QC LNG - CURTIS ISLAND COMPONENTS

Flora Report

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EXECUTIVE SUMMARY

This technical paper investigates the existing floral values and potential impacts on these values, as a result of the proposed construction and operation of the LNG site facility and corridors for the road and pipeline to supply the facility.

The field inspections aimed to establish the presence/absence of previously mapped regional ecosystems (REs) as per the most recent Queensland Herbarium mapping. The field inspections were also used to determine the state of these REs and to inspect these areas for plant species afforded additional protection under Commonwealth and/or Queensland legislation.

The mainland section of the road corridor was assessed primarily by desktop due to land access constraints (in particular wet weather and cultural heritage). A conservative (precautionary principle) approach has therefore been adopted for this area.

The assessement of the floral features and values along the proposed gas pipeline corridor on the mainline is the subject of a separate report.

Vegetation Communities / Regional Ecosystems

The area proposed to be developed contains remnant vegetation which is generally in average to good condition. Due to historic landuse and previous fires, the shrub and ground layers in places were dominated by a number of *Acacia* species and herbaceous weeds.

This vegetation includes one 'Endangered' RE, two 'Of Concern' REs and three 'Not of Concern' REs within the facility site in accordance with the Queensland *Vegetation Management Act 1999* (VM Act). No communities that are afforded additional protection under the Commonwealth *Environment Protection and Biodiverstiy Conservation Act 1999* (EPBC Act) occur in the site.

The area of each category of RE to be removed is estimated to be approximately:

- 48.24 ha of an 'Endangered' RE
- 17.14 ha of 'Of Concern' REs
- 279.79 ha of 'Not of Concern' REs.

The area of the 'Endangered' RE to be removed was found to represent approximately 5% of that which occurs in the local area. A number of mitigation measures are recommended to minimise the area of this RE that is adversely affected, although it is recognised that the majority of the area proposed to be cleared is unlikely to be avoidable.

The mitigation measures presented include a recommendation that environmental offsets be established (preferably in the local area) to compensate for all proposed vegetation clearing. In particular, the offsets program should include reestablishment of an area of 'Endangered' RE 12.3.3. According to the Queensland Governments current Vegetation Management Offsets Policy the reestablishment of an area of at least 75ha would be required.

Other potential impacts on vegetation include:

- Introduction and further spread of invasive weeds
- Introduction or proliferation of pest animals
- Leaching of pollutants into adjoining mangrove and wetland areas
- Release of silt into adjoining mangrove and wetland areas
- Altered hydrological and sedimentation regimes due to construction of the access road across the mainland wetland areas
- Air emission impacts on adjoining areas.

Wetlands and Mangroves

The field survey found the potential impacts of removing small areas of mangroves and degraded wetland areas on Curtis Island was minimal. The mangrove and wetland areas transected by the road corridor on the mainland were not inspected in the field and are assumed to be in good condition.

Futher studies are recommended in relation to the potential for altered hydrological and sedimentation regimes to impact on the mainland wetland communities. Mitigation measures (in particular monitoring) should be employed in order to help maintain the current good state of the wetland and mangrove areas where the road transects them on the mainland and on Curtis Island to the north and the south of the site facility.

Scheduled Flora Species

The field survey indicated that Endangered, Vulnerable or Rare flora species are unlikely to occur in the study area.

Declared Weeds

Three declared weed declared weed species were observed during the field surveys. The most common was *Optunia* spp (Prickly Pear), which was found to be prevalent around the marine fringes. The two other declared weeds species recorded within the study area were *Cryptostegia grandiflora* (Rubber Vine) and *Lantana camara* (Lantana).

The field survey also identified the presence of the non-declared weed *Praxelis clematidea* (Praxelis). This weed is currently listed on the '*Alert List for Environmental Weeds'* collated by the Federal Department of the Environment, Water, Heritage and the Arts.

Appropriate mitigation measures (e.g. a weed management program) will be required to minimise the risk of introducing and spreading declared and other weed species onto Curtis Island.

1.0 INTRODUCTION

These flora field survey results are provided in support of the broader ecological assessment coordinated by ERM for the proposed QC LNG development on Curtis Island. The desktop flora assessment components were undertaken by ERM. While, the findings of the ERM desktop assessment are presented, in part, in this report, the report primarily presents the fieldwork component of the flora studies. This fieldwork component was conducted by Ms Ann Moran and Mr Martin Bennett from Unidel Group, Brisbane (refer to **Attachment 1** for CVs). The fieldwork assessed the proposed LNG facility site as well as the proposed Curtis Island corridors for a road and a gas pipeline to supply the facility (**Figure 1**). Two sites were also surveyed in the field at the southern end of the mainline section of the access road in order to confirm the existing Queensland Herbarium Regional Ecosystem (RE) mapping of an Endangered RE in this area.

The studies targeted the identification of known and potential occurrences of protected vegetation communities and Endangered, Vulnerable or Rare (EVR) flora and fauna species under the Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act), the Queensland *Nature Conservation Act 1992* (NC Act) and the *Queensland Vegetation Management Act 1999* (VM Act). The assessment also considered declared pest species under the Queensland *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) as well as common and general flora and fauna values.

2.0 ASSUMPTIONS AND LIMITATIONS

The existing Queensland Herbarium RE mapping was assumed to be correct except in those locations where site specific surveys identified inaccuracies at the local scale. Such locations are detailed in the report.

The mainland section of the road corridor was assessed primarily by desktop due to land access constraints (in particular wet weather and cultural heritage). A conservative (precautionary principle) approach has therefore been adopted for this area.

The assessement of the floral features and values along the proposed gas pipeline cooridor on the mainline is the subject of separate reports.

3.0 METHODOLOGY

The Kilometre Points (KPs) referenced in this report are the KPs for the Rev D (dated 13th February 2009) pipeline alignment.

3.1 Determination of Flora Species and Vegetation Community / RE Significance Level

The significance of vegetation communities / REs is listed by the Commonwealth EPBC Act as Critically Endangered, Endangered or Vulnerable and by the Queensland VM Act as Endangered, Of Concern and Not of Concern.

Listed EVR flora are defined as those taxa listed in the EPBC Act and / or the NC Act as Critically Endangered, Endangered, Vulnerable or Rare.

3.2 Flora Desktop Assessment

The flora desktop assessment included:

- Review of the Queensland Environmental Protection Agency (EPA) Wildlife Online database and Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA) Protected Matters flora data. The data search area was a 10 km buffer around the site (equating to the area -23.7253, 151.1789, -23.8105, 151.1789, -23.8105, 151.2682, -23.725, 151.2682). The data searches were undertaken 7 August 2008 (**Attachment 2**)

- Review Queensland Herbarium RE mapping (Version 5.0, 2005) to establish those vegetation communities mapped by the Queensland Herbarium at a scale of 1:100 000

- Examination of satellite imagery to gain an appreciation of the project's proximity to sensitive areas, assess vegetation patterns and identify target areas for field investigations.

It is recognised that the information gained from these databases has caveats attached to them regarding the robustness or completeness of the information.

Wildlife Online data is based almost exclusively on plant specimens actually recorded as present in the given locations. The absence of any specimen records for a particular species from an area does not imply that that species does not occur in the area.

Data from the DEWHA website is based on a combination of actual records, primarily from State Government databases, combined with modelled distributions of species according to their ecological characteristics.

3.3 Flora Field Survey

The field survey comprised 15 days of ground truthing over the periods 29 Sept - 4 Oct, 12 -17 Oct 2008, 12-13 Feb and 19-20 Feb 2009. The field survey was limited to Curtis Island sites, with the exception of two sites near the southern end of the road corridor on the mainland (**Figure 1**).

The field survey was designed to:

- Confirm the presence / absence of those REs mapped by the Queensland Herbarium and listed as 'Endangered' and 'Of Concern' REs under Queensland legislation (**Figure 1**)
- Confirm the presence/absence of coastal wetlands as mapped by DPI (**Figure 2**)
- Determine the structure and condition of vegetation communities on the site
- Identify any plant species afforded additional protection under Australian or Queensland legislation
- Gain an understanding of the wider environment of the LNG site and roads and, on Curtis Island, the pipeline corridor, so that the potential impacts associated with proposed clearing could be discussed in the local and regional contexts.

The site survey was conducted in accordance with the Queensland Herbarium vegetation survey methods described in Nelder, et. al. (1999). The following data was collected for the investigated sites:

- Confirmation of mapped RE
- General description of vegetation
- Structural characteristics of vegetation (based on life forms, height and canopy cover)
- Groundcover characteristics
- Vegetation condition (integrity) (as either pristine, excellent, very good, good, degraded or completely degraded)
- Occurrence of weed species.

The flora survey sites were selected to sample the variety of REs mapped by the existing Queensland Herbarium mapping and the vegetation types observed in the field.

A total of 35 survey sites were assessed to a Tertiary level (**Figure 1**).

4.0 RESULTS

A summary of the survey results for each site is provided in **Attachment 3**. A combined list of all flora species recorded in the study area is provided at **Attachment 4**.

The vegetation within the site is generally in average to good condition. Due to historic landuse and previous fires, the shrub and ground layers in places were dominated by a number of *Acacia* species and herbaceous weeds.

4.1 Background to Regional Ecosystem / Vegetation Community Classification Systems

Vegetation communities in Queensland are defined by means of a systematic classification method. The identified communities are termed 'Regional Ecosystems' (REs). REs are consistently associated with a particular combination of geology, landform and soil (as per Sattler & Williams 1999).

REs provide the framework for assessing the conservation value of remnant vegetation. Under the Commonwealth EPBC Act, threatened ecological communities in Queensland are identified by means of the RE classification. REs also provide the legislative framework for vegetation community conservation in Queensland under the *Vegetation Management Act 1999* (VM Act). A brief introduction to the conservation status under the two frameworks is provided below. The findings of the field assessments in relation to REs and their respective conservation status are then provided in **Section 4.2**.

Commonwealth Protected Communities

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides protection for vegetation communities identified as being of national significance. These are termed 'threatened ecological communities'. There are three types of threatened ecological communities:

- Critically Endangered: communities that are facing an extremely high risk of extinction in the wild in the immediate future
- Endangered: communities that are not critically endangered and are facing a very high risk of extinction in the wild in the near future
- Vulnerable: communities that are not critically endangered or endangered and are facing a high risk of extinction in the wild in the medium-term future

Threatened ecological communities are listed under the EPBC Act. For those communities listed for Queensland, a corresponding RE has in most cases been identified by DEWHA to assist in the determination of the communities.

No EPBC Act Listed communities occur in the study area.

Queensland Protected Communities

Vegetation communities in Queensland are afforded additional protection under the provisions of the VM Act.

The proposed petroleum activities are recognised as an exempt activity under the *Integrated Planning Act 1997* (Qld) and therefore is also exempt from the VM Act. However, the intent of the VM Act should be taken into consideration and attempts made to minimise the environmental impacts associated with the proposal. As such, this study also considers the impacts on REs protected under the VM Act.

The VM Act provides a legislative framework for managing and assessing clearing of remnant vegetation on freehold and leasehold land. The Department of Natural Resources and Water administer the VM Act. The status of vegetation communities is based on the remaining extent of each RE in the bioregion. Three conservation categories are recognised:

- 'Endangered': where there is either less than 10% of the pre-clearing extent remaining, or 10% - 30% of its pre-clearing extent remaining if the remnant is less than 10,000 hectares
- 'Of Concern': where there is either 10-30% pre-clearing extent remaining, or more than 30% remaining if the remnant is less than 10,000 hectares
- 'Not of Concern': where there is over 30% pre-clearing extent remaining and remnant is greater than 10,000 hectares.

4.2 Findings of Assessment in Relation to Vegetation Communities / Regional Ecosystems

The REs identified within the existing Queensland Herbarium RE mapping as occurring within the study area are set out in **Table 1** and illustrated in **Figure 2**

The results of the field surveys are shown in **Table 2**. **Figure 3** shows the ground-truthed RE locations within the study area.

Table 1 Regional Ecosystems as Mapped by the Queensland Herbarium Identified Within the Study Area

Vegetation Communities / REs		Status			As Mapped by Queensland Herbarium	Confirmed in field	Survey Site No.^
RE Number	Description	EPBC	VM ACT	Biodiversity			
11.1.2	Samphire forbland on marine clay plains		NOC	NOC	11.1.2		
11.1.4	Mangrove forest/woodland on marine clay plains		NOC	NOC	11.1.4		
11.3.29	*Eucalyptus crebra, E. exserta, Melaleuca spp.* woodland on alluvial plains		NOC	NOC	11.3.29 11.3.29/12.3.3	11.3.29 11.3.29/12.3.3	34,35
12.1.2	Saltpan vegetation including grassland and herbland on marine clay plains		NOC	NOC	12.1.2	12.1.2	
12.1.3	Mangrove shrubland to low closed forest on marine clay plains and estuaries		NOC	NOC	12.1.3	12.1.3	2,3,12
12.2.2	*Microphyll/notophyll* vine forest on beach ridges		OC	E	12.2.2	12.11.14/12.2.2	17
12.3.3	*Eucalyptus tereticornis* woodland to open forest on alluvial plains		E	E	12.3.3 12.3.3/12.3.7	12.3.3 12.3.3	4,6,9,11,13,14, 24,27
12.3.7	*Eucalyptus tereticornis, Melaleuca viminalis, Casuarina cunninghamiana* fringing forest		NOC	NOC	12.3.7 12.3.7/12.3.11 12.3.3/12.3.7	Not present 12.3.11 12.3.3	4,6,9,11,13,14, 22,24,27

12.3.11	*Eucalyptus siderophloia, E. tereticornis, Corymbia intermedia* open forest on alluvial plains usually near coast		OC	OC	12.3.7/12.3.11	12.3.11	22
12.11.6	*Corymbia citriodora, Eucalyptus crebra* open forest on metamorphics ± interbedded volcanics		NOC	NOC	12.11.6 12.11.6 12.11.6/12.11.14	12.11.6 12.11.14 12.11.14	12,8,10,16,17, 18,19,20,21,23 25,26,28,29,30 31,32,33
12.11.14	*Eucalyptus crebra, E. tereticornis* woodland on metamorphics ± interbedded volcanics tree species.		OC	OC	12.11.14 12.11.6/12.11.14	12.11.14 12.11.14	12,8,10,16,17, 18,30,31,32

Table 2 Regional Ecosystems Present Within the Study Area

1	12.3.7/12.3.11	12.3.11	C01 NORTH CHINA POINT	315600	7370805
2	12.1.3	12.11.14	C02 MANGROVE ISLAND	315598	7370554
3	12.1.3	12.1.3	C03 MANGROVES	315596	7370392
4	12.3.3/12.3.7	12.3.3	C04 BLUE GUM FLATS	316272	7370002
5	12.11.6	12.11.6	C05 HILLOCK	316825	7369951
6	12.3.3/12.3.7	12.3.3	C06 QUADBIKE TRACK	317349	7370822
7	12.11.6	12.11.6	C07 TALL OPEN FOREST	317231	7370554
8	12.11.6/12.11.14	12.11.14	C08 WOODLAND	315829	7370600
9	12.3.3/12.3.7	12.3.3	C09 BLUE GUM AREA	316213	7370144
10	12.11.6	12.11.6	C10 TALL OPENFOREST	317009	7370089
11	12.3.3/12.3.7	12.3.3	C11 CURTIS WOODLAND	316617	7369951
12	12.1.3	12.1.3	C12 MANGROVE EDGES	316048	7369563
13	12.3.3/12.37	12.11.14	C13 PENINSULA	316056	7369718
14	12.3.3/12.3.7	12.3.3	C14 TALL WOODLAND	316040	7370055
15	12.1.2	12.1.2	C15 COASTAL WETLAND	316012	7370192
16	12.11.6/12.11.14	12.11.14	C16 BRIDGE RD END	314091	7372448
17	12.2.2	12.11.14/12.2.2	C17 HAMILTON POINT	317817	7368086
18	12.11.6/12.11.14	12.11.14	C18 LAIRDS POINT	314586	7371349
19	12.11.6	12.11.6	C19 BLUE GUM HILL	306665	7405546
20	12.11.6	12.11.6	C20 LEMON SCENTED HILL	314548	7372481
21	12.11.6	12.11.6	C21 LEMON SCENTED WOODLAND	314999	7372412
22	12.3.7/12.3.11	12.3.11	C22 MIXED FOREST	315760	7372567
23	12.11.6	12.11.6	C23 LEMON SCENTED WOODLAND	315928	7372498
24	12.3.3/12.3.7	12.3.3	C24 BLUE GUM FLAT	316521	7372536
25	12.11.6	12.11.6	C25 PIPELINE ROUTE (KP 382.4)	317391	7371033
26	12.11.6	12.11.6	C26 LEMON SCENTED WOODLAND	316670	7371046
27	12.3.3/12.3.7	12.3.3	C27 PIPELINE ROUTE (KP 382.7)	317124	7370697
28	12.11.6	12.11.6	C28 LEMON SCENTED WOODLAND	317916	7369791
29	12.11.6	12.11.6	C29 IRONBARK / LEMON SCENTED WOODLAND	318454	7369618

30	12.11.6/12.11.14	12.11.14	C30 BLUE GUM FENCE	318930	7369272
31	12.11.6/12.11.14	12.11.14	C31 HAMILTON POINT	318719	7368732
32	12.11.6/12.11.14	12.11.14	C32 IRONBARK WOODLAND	318619	7368732
33	12.11.6	12.11.14	C33 MARINE WOODLAND	318135	7368276
34	11.3.29	11.3.29	C34 LANDING ROAD	311446	7368526
35	11.3.29/12.3.3	11.3.29/12.3.3	C35 MAINLAND ROAD	311207	7369216

4.2.1 EPBC Act Threatened Vegetation Communities

The field survey confirmed that no vegetation communities listed under the EPBC Act occur within or in the vicinity of the study area.

4.2.2 VM Act 'Endangered' Regional Ecosystems

'Endangered' RE 12.3.3 (Blue Gum open woodland on alluvial plains) was verified at eight locations within the study area. These field surveys identified that all areas mapped as the mixed community RE 12.3.3/12.3.7, only showed characteristics of the RE 12.3.3.

Its principal occurrence was within the southern third of the facilities site which includes an area of approximately 45.65 ha. This RE was generally found to be in good condition. There was however, some evidence of erosion and herbaceous weeds were found to be prevalent due to high water and nutrient availability.

The pipeline transects the edge of a remnant of RE 12.3.3 at approximate KP 380.7 (**Figure 3**). The area of RE 12.3.3 that is estimated to fall within the proposed pipeline corridor is 0.44 ha. Field surveys of this area found it to be in an average condition and to historic landuse and previous fires, the shrub and ground layers in places were dominated by a number of *Acacia* species and herbaceous weeds.

RE 12.3.3 also occurs near the southern end of the access road on Curtis Island and (as a subdominant component of a 90/10 mosaic) near the southern end on the mainland (**Figure 3**). The total area of these communities that are transected by the access road is approximately 2.15 ha.

4.2.3 VM Act 'Of Concern' Regional Ecosystems

RE 12.3.11 (Grey Ironbark open woodland on alluvial plains) and REs 12.11.14 (Ironbark woodlands on metamorphics ± interbedded volcanics) which are regarded as areas 'Of Concern' were identified within the study site.

The field survey found RE 12.3.11 to be present at the most northern point of the pipeline and the access road and a small area of the site facility (**Figure 3**). The remnant that occurs over the pipeline and access road was generally found to be in average condition due to regular fires and weed infestations. The small area (1.3 ha) that occurs within the facilities site however, was found to be in good condition due to low weed density and was considered to be high-quality fauna habitat (**Site 1** in **Attachment 3** and **Figure 3**).

A significant portion of the road corridor to the east of the facilities site and a smaller area to the south of the facilities site transects a mixed forest of RE 12.11.6/12.11.14. This remnant was found to be in average condition as a result of regular fires in the area and weed infestations.

The total area of REs that are 'Of Concern' and fall within the area of the access road or pipeline corridor is approximately 6.89 ha.

The field survey confirmed that RE 12.11.14 also occurs as belts of vegetation crisscrossing the facilities site (**Figure 3**). Field surveys found this area to be in average condition as a result of regular fires in the area.

The field survey identified two remnants of RE 12.11.14 that were additional to those identified in the existing Queensland Herbarium RE mapping (**Figure 3**). In total, 8.94 ha of RE 12.11.14 occurs the facilities site, 3.49 ha occurs on the access road and 1.54 ha on the pipeline corridor. Due to the openness of the native vegetation and high weed density these remnants are considered to be in poor condition.

4.2.4 VM Act 'Not of Concern' Regional Ecosystems

According to the Queensland Herbarium RE Mapping, REs 12.1.2, 12.1.3, 12.3.7 and 12.11.6 occur within the facility site.

The field survey found this to be generally accurate with the notable exception that the area mapped as RE 12.3.3/12.3.7 was in fact RE 12.3.3, with no RE 12.3.7 observed on the entire site.

RE 12.1.2 (saltpan vegetation) were found to be in generally in very poor condition with only a few clumps of vegetation present. This low density of vegetation is likely to be due to trampling and grazing by cattle and brumbies (**Site 15 in Attachment 3**).

RE 12.1.3 (mangroves) adjacent to the facilities site showed evidence of significant dieback and were found to be in a degraded state. The mangrove areas to the north and the south of the site facility however, were generally observed to be in a good condition. Lairds Point (**Site 16 in Attachment 3**), was an exception where mangroves were found to be in a degraded condition due to the accumulation of organic matter around mangrove roots.

RE 12.11.6 (Open forest of Lemon-scented Gum and Narrow Leaf Ironbark on metamorphics ± interbedded volcanics) present within the facilities site were generally found to be in average condition with evidence of regular fire damage. These regular fires are likely to be a contributing factor to the limited shrub layer observed in some areas (**Site 10 in Attachment 3**).

The total area of REs that are 'Not of Concern' found within the facility site is approximately 221.87 ha.

Not of Concern REs that occur in the road and pipeline corridors are RE 11.1.2, 11.1.4, 12.1.2 and 12.11.6 while RE 11.3.29 occurs in the road corridor only.

A significant portion of the road corridor to the east of the facilities site and a smaller area to the south of the facilities site occurs in a mixed woodland of RE 12.11.6/12.11.14. This area was found to be in average condition due to frequent fire damage and a high weed density in the area.

Road corridor crosses very small areas of RE 12.1.2 where it crosses the Curtis Island coast near each end.

Significant portions of the road corridor on the mainland transects RE 11.1.2 and 11.1.4. As these saltpan vegetation and mangrove communities were not inspected in the field due to access constraints they are assumed to be in good condition.

The southern portions of the road corridor on the mainland transect a mosaic RE which is dominated by RE 11.3.29. Site surveys at two locations within this RE observed the condition to be degraded due to frequent fire damage and a high weed density in the area.

The total area of 'Not of Concern' REs that occur within the road and pipeline corridors is approximately 260.28 ha.

4.3 Findings of Assessment in Relation to Coastal Wetlands

The wetlands that were mapped by DNRW as coastal wetlands (**Figure 2**) were observed in the field to consist of tidal mud/salt flats. On Curtis Island these areas are predominantly bare with only one or two small clumps of saltmarsh species observed across the entire site. As a result of this sparsity of vegetation these coastal wetlands are considered to be in degraded condition (**Site 15 in Attachment 3**, **Photo 1**).

The mangrove and wetland areas transected by the road corridor on the mainland were not inspected in the field and are assumed to be in good condition.

Plate 1: Coastal Wetlands (Site 15)

4.4 Scheduled Flora Species

The database searches identified 12 EVR flora species that are known to, or potentially occur in the vicinity of the study area (see **Attachment 2** for complete database search results). **Table 3** lists these species, their preferred habitat and whether that preferred habitat is present within the study area.

Table 3 EVR Flora Species Present in the Area

Scientific Name	Conservation Status	Habitat	Known or Potential to Occur in Project Area	Located During Field Survey
Alyxia magnifolia	Rare *Qld*	Remnant rainforest or depauperate mainly north of Brisbane (Stanley and Ross, 1986).	No	No
Asplenium pellucidum	Vulnerable *Aust/Qld*	Grows on mossy branches or rocks especially near waterfalls in North-Eastern Queensland (Palmerston Valley) (Andrews, 1990)	No	No
Atalaya collina	Endangered *Aust/* Vulnerable *Qld*	Grows on hillsides, in remnant dry scrubs, together with *A. salicifolia,* but is not as common as that species (Reynolds, 1991).	Yes	No
Atalaya rigida	Rare *Qld*	Restricted to eastern Qld from Mt Aberdeen near Bowen, south to Mt Glastonbury south west of Gympie. Occurs in vine thicket and araucarian microphyll notophyll vineforest on red clay soil or black clay loam (DNR, 1999)	Yes	No
Bosistoa selwynii	Vulnerable *Aust*	Lowland rainforest (Stanley and Ross, 1983).	No	No
Bosistoa transversa	Vulnerable *Aust*	Lowland rainforest (Stanley and Ross, 1983).	No	No
Bulbophyllum globuliforme	Vulnerable *Aust/Qld*	Dry notophyll and microphyll vine forests, between 500 and 800m, on old hoop pines (DNR, 1999).	No	No
Cupaniopsis shirleyana	Vulnerable *Aust/Qld*	Depauperate rainforests from Brisbane to Bundaberg (Stanley and Ross, 1983).	No	No
Hernandia bivalvis	Rare *Qld*	Vine forests on rocks with shallow soils (DNR, 1999).	Yes	No
Parsonsia larcomensis	Vulnerable *Aust/Qld*	Restricted to central east and south east Qld, from three locations in the Rockhampton – Mt Perry area. Occurs in open heathland and shrubland at or near the summits of mountain peaks from 350 to 750 m elevation (DNR, 1999)	No	No
Quassia bidwillii	Vulnerable *Aust/Qld*	Below 650m in rainforests, open forest, woodland and mangroves (DNR,1999).	Yes	No
Taeniophyllum muelleri	Vulnerable *Aust*	Epiphytic Orchid associated with rainforest trees (NSW Flora Online)	No	No

As detailed in **Table 3**, four EVR flora species have preferred habitat within the study area. These species were specifically targeted during the field survey.

No protected flora species were recorded within the study area during the field survey. Based on this, the survey effort and the existing level of disturbance, EVR flora species are not expected to occur within the study area.

4.5 Declared Weeds

Pursuant to the *Land Protection (Pest and Stock Route) Management Act 2002* (Qld) pest flora and fauna species are classified into 3 categories:

- Class 1 species: not generally established in Queensland and has potential to cause adverse economic, environmental or social impact. The landowner is obliged to take reasonable steps to keep their land free of Class 1 pest species, unless the owner holds a declared pest permit allowing the pests to be kept on the land
- Class 2 species: are established in Queensland and can cause significant adverse economical, environmental or social impact. The landowner is obliged to take reasonable steps to keep their land free of Class 2 pest species, unless the owner holds a declared pest permit allowing the pests to be kept on the land
- Class 3 species: established in Queensland and has or could have adverse economical, environmental or social impact. Legislative obligations in regard to the control of these species are generally limited to specific conservation areas

Three declared species were detected and recorded within the study area during the field surveys. These were:

1. *Cryptostegia grandiflora* (Rubber Vine) Class 2
2. *Optunia* spp (Prickly Pear) Class 2
3. *Lantana camara* (Lantana) Class 3

The most abundant of these was Prickly Pear, which was found to be most prevalent around the marine fringes.

The non-declared weed *Praxelis clematidea* (Praxelis) was also observed within the study area. This weed is rapidly spreading throughout parts of Northern Queensland and is currently listed under the '*Alert List for Environmental Weeds'* collated by the Federal Department of the Environment, Water, Heritage and the Arts. (see **Attachment 5** for Weed Profile).

Generally weeds were found to be in low abundance within the study area. The weeds that were most commonly observed were generally found to be herbaceous non-problematic species.

5.0 POTENTIAL IMPACTS

5.1 Vegetation Communities / REs

Impacts on vegetation communities / REs are likely to be primarily associated with the physical clearing of vegetation to site the infrastructure. **Table 4** presents the estimated clearance footprint within each RE type. In order to consider these impacts within their local context, the proposed clearing is compared to the amount of each RE which occurs within 10km of the site.

Other potential impacts on vegetation are:

- Introduction and further spread of invasive weeds
- Introduction or proliferation of pest animals
- Leaching of pollutants into adjoining mangrove and wetland areas
- Release of silt into adjoining mangrove and wetland areas
- Altered hydrological and sedimentation regimes due to construction of the access road across the mainland wetland areas
- Air emission impacts on adjoining areas.

Edge effects and fragmentation of vegetation is not considered to be a significant impact in relation to flora values with the exception of the Mangrove and saltpan communities on the mainland (RE 11.1.2 and RE 11.1.4). In particular, the other REs which occur in the study area are open communities which are already affected to varying extents by regular burning, livestock and other modifying influences.

Table 4 Estimated Area of Each Regional Ecosystems to be Cleared

Vegetation Community/RE		Status*			Estimated Area to be Cleared by Each Structure (ha)			Total Area Cleared (ha)	% cleared in 10 km buffer
RE code	**RE Description**	**EPBC Act**	**VM Act**	**Biodiversity**	**LNG Plant**	**Pipeline**	**Access Road**		
11.1.2	Samphire forbland on marine clay plains		NOC	NOC			10.21	10.21	1.39
11.1.4	Mangrove forest/woodland on marine clay plains		NOC	NOC			3.54	3.54	0.33
11.3.29	Eucalyptus crebra, E. exserta, Melaleuca spp. woodland on alluvial plains		NOC	NOC			3.35	3.35	0.63
12.1.2	Saltpan vegetation including grassland and herbland on marine clay plains		NOC	NOC	0.58		0.43	1.01	0.05
12.1.3	Mangrove shrubland to low closed forest on marine clay plains and estuaries		NOC	NOC	0.07			0.07	0.025
12.3.3	*Eucalyptus tereticornis* woodland to open forest on alluvial plains		E	E	45.65	0.44	2.15	48.24	5.63
12.3.7	*Eucalyptus tereticornis, Melaleuca viminalis, Casuarina cunninghamiana* fringing forest		NOC	NOC		0.28		0.28	0.05
12.3.11	*Eucalyptus siderophloia, E. tereticornis, Corymbia intermedia* open forest on alluvial plains usually near coast		OC	OC	1.30	0.85	1.01	3.16	0.60
12.11.6	*Corymbia citriodora, Eucalyptus crebra* open forest on metamorphics ± interbedded volcanics		NOC	NOC	212.29	19.15	29.88	261.32	2.66
12.11.14	*Eucalyptus crebra, E. tereticornis* woodland on metamorphics ± interbedded volcanics tree species.		OC	OC	8.94	1.54	3.49	13.98	2.42

5.1.1 Potential Impacts on EPBC Act Listed Vegetation Communities

As discussed in **Section 3.2** there are no REs that are afforded additional protection under the EPBC Act within or in the vicinity of the study area. As such, there is no significant potential to impact on EPBC Act listed Vegetation Communities.

5.1.2 Potential Impacts on VM Act 'Endangered' REs

The facilities site, access road and pipeline corridor are proposed to be located within areas of 'Endangered' RE 12.3.3 (Blue Gum open woodland on alluvial plains) at four locations.

Field surveys of these communities that occur within the facilities site (Sites 4, 6, 9, 11 and 13) found that these remnants were generally in good condition. There was however, some evidence of erosion and weeds were common within these localities. The sites on the pipeline (Sites 24 and 27) were in average condition and the site on the access road on the mainland (Site 35) was degraded due to frequent fires and weeds.

The amount of RE 12.3.3 that will require removal as a result of the proposal will be approximately 48.24 ha. This equates to approximately 5.6% of that which occurs within a 10 km buffer of the site (**Table 4**).

Mitigation measures should be employed in order to minimise the area of the RE to be cleared. Opportunities to reduce the footprint exist at two of the locations:

1. Realigning the north-eastern most point of the pipeline further south by 100 m, and
2. Realigning the southern portions of the access road on the mainland further east by approximately 100 m into more open and lightly vegetated areas.

It is however, recognised that the area of RE 12.3.3 which occurs within the facilities site and further south on the access road on Curtis Island is unlikely to be able to be avoided due to site and engineering constraints. As such, the mitigation measures presented in **Section 6** include a recommendation to create environmental offsets for the unavoidable clearing of this RE.

5.1.3 Potential Impacts on VM ACT 'Of Concern' REs

The facilities site, access road and pipeline occur over REs 12.3.11 and 12.11.14.

RE 12.3.11 (Grey Ironbark open woodland on alluvial plains) occurs within the proposed developments at two locations. The proposed development would require the removal of a total of approximately 3.16 ha of this RE, which equates to approximately 0.6% of this RE type which occurs within a 10 km buffer of the site (**Table 4**). The remnant that occurs in the area of the proposed pipeline corridor and access road is in average condition due to regular fires and weed infestations. The small area (1.3 ha) that is present within the facilities site is in good condition due to low weed density.

The proposed clearing of RE 12.3.11 is a relatively small area and represents a relatively small proportion of that found within the local area. As such, it is considered that impacts on this RE is not likely to be significant, provided the mitigation measures recommended in **Section 6** are implemented.

RE 12.11.14 (Ironbark woodlands on metamorphics ± interbedded volcanics) falls within the proposed development at several locations. The total area of RE 12.11.14 that will require removal is approximately 13.98 ha. This equates to 2.4% of this RE type found within a 10 km buffer of the site (**Table 4**). Generally the remnants of this community were found to be in poor condition due to regular fires in the area and a high weed density.

5.1.4 Potential Impacts on VM ACT 'Not of Concern' REs

The field survey indicated that six REs that are listed as 'Not of Concern' under the VM Act fall within the area of the facilities site, access road and pipeline. The six relevant REs are 11.1.2, 11.1.4, 11.3.29, 12.1.2, 12.1.3, and 12.11.6 (**Figure 3**).

The total amount of RE 11.1.2 (Saltpan vegetation) that will be required to be cleared is approximately 10.21 ha. This makes up approximately 1.4% of the total amount of this RE type within 10 km of the site (**Table 4**).

The total amount of RE 11.1.4 (Mangroves) that will be required to be cleared is approximately 3.14 ha. This makes up 0.3% of the total amount of this RE type within 10 km of the site (**Table 4**).

Both RE 11.1.2 and 11.1.4 areas are assumed to be in good condition as they were not inspected in the field. Both contain plants which are 'Marine Plants' under the Queensland *Fisheries Act 1994* and permits for clearing of these plants will be required. There is potential for significant impacts to both of these community types and it is recommended that detailed field investigations be conducted in order to confirm the location, health and avoidability of these REs. Potentially significant impacts may be caused by altered hydrological conditions and sedimentation as a result of the construction of the access road.

The total amount of RE 11.3.29 (*Eucalyptus crebra, E. exserta, Melaleuca spp.* woodland on alluvial plains) that will be required to be cleared is approximately 3.35 ha. This makes up 0.6% of the total amount of this RE type within 10 km of the site (**Table 4**). This remnant is was in degraded condition and the potential impact on this community is not significant.

The total amount of RE 12.1.2 (Saltpan vegetation) that will be required to be cleared is approximately 1.01 ha. This makes up 0.05% of the total amount of this RE type within 10 km of the site (**Table 4**). This remnant is in poor condition as it was only very sparsely vegetated as a result of trampling by cattle and brumbies.

The RE 12.1.3 (Mangroves) also occurs within the area of the facilities site (**Figure 2** and **Figure 3**). The total amount of this community that will be required to be removed for the construction of the facilities site is approximately 0.07 ha. This makes up approximately 0.025% of the total amount of this RE type within 10 km of the site (**Table 4**). The field survey found these areas to be in a degraded with evidence of significant dieback.

Because of their poor condition and the small proportion to be removed (less than 1.5% of that which occurs in a 10 km buffer), the impact of removing these areas is not significant. As for RE 11.1.2 and RE 11.1.4; plants within RE 12.1.2 and RE 12.1.3 are 'Marine Plants' under the Queensland *Fisheries Act 1994* and permits for clearing of these plants will be required.

In order to minimise impacts and protect the healthy mangroves further north and south, mitigation measures are presented in **Section 6**.

The RE 12.11.6 (Open forest of Lemon-scented Gum and Narrow Leaf Ironbark on metamorphics ± interbedded volcanics) occurs within the facilities site, access road and pipeline at three locations.

The amount of this community that will be required to be removed will be approximately 261.32 ha. This equates to approximately 2.7% of the total amount of this RE within 10 km of the site (**Table 4**). These areas were generally found to be in average condition as a result of regular fires in the area and weed infestations.

Provided that the mitigation measures recommended in **Section 6** are implemented, the potential for the construction and operation of the facilities site, access road and pipeline to impact on the 'Not of Concern' REs which occur on Curtis Island is not significant.

5.2 Scheduled Flora Species

The site facility, access road and pipeline areas contain potential habitat for four EVR flora species. As no protected flora species were recorded or expected to occur within the study area, there is limited potential to have any impact on such species.

None-the-less, mitigation measures are provided in **Section 6** which will further reduce any potential to impact EVR flora species.

5.3 Declared Weed Species

The construction and operation of the facilities site, access road and pipeline could potentially spread existing and introduce new weeds to the study area.

Declared weeds that were not observed in the study area during field studies but nevertheless have preferred habitat within the study areas include:

- Giant Rat-tail Grass (*Sporobolus* spp.), a declared weed commonly found in the Gladstone area
- Groundsel Bush (*Baccharis halimifolia*), which has the potential to occur on the site, particularly within areas of RE 12.3.3 (Blue Gum open woodland on alluvial plains), which is a preferred habitat
- Singapore Daisy (*Sphagneticola trilobata*), a common garden plant that was observed during field studies in gardens and rocky headlands on the eastern side of Curtis Island.

The introduction of these and other new weed species could potentially render neighbouring lands less productive and in some cases could have adverse impacts on livestock health.

Mitigation measures aimed at reducing the risk of introducing and spreading weeds on Curtis Island are provided in **Section 6**.

6.0 MITIGATION MEASURES

Mitigation measures which are recommended to help avoid or minimise impacts on flora values include:

- Minimise area of clearing for the 'Endangered' RE 12.3.3 where possible (e.g. realign pipeline and road is possible to avoid RE 12.3.3 in the north of the pipeline alignment and southern portion of the mainland road alignment (**Figure 3**))
- Where clearing of vegetation is unavoidable environmental offsets should be established elsewhere (preferably in the local area) to compensate for all proposed clearing. In particular, the offsets program should include re-establishment of an area of at least 75 ha of the Endangered RE 12.3.3 (area of offsets to be in accordance with the Queensland Governments current Vegetation Management Offsets Policy)
- Minimise area of clearing within mangrove vegetation (RE 12.1.3) (**Figure 3**)
- Apply for a permit to clear 'Marine Plants' under the Queensland *Fisheries Act 1994*
- Ensure that siltation is controlled, particularly in and near coastal wetland areas and mangroves
- Detailed field investigations of the mainland mangrove and saltpan vegetation communities should be conducted in order to confirm the location, health and avoidability of these REs
- Detailed modelling should be undertaken to quantify potential impacts on the mainland mangrove and saltpan vegetation communities due to any hydrological and sedimentation changes that may be likely to result from the construction of the access road
- Design and construct the mainland access road in a manner that minimises impacts on the mangrove and saltpan vegetation communities
- Ensure that site development design and construction prevents leaching into surface and ground waters
- Monitor mangrove health in mangroves immediately adjacent to the mainland access road as well as the facilities site and areas as further along the Curtis Island coast in both directions with the aim of identifying any impacts associated with the construction and/or operation of the facility
- Monitor saltmarsh vegetation health immediately adjacent to the mainland access road
- Assess the potential for air emissions to impact on local vegetation
- Monitor adjoining vegetation for risk of poisoning from air emissions
- Address any impacts identified during the recommended monitoring
- A weed management program should be put in place in order to minimise the risk of spreading and introducing declared weeds to or within Curtis Island
- All vehicles and plant should have certification that they are weed free prior to their initial commencement of works on Curtis Island.

It is recognised that the facilities site will be permanently cleared of vegetation. However, where the pipeline alignment or site periphery areas are proposed to be revegetated the following mitigation measures are recommended:

- A reseeding plan should be developed based on soil type and existing local vegetation characteristics (native species)
- Monitor vegetation re-establishment post construction
- Clearing boundaries should be clearly marked on design drawings and in the field
- Monitor for weed infestations quarterly for a period of two years following construction and apply appropriate control measures.

7.0 REFERENCES

Andrews, S.B. 1990. *Ferns of Queensland: A Handbook to the Ferns and Fern Allies*, Department of Primary Industries, State of Queensland.

Botanic Gardens Trust (24/11/2008). PlantNET - The Plant Information Network System of Botanic Gardens Trust, Sydney, Australia (version [number]). http://plantnet.rbgsyd.nsw.gov.au.

Department of Natural Resources. 1999. Species Management Manual Volume 3. Environmental Management, Forest Resources. November 1999.

Neldner, V.J., Thompson, E. J., Bean, A.R. and Dillewaard, H. A. (1999) Methodology for Survey and Mapping of Vegetation Communities and Regional Ecosystems in Queensland (Draft Working Copy) . BRI – Queensland Herbarium. Environmental Protection Agency. April 1999.

Reynolds, S.T. 1991. *New Species and Changes in Sapindaceae from Queensland. Austrobaileya 3 (3): 492, fig. 1D-F, Map 2.*

Sattler, P. & Williams, R. (Eds.) 1999. The Conservation Status of Queensland's Bioregional Ecosystems. Environmental Protection Agency, Brisbane.

Stanley T. D. and Ross E. M. 1986. *Flora of south-eastern Queensland, Volume II.* Queensland Herbarium, Department of Primary Industries, Queensland Government.

Stanley T. D. and Ross E. M. 1983. *Flora of south-eastern Queensland, Volume I*. Queensland Herbarium, Department of Primary Industries, State of Queensland

ATTACHMENT 1: CURRICULA VITAE

Ann Moran Principal Field Botanist / Ecologist

Profile

Ann is the Owner and Director of a small environmental business and has over 20 years experience in environmental assessment, property management plans and mine rehabilitation in Queensland and the Northern Territory. She provides her expertise to Community Group Education with Land for Wildlife, Coast Care programs, nature conservation and catchment management programs. Ann initiates strategies and guidelines for sustainable development and the protection, enhancement and rehabilitation of species and regional ecosystems

Qualifications

Bachelor of Science (Environmental)	University of the Sunshine Coast
Train the trainer courses CN404 Instructional Skills	Cooloola Sunshine Coast Institute of TAFE
Regional Ecosystem Assessment and Accreditation	

Affiliations

Greencorp

TAFE Greening Australia Community Group training

Department of Natural Resources

Awards

Australian Federation of University Women Sunshine Coast Branch Science Faculty Award: USC Maroochydoore Shire Bicenential Foundation Award 1992 – Pursuit of excellence for outstanding achievements in Biology

Scientific permit: No. WISP01050603 from EPA – DPI certificate no.85

Areas Of Expertise

- Environmental surveys, monitoring and mapping
- Environmental policy and planning development and review
- Biodiversity, conservation significance and environmental impact assessment
- Biodiversity Mapping fauna corridors, foreshores, vegetation, waterways and weeds
- Environmental monitoring for Developments and Councils

Relevant Experience

- Biodiversity Mapping Methodology and Ecological Assessments
- Landscape plans Environmental Management Plans
- Weed Management and Environmental monitoring Programs
- Vegetation Management retention of vegetation communities
- Rare and Threatened species and related issues
- Flora and Fauna surveys, Vegetation and species mapping (GIS & GPS)
- Prepare and post auditing under power line for tree removal throughout Queensland
- Assessed several optional routes for (Main Road, Water and Gas pipeline)
- NHT Panel assessing community projects and catchment management initiatives
- Review and verifying Regional Ecosystems in Caboolture and other shires
- Monitoring recreational use and impacts on migratory and resident shorebirds of the Noosa North Shore
- Design and implementation of Greening Brisbane re-vegetation project

Martin Bennet

Profile

Martin's identification skills have been learnt in the field under the teaching of botanists, field naturalists, the use of the Queensland Herbarium and his own keen observation skills. His involvement in the weed control and re-vegetation of a 35ha area with vine thicket species an example of his knowledge. His expertise in weed control and re-vegetation has been welcomed by many Queensland Councils, EPA Nature refuges, Voluntary Conservation Agreement Landholders as well as CSIRO, West Moreton Landcare Group and New Hope Coal Australia to name a few. He was also involved in the weed control and re-vegetation of a 35ha area with vine thicket species.

Martin has delivered presentations for Ipswich City Council, South East Queensland Catchments, and local Landcare groups on weed control, native plant identification and re-vegetation projects and has issued environmental reports for Councils and the University of Queensland (Gatton Campus).

Career Summary

2007 – Present Land for Wildlife Extension Officer for Somerset Regional Council

2007 – Present Land for Wildlife Extension Officer for Lockyer Valley Regional Council

2000 – 2007 Weed Control Contractor (self employed)

- Lockyer Valley Regional Council
- Somerset Regional Council
- Ipswich City Council
- EPA Nature Refuges
- Land for Wildlife
- Voluntary Conservation Agreement Landholders
- Voluntary Conservation Covenant Landholders
- CSIRO
- West Moreton Landcare Group
- Black Snake Creek Catchment
- Woolshed & Plain Creek Catchment
- Oxley Catchment Group
- New Hope Coal (Australia)

1998 – 2000 Lockyer Valley Rainforest Nursery

Areas Of Expertise

- Araucarian ecosystems
- Microphyll vine thickets
- Open forest/woodland communities
- Regional ecosystems in the Lockyer Valley

Relevant Experience

- Flora Surveys
- Environmental reports
- Re-vegetation projects
- Weed Control
- Native plant identification

ATTACHMENT 2: DESKTOP DATABASE SEARCH RESULTS

EPA Wildlife Online Search Results	Latitude: Aug-08	23.766	Longitude:	151.199	Distance:	10km

Kingdom	Class	Family	Scientific Name	Common Name	Qld	Aust
plants	higher dicots	Rutaceae	Bosistoa transversa	three-leaved bosistoa	C	V
plants	higher dicots	Apocynaceae	Alyxia magnifolia		R	
plants	lower dicots	Hernandiaceae	Hernandia bivalvis	cudgerie	R	
plants	higher dicots	Sapindaceae	Atalaya rigida		R	
plants	ferns	Aspleniaceae	Asplenium pellucidum		V	V
plants	higher dicots	Sapindaceae	Cupaniopsis shirleyana		V	V

EPBC ACTAct Protected Areas Report
Plants

Search Type: Area
Buffer : 10km
Coordinates: -23.7253,151.1789, -23.8105,151.1789, -23.8105,151.2682, -23.725,151.2682

Atalaya collina	Endangered	Species or species habitat likely to occur within area
Bosistoa selwynii Heart-leaved Bosistoa	Vulnerable	Species or species habitat likely to occur within area
Bosistoa transversa Three-leaved Bosistoa	Vulnerable	Species or species habitat likely to occur within area
Bulbophyllum globuliforme Miniature Moss-orchid	Vulnerable	Species or species habitat likely to occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo	Vulnerable	Species or species habitat likely to occur within area
Parsonsia larcomensis	Vulnerable	Species or species habitat likely to occur within area
Quassia bidwillii Quassia	Vulnerable	Species or species habitat likely to occur within area
Taeniophyllum muelleri Minute Orchid, Ribbon-root Orchid	Vulnerable	Species or species habitat may occur within area

ATTACHMENT 3: FLORA SURVEY SITE SUMMARIES

Site 1 Mixed Open Forest

Description Mixed Open Forest

Condition Good with lower weed percentage.

Good quality habitat for mammals and reptiles.

Soil Grey silty loam on alluvial plains and lower slopes.

SITE 1 STRUCTURE REPORT for RE12.3.11

Canopy 15-20m (70%)

Eucalyptus siderophloia	grey ironbark
Eucalyptus tereticornis	Qld blue gum
Corymbia citriodora	lemon scented gum

Mid-Storey 6-10 m (30%)

Eucalyptus exserta	Qld peppermint
Melaleuca viridiflora v viridiflora	broad-leaved tea-tree
Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus tereticornis	Qld blue gum
Lophostemon suaveolens	coastal swamp box
Corymbia tessellaris	moreton bay ash

Shrub Layer 2-5 m (50%)

Acacia leiocalyx ssp leiocalyx	early-flowering wattle
Melaleuca nervosa	fibrebark
Planchonia careya	cocky apple
Heteropogon contortus	bunch speargrass
Themeda triandra	kangaroo grass
Breynia oblongifolia	coffee bush
Acacia julifera ssp julifera	catkin wattle

Understorey <1m (Grass 50% + Rock 10% + Litter 40%)

Arundinella nepalensis	reed grass
Eremochloa bimaculata	poverty grass
Panicum decompositum	native millet
Glycine tabacina	variable glycine-pea
Cyanthillium cinereum	purple fleabane
Fimbristylis dichotoma	common fringe-rush
Flemingia parviflora	flemingia
Aristida calycina v calycina	dark wire-grass
Achyranthes aspera	chaff flower
Lomandra filiformis	wattle mat-rush
Murdannia graminea	slug herb

Site 2 Island Surrounded by Mangroves

Description: Ironbark Woodland

Condition: Degraded shrub and ground layer of 25-50% coverage with weeds such as Prickly Pear, Lantana and Rubber Vine. The canopy and mid-storey was in good health. Fragmented isolated remnant surrounded by Coastal wetland and Mangroves:

Soil: Brown stony clay on metamorphics ± interbedded volcanics.

Impacts: Declared weeds had a potential to spread with soil disturbance**.**

STRUCURE REPORT for RE 12.11.14

Canopy 15 m (30%)

Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus exserta	Qld peppermint

Mid-Storey 8-10 m (10%)

Pleiogynium timorense	burdekin plum

Shrub Layer 2-6 m (25-50%)

Pogonolobus reticulatus	medicine bush
Acacia julifera ssp julifera	catkin wattle
Alstonia constricta	bitter bark quinine tree
Alphitonia excelsa	soapy or red ash
Breynia oblongifolia	coffee bush

Cryptostegia grandiflora	rubber vine
Acacia disparrima ssp disparrima	ironbark wattle
Dodonaea viscosa ssp	sticky hop-bush
Capparis canescens	wild orange
Alyxia ruscifolia	chain fruit, prickly alyxia
Pleiogynium timorense	burdekin plum
Diospyros geminata	native ebony, iron tree

Understorey <1 m

Pogonolobus reticulatus	medicine bush
Aristida calycina v calycina	dark wire-grass
Achyranthes aspera	chaff flower
Dianella brevipedunculata	clumping flax lily
Cymbopogon refractus	barbwire grass
Myoporum acuminatum	mangrove boobialla
Fimbristylis dichotoma	common fringe-rush
Mitracarpus hirtus	pear fruit
Secamone elliptica	cork milk vine
Lomandra filiformis ssp filiformis	wattle mat-rush
Eustrephus latifolius	wombat berry

Site 3 Mangrove

Description: Mangrove shrubland to low closed forest.

Condition: Degraded with many dead trees.

Soil: Stony orange on marine clay plains or estuaries.

STRUCTURE REPORT for RE 12.1.3

Canopy 5 m (90%)

Rhizophora stylosa	spotted-leaved red mangrove

Mid-Storey 3-5 m (10%)

Rhizophora stylosa	spotted-leaved red mangrove
Ceriops tagal	yellow mangrove

Shrub Layer 2-4 m (50%)

Ceriops tagal	yellow mangrove
Lumnitzera racemosa	black mangrove
Aegiceras corniculatum	river mangrove

Ground Layer (90% Bare + 10% Rock)

Site 4 Open Forest

Description: Blue Gum Open Forest

Condition: Good with lower proportion of herbaceous weeds.

Soil: Grey clay loam on alluvial plains.

STRUCTURE REPORT for RE 12.3.3

Canopy 15-25 m (70%)

Eucalyptus tereticornis	Qld blue gum
Eucalyptus crebra	narrow-leaved ironbark
Corymbia tessellaris	moreton bay ash
Eucalyptus exserta	Qld peppermint

Mid-Storey 8-10m (10%)

Lophostemon suaveolens	coastal swamp box

Shrub Layer 2-5 m (30%)

Pogonolobus reticulatus	medicine bush
Sida subspicata	qld hemp
Acacia disparrima ssp disparrima	ironbark wattle
Acacia leiocalyx ssp leiocalyx	early-flowering wattle
Planchonia careya	cocky apple
Melaleuca nervosa	fibrebark

Understorey <1 m (Grass 50% + Litter 40% + Bare Soil 10%)

Heteropogon contortus	bunch speargrass
Arundinella nepalensis	reed grass
Dianella longifolia v stenophylla	smooth flax lily
Eremophila debilis	winter apple

Site 5 Hillock

Description: Lemon-scented Gum Open Forest

Condition: Average condition with less than 5% weed coverage (some large habitat trees in gully line);

Soil: Stony brown clay on metamorphics ± interbedded volcanics

STRUCTURE REPORT FOR RE 12.11.6

Canopy 15 - 20 m (70%)

Corymbia citriodora	lemon scented gum
Eucalyptus crebra	narrow-leaved ironbark
Corymbia clarksoniana	clarkson's bloodwood

Mid-Storey (10%)

Planchonia careya	cocky apple
Acacia disparrima ssp disparrima	ironbark wattle
Exocarpos latifolius	broad-leaved scrub cherry
Eucalyptus exserta	Qld peppermint
Corymbia tessellaris	moreton bay ash
Pleiogynium timorense	burdekin plum

Shrub Layer (90%)

Acacia julifera ssp julifera	catkin wattle
Exocarpos latifolius	broad-leaved scrub cherry

Acacia disparrima ssp disparrima	ironbark wattle
Planchonia careya	cocky apple
Alyxia ruscifolia	prickly alyxia
Mallotus philippensis	red kamala
Alphitonia excelsa	soapy or red ash
Alstonia constricta	bitter bark quinine tree

Understorey <1m (Grass 70% + Bare ground 15% + Litter 10% + Rock 5%)

Heteropogon contortus	bunch speargrass
Pogonolobus reticulatus	medicine bush

Site 6 Quadbike Track

Description: Riparian woodland

Condition: Good with less than 5% weed coverage;

Soil: Orange yellow stony to sand on alliuvial plains.

Impacts: Steep eroded banks.

SITE 6 STRUCTURE REPORT FOR 12.3.3

Canopy 15-25 m (50%)

Eucalyptus tereticornis	Qld blue gum

Mid-Storey 5-10 m (30%)

Acacia disparrima ssp disparrima	ironbark wattle
Lophostemon suaveolens	coastal swamp box
Corymbia clarksoniana	clarkson's bloodwood
Erythrina vespertilio	bat-winged coral tree
Eucalyptus exserta	Qld peppermint
Pleiogynium timorense	burdekin plum
Petalostigma pubescens	hairy quinine tree

Shrub Layer (90%)

Sida subspicata	qld hemp

Acacia leiocalyx ssp leiocalyx	early-flowering wattle
Glochidion lobocarpum	pink flower tree
Planchonia careya	cocky apple
Timonius timon v timon	tim tim
Acacia disparrima ssp disparrima	ironbark wattle
Mallotus philippensis	red kamala
Acacia julifera ssp julifera	catkin wattle
Alphitonia excelsa	soapy or red ash
Petalostigma pubescens	hairy quinine tree
Grewia retusifolia	emu berry shrub

Understorey <1 m (Grass 50% + Rock 30% + litter 20%)

Planchonia careya	cocky apple
Cyanthillium cinereum	purple fleabane
Cyperus gracilis	whisker grass
Oplismenus aemulus	rainforest grass
Imperata cylindrica	blady grass
Lomandra longifolia	spiny headed mat-rush

SITE 7 Tall Open Forest

Description: Lemon scented gum tall open forest

Condition: Good with less than 5 percent weed coverage;

Soil: Stony brown clay on metamorphics ± interbedded volcanics

SITE 7 STRUCTURE REPORT FOR RE 12.11.6

Canopy 20- 25 m (70%)

Corymbia citriodora	lemon scented gum
Eucalyptus crebra	narrow-leaved ironbark

Mid-Storey 8-10 m (10%)

Eucalyptus crebra	narrow-leaved ironbark
Lophostemon suaveolens	coastal swamp box
Corymbia clarksoniana	clarkson's bloodwood
Eucalyptus exserta	Qld peppermint
Corymbia tessellaris	moreton bay ash

Shrub Layer 1-3 m (90%)

Acacia leiocalyx ssp leiocalyx	early-flowering wattle
Glochidion lobocarpum	pink flower tree
Sida subspicata	qld hemp
Acacia julifera ssp julifera	catkin wattle

Acacia disparrima ssp disparrima	ironbark wattle
Planchonia careya	cocky apple
Gomphocarpus physocarpus	balloon cotton
Pogonolobus reticulatus	medicine bush
Tephrosia filipes	tephrosia
Alphitonia excelsa	soapy or red ash
Acacia penninervis v	mountain hickory
Sida cordifolia	flannel weed
Ficus racemosa	cluster fig
Mallotus philippensis	red kamala
Grewia latifolia	dogs nuts
Diospyros geminata	native ebony, iron tree
Melaleuca nervosa	fibrebark
Acronychia laevis	hard aspen

Understorey <1 m (grass 70% + Rock 5% + Bare 15% + litter 10%)

Planchonia careya	cocky apple
Eustrephus latifolius	wombat berry
Lomandra longifolia	spiny headed mat-rush
Dianella rara	northern vanilla lily
Passiflora suberosa	corky passionflower
Panicum decompositum	native millet
Lomandra filiformis ssp filiformis	wattle mat-rush
Lindernia anagallis	lindernia
Desmodium rhytidophyllum	native desmodium
Arundinella nepalensis	reed grass
Heteropogon triticeus	giant speargrass
Fimbristylis dichotoma	common fringe-rush
Cymbopogon refractus	barbwire grass
Velleia paradoxa	spur velleia

SITE 8 Woodland

Description: Ironbark woodland

Condition: Average health with nil weeds observed

Soil: Whitish sandy clay on metamorphics ± interbedded volcanics

SITE 8 STRUCTURE REPORT FOR RE 12.11.14

Canopy 15 m (70%)

Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus exserta	Qld peppermint

Mid-Storey 8-10 m (30%)

Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus exserta	Qld peppermint
Lophostemon suaveolens	coastal swamp box

Shrub Layer 1-2 m (90%)

Acacia julifera ssp julifera	catkin wattle
Pogonolobus reticulatus	medicine bush
Lophostemon suaveolens	coastal swamp box
Breynia oblongifolia	coffee bush
Acacia disparrima ssp disparrima	ironbark wattle

Understorey <1 m (Grass 60% + Rock 5% + Bare 5% + Litter 30%)

Lomandra confertifolia ssp pallida	slender mat-rush
Dianella rara	northern vanilla lily
Cymbopogon refractus	barbwire grass
Murdannia graminea	slug herb
Aristida calycina v calycina	dark wire-grass
Alphitonia excelsa	soapy or red ash
Panicum decompositum	native millet
Eragrostis elongata	clustered love-grass
Crotalaria montana	rattlepod

SITE 9 Blue Gum Woodland

Description: Blue Gum Woodland

Condition: Average (less than 5% percentage of weeds)

Soil : Whitish silty clay on alliuvial plains

Impacts: Deep gully erosion on ectone of RE 12.11.14

SITE 9 STRUCTURE REPORT FOR RE 12.3.3

Canopy 15-25 m (50%)

Eucalyptus tereticornis	Qld blue gum
Eucalyptus crebra	narrow-leaved ironbark

Mid-Storey 10 m (20%)

Eucalyptus tereticornis	Qld blue gum
Acacia julifera ssp julifera	catkin wattle
Lophostemon suaveolens	coastal swamp box
Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus exserta	Qld peppermint

Shrub Layer 1-4 m (80%)

Eucalyptus tereticornis	Qld blue gum
Lophostemon suaveolens	coastal swamp box
Acacia julifera ssp julifera	catkin wattle

Acacia leiocalyx ssp leiocalyx	early-flowering wattle
Pogonolobus reticulatus	medicine bush
Eucalyptus crebra	narrow-leaved ironbark
Abutilon oxycarpum	small-leaved abutilon
Flindersia australis	crows ash

Understorey <1m (Grass 60%+ Litter 30% + Rock 5% + Bare 5 %)

Eustrephus latifolius	wombat berry
Dianella rara	northern vanilla lily
Cyanthillium cinereum	purple fleabane
Lomandra confertifolia ssp pallida	slender mat-rush
Lophostemon suaveolens	coastal swamp box
Glycine tabacina	variable glycine-pea
Arundinella nepalensis	reed grass
Heteropogon triticeus	giant speargrass
Murdannia graminea	slug herb
Dodonaea viscosa ssp	sticky hop-bush
Planchonia careya	cocky apple

SITE 10 Ridgeline

Description: Lemon-scented gum tall open forest on ridgeline.

Condition: Average to good due to the low weed percentage.

Soil: Pale grey stony clay on metamorphics ± interbedded volcanics

SITE 10 STRUCTURE REPORT FOR 12.11.6

Canopy 15-25 m (70%)

Corymbia citriodora	lemon scented gum
Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus tereticornis	Qld blue gum

Mid-Storey 8-10 m (50%)

Lophostemon suaveolens	coastal swamp box
Eucalyptus exserta	Qld peppermint

Shrub Layer 1-5 m (10%)

Acacia leiocalyx ssp leiocalyx	early-flowering wattle
Dodonaea viscosa	sticky hop-bush
Acacia disparrima ssp disparrima	ironbark wattle
Melaleuca nervosa	fibrebark
Lophostemon suaveolens	coastal swamp box
Jacksonia scoparia	broome

Acacia penninervis	mountain hickory
Pterocaulon serrulatum	apple bush
Trema tomentosa v viridis	poison peach

Understorey <1 m (Grass 10% + Rock 80% + Litter 10%)

Eremochloa bimaculata	poverty grass
Dianella rara	northern vanilla lily
Lophostemon suaveolens	coastal swamp box
Aristida calycina v calycina	dark wire-grass
Eustrephus latifolius	wombat berry

Site 11 Woodland South

Description: Blue Gum Woodland South

Condition: Average (no weeds oberserved)

Soil: Yellow silty clay on alluvial plains.

SITE 11 STRUCTURE REPORT FOR RE 12.3.3

Canopy 15-20m (50%)

Eucalyptus tereticornis	Qld blue gum
Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus exserta	Qld peppermint

Shrub Layer 2-3 m (80%)

Acacia leiocalyx ssp leiocalyx	early-flowering wattle
Pogonolobus reticulatus	medicine bush
Melaleuca nervosa	fibrebark

Understorey <1m (Grass 50%+ Bare 30% + Litter 20 %)

Eremochloa bimaculata	poverty grass
Rostellularia adscendens	pink tongues
Epaltes australis	spreading nut-heads

SITE 12 Mangrove Edges

Description: Mangrove Shrubland

Condition: Degraded health (Rubber Vine on the edges). (Mangroves south of the study area are in excellent condition)

Soil: Orange rocks on marine flats

SITE 12 STRUCTURE REPORT FOR 12.1.3

Shrub Layer 2 - 7 m (90%)

Rhizophora stylosa	spotted-leaved red mangrove
Ceriops australis	yellow mangrove
Lumnitzera racemosa	black mangrove
Avicennia marina	grey mangrove
Aegiceras corniculatum	river mangrove

Understorey <1 m (Rock 90% + Litter 10 %)

Sporobolus virginicus	marine couch
Fimbristylis polytrichoides	fringe-rush
Fimbristylis ferruginea	rusty fringe-rush
Juncus kraussii	spiny searush
Aegiceras corniculatum	river mangrove

Site 13 Peninsular

Description: Ironbark Woodland on a peninsular.

Condition: Average health and condition

Soil: Orange stony on metamorphics ± interbedded volcanics.

SITE 13 STRUCTURE REPORT FOR 12.11.14

Canopy 15-20 m (70%)

Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus siderophloia	grey ironbark

Mid-Storey 6-8m (30%)

Pleiogynium timorense	burdekin plum
Petalostigma pubescens	hairy quinine tree

Shrub Layer 1-5 m (10%)

Pogonolobus reticulatus	medicine bush
Acacia disparrima	ironbark wattle
Planchonia careya	cocky apple
Petalostigma pubescens	hairy quinine tree

Pleiogynium timorense	burdekin plum

Understorey <1 m (Grass 20% + Rock 50%+ Bare 10% + Litter 20 %)

Enneapogon nigricans	bottle washer grass
Planchonia careya	cocky apple
Abutilon auritum	mountain lantern-bush

SITE 14 Tall Woodland

Description: Blue gum woodlands

Condition: Good condition with several ephemeral watercourses.

Soil: Grey silty loam on flat alliuval plains;

SITE 14 STRUCTURE REPORT FOR RE12.3.3

Canopy 15- 20 m (70%)

Eucalyptus tereticornis	Qld blue gum
Eucalyptus crebra	narrow-leaved ironbark

Mid-Storey 8-10 m (30%)

Eucalyptus tereticornis	Qld blue gum
Lophostemon suaveolens	coastal swamp box
Livistona decora	weeping cabbage palm
Melaleuca viridiflora v viridiflora	broad-leaved tea-tree
Corymbia tessellaris	moreton bay ash

Shrub Layer 2-6 m (20%)

Pogonolobus reticulatus	medicine bush
Planchonia careya	cocky apple
Asclepias curassavica	red head cottonbush

Indigofera hirsuta	hairy indigo
Timonius timon v timon	tim tim
Sida subspicata	qld hemp
Hibiscus meraukensis	ballerina hibiscus
Livistona decora	weeping cabbage palm
Alphitonia excelsa	soapy or red ash
Gomphocarpus physocarpus	balloon cotton
Pterocaulon redolens	fruit salad plant

Understorey <1m (Grass 80% + Litter 18% + Bare 2%)

Imperata cylindrica	blady grass
Epaltes australis	spreading nut-heads
Ottochloa gracillima	slender forest grass
Arundinella nepalensis	reed grass
Alyxia spicata	crow vine
Eustrephus latifolius	wombat berry

SITE 15 Coastal Wetland

Description: Coastal wetland containing saltmarsh species

Condition: Degraded (low diversity and scattered clumps only)

Soil: Marine sand/mud

SITE 15 STRUCTURE REPORT FOR RE12.1.2

Understorey <1m (fpc <1%)

Halosarcia indica ssp indica	brown-head glasswort
Dysphania littoralis	red goosefoot
Limonium solanderi	yellow sea-lavender

SITE 16 Laird Point - Bridge Road End (Road and Pipeline)

Description: Ironbark Open forest/Wooland RE 12.11.14

Condition: Average condition edged with marine areas containing large amounts of sawdust-like orangic matter washed in with tide with dead mangroves to the Western side of the peninsular (Eastern side Nil); Signage" Spawning grounds for Barrimundi";

Soil: Dark stoney clay;

Canopy 15 m (70%)

Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus exserta	Qld peppermint

Mid-Storey 8-10 m (30%)

Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus exserta	Qld peppermint
Corymbia clarksoniana	clarkson's bloodwood
Erythrina vespertilio	bat-winged coral tree

Shrub Layer 1-2 m (50%)

Pogonolobus reticulatus	medicine bush
Clerodendrum inerme	mangrove lollybush
Dodonaea viscosa	sticky hop-bush
Acacia leiocalyx ssp leiocalyx	early-flowering wattle
Acacia disparrima ssp disparrima	ironbark wattle

Understorey <1m (Grass 60% + Rock 5% + Bare 5% + Litter 30%)

Dianella rara	northern vanilla lily
Panicum decompositum	native millet
Murdannia graminea	slug herb

SITE 17 Hamilton Point - Barge Ferry

Description: Mixed Ironbark Woodland in Regional Ecostystem 12.11.14 with small vine thicket 12.2.2 too small to map;

Condition: Good, old machinery relics around camping grounds

Soil: Whitish stony disturbed sandy clayand moved for dam site;

Canopy

Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus tereticornis	Qld blue gum
Lophostemon suaveolens	swamp mahogany

Mid-Storey

Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus tereticornis	Qld blue gum
Lophostemon suaveolens	swamp mahogany
Diospyros geminata	
Pleiogynium timorense	
Myrsine variabilis	

Shrub Layer 1-2 m

Pogonolobus reticulatus	medicine bush
Alyxia ruscifolia	chain fruit
Carissa ovata	native currant
Turraea pubescens	

Understorey <1 m

Cyperus cyperoides
Cyperus gracilis
Sida subspicata

Site 18 Lairds Point

Discription Woodland at Lairds Point

Condition Average

Evidence of previous fires.

Soil Mottled stony

SITE 18 STRUCTURE REPORT for RE 12.11.14

Canopy 15-25 (70%)

Eucalyptus exerta	Qld peppermint
Eucalyptus crebra	narrow-leaf ironbark
Corymbia clarksoniana	clarkson's bloodwood

Mid-Storey 6-10 m (20%)

Eucalyptus exerta	Qld peppermint
Eucalyptus crebra	narrow-leaf ironbark

Shrub Layer 2-5 m (50%)

Alphitonia excelsa	soapy or red ash
Acacia leiocalyx ssp leiocalyx	earth-flowering wattle

Dodonaea viscosa ssp spatulata	sticky hopbush
Pogonolobus reticulates	medicine bush
Psydrax attenuata forma attenuate	
Clerodendrum floribundum	

Understorey <1m (Grass 50%+ Rock 20%+ Litter 20%)

Phyllanthus virgatus	
Boerhavia sp	
Digitaria ammophila	
Enneapogon nigricans	
Eriochloa procera	
Perotis rara	
Tephrosia filipes	
Chrysopogon sylvaticus	
Cymbopogon refractus	barbwire grass
Cyanthillium cinereum	purple fleabane
Cyperus gracilis	whisker grass
Scleria mackaviensis	
Desmodium rhytidophyllum	
Glycine clandestine	
Eustrephus latifolius	wombat berry
Capparis canescens	
Brunoniella acaulis ssp acaulis	
Crotalaria montana	rattlepod

Site 19 Blue Gum Hill

Discription Regrowth Woodland

Condition Degraded as a result of previous fires in the area.

Soil Brown stony

SITE 19 STRUCTURE REPORT for RE 12.11.6

Canopy 15-25 (30%)

Eucalyptus tereticornis	Qld blue gum
Eucalyptus crebra	narrow-leaf ironbark
Corymbia clarksoniana	clarkson's bloodwood
Corymbia intermedia	pink bloodwood
Corymbia trachyphloia	brown bloodwood

Mid-Storey 6-10 m (10%)

Eucalyptus tereticornis	Qld blue gum
Eucalyptus exerta	Qld peppermint
Livistona decora	
Acacia julifera	
Acacia disparrima	ironbark wattle

Shrub Layer 2-5 m (90%)

Eucalyptus tereticornis	Qld blue gum
Acacia crassa	
Alphitonia excelsa	soapy or red ash
Acacia julifera	catkin wattle
Acacia disparrima	ironbark wattle
Acacia leiocalyx	earth-flowering wattle
Pogonolobus reticulates	medicine bush

Understorey <1m (Grass 40%+ Rock 20%+ Litter 30%)

Sida subspicata	
Breynia oblongifolia	coffee bush
Pogonolobus reticulates	medicine bush
Eustrephus latifolius	wombat berry
Crotalaria medicaginea v neglecta	
Rhynchosia minima	
Boerhavia spp	
Heteropogon contortus	spear grass
Imperata cylindrical	blady grass
Panicum decompositum	native mellet
Paspalidium gausum	
Cyanthillium cinereum	
Euphorbia tannensis ssp eremophila	
Galactia tenuiflora	
Lomandra longifolia	spiny headed mat-rush
Dianella caerulea	
Grewia retusifolia	
Cyperus cyperoides	whisker grass
Gahnia aspera	
Scleria mackaviensis	
Jasminum simplicifolium ssp australiense	native jasmin

Site 20 Lemon-scented Woodland

Discription Lemon-scented woodland

Condition Good condition.

Evidence of fires. Currently used for cattle grazing

Soil Dark sandy loam

SITE 20 STRUCTURE REPORT for RE 12.11.6

Canopy 15-25 (70%)

Corymbia citriodora	lemon-scented gum
Eucalyptus exerta	Qld peppermint
Eucalyptus crebra	narrow-leaf ironbark
Corymbia clarksoniana	clarkson's bloodwood

Mid-Storey 6-10 m (30%)

Eucalyptus exerta	Qld peppermint
Eucalyptus crebra	narrow-leaf ironbark
Acacia disparrima	iron-bark wattle
Planchonia careya	cocky apple
Corymbia trachyphloia	brown bloodwood

Shrub Layer 2-5 m (10%)

Corymbia citriodora	lemon-scented gum
Acacia julifera	catkin wattle
Planchonia careya	cocky apple
Alphitonia excelsa	soapy or red ash

Understorey <1m (Grass 40%+ Rock 0%+ Litter 40%)

Pogonolobus reticulates	medicine bush
Acacia leiocalyx	earth-flowering wattle
Alphitonia excelsa	soapy or red ash
Breynia oblongifolia	coffee bush
Hibiscus meraukensis	
Galactia tenuiflora	
Glycine tabacina	
Lomandra confertifolia spp.Pallida	
Lomandra filiformis	
Dianella caerulea	
Rhynchosia minima	
Sida subspicata	Qld hemp
Gahnia aspera	
Achyranthes aspera	
Crotalaria montana	

Site 21 Lemon-scented Woodland

Discription Lemon-scented woodland

Condition Good condition with no weed species present

Currently used for cattle grazing

Soil Black clay loam

SITE 21 STRUCTURE REPORT for RE 12.11.6

Canopy 15-25 (70%)

Corymbia citriodora	lemon-scented gum
Eucalyptus exerta	Qld peppermint
Eucalyptus crebra	narrow-leaf ironbark

Mid-Storey 6-10 m (30%)

Eucalyptus exerta	Qld peppermint
Eucalyptus crebra	narrow-leaf ironbark
Eucalyptus tereticornis	Qld blue gum
Pogonolobus reticulates	medicine bush
Corymbia citriodora	lemon-scented gum
Eucalyptus crebra	narrow-leaf ironbark

Shrub Layer 2-5 m (30%)

Corymbia citriodora	lemon-scented gum
Acacia julifera	catkin wattle
Acacia disparrima	iron-bark wattle
Pogonolobus reticulates	medicine bush
Acacia leiocalyx	earth-flowering wattle

Understorey <1m (Grass 40%+ Rock 0%+ Litter 60%)

Themeda triandra	kangaroo grass
Cymbopogon refractus	barbwire grass
Imperata cylindrica	blady grass
Murdannia graminea	slug herb
Emilia sonchifolia	
Eustrephus latifolius	wombat berry
Bothriochloa decipiens	pitted bluegrass

Site 22 Mixed Forest

Discription Mixed Forest

Condition Average condition with low weed cover

Currently used for cattle grazing

Soil Brown sandy loam.

SITE 22 STRUCTURE REPORT for RE 12.3.11

Canopy 15-25 (60%)

Eucalyptus tereticornis	Qld blue gum
Corymbia citriodora	lemon-scented gum
Eucalyptus exerta	Qld peppermint
Eucalyptus crebra	narrow-leaf ironbark

Mid-Storey 6-10 m (40%)

Eucalyptus tereticornis	Qld blue gum
Pogonolobus reticulates	medicine bush
Corymbia citriodora	lemon-scented gum
Eucalyptus crebra	narrow-leaf ironbark

Shrub Layer 2-5 m (40%)

Eucalyptus tereticornis	Qld blue gum
Corymbia citriodora	lemon-scented gum
Acacia julifera	catkin wattle
Acacia disparrima	iron-bark wattle
Pogonolobus reticulates	medicine bush
Acacia leiocalyx	earth-flowering wattle
Alphitonia excelsa	soapy or red ash
Planchonia careya	cocky apple

Understorey <1m (Grass 40%+ Rock 0%+ Litter 40

Themeda triandra	kangaroo grass
Cymbopogon refractus	barbwire grass
Heteropogon contortus	bunch speargrass
Arundinella nepalensis	reed grass
Murdannia graminea	slug herb
Eremochloa bimaculata	poverty grass
Glycine tabacina	variable glycine-pea
Eustrephus latifolius	wombat berry
Hybanthus stellarioides	

Site 23 Ironbark/Lemon-scented Woodland

Discription Ironbark/Lemon scented woodland

Condition Average condition with low weed cover

Evidence of previous fires is currently used for cattle grazing

Soil Dark sandy loam.

SITE 23 STRUCTURE REPORT for RE 12.11.6

Canopy 15-25 (60%)

Corymbia citriodora	lemon-scented gum
Eucalyptus exerta	Qld peppermint

Mid-Storey 6-10 m (40%)

Corymbia citriodora	lemon-scented gum
Eucalyptus exerta	Qld peppermint
Lophostemon suaveolens	coastal swamp box
Eucalyptus crebra	narrow leafed ironbark
Acacia disparrima	iron-bark wattle

Shrub Layer 2-5 m (40%)

Corymbia citriodora	lemon-scented gum
Acacia julifera	catkin wattle
Acacia disparrima	iron-bark wattle
Pogonolobus reticulates	medicine bush
Acacia leiocalyx	earth-flowering wattle
Alphitonia excelsa	soapy or red ash

Understorey <1m (Grass 45% + Rock 5% + Litter 50%)

Sida subspicata	Qld hemp
Aristida calycina	dark wire grass
Heteropogon contortus	bunch speargrass
Cyanthillium cinereum	purple fleabane
Lomandra confertifolia	
Lomandra filiformis	wattle mat rush
Glycine tabacina	variable glycine-pea
Eustrephus latifolius	wombat berry
Brunoniella acaulis spp. acaulis	
Pterocaulon redolens	
Parsonsia straminea	

Site 24 Blue Gum Flat

Discription Blue Gum Flat

Condition Average condition

Currently used for cattle grazing and shows evidence of previous fires.

Soil Black clay loam.

SITE 24 STRUCTURE REPORT for RE 12.3.3

Canopy 15-25 (60%)

Eucalyptus tereticornis	Qld blue gum
Corymbia clarksoniana	clarkson's bloodwood
Lophostemon suaveolens	coastal swamp box
Eucalyptus exerta	Qld peppermint

Mid-Storey 6-10 m (40%)

Eucalyptus tereticornis	Qld blue gum
Corymbia clarksoniana	clarkson's bloodwood
Lophostemon suaveolens	coastal swamp box
Acacia disparrima	iron-bark wattle
Planchonia careya	cocky apple

Shrub Layer 2-5 m (40%)

Acacia julifera	catkin wattle
Acacia disparrima	iron-bark wattle
Planchonia careya	cocky apple
Glochidion lobocarpum	
Alphitonia excelsa	soapy or red ashe

Understorey <1m (Grass 45% + Rock 5% + Litter 50%)

Sida subspicata	Qld hemp
Centella asiatica	
Heteropogon contortus	bunch speargrass
Imperata cylindrical	blady grass
Cyperus polystachyos	
Arundinella nepalensis	reed grass
Glycine tabacina	variable glycine-pea
Galactia tenuiflora	
Cajan reticulates	
Emilia sonchifolia	

Site 25 Ironbark/Lemon-scented Woodland

Discription Ironbark/Lemon-scented Woodland

Condition Average condition beside a creek.

Currently used for cattle grazing. Shows evidence of previous fires.

Soil Black clay loam.

SITE 25 STRUCTURE REPORT for RE 12.11.6

Canopy 15-25 (50%)

Corymbia citriodora	lemon-scented gum
Eucalyptus crebra	narrow-leafed ironbark
Eucalyptus tereticornis	Qld blue gum
Corymbia clarksoniana	clarkson's bloodwood
Corymbia trachyphloia	brown bloodwood
Lophostemon suaveolens	coastal swamp box

Mid-Storey 5-10 m (30%)

Lophostemon suaveolens	coastal swamp box
Mallotus philippensis	red kamala
Acacia disparrima	ironbark wattle
Glochidion lobocarpum	
Corymbia citriodora	lemon-scented gum

Shrub Layer 2-5 m (20%)

Lophostemon suaveolens	coastal swamp box
Planchonia careya	cocky apple
Alphitonia excelsa	soapy or red ash
Mallotus philippensis	red kamala
Glochidion lobocarpum	
Acacia disparrima	iron-bark wattle

Understorey <1m (Grass 5% + Rock 10% + Litter 85%)

Alphitonia excelsa	soapy or red ash
Mallotus philippensis	red kamala
Acacia disparrima	iron-bark wattle
Sida subspicata	Qld hemp
Oplismenus aemulus	
Capillipedium spicigerum	
Lomandra longifolia	spiny headed mat-rush
Oxalis sp.	

Site 26 Ironbark/Lemon-scented Woodland

Discription Ironbark/Lemon-scented Woodland

Condition Average with declared weed species present

Currently used for cattle grazing contains a number of creeks and drainage lines.

Soil Dark clay loam.

SITE 26 STRUCTURE REPORT for RE 12.11.6

Canopy 15-25 (60%)

Corymbia citriodora	lemon-scented gum
Eucalyptus crebra	narrow-leafed ironbark
Eucalyptus exerta	Qld peppermint

Mid-Storey 5-10 m (40%)

Eucalyptus exerta	Qld peppermint
Corymbia citriodora	lemon-scented gum

Shrub Layer 2-5 m (30%)

Dodonaea viscosa	
Acacia leiocalyx	earth-flowering wattle

Acacia disparrima	iron-bark wattle
Acacia julifera	catkin wattle
Acacia falciformis	

Understorey <1m (Grass 10% + Rock 50% + Litter 40%)

Dodonaea viscose	
Hibiscus meraukensis	
Breynia oblongifolia	coffee bush
Pogonolobus reticulates	medicine bush
Planchonia careya	cocky apple
Eustrephus latifolius	wombat berry
Galactia tenuiflora	
Sida cordifolia	
Rhynchosia minima	
Bothriochloa decipiens	pitted blue grass
Sida subspicata	Qld hemp

Site 27 Blue Gum Flat

Discription Blue Gum Flat (end of pipeline)

Condition Average with low weed cover

Currently used for cattle grazing. Shows evidence of previous fires in the area.

Soil Grey clay.

SITE 27 STRUCTURE REPORT for RE 12.3.3

Canopy 15-25 (70%)

Lophostemon suaveolens	coastal swamp box
Corymbia citriodora	lemon-scented gum
Eucalyptus crebra	narrow-leafed ironbark
Eucalyptus tereticornis	Qld blue gum

Mid-Storey 5-10 m (30%)

Lophostemon suaveolens	coastal swamp box
Eucalyptus exerta	Qld peppermint
Corymbia clarksoniana	clarkson's bloodwood
Mallotus philippensis	

Shrub Layer 2-5 m (15%)

Lophostemon suaveolens	coastal swamp box

Corymbia citriodora	lemon-scented gum
Planchonia careya	cocky apple
Acacia julifera	catkin wattle
Mallotus philippensis	red kamala
Acacia disparrima	iron-bark wattle

Understorey <1m (Grass 15% + Rock 0% + Litter 70%)

Lophostemon suaveolens	coastal swamp box
Planchonia careya	cocky apple
Mallotus philippensis	red kamala
Tephrosia filipes	
Bothriochloa decipiens	pitted blue grass
Capillipedium spicigerum	
Cyperus gracilis	
Glycine tabacina	variable glycine-pea
Galactia tenuiflora	
Imperata cylindrical	blady grass
Cymbopogon refractus	barbwire grass

Site 28 Ironbark/Lemon-scented Woodland

Discription Ironbark/Lemon-scented Woodland

Condition Average with declared weed species present

Currently used for cattle grazing contains a number of creeks and drainage lines.

Soil Dark clay loam.

SITE 28 STRUCTURE REPORT for RE 12.11.6

Canopy 15-25 (70%)

Corymbia citriodora	lemon-scented gum
Eucalyptus crebra	narrow-leafed ironbark
Eucalyptus tereticornis	Qld blue gum

Mid-Storey 5-10 m (30%)

Corymbia citriodora	lemon-scented gum
Eucalyptus crebra	narrow-leafed ironbark
Planchonia careya	cocky apple
Corymbia clarksonia	clarkson's bloodwood
Acacia julifera	catkin wattle
Acacia disparrima	iron-bark wattle
Erythrina vespertilio	bat-winged coral trees
Pleiogynium timorense	Burdekin plum

Shrub Layer 2-5 m (50%)

Ficus opposite	sandpaper fig
Timonius timon	tim tim
Acacia disparrima	iron bark wattle
Erythrina vespertilio	bat-winged coral trees

Understorey <1m (Grass 50% + Rock 10% + Litter 40%)

Sida subspicata	Qld hemp
Bothriochloa decipiens	pitted blue grass
Imperata cylindrical	blady grass
Alloteropsis semialata	cockatoo grass
Capillipedium spicigerum	
Eustrephus latifolius	wombat berry
Aristida calycina	dark wire-grass

Site 29 Ironbark/Lemon-scented Woodland

Discription Ironbark/Lemon-scented Woodland

Condition Good with low weed cover

Currently used for cattle grazing and shows evidence of previous fires.

Soil Black silty loam.

SITE 29 STRUCTURE REPORT for RE 12.11.6

Canopy 15-25 (60%)

Corymbia citriodora	lemon-scented gum
Eucalyptus crebra	narrow-leafed ironbark

Mid-Storey 6-10 m (15%)

Corymbia citriodora	lemon-scented gum
Eucalyptus crebra	narrow-leafed ironbark
Eucalyptus exerta	Qld peppermint
Planchonia careya	cocky apple
Cupaniopsis anacardioides	tuckeroo
Acacia julifera	catkin wattle
Acacia disparrima	iron-bark wattle
Erythrina vespertilio	bat-winged coral trees
Breynia oblongifolia	coffee bush

Shrub Layer 2-5 m (70%)

Acacia disparrima	ironbark wattle
Erythrina vespertilio	bat-winged coral trees
Corymbia citriodora	lemon-scented gum

Understorey <1m (Grass 80% + Rock 5% + Litter 15%)

Sida subspicata	Qld hemp
Bothriochloa decipiens	pitted blue grass
Sida cordifolia	
Imperata cylindrical	blady grass
Oplismenus aemulus	rainforest grass
Eustrephus latifolius	wombat berry
Cyanthillium cinereum	
Emilia sonchifolia	
Panicum decompositum	
Glycine tabacina	variable glycine-pea
Flemingia parviflora	
Aristida calycina	dark wire-grass
Murdannia graminea	slug herb

Site 30 Blue Gum Woodland

Discription Blue Gum Woodland

Condition Degraded

Currently used for cattle grazing.

Soil Black clay loam.

SITE 30 STRUCTURE REPORT for RE12.11.14

Canopy 15-20m (15%)

Eucalyptus tereticornis	Qld blue gum

Mid-Storey 6-10 m (30%)

Acacia disparrima	ironbark wattle
Corymbia clarksoniana	clarkson's bloodwood

Shrub Layer 2-5 m (55%)

Lophostemon suaveolens	coastal swamp box
Planchonia careya	cocky apple
Alphitonia excelsa	soapy or red ash

Understorey <1m (Grass 45% + Rock 5% + Litter 50%)

Sida subspicata	Qld hemp
Bothriochloa decipiens	pitted blue grass
Sida cordifolia	
Imperata cylindrical	blady grass

Site 31 Hamilton Point

Discription Woodland

Condition Average health due to recent fires in the area..

Currently used for cattle grazing

Soil Brown sandy clay.

SITE 31 STRUCTURE REPORT for RE 12.11.14

Canopy 15-25 (70%)

Eucalyptus crebra	narrow-leaf ironbark
Eucalyptus tereticornis	Qld blue gum
Corymbia tessellaris	moreton bay ash
Lophostemon suaveolens	coastal swamp box

Mid-Storey 6-10 m (30%)

Lophostemon suaveolens	coastal swamp box
Eucalyptus exserta	qld peppermint
Corymbia tessellaris	moreton bay ash
Eucalyptus siderophloia	
Corymbia clarksoniana	clarkson's bloodwood

Shrub Layer 2-5 m (50%)

Planchonia careya	cocky apple
Melaleuca nervosa	fibrebark
Acacia disparrima	iron-bark wattle
Alphitonia excelsa	soapy or red ash
Tephrosia filipes	tephrosia
Acacia julifera	catkin wattle
Sida subspicata	Qld hemp
Breynia oblongifolia	

Understorey <1m (Grass 50%+ Rock 10%+ Litter 20%)

Cyanthillium cinereum	
Lomandra filiformis	wattle mat-rush
Dianella rara	northern vanilla lily
Arundinella nepalensis	reed grass
Eremochloa bimaculata	poverty grass
Heteropogon contortus	spear grass
Panicum decompositum	native millet
Themeda triandra	kangaroo grass
Cassytha pubescens	
Chrysopogon fallax	golden breadgrass
Pterocaulon redolens	
Parsonsia eucalyptophylla	
Flemingia parviflora	

Aristida calycina	Qld wiregrass
Sporobolus creber	
Murdannia graminea	slug herb
Fimbristylis dichotoma	common fringe-rush

Site 32 Ironbark Woodland

Discription Ironbark woodland

Condition Degraded.

Dead trees along the marine edge

Soil Brown sandy clay loam

SITE 32 STRUCTURE REPORT for RE 12.11.14

Canopy 15-25 (30%)

Eucalyptus crebra	narrow-leaf ironbark
Eucalyptus tereticornis	Qld blue gum

Mid-Storey 6-10 m (10%)

Lophostemon suaveolens	coastal swamp box
Eucalyptus exserta	Qld peppermint
Corymbia tessellaris	moreton bay ash

Shrub Layer 2-5 m (10%)

Pogonolobus reticulates	medicine bush
Acacia julifera	catkin wattle
Acacia leiocalyx	earth-flowering wattle
Eucalyptus tereticornis	Qld blue gum
Alphitonia excelsa	soapy or red ash
Dodonaea burmanniana	

Understorey <1m (Grass 50%+ Rock 10%+ Litter 20%)

Cyanthillium cinereum	
Lomandra confertifolia	
Dianella rara	northern vanilla lily
Glycine tabacina	variable glycine-pea
Arundinella nepalensis	reed grass
Heteropogon contorta	bunch speargrass
Murdannia graminea	slug herb
Cassytha pubescens	
Eustrephus latifolius	wombat berry
Galactia tenuiflora	
Desmodium rhytidophyllum	native desmodium
Rhynchosia minima	
Crotalaria medicaginea	
Cajanus reticulatus	

Site 33 Marine/Woodland

Discription Woodland

Condition Degraded. Declared weed species present

Soil Black silty clay loam.

SITE 33 STRUCTURE REPORT for RE 12.11.14

Canopy 15-25 (30%)

Eucalyptus crebra	narrow-leafed ironbark

Mid-Storey 6-10 m (10%)

Lophostemon suaveolens	
Eucalyptus exerta	Qld peppermint
Corymbia tessellaris	moreton bay ash

Shrub Layer 1-5 m (50%)

Planchonia careya	cocky apple
Pogonolobus reticulates	medicine bush
Acacia julifera	catkin wattle
Acacia leiocalyx	earth-flowering wattle
Alphitonia excelsa	soapy or red ash

Abutilon oxycarpum	
Hibiscus meraukensis	
Sida subspicata	qld hemp
Dodonaea burmanniana	

Understorey <1m (Grass 50% + Rock 10% + Litter 20%)

Cyanthillium cinereum	purple flea bane
Lomandra confertifolia	
Dianella rara	northern vanilla lily
Glycine tabacina	variable glycine-pea
Arundinella nepalensis	reed grass
Heteropogon contorta	bunch speargrass
Murdannia graminea	slug herb
Cassytha pubescens	
Eustrephus latifolius	wombat berry
Desmodium heterocarpon	
Desmodium rhytidophyllum	native demodium
Rhynchosia minima	
Pterocaulon sp	
Desmodium gangeticum	

Site 34 Landing Road

Discription Woodland

Condition Degraded.

High numbers of weed species present

Soil Brown sandy clay loam

SITE 34 STRUCTURE REPORT for RE 11.3.29

Canopy 15-25 (30%)

Eucalyptus crebra	narrow-leaf ironbark
Eucalyptus tereticornis	Qld blue gum
Corymbia tessellaris	moreton bay ash

Mid-Storey 6-10 m (10%)

Eucalyptus tereticornis	Qld blue gum
Melaleuca quinquenervia	paperbarked tea tree
Petalostigma pubescens	quinine tree
Planchonia careya	cocky apple
Acacia disparrima	iron bark wattle
Alstonia constricta	bitter bark

Melaleuca dealbata	
Corymbia tessellaris	moreton bay ash

Shrub Layer 2-5 m (10%)

Melaleuca quinquenervia	paperbarked tea tree
Acacia disparrima	ironbark wattle
Alstonia constricta	
Eucalyptus tereticornis	qld blue gum

Understorey <1m (Grass 90%+ Rock 0%+ Litter 10%)

Bothriochloa decipiens	pitted blue grass
Cymbopogon refractus	barbwire grass
Heteropogon contortus	bunch speargrass
Alloteropsis semialata	
Commelina diffusa	
Epaltes australis	
Flemingia parviflora	
Pterocaulon redolens	
Spermacoce brachystema	
Zornia dyctiocarpa	
Aristida benthamii	
Fimbristylis dichotoma	common fringe rush
Grewia retusifolia	
Murdannia graminea	slug herb

Site 35 Roadside on the Mainland

Discription Woodland

Condition Degraded. High numbers of weed species present.

Soil .Sandy clay loam

SITE 35 STRUCTURE REPORT for RE 11.3.29 / 12.3.3

Canopy 15-25 (30%)

Corymbia tessellaris	moreton bay ash
Eucalyptus tereticornis	qld blue gum
Melaleuca quinquenervia	paperbarked tea tree

Mid-Storey 6-10 m (10%)

Acacia fasciculifera	
Acacia leiocalyx	earth-flowering wattle
Lophostemon suaveolens	coastal swamp gum
Melaleuca dealbata	

Shrub Layer 2-5 m (20%)

Lophostemon suaveolens	coastal swamp gum
Planchonia careya	cocky apple

Understorey <1m (Grass 90% + Rock 0% + Litter 10%)

Sida subspicata	Qld hemp
Panicum decompositum	
Arundinella nepalensis	reed grass
Heteropogon contortus	bunch speargrass
Capillipedium spicigerum	
Epaltes australis	
Brunoniella acaulis	
Grewia retusifolia	

ATTACHMENT 4: PLANT SPECIES AND ABUNDANCE FOR FLORA SURVEY SITES

SITES 1-15 Facility Site
SITES 16-17 Laird Point and Hamilton Points

Genus species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Abutilon auritum													P				
Abutilon oxycarpum									O					P			
Acacia disparrima ssp disparrima	P	O		O	O	C	C	U		U	C		O	U		O	O
Acacia julifera ssp julifera	U	C			A	O	C	A	C				E				
Acacia leiocalyx ssp leiocalyx	A			O		C	A		C	O	C					O	
Acacia maidenii							O										
Acacia penninervis							U			P							
*Achyranthes aspera**	U	C			P												P
Acronychia laevis							P										U
Aegialitis annulata			O														
Aegiceras corniculatum			O									P					
Alchornea thozetiana																	U
Alectryon diversifolius													R				P
Allocasuarina littoralis						E											
Alloteropsis semialata							R										
Alphitonia excelsa	P	O		P	P	O	U	O	P	E			E	P			P
Alstonia constricta		C			P								P				
Alyxia ruscifolia		R			U								R				C
Alyxia spicata														O			
Alyxia stellata		E											E				
Aristida calycina v calycina	U	A				O		O		U							
Arundinella nepalensis	O			O		O	U		O	P				O			
*Asclepias curassavica**						U						P		O			
Avicennia marina ssp australasica												U					
Breynia oblongifolia	U	O		R				P		P				O		O	U

Bridelia exaltata																	U
Bridelia leichhardtii																	U
Brunoniella acaulis ssp acaulis		R				U											
Bursaria incana																	U
Capparis canescens		U			R								O			P	P
Carissa ovata																	O
Cassia fistula#												E					
Cassytha pubescens	O							O	O								
Centaurium erythraea			E														
*Centaurium spicatum**															P		
Centella asiatica														P			
Centipeda minima v minima															O		
Ceriops australis												C					
Ceriops tagal			C														
Cheilanthes tenuifolia														P			
*Chloris virgata**		O											P				
Chrysopogon fallax	P																
Cissus oblonga					P												P
Clematis glycinoides v glycinoides							P										
Clerodendrum floribundum																	O
Clerodendrum inerme																C	
Clerodendrum tomentosum		R															
*Conyza sumatrensis**						R											
Corymbia citriodora ssp citriodora	U				C	E	A	E		A	E		E	E			E
Corymbia clarksoniana	U				O	O	P									O	
Corymbia tessellaris	R			P	U	R	P		R				E	R			
Crinum flaccidum		P															
Crotalaria montana								U			U						
*Crotalaria pallida v obovata**												R					
*Cryptostegia grandiflora**		O										O					
Cupaniopsis anacardioides					P								R				U
Cupaniopsis wadsworthii							R										
Cyanthillium cinereum	U	U		O	U	O	U		C	P							U
Cyclophyllum coprosmoides v		P															

coprosmoides																	
Cymbidium canaliculatum		P				P											
Cymbopogon refractus		O				O	P	O		P							
Cymbopogon refractus																O	
Cyperus cyperoides										P			E				
Cyperus cyperoides																	C
Cyperus gracilis		U		P		O	U										C
Cyperus haspan				U													
Cyperus javaensis		P										O					
Cyperus polystachyos			E				U										
Desmodium gangeticum									P	U							
Desmodium heterocarpon v heterocarpon									P	U							
Desmodium rhytidophyllum		C		O	P	U	U		P	P						U	
Dianella brevipedunculata																U	
Dianella caerulea v caerulea						U										P	
Dianella longifolia v longifolia						O				R							
Dianella longifolia v stenophylla				U													
Dianella rara	P	P		U		U	O	O	C	O				P		O	
*Digitaria sanguinalis**				P													
Diospyros geminata		R					P										A
Dodonaea viscosa ssp burmanniana		O				P			U	U						O	
Drypetes deplanchei					P								E				O
Dysphania littoralis															O		
Embelia australiana																	U
*Emilia sonchifolia v javanica**	P			O													U
*Emilia sonchifolia v sonchifolia**						U								U			
Enneapogon nigricans													O				
Enteropogon acicularis		P															
Epaltes australis			E			O				E	U	P		O	C		
Eragrostis elongata				P				O									
Eremochloa bimaculata	O							O		C	C						
Eremophila debilis				U		U										U	
Erythrina vespertilio						U								U		P	
Eucalyptus crebra	O	A		C	O	P	O	A	O	O	C		C	P		C	C

Eucalyptus exserta	*C*	P		P	U	U	P	C	P	P	O					O	
Eucalyptus Hybrids"														P			
Eucalyptus siderophloia	O												O				
Eucalyptus tereticornis	O			A	R	A	E	U	A	E	*A*			A		E	C
Euroschinus falcatus v falcatus																	P
Eustrephus latifolius		U		U	U	O	C	O	C	P				U		O	U
Evolvulus alsinoides v decumbens												R					
Exocarpos latifolius					O												O
Ficus obliqua v obliqua																	U
Ficus opposita v opposita					R												
Ficus racemosa							U							O			
Ficus virens v virens																	R
Fimbristylis dichotoma	U	U					P			C							
Fimbristylis ferruginea			O									C			O		
Fimbristylis polytrichoides			E									C			C		
Flemingia parviflora	U																
Flindersia australis									P								
Gahnia aspera		P			P				R								U
Geijera parviflora																	U
Geitonoplesium cymosum																	P
Glochidion lobocarpum						C	A										
Glycine microphylla										R							
Glycine tabacina	O	U			U	O			O					P			
Glycine tomentella																O	
*Gomphocarpus physocarpus**		O		U		U	O			P				P			
Grewia latifolia							U										
Grewia retusifolia						P											
Halosarcia indica ssp indica															C		
Hardenbergia violacea																R	
Heteropogon contortus	O	U		C	O	U		U		R				U		U	
Heteropogon triticeus						U	P		O								
Hibiscus meraukensis						C			O	R				U			
Imperata cylindrica				P		O								O			U
Indigofera hirsuta														O			

Indigofera linnaei											P						
Jacksonia scoparia										P							
Jagera pseudorhus v pseudorhus																	O
Jasminum simplicifolium ssp australiense		P			U								U			O	O
Juncus continuus						O				P							
Juncus kraussii			O									P					
*Lantana camara**		P		R													
*Lantana montevidensis**																	E
limonium solanderi			*P*														
Lindernia anagallis							U										
Livistona decora					R									U			
Lomandra confertifolia ssp pallida					O			O	C	P						O	U
Lomandra filiformis ssp filiformis	U	U					U										
Lomandra longifolia				P		U	O										
Lomandra multiflora ssp multiflora		P		U		O							U				
Lophostemon suaveolens	U			U		C	O	O	C	U			E	C			C
Lumnitzera racemosa			O									O					
Maireana microcarpa							U										
Mallotus philippensis					U	O	U										U
*Malvastrum americanum v americanum**				P		U											
*Malvastrum coromandelianum**				P			O										
Maytenus cunninghamii							E										
*Megathyrsus maximus v trichoglume**																	E
Melaleuca nervosa	C	E		U			P	O	E	U	O			P			
Melaleuca viridiflora v viridiflora	O										R			P			
*Melinis repens**						U							P				
*Mitracarpus hirtus**		U				O											
Murdannia graminea	U			U				O	O		O					U	
Myoporum acuminatum		O	P														
Myrsine variabilis																	C
Oplismenus aemulus						O											
*Opuntia stricta v stricta**		A	P		U							P	P	O			
Ottochloa gracillima														O			
Oxalis chnoodes						P											

Pandorea pandorana																	P
Panicum decompositum	O	P		U		O	O	O		P						U	
Parsonsia eucalyptophylla	U						P	O									
Parsonsia lanceolata					P												
Paspalidium distans					O												
*Passiflora foetida**												P					
*Passiflora suberosa**	U	O				C	O			P		U		O			
Pavetta australiensis					R												
Petalostigma pubescens						U							O				
Planchonia careya	C			O	O	C	C	R	P	R			O	O			
Pleiogynium timorense		R			U	U							O				O
Pogonolobus reticulatus		A		C	C		O	C	C	P	O		O	C		C	C
Polyalthia nitidissima																	C
Polymeria calycina				P			P										
Polyscias elegans														E			
Pouteria sericea																	P
Psychotria daphnoides v daphnoides																	U
Psydrax odorata																	U
Pterocaulon redolens	P	P				O				P			E	P			U
Pterocaulon serrulatum v serrulatum					P				P	P							
Rhizophora stylosa			C									C					
Rhynchosia minima v minima						O			P								
Rostellularia adscendens v adscendens											U						
Sarcocornia quinqueflora			E														
Scleria mackaviensis					O	U											
Secamone elliptica		U											O				
Senna gaudichaudii																	P
Sesbania cannabina			E														
*Sida cordifolia**						A	U		P	R						U	
*Sida rhombifolia**				U										P			
Sida subspicata	U	P		C		A	A	P	U	P	U		E	O		P	A
Sigesbeckia orientalis						P											
*Solanum seaforthianum**																	O
*Sonchus oleraceus**												P					

Sorghum leiocladum						U											
Sporobolus creber	U									P							
Sporobolus virginicus			E									D			P		
Stephania japonica v discolor													P				
Suaeda arbusculoides															U		
Tephrosia filipes	R						U										
Themeda avenacea						P										U	
Themeda triandra	O			P						U							
Timonius timon v timon						C								O			
Trema tomentosa v aspera										P							
Trichodesma zeylanicum v latisepalum						P											
*Tridax procumbens**						U											
Trophis scandens																	P
Turraea pubescens																	C
*Urena lobata**						R											
Velleia paradoxa							P										
Vigna marina												P					
Vitex trifolia v bicolor			E									E	U				
Vittadinia cuneata v hirsuta						P											
Xanthorrhoea johnsonii							E			E							
Xanthorrhoea latifolia ssp latifolia					P				U								
Xerochrysum bracteatum																	U
Xylocarpus moluccensis			R									R					

ATTACHMENT 5: WEED PROFILE FOR PRAXELIS CLEMATIDEA

Praxelis clematidea COMMON NAME Praxelis

Photo taken on site by Martin Bennett

FAMILY	Asteraceae
ETYMOLOGY	(Praxelis) The species clematidea = a branch twig, dim.
LIFEFORM	1m Herb
ORIGIN	Brazil, South America
HABITAT	Northern Disturbed
LEAVES	Opposite, rounded triangular with acute apex, hairy and toothed along edges (unpleasant smell when crushed) more deeply toothed leaves
FLOWERS	Pappus larger and bluer (umbrella of hairs on the seed) is more umbrella-like than those of *Ageratum* spp.
FLOWERING	Nov, Dec, Jan, Feb, March, April, May
FRUIT	Achenes, minute whorl of 5 rounded petals around each floret c.f. blue-top.
FRUITING TIMES	Dec, Jan, Feb, March, April, May, June
STEM	brittle hairy stems
COMMENTS	Confused with *Ageratum* but smells a lot worse then *Ageratum*, maybe toxic, tends to be a short-lived perennial.