	Х	Х
Typha orientalis	Cumbungi	-	Х	Х		
Portulacaceae						
Portulaca pilosa	Hairy pigweed	-	Х			
Proteaceae						
Banksia integrifolia	Coastal banksia	-	Х	Х	Х	
Sapindaceae						
Cardiospermum halicacabum	Balloon vine	-	Х			
Cupaniopsis anacardioides	Tuckeroo	-	Х	Х	Х	
Dodonaea triquetra	Hop bush				Х	
Solanaceae						
Solanum nigrum	Brazilian nightshade	-	Х		Х	
Verbenaceae						
Lantana camara	Climbing lantana	3	Х	Х	Х	
Verbena bonariensis	Purple top	-			Х	
Verbena aristigera		-				
Vitex trifolia var trifolia		-			Х	

#### Notes: -

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- \* designates indigenous species LPRA Land Protection (pest and stock route management) Regulations 2003, Schedule 2.

# Appendix II - plant species list

This species list is a combination of the all plant surveys undertaken along the Lucinda Drain, Fisherman Islands.

Form code: - T = tree; t = small tree; s = shrub; g = grass; h = herb; f = fern; v = vine; w = weed; a = aquatic plant; (p) = planted, n = native or planted. Highlighted species indicate new species recorded during the plant survey. LPA - Land *Protection (pest and stock route management) regulations* (2003)

Family/Species	Common name	Form	Declaration category (LPR)	
<b>Aizoaceae</b> Carpobrotus glaucescens <sup>n</sup> Sesuvium portulacastrum <sup>n</sup>	pigface sea purslane	v h	-	
Amaranthaceae Alternanthera pungens Amaranthus viridis	Khaki weed Green amaranthus	h,w h,w	-	
Anacardiaceae Schinus terebinthifolia	Broad-leaved peppertree	S,W	-	
Asclepiadaceae Gomphocarpus physocarpus	Balloon cotton bush	S,W	-	
Asteraceae Ageratum houstonianum Ambrosia artemisiifolia Baccharis halimifolia Bidens pilosa Calyptocarpus vialis Cirsium vulgare Conyza bonariensis Conyza pusilla Crassocephalum crepidioides Hypochaeris radicata Parthenium hysterophorus Senecio sp (lautus) Sonchus oleraceus Sphagneticola trilobata Tagetes minuta	blue billy-goat annual ragweed groundsel bush cobblers pegs creeping cinderella weed spear thistle flaxleaf fleabane Canadian fleabane thickhead flatweed Parthenium weed Fireweed Rough sow thistle Singapore daisy Stinking Roger	h,w h,w s,w h,w h,w h,w h,w h,w h,w h,w h,w h,w h	- 2 2 - - - - 2 - - 3 -	
Boraginaceae Heliotropium amplexicaule	Blue heliotrope	h,w		
Cactaceae <i>Opuntia sp.</i>	Prickly pear	S,W	2	
Casuarinaceae Casuarina equisetifolia* Allocasuarina littoralis*	Coastal sheoak Black sheoak	t t	-	
Caesalpiniaceae Crotalaria paniculata Senna pendula var glabrifolia	Poor mans gold Easter cassia	h s,w	-	
Convolvulaceae Cuscuta campestris Convolvulus arvensis	Dodder European bindweed	v,w h,w	-	

Ipomoea sp. (alba) Ipomoea cairica Ipomoea pes-caprae <sup>n</sup>	mile-a-minute goats foot convolvus	V,W V,W V
<b>Euphorbiaceae</b> Chamaesyce maculata Euphorbia hirta Euphorbia sp. Macaranga tanarius <sup>n</sup> Phyllanthus virgatus	Caustic weed Asthma plant Spurge Macaranga creeping phyllanthus	h,w h,w h,w t (p) h,w
Fabaceae Crotalaria pallida Desmodium uncinatum Macroptilium atropurpureum Medicago sativa Melilotus indicus Sesbania cannabina Trifolium repens	rattle pod Silver-leafed desmodium siratro Lucerne Sweet melilotus Sesbania pea White clover	h,w v,w v,w h,w h,w h,w
Lauraceae Cinnamomum camphora	camphora laurel	t,w
<b>Malvaceae</b> Hibiscus tiliaceus <sup>n</sup> Modiola caroliniana <sup>n</sup> Sida cornifolia Sida rhombifolia	cotton tree red flower mallow flannel weed common sida	t h,w h,w h,w
Mimosaceae Acacia aulacocarpa <sup>n</sup>	hickory wattle	t
<b>Myrtaceae</b> Eucalyptus robusta <sup>n</sup> Lophostemon confertus <sup>n</sup> Melaleuca linariifolia <sup>n</sup> Melaleuca quinquenervia <sup>n</sup>	swamp mahogany brush box flax-leafed paperbark paperbark teatree	T,(p) T,(p) t,(p) T,(p)
Onagraceae <i>Oenothera drummondii</i> <sup>n</sup>	beach evening primrose	S
Oxalidaceae Oxalis corniculata	Creeping oxalis	h,w
Pandanaceae Pandanus tectorius <sup>n</sup>	screw pine	t,(p)
Passifloraceae Passiflora cairica Passiflora subpeltata	stinking passion vine white passion vine	V,W V,W
Plantaginaceae Plantago lanceolata Plantago major	lamb's tongue Great plantain	h,w h,w
Poaceae Brachiaria decumbens Brachiaria mutica Cenchrus ciliaris Cenchrus echinatus Chloris gayana Chloris truncata Chloris virgata Cynodon dactylon Dichanthium aristatum Digitaria ciliaris Eleusine indica	signal grass Para grass buffel grass Mossman River grass Rhodes grass windmill grass feather-top Rhodes grass couch grass Angleton grass summer grass crowsfoot grass	g,w g,w g,w g,w g,w g,w g,w g,w g,w g,w

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Hemarthria uncinata Imperata cylindrica <sup>n</sup> Melinis repens Melinis minutifolia Poa annua Panicum effusum Panicum maximum Paspalum dilatatum Phragmites australis <sup>n</sup> Sorghum halepense <sup>n</sup> Typha orientalis <sup>n</sup>	Mat grass Blady grass red Natal grass molasses grass winter grass hairy panic green panic paspalum Common reed Johnson grass Typha	g, w g g, w g, w g, w g, w g, w g, w g,	
Portulacaceae Portulaca pilosa	Hairy pigweed	h,w	
Proteaceae Banksia integrifolia <sup>n</sup>	coastal banksia	t (p)	
Sapindaceae Cardiospermum halicacabum Cupaniopsis anacardioides <sup>n</sup> Dodonaea triquetra	Balloon vine tuckeroo Hop bush	v,w T s	
Solanaceae Solanum nigrum	Brazilian nightshade	S,W	
<b>Verbenaceae</b> Lantana camara Verbena bonariensis Verbena aristigera Vitex trifolia var trifolia <sup>n</sup>	climbing lantana purple top	s,w h,w h,w s	

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# Appendix III - Weed Target List (AQIS)

	List reference:	- http://ww	w.affa.gov.au
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Family	Genus species	Author	Common name	Comments
Amaranthaceae	Amaranthus dubius	Mart. ex Thell	Chinese spinach	annual crops, rice, gardens, disturbed sites and secondary vegetation.
Asteraceae	Austroeupatorium inulaefolium	(H.B.K.) King and Robinson		tea, rubber, rosella and other plantation crops; roadsides; environmental weed in secondary forests.
Asteraceae	Chromolaena odorata	(L.) King and Robinson	Siam weed, Christmas bush	pastures, oil palm, rubber, coffee, cashew, fruit, maize, forestry. Toxic to livestock. Major environmental weed: secondary forests, roadsides, disturbed sites.
Asteraceae	Mikania cordata	(Burm. f.) B.L. Robinson		rubber, coffee, banana, cocoa and oil palm plantations, pastures; potential environmental weed
Asteraceae	Mikania micrantha	H.B.K.	mile-a-minute	cocoa, coconut, orchards, rubber, oil palm, sugarcane, vegetables, upland rice, pastures; serious environmental weed
Capparaceae	Cleome rutidosperma	DC.	spiderflower	crops including vegetables, bananas, maize, tobacco, watermelons, cocoa, pineapples and coconuts; weed of disturbed ground and immature plantations.
Cyperaceae	Fimbristylis umbellaris	(Lam.) Vahl	globular Fimbristylis	rice, pastures; swamps.
Cyperaceae	Schoenoplectus juncoides	(Roxb.) Palla		rice, freshwater and tidal swamps.
Cyperaceae	Scirpus maritimus	L.		rice, freshwater and tidal swamps.
Equisetaceae	Equisetum ramosissimum	Desf. subsp. debile (Vauch.) Hauke	horsetail, scouring rush	rice terraces and bunds, tea plantations.
Eriocaulaceae	Eriocaulon truncatum	Buch Ham. ex Mart		rice, wetlands, river banks and floodplains
Euphorbiaceae	Croton hirtus	L'Herit		rubber plantations; crops including mung beans, peanuts, soybeans, papaya, vegetables and tobacco.
Fabaceae	Mucuna pruriens	DC.	velvet bean, cow-itch	weed of pastures and a wide range of dryland crops; smothering habit and ability to climb to tree tops makes a

Family	Genus species	Author	Common name	Comments
				significant potential environmental weed. Irritant hairs can kill livestock if ingested and cause severe skin reaction if touched.
Haloragaceae	Myriophyllum spicatum	L.	Eurasian watermilfoil	serious weed of lakes, water- storages, canals and rivers. Affects fish and shellfish production and recreational use of water bodies
Lamiaceae	Hyptis brevipes	Poit.	lesser roundweed	plantation crops, orchards, vegetables rice; secondary forest, and disturbed sites in areas of high rainfall.
Limnocharitaceae	Limnocharis flava	(L.) Buchenau	yellow bur- head, yellow sawah lettuce	serious weed of rice and wetlands. Used as a green vegetable.
Lythraceae	Rotala indica	(Willd.) Koehne	toothcup	rice fields, river banks, ditches and moist environments
Melastomaceae	Clidemia hirta	(L.) D. Don.	Koster's curse, soap bush	cocoa, tea, coconut, oil palm and rubber plantations, cultivated areas, pastures, secondary forest and woodlands; other disturbed sites.
Myrtaceae	Rhodomyrtus tomentosa	(Ait.) Hassk.	downy rose myrtle	environmental weed; pastures, rangelands and untended areas.
Nyctaginaceae	Boerhavia erecta	L.		peanuts, sorghum, rice and other annual crops; weed of cultivated land, pastures and coastal environments.
Piperaceae	Piper aduncum	L.		weed of grazing lands and secondary forest, roadsides; environmental weed.
Poaceae	Brachiaria paspaloides	(Presl.) C.E. Hubb	common Brachiaria, Thurston grass	orchards, tea, coffee, rice, lawns, roadsides, disturbed sites.
Poaceae	Coix aquatica	Roxb.	Job's tears	serious weed of waterways, rice
Poaceae	Digitaria fuscescens	(Presl.) Henr.	common crabgrass	tobacco, vegetables, rubber, rice; pastures, disturbed sites, roadsides, coastal dunes, dry forests.
Poaceae	Digitaria insularis	(L.) Mes ex Ekman		pineapples; unpalatable weed of pastures, headlands, roadsides.
Poaceae	Echinochloa glabrescens	Munro ex Hook. f.	a barnyard grass	rice, maize.
Poaceae	Echinochloa stagnina	(Retz) Beauv.		rice; lakes, rivers, wetlands; roadsides, open places. Potential major environmental weed.
Poaceae	Eriochloa	H.B.K.	Carib grass	rice, riverbanks, swamps,

Family	Genus species	Author	Common name	Comments
	polystachya			drains and ditches; suppresses other vegetation.
Poaceae	lschaemum timorense	Kunth.	centipede grass	cloves, cocoa, rubber, coconut, oil palm, sugarcane and rice plantations; weed of roadsides, ditches, forest margins.
Poaceae	Leptochloa chinensis	(L.) Nees.	red sprangletop, feathergrass	rice, cotton, soybean, maize, sugarcane, pineapple, sweet potato, vegetables, peanuts, tea, bananas.
Poaceae	Leptochloa panicea	(Retz.) Ohwi	sprangletop	rice, cotton, soybeans, peas, sugarcane, maize, peanuts, pastures.
Poaceae	Sacciolepis interrupta	(Willd.) Stapf.		rice, irrigation channels, wetlands. Potential environmental weed.
Rubiaceae	Diodia sarmentosa	Sw.		coffee, tea, leucaena, Stevia sp. plantations.
Rubiaceae	Paederia foetida	L.	lesser Malayan stinkwort	sugarcane, secondary forest; climbs over shrubs and trees - potential environmental weed.
Rubiaceae	Spermacoce assurgens	Ruiz & Pav.		rice, maize, coconuts, sugarcane, bananas, pasture, gardens, forest clearings
Rubiaceae	Spermacoce mauritiana	Gideon		invades tracks in primary rainforest; rice, sugarcane, gardens, lawns.
Salviniaceae	Salvinia cucullata	Roxb.	Salvinia	rice, waterways, wetlands.
Salviniaceae	Salvinia natans	(L.) All.	Salvinia	rice, waterways wetlands.
Scrophulariaceae	Striga angustifolia	(D. Don.) C.J. Saldanha	witchweed	root parasite on rice, sorghum, sugarcane.
Scrophulariaceae	Striga asiatica	(L.) O. Ktze.	witchweed	serious root parasite on rice, maize, sorghum, sugarcane, millet; also on some broadleaf crops including sunflower, tomatoes, some legumes.
Violaceae	Hybanthus attenuatus	(Humb. & Bonpl.) G.K. Schulze		rice, a wide diversity of annual crops, pastures, waste places.

# Appendix IV - Land Protection Regulations 2003 - Classes.

The following table contains a list of species recorded from the Lucinda Drain and which have been listed in Schedule 2 of the *Land Protection (Pest and Stock Route Management) Regulations* 2003.

Class	Species
Class 1 pests	<ul> <li>No species recorded</li> </ul>
Class 2 pests	<ul> <li>Groundsel bush - Baccharis halimifolia</li> <li>Prickly pear - Opuntia spp.</li> </ul>
Class 3 pests	<ul> <li>Broad-leafed peppertree - Schinus terebinthifolia</li> <li>Camphora laurel - Cinnamomum camphora</li> <li>Lantana - Lantana camara</li> <li>Singapore Daisy - Sphagneticola trilobata</li> </ul>

# Appendix V - Plant Survey Tool

Family/Species	Common name	Form	Declaration category (LPA)	Presence	Abundance
Aizoaceae					
Carpobrotus glaucescens <sup>n</sup>	pigface	V	-		
Sesuvium portulacastrum	sea purslane	h	-		
Amaranthaceae					
Alternanthera pungens	Khaki weed	h,w	-		
Amaranthus viridis	Green amaranthus	h,w	-		
Anacardiaceae					
Schinus terebinthifolia	Broad-leaved peppertree	S,W	-		
Asclepiadaceae					
Gomphocarpus	Balloon cotton	S,W	-		
physocarpus	bush				
Asteraceae					
Ageratum houstonianum	blue billy-goat	h,w	-		
Ambrosia artemisiifolia	annual ragweed	h,w	2		
Baccharis halimifolia	groundsel bush	S,W	2		
Bidens pilosa	cobblers pegs	h,w	-		
Calyptocarpus vialis	creeping cinderella weed	h,w	-		
Cirsium vulgare	spear thistle	h,w	-		
Conyza bonariensis	flaxleaf fleabane	h,w	-		
Conyza pusilla	Canadian fleabane	h,w	-		
Crassocephalum crepidioides	thickhead	h,w	-		
Hypochaeris radicata	flatweed	h.w	-		
Parthenium hysterophorus	Parthenium weed	h,w	2		
Senecio sp (lautus)	Fireweed	h	-		
Sonchus oleraceus	Rough sow thistle	h,w	-		
Sphagneticola trilobata	Singapore daisy	h,w	3		
Tagetes minuta	Stinking Roger	h,w	-		
Avicenniaceae					
Avicennia marina <sup>n</sup>	grey mangrove	t	-		
Boraginaceae					
Heliotropium amplexicaule	Blue heliotrope	h,w	-		
Cactaceae	Dricklymaar		2		
Opuntia sp.	Prickly pear	S,W	2		
Casuarinaceae					
Casuarina equisetifolia*	Coastal sheoak	t	-		
Allocasuarina littoralis*	Black sheoak	t	-		+
Caesalpiniaceae					
Crotalaria paniculata	Poor mans gold	h	-		
Senna pendula var glabrifolia	Easter cassia	S,W	-		
Convolvulaceae					
Cuscuta campestris	Dodder	V,W	-		
Convolvulus arvensis	European	h,w	-		
	bindweed				

Family/Species	Common name	Form	Declaration category (LPA)	Presence	Abundance
Ipomoea sp. (alba)		V,W	-		
Ipomoea cairica	mile-a-minute	V,W	-		
Ipomoea pes-caprae <sup>n</sup>	goats foot convolvus	V	-		
Euphorbiaceae					
Chamaesyce maculata	Caustic weed	h,w	-		
Euphorbia hirta	Asthma plant	h,w	-		
Euphorbia sp.	Spurge	h,w	-		
Macaranga tanarius <sup>n</sup>	Macaranga	t (p)	-		
Phyllanthus virgatus	creeping phyllanthus	h,w	-		
Fabaceae					
Crotalaria pallida	rattle pod	h,w	_		
Desmodium uncinatum	Silver-leafed desmodium	V,W	-		
Macroptilium atropurpureum	siratro	V,W	-		
Medicago sativa	Lucerne	h,w	- 1		
Melilotus indicus	Sweet melilotus	h,w	-		
Sesbania cannabina	Sesbania pea	h,w	-		
Trifolium repens	White clover	h,w	-		
Lauraceae					
Cinnamomum camphora	camphora laurel	t,w	3		
Malvaceae					
Hibiscus tiliaceus <sup>n</sup>	cotton tree	t	-		
Modiola caroliniana <sup>n</sup>	red flower mallow	h,w	-		
Sida cornifolia	flannel weed	h,w	-		
Sida rhombifolia	common sida	h,w	-		
Mimosaceae					
Acacia aulacocarpa <sup>n</sup>	hickory wattle	t	-		
Myrtaceae					
Eucalyptus robusta <sup>n</sup>	swamp mahogany	Т,(р)	-		
Lophostemon confertus <sup>n</sup>	brush box	Т,(р)	-		
Melaleuca linariifolia <sup>n</sup>	flax-leafed paperbark	t,(p)	-		
Melaleuca quinquenervia	paperbark teatree	Т,(р)	-		
Onagraceae					
Oenothera drummondii <sup>n</sup>	beach evening primrose	S	-		
Oxalidaceae					
Oxalis corniculata	Creeping oxalis	h,w	-		
Pandanaceae					
Pandanus tectorius <sup>n</sup>	screw pine	t,(p)	-		
Passifloraceae					
Passiflora cairica	stinking passion vine	V,W	-		
Passiflora subpeltata	white passion vine	V,W	-		
Plantaginaceae					
Plantago lanceolata	lamb's tongue	h,w	-		
Plantago major	Great plantain	h,w	-		
Poaceae					
Brachiaria decumbens	signal grass	g,w	-		

Family/Species	Common name	Form	Declaration category (LPA)	Presence	Abundance
Brachiaria mutica	Para grass	g,w	-		
Cenchrus ciliaris	buffel grass	g,w	-		
Cenchrus echinatus	Mossman River grass	g,w	-		
Chloris gayana	Rhodes grass	g,w	-		
Chloris truncata	windmill grass	g,w	-		
Chloris virgata	feather-top Rhodes grass	g,w	-		
Cynodon dactylon	couch grass	g,w	-		
Dichanthium aristatum	Angleton grass	h,w	-		
Digitaria ciliaris	summer grass	g,w	-		
Eleusine indica	crowsfoot grass	g,w	-		
Hemarthria uncinata	Mat grass	g,w	-		
Imperata cylindrica <sup>n</sup>	Blady grass	g	-		
Melinis repens	red Natal grass	g,w	-		
Melinis minutifolia	molasses grass	g,w	-		
Poa annua	winter grass	g,w	-		
Panicum effusum	hairy panic	g	-		
Panicum maximum	green panic	g,w	-		
Paspalum dilatatum	paspalum	g,w	-		
Phragmites australis <sup>n</sup>	Common reed	g	-		
Sorghum halepense <sup>n</sup>	Johnson grass	g,w	-		
Typha orientalis <sup>n</sup>	Typha	g	-		
Portulacaceae					
Portulaca pilosa	Hairy pigweed	h,w	-		
Proteaceae					
Banksia integrifolia <sup>n</sup>	coastal banksia	t (p)	-		
Sapindaceae					
Cardiospermum	Balloon vine	V,W	-		
halicacabum					
Cupaniopsis anacardioides	tuckeroo	Т	-		
Dodonaea triquetra	Hop bush	S	-		
Solanaceae					
Solanum nigrum	Brazilian nightshade	S,W	-		
Verbenaceae					
Lantana camara	climbing lantana	S,W	2		
Verbena bonariensis	purple top	h,w	-		
Verbena aristigera		h,w	-		
Vitex trifolia var trifolia "		S	-		