FINAL REPORT

Curtis Island Facility
Flora Report

Prepared for

Santos Limited

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Executive Summary

A desktop assessment and terrestrial flora survey was conducted at the study area of the LNG Facility on Curtis Island, which lies approximately 5 km offshore from the city of Gladstone, central Queensland. The aims of the terrestrial flora investigation were to provide baseline floristic and structural data for vegetation communities occurring in the study area and map these communities, identify the occurrence or expected occurrence of conservation significant flora species, describe weed species and their distribution in the study area, and identify ecologically sensitive areas. Additionally, the potential impacts of the LNG facility on the surrounding vegetation were to be determined and appropriate mitigation and management strategies developed.

The desktop assessment identified eight flora species of conservation significance, listed under the Queensland *Nature Conservation Act, 1992* and the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999*, as potentially present on-site.

Three vegetation communities were identified on site as having either Of Concern or Endangered conservation status (as listed under the *Vegetation Management Act, 1999*) and Of Concern or Endangered status. as per EPA biodiversity status An area of up to approximately 127 ha will be impacted by proposed vegetation disturbance associated with construction of the LNG Facility and associated infrastructure.

Despite extensive targeted surveys, no conservation significant flora species were identified from the surveys as being present within the study area. Of the 30 exotic weed species described in this survey for the LNG Facility site, four were identified as being of management concern. These species are listed as pest species under the Queensland *Land Protection (Pest and Stock Route Management) Act, 2002.* Two of these species, rubber vine and lantana, are also listed as Weeds of National Significance.

Vegetation of the proposed LNG Facility has a long history of disturbance including grazing, thinning and exotic weed invasion. The majority of vegetation at the proposed LNG Facility site is currently grazed and exhibits some degradation of ground-cover and mid-strata. Despite the relatively high degree of past disturbance, the ecological integrity of remnant communities within the proposed LNG facility was found to be moderate, with integral ecological processes intact. A number of potential impacts and mitigation strategies for remnant vegetation communities are discussed. The proposed overall clearing of vegetation communities within the LNG Facility appears not to be of severe consequence on a sub-regional scale..

Section 1 Introduction

1.1 Study Aim and Objectives

The aims of the terrestrial flora investigation were to map the vegetation communities of the proposed LNG facility site and immediate surrounds (referred to as the LNG facility study area) and identify areas of vegetation communities and species of conservation significance. In meeting these aims, the objectives of the flora survey were to:

- Review existing terrestrial vegetation data for the local area and region;
- Provide baseline floristic and structural data for vegetation communities occurring in the study area;
- Assess the diversity of terrestrial vascular flora within the study area and identify ecologically sensitive areas;
- Identify the occurrence or expected occurrence of conservation significant flora species;
- Describe weed species and their distribution in the study area; and
- Determine the impacts of the proposed project on the surrounding vegetation and develop appropriate mitigation and management strategies.

1.2 Study Area

The LNG facility study area is situated south of Graham Creek in the south-west of Curtis Island, which lies approximately 5 km offshore from the city of Gladstone, central Queensland. Curtis Island itself is approximately 47 km long and 24 km wide. Situated at the north-eastern end of this island is Curtis Island National Park. Further information on Curtis Island National Park and other relevant environmentally sensitive areas is provided in Section 2-1

1.3 Legislative Context

1.3.1 Environment Protection and Biodiversity Conservation Act

The Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act, 1999* provides for the protection of the environment, especially matters of National Environmental Significance (Protected matters), and is administered by the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA). It is designed to provide for the conservation of biodiversity through the protection of threatened species and ecological communities, migratory, marine and other protected species listed under the Act. In general, the EPBC Act streamlines national environmental assessment and approvals process, protects Australian biodiversity and integrates management of important natural and cultural places.

1.3.2 Nature Conservation Act

The Queensland *Nature Conservation* (NC) *Act, 1992* is administered by the Environmental Protection Agency (EPA) and is the principal legislation for the conservation and management of the State's native flora and fauna. The primary objective of the NC Act is ensuring the preservation of endangered, vulnerable and rare (EVR) species of flora and fauna as listed under the *Nature Conservation (Wildlife) Regulation, 1994*.

1.3.3 Lands Protection (Pest and Stock Route Management) Act

The Queensland *Lands Protection (Pest and Stock Route Management) Act*, *2002* (LPA) provides pest management for agricultural lands. The LPA lists several species of flora and fauna that are considered Class 1, 2 or 3 pests under the Act.

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1.3.4 Vegetation Management Act

The purpose of the Queensland *Vegetation Management* (VM) *Act, 1999* is to regulate the clearing of native vegetation, i.e. Remnant Regional Ecosystems (REs), to prevent the loss of biodiversity or any increase in land degradation from vegetation clearing, to maintain ecological processes, reduce greenhouse gas emissions, and to manage the effects of clearing. Additionally, areas of remnant vegetation specific to conservation significant species (listed under the NC Act) are further classified as Essential Habitat.

The Department of Natural Resources and Water (DNRW) uses certified mapping of Remnant Vegetation and Essential Habitat to administer the VM Act. Clearing of native vegetation mapped as REs and/or Essential Habitat is subject to assessment by the DNRW against the applicable Regional Vegetation Management Code for the Brigalow Belt and New England Tableland Bioregions (DNRW, 2008).

1.3.4.1 Vegetation Clearing

The following information describes the circumstances in which the GLNG project must comply with the Queensland *Vegetation Management Act, 1999* in regards to vegetation clearing (as per conversations with representatives of the Department of Mines and Energy).

Petroleum activities[1] (including the GLNG project) do not require a permit to clear native vegetation when the *Vegetation Management Act, 1999* regards it as a 'specified activity' (under Schedule 8 of the *Integrated Planning Act* (IPA), *1997*). This exemption for clearing native vegetation does not extend to purposes outside the definition of an 'authorised activity' [2] (Section 22 of the *Petroleum and Gas (Production and Safety) Act, 2004*). Petroleum activities are also exempt from assessment against a planning scheme (under Schedule 9 of IPA).

Note that any conditions contained in the Environmental Authority (under EP Act) regarding vegetation management must be complied with.

Santos (as the leaseholder) is authorised to undertake vegetation clearing when it is regarded as an 'incidental activity' for the following:

- Exploration or testing (Section 32 Exploration and testing (1) and 152 Petroleum production or storage testing (1));
- Pipeline construction or operation; and
- Construction or operation of the petroleum facility.

The clearing of native vegetation for the purpose of an 'incidental activity' is limited to that which is reasonably necessary for, or incidental to, another authorised activity for the lease. For example, clearing to enable the construction and operation of a petroleum well, natural underground reservoir for petroleum storage, pipeline or a petroleum facility. It is surmised that 'reasonably necessary' clearing of vegetation may include activities such as:

- Clearing within the infrastructure / building envelope to enable construction and operation; and
- Clearing for safety / maintenance purposes (e.g. fire break).

The clearing of vegetation should be viewed in context of the authorised activity and should be relative to the scale and /or nature of the activity. Where the clearing of native vegetation is for purposes outside of an authorised or incidental activity (as previously defined), the VM Act applies.

[1] As defined by the Petroleum and Gas Act 2004 and the Environmental Protection Act (EP Act) 1994
[2] Such as exploration, production and storage activities; pipeline construction and operation; and petroleum processing (Part 2 of the *Petroleum and Gas Act, 2004*)

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1.3.4.2 Remnant Vegetation Conservation Status

The Regional Ecosystem Description Database (REDD) lists the status of REs as gazetted under the VM Act (Vegetation Management Status) and their Biodiversity Status as recognised by the Environmental Protection Agency.

Biodiversity status of affected communities is to be listed in the EIS as requested within the Terms of Reference; however the VM Act status is the primary classification.

Biodiversity Status is defined by the Environmental Protection Agency and is based on an assessment of the condition of remnant vegetation in addition to the pre-clearing and remnant extent of REs in accordance with the following criteria:

Endangered

REs are listed as having 'Endangered' VM status when remnant vegetation is less than 10 per cent of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares.

REs are listed as having 'Endangered' biodiversity status when less than 10 per cent of the pre-clearing extent of remnant remains unaffected by severe degradation and/or biodiversity loss; or 10-30 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or it is a rare RE subject to a threatening process.

Of Concern

REs are listed as having 'Of Concern' VM status when remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 30 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares.

REs are listed as having 'Of concern' biodiversity status when remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 30 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, and if 10-30 per cent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.

Not of Concern / No Concern at Present

REs are listed as having 'Not of concern' VM status when remnant vegetation is over 30 per cent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares.

REs are listed as having 'Not of concern' Biodiversity status when remnant vegetation is over 30 per cent of its pre-clearing extent across the bioregion, the remnant area is greater than 10,000 hectares and the degradation criteria for endangered or of concern REs are not met.

1.4 Review of Existing Information

In order to identify the range of species, habitats, and communities that may be present within the proposed LNG plant facility a review of existing data was compiled through the acquisition of the following key references:

- Queensland Environmental Protection Agency (EPA) Herbarium flora database (HERBRECS);
- Queensland EPA Wildnet Database;
- Queensland EPA 1:100 000 Regional Ecosystems (RE) mapping;
- Queensland EPA Ecomap environmentally sensitive areas database;

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- Commonwealth Department of Environment, Water, Heritage and Arts (DEHWA) 'Matters of National Environmental Significance' Environment Protection and Biodiversity Conservation (EPBC) database; and
- Previous relevant studies undertaken in the area including: URS, (2007), EPA (2003), EPA (2007a) and EPA (2008)

Searches of the above databases was undertaken for an area bounding the study site as defined by the following co-ordinates: Latitudes from 23°45' to 23°47'; and longitudes from 151°12' to 151°13'.

Conservation significant or otherwise noteworthy flora[3] potentially occurring within the site was identified from the EPA Wildnet, Queensland Herbarium and DEWHA databases. The likelihood of each species presence was assessed based on suitable habitat and resources present on site. Species identified as being potentially present in the project area were targeted for identification during the field assessment. Details of potentially present significant species are provided in Appendix A.1

1.5 Flora Field Survey Approach

The flora survey employed an assessment of floral taxa and vegetation communities in keeping with the methodology employed by the Queensland Herbarium for the survey of Regional Ecosystems and vegetation communities (Neldner *et al.* 2005). Preliminary identification of the vegetation communities of the study area was conducted prior to the commencement of fieldwork via interpretation of 1:100 000 Regional Ecosystems coverage Version 5.0 for the region (EPA, 2008a).

Preliminary vegetation community definition was used to identify locations for representative field survey plots to ground truth communities and obtain floristic and structural data. Fieldwork for the flora survey was conducted over an eight day period between 2 and 9 April 2008 inclusive.

Surveys were undertaken during a period of high rainfall that followed an extended period of drought. Seasonally the survey period was the best window of opportunity to capture the potential floristic variation for the site. Floristic variation within the woodland communities on Curtis Island can be expected to vary for the grasses, herbs and forbs species found within undisturbed areas native ground cover, with identifiable diversity expected at its highest following late summer rains. This survey was in keeping with the Queensland Herbariums guideline for floristic survey of woodland communities in Queensland which recommends sampling between March and May for optimum species diversity, particularly ground cover (Neldner *et. al.,* 2004).

Field surveys involved a minimum of three botanical assessments per community, in order to gain a representative sample of each vegetation community. A number of standard botanical assessment methods were employed including secondary transects, quaternary sample plots, and random meander searches. Vehicle traverses of the study site were also undertaken throughout the survey period to identify changes in landform and community boundaries. Community structural formation classes were assessed according to Specht (1970). Regional ecosystem (RE) classification of communities was determined as per Sattler and Williams (1999) and in accordance with the Regional Ecosystems Description Database (REDD) (EPA, 2005). Further RE clarification of cryptic vegetation communities that were not floristically matched to the RE classification scheme was determined from consultation with a Queensland Herbarium Botanist. Final vegetation mapping was undertaken utilising field survey data and aerial photograph interpretation of stereo pair image s at a scale of approximately 1:7,000 (Aerometrix, 2005).

[3] The term Conservation signifcane pertains to threatened species identified by Queensland State Government (*Nature Conservation Act, 1992*) and Commonwealth (*Environment Protection and Biodiversity Conservation Act, 1999)* legislation as critically endangered, endangered, vulnerable or rare. Otherwise noteworthy flora are species that carry other legislation status or those that occur at the extent of their natural geographic range.

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Taxonomic nomenclature used for the description of floral species is according to Henderson (2002). Introduced species (as per Henderson, 2002) are signified in all text by an asterix (*). Any additional changes in Taxonomic nomenclature have been incorporated as described in Jessup (2002, 2003, 2005). Field references utilised for the identification and description of floral species include: Anderson (2003); Brooker and Kleinig (1994); Johns (2006); Milson (2000); and, Stanley and Ross (1986, 1989, 1995).

1.6 Flora Survey Methodology

The flora survey employed an assessment of floral taxa and vegetation communities in keeping with the methodology employed by the Queensland Herbarium for the survey of Regional Ecosystems and vegetation communities (Neldner *et al.,* 2005). Preliminary identification of the vegetation communities of the project areas was conducted prior to the commencement of fieldwork. Preliminary identification included vegetation community definition from stereo image 1:7 000 colour aerial photography (DNRW, 2005) and interpretation of 1:100 000 Regional Ecosystems coverage Version 5.0 for the region (EPA, 2008).

Preliminary community definition was used to identify locations for representative field survey sample plots to obtain floristic and structural data and ground truth communities. Field surveys involved a botanical assessment at a number of representative sites within each vegetation community, employing a number of standard methods including: modified secondary sample plots; quaternary sample plots; and random meander search areas. A target of three secondary transects per vegetation community was not achievable in some vegetation communities due to their limited extent within the study site. A number of vehicle traverses of the study site were also undertaken throughout the survey period to identify changes in landform and identify community boundaries. Community structural formation classes were assessed according to Specht (1970). Regional ecosystem classification of communities was determined as per Sattler and Williams (1999), and in accordance with the Regional Ecosystems Description Database {REDD (EPA, 2005b)}.

Final vegetation mapping was undertaken utilising field survey data and aerial photograph interpretation of stereo pair images at a scale of 1:7,000. The survey was conducted under Queensland Environmental Protection Agency Scientific Purposes Permit number WISP02056306.

Nomenclature

Taxonomic nomenclature used for the description of floral species is according to Henderson (2002). Introduced species (as per Henderson, 2002) are signified in all text by an asterix (*). Any additional changes in Taxonomic nomenclature have been incorporated as described in Jessup (2002, 2003, 2005). Field references utilised for the identification and description of floral species include: Anderson (2003); Brooker and Kleinig (1994); Johns (2006); Milson (2000); and, Stanley and Ross (1986, 1989, 1995).

Specimen Identification

Where available, fruiting and/or flowering specimens were taken to assist with identification, where plant species were not identified in the field. For those species not field identified, samples were pressed and dried and positive identifications of plant specimens were subsequently made under laboratory conditions or forwarded to the Queensland Herbarium for identification. All identifications were made by qualified botanists with experience identifying flora taxa of central Queensland coastal ecosystems.

Secondary Plots

Field surveys employed seventeen (17) secondary sample plots within the study site (Figure 1). Secondary plots were comprised of 10x50m (500m2) transects.

Descriptive site information recorded at secondary transects included; location, orientation, aspect, slope, soil type, landform, disturbance, fire history and general notes on ecological integrity. Several time-encoded digital photographs were taken at each plot as a visual reference. Locations of transects were recorded using a handheld GPS unit.

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Floristic analysis included plant identification and species diversity characterisation of all flora present. Relative abundance was assigned for all species recorded.

Structural analysis included recording the height class and life form of the dominant species within each strata present. Height of each strata was recorded using a hand held laser hypsometer. Foliage projection cover (FPC) of the mid and upper strata was calculated along each transect, where foliage projection intersected the 50m centre tape. FPC of the ground layer was determined using ocular estimation of cover within five 1m subplots spaced at 10m intervals along the primary transect.

Quaternary Plots

Twenty-two (22) quaternary plots were utilised to ground truth vegetation units and confirm dominant characteristic species (Figure 1).

Descriptive site information recorded at quaternary sites included; location, orientation, aspect, slope, soil type, landform, disturbance, fire history and general notes on ecological integrity. Several time encoded digital photographs were taken at each plot as a visual reference. Locations of transects were recorded using a handheld GPS unit.

Floristic analysis included determination of the dominant species within the mid and canopy strata. Structural analysis included recording the height class and life form of the dominant species within the mid and canopy strata. Height of each strata was recorded using a hand help laser hypsometer.

Meander Searches

Following assessment of each secondary plot and selected quaternary plots, an area of approximately 1 ha surrounding each plot was searched for 20 minutes utilising the random meander technique (Cropper, 1993). Care was taken to avoid sampling in different vegetation types to those of the plots. Meander searches were employed to:

- Identify additional less abundant species not recorded within survey plots;
- Identify any potential significant threatened or species not identified within the survey plot;
- Confirm the representativeness of plot locations; and
- Confirm boundaries and ecotonal areas between vegetation communities.

1.6.1 Survey Limitations

Data acquisition during flora surveys has inherent limitations associated with variability of vegetation communities across a site, and changes to the detectability and presence of species with time. All survey sites were strategically located to capture representative samples of all communities and the seasonal conditions during which this survey was undertaken were conducive to a relatively high degree of detectable floral diversity (Section 1.4.2).

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2.1 Regional Context

2.1.1 Bioregion

The LNG facility is situated within the Southeast Queensland bioregion, close to the boundary with the Brigalow Belt bioregion (Sattler and Williams, 1999). The bioregions of Queensland are based on landscape patterns that reflect changes in geology and climate, as well as major changes in floral and faunal assemblages at a broad scale and are used as the fundamental framework for the planning and conservation of biodiversity.

The Southeast Queensland bioregion is one of the most species rich and diverse areas of Australia for flora and fauna (Young and Dilewaard, 1999). The bioregion is approximately 6,600,000 ha in size and contains localised areas of endemism and a wide range of habitat types (Young and Dilewaard, 1999).

2.1.2 Sub-regions

The Southeast Queensland bioregion contains 10 sub-regions or provinces that delineate significant differences in geology and geomorphology (Young and Dilewaard, 1999). The proposed LNG facility site is located within the Burnett-Curtis Hills and Ranges sub-region. It should be noted that the site is situated near the northern-most boundary of the Burnett-Curtis Hills and Ranges sub-region, bordering on the Marlborough Plains sub-region of the adjacent Brigalow Belt bioregion.

The Burnett-Curtis Hills and Ranges sub-region is geologically diverse and includes low rolling hills on old sedimentary rocks in the west and granite hills and ranges in the east. Major vegetation types of the province include *Eucalyptus crebra* and *Corymbia citriodora* woodlands, eucalypt mixed open forests and *Araucarian* microphyll rainforests (Young and Dilewaard, 1999). Known threats to the biodiversity of the sub-region include the habitat fragmentation, and weed and feral animal invasion.

2.1.3 Regional Ecosystems

Regional Ecosystems (REs) describe the relationships between major floral species and the environment at the regional scale. They are mostly derived from linking vegetation mapping units recognised at a scale of 1:100,000 to land zones that represent major environmental variables, in particular geology, rainfall and landform.

There are 104 REs identified for the Burnett-Curtis Hills and Ranges sub-region. Of these, 57 REs are currently of conservation significance as they are listed as either Of Concern (47) or Endangered (10) under the *Vegetation Management Act, 1999*. Discussion of RE s relevant to the LNG facility site is provided in detail in Section 2.2.3.

2.1.4 Environmentally Sensitive Areas

Environmentally sensitive areas (ESAs) include national parks, state forests, World heritage areas, Ramsar wetlands, nationally important wetlands and Essential Habitat. The following section details those in close proximtiy to the project site. The following table identifies national parks state forests, world heritage areas and nationally important wetlands within Curtis Island (Table 2.1). All ESAs are shown in Figure 3.

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Table 2-1 Environmentally sensitive areas

Name of ESA	Area (hectares)	Values/Comments
National Park/Conservation Areas		
Garden Island Conservation Park	7,928 ha	4 km east of project site
Curtis Island National Park	1,498 ha	5 km north of project site
State Forest		
Curtis Island State Forest	6,488 ha	5 km north of project site
World Heritage Areas		
Great Barrier Reef Marine Park	Approximately 257 kilometres of coastline	Curtis Island coastline including estuary tidal zones and the entire Curtis Island coastline
Nationally Important Wetlands		
Port Curtis Wetland	31,232 ha	Curtis Island coastline including estuary tidal zones
The Narrows Wetland	20,903 ha	Curtis Island coastline including estuary tidal zones
Great Barrier Reef Marine Park	Approximately 120 kilometres of coastline	Curtis Island coastline including estuary tidal zones adjacent the mainland , but does not include the east coastline of Curtis island
Northeast Curtis Island Wetland	9,541 ha	Not in close proximity to project site

The following section describes environmentally sensitive values in terms of World Heritage areas, Ramsar wetlands, Nationally Important wetlands and essential habitats for Curtis Island.

2.1.4.1 World Heritage Areas

World Heritage areas or national heritage places listed as within the Curtis Island boundaries include the Great Barrier Reef Marine Park (DEWHA, 2008c). This World Heritage area encompasses the entire 257 kilometres of Curtis Island coastline. (Figure 3), refer to the Curtis Island marine report for further detailed Great Barrier Reef Marine Park information.

2.1.4.2 Ramsar Wetlands of International Significance

No Ramsar wetlands of international significance are located on Curtis Island.

2.1.4.3 Nationally Important Wetlands

The Directory of Important Wetlands in Australia (DIWA) lists three nationally important wetlands that are located in close proximity to the project area (Figure 3). One other nationally listed wetland, namely Northeast Curtis Island Wetland on Curtis Island, is considered not to be in close proximity to the project area. The nationally important wetlands include:

- Port Curtis Wetland includes all tidal areas in the vicinity of Gladstone, from Laird Point and Friend Point (southern end of The Narrows), to Gatcombe Head and Canoe Point, including the seaward side of Facing Island and Sable Chief Rocks, and southern Curtis Island between North Point and Connor Bluff. Physical features include a partially enclosed embayment, shallow estuaries including

small continental rocky islands, intertidal flats and estuarine islands. The significant features include extensive mangrove forests, seagrass beds and salt flats (DEWHA 2008a).

- The Narrows Wetland is situated between the passage between Curtis Island and the Australian mainland, including tidal estuaries on north-western Curtis Island and Graham Creek. The Narrows is one of only four tidal passages in Australia and is considered a unique wetland (Queensland Department of Environment and Heritage 1994). The wetland habitat includes saline coastal flats, mangrove forests, intertidal sand and mud flats, seagrass beds, open marine and estuarine waters (DEWHA 2008b).
- The Great Barrier Reef Wetland is a nationally listed wetland which includes the120 kilometres of Curtis Island coastline, including estuary tidal zones, adjacent the Australian mainland. The area is recognised for its seagrass beds, estuarine wetlands, and mangrove communities (DEWHA 2008c). The Great Barrier Reef wetland includes the coastline, marine waters and estuary tidal zones of the Port Curtis and Narrows Wetlands.
- Northeast Curtis Island Wetland is situated on north-eastern side of Curtis Island, between Cape Keppel and Cape Capricorn. This wetland is not in close proximity to the project area (DEWHA 2008d) and is not considered to be an ESA that may be affected from the project area or associated project area activities.

2.1.4.4 Essential Habitat

An area of essential habitat is a vegetation community in which a species that is endangered, vulnerable, rare or near threatened, as defined by the *Nature Conservation Act 1992*,.might potentially utilise as suitable habitat. The following table lists the essential habitat areas and their corresponding REs within Curtis Island (Table 2.2).

Table 2-2 Curtis Island areas of essential habitat

Location	Number of Essential Habitats	REs Associated with Essential Habitat
LNG facility project area	1	RE 12.3.3
5 kilometre buffer zone from centre point of LNG facility	15	RE 12.1.2, RE 12.1.3, RE 12.11.14/12.3.3, RE 12.11.20/12.3.3, RE 12.11.4, RE 12.11.6, RE 12.2.15, RE 12.3.11, RE 12.3.11/12.11.6/12.11.14, RE 12.3.3, RE 12.3.3/12.3.7, RE 12.3.5, RE 12.3.7, RE 12.3.7/12.3.11.
Outside of the 5 kilometre LNG facility buffer zone	17	RE 12.1.2, RE 12.1.3, RE 12.11.18/12.11.6, RE 12.11.18/12.11.6/12.11.21, RE 12.11.20/12.3.3, RE 12.11.21/12.3.11, RE 12.11.4, RE 12.11.6, RE 12.3.11, RE 12.3.11/12.11.21, RE 12.3.11/12.3.7, RE 12.3.3, RE 12.3.3/12.3.11/12.3.7, RE 12.3.3/12.3.7, RE 12.3.5/12.2.15, RE 12.3.7/12.3.11, RE 12.3.7/12.3.3

The essential habitat RE 12.3.3 (*Eucalyptus tereticornis* woodland to open forest on alluvial plains) is recorded in the LNG project area (43 hectares), which has been mapped and classified by the EPA as an Essential Habitat for the koala (*Phascolarctos cinereus*) (EPA, 2003). The study area and five kilometre

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buffer zone from the centre point of the LNG facility area records six dominant and one sub-dominant *Eucalyptus tereticornis* woodland communities. The remaining area in Curtis Island records 15 dominant and 10 sub-dominant *Eucalyptus tereticornis* woodland communities.

2.2 Survey Results

This section documents the floristics and vegetation communities of the LNG facility site. Detailed community descriptions and quantitative floristic and structural data for each survey site are detailed in Appendix A.4. A complete flora species list for all taxa identified is provided in Appendix A.5.

2.2.1 Weather Conditions

The flora survey of the LNG facility site was undertaken between 2 and 9 April 2008. Weather conditions were typical for the season in the region; warm days and mild nights with occasional gusty winds. Bureau of Meteorology daily weather observations at the Gladstone Radar shows that the minimum and maximum temperatures were 17.3°C and 29.5° C respectively. Relative humidity (recorded daily at 9 am) for the survey period averaged 57.4 %. Wind direction was predominantly easterly, changing to south-easterly during the survey period. A total of 0.6 mm rainfall was recorded over the eight days of survey (BoM, 2008a)

Prior to the survey period, Curtis Island experienced unseasonally high rainfall during the month of February 2008 with a total rainfall of 451 mm recorded (BoM, 2008b). Furthermore, within a single day a total of 77.4 mm rainfall was recorded at the Gladstone Radar only four days prior to survey commencement (BoM, 2008c). This rainfall was a dramatic change in anticipated meteorological conditions, as the Curtis coast area had experienced significant long term drought conditions. Rainfall statistics for the region indicate that rainfall had been below average for approximately the past 10 years (BoM, 2008d).

2.2.2 Species Diversity

The survey identified the presence of 191 taxa representing 60 families and 150 genera.. Families represented by 3 or more genera included Asteraceae (10 genera), Chenopodiaceae (3), Convolvulaceae (3), Euphorbiaceae (4), Fabaceae (13), Malvaceae (3), Myrtaceae (4), Poaceae (26), Rhizophoraceae, and Verbenaceae (5).

Genera represented by 3 or more species included *Acacia* (6 species), *Chloris* (3), *Corymbia* (5), *Cyperus* (4), *Eucalyptus* (3), *Fimbristylis* (4) and *Sida* (3).

There was a relatively moderate diversity of weed species within the site with 30 species found. Families with the most exotic weed taxa were Asclepiadaceae (3), Asteraceae (5), Poaceae (5) and Verbenaceae (4). Weed species of concern at the LNG facility site are discussed further in Section 2.2.4.

A full flora species list and a list of exotic species are provided in Appendix A.5.

2.2.3 Vegetation Communities

Six Regional Ecosystems were described and mapped for the LNG facility site, based upon the field survey results and interpretation of aerial photo stereo images (Figure 1 and Figure 2). Table 2-3details the total area of each community found on the LNG facility site. It also shows the area for each vegetation community within the sub-region (as defined by RE types within the Burnett-Curtis Hills and Ranges sub-region). Full community descriptions including floristics, structure, location, ecological integrity and disturbance notes are given in Appendix A.4.

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Table 2-3 Regional Ecosystems recorded at LNG Facility site

Regional Ecosystem (RE)	Community Description	Area on LNG facility study area (ha)	Area within subregion (ha) [1]	%of subregional extent represented within study area
12.1.2	Saltpan vegetation comprising *Sporobolus virginicus* grassland and samphire herbland on Quaternary estuarine deposits	47.4	15,242	0.31
12.1.3	Mangrove shrubland to low closed forest on Quaternary estuarine deposits	8	16,580	0.05
12.2.2	Microphyll/notophyll vine forest on beach ridges	0.4	1,562	0.03
12.3.3	*Eucalyptus tereticornis* open forest to woodland on Cainozoic alluvial plains	45.6	28,652	0.16
12.11.6	*Corymbia citriodora* and *Eucalyptus crebra* open forest to woodland on Mesozoic to Proterozoic moderately to strongly deformed and metamorphosed sediments and interbedded volcanics	99.9	178,480	0.06
12.11.14	*Eucalyptus crebra, E. tereticornis* grassy woodland on Mesozoic to Proterozoic moderately to strongly deformed and metamorphosed sediments and interbedded volcanics	87	4,171	2.09
n/a Non-remnant areas		5	n/a	n/a

1 Derived from RE data for the Burnett-Curtis Hills and Ranges sub-region as per Accad *et al* (2006)

The majority of the vegetation associations surveyed have been disturbed or modified to some degree by grazing, thinning, clearing for agriculture or weed invasion. Regeneration has occurred across most of the study area and now support open forest or woodland. A cleared area remains surrounding abandoned buildings in the east of the study area. This area supports a mixture of native grasses and herbs including *Bothriochloa decipiens* (pitted bluegrass), *Heteropogon contortus* (black speargrass) and *Cyperus gracilis* (graceful sedge) and exotic grass species including *Cenchrus ciliaris** (buffel grass) and *Melinis repens** (red natal grass).

The geology of the study area is predominantly metamorphic substrates which form low rising hills and support two distinct vegetation communities. The hill top and mid-slope areas support open forest dominated by *Corymbia citriodora* subsp. *citriodora* (lemon-scented gum) (RE 12.11.6); whereas the lower slopes and more flat, coastal areas support grassy woodlands dominated by *Eucalyptus tereticornis* (forest red gum) and *Eucalyptus crebra* (narrow-leaved ironbark) (RE 12.11.14). The ground layer of RE 12.11.6 was found to be relatively sparse due to the rocky substrate and shallow soils exhibited on the slopes and hilly areas on the site. Weed invasion also appeared to be more prevalent in this community.

Three alluvial plains associated with main drainage lines occur within the LNG facility study area. These plains support *Eucalyptus tereticornis* (forest red gum) open woodlands (RE 12.3.3) with a mid-storey of *Lophostemon suaveolens* (swamp box) and a grassy understorey. The ground layer of this community was generally the most disturbed by grazing adjacent to ephemeral streams; nonetheless, the ground layer was generally in good condition and supported a diversity of native grass species including *Themeda triandra* (kangaroo grass), *Cymbopogon refractus* (barbwire grass) and *Heteropogon contortus* (spear grass).

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A single semi-evergreen vine thicket (RE 12.2.2) was identified within the study area on the proposed materials offloading facility (MOF) road on Hamilton Point. Although this community was only relatively small in size, it was also relatively diverse and included dry rainforest shrub/tree species such as *Alectryon diversifolius* (scrub boonaree), *Cupaniopsis anacardioides* (tuckeroo), *Mallotus philippensis* (kamala) and *Alchornea ilicifolia* (native holly). The ground cover was relatively dense and dominated by a number of invasive species including *Sida rhombifolia** (common flannel weed) and *Megathyrsus maximus* var. *maximus** (guinea grass), as well as numerous native rainforest creepers and herbs such as *Eustrephus latifolius* (wombat berry), *Indigofera hirsuta* (hairy indigo), *and Cyperus gracilis* (slender sedge).

Saltpan and mangrove communities were present along the sheltered intertidal zones at the south and west of the site. Saltpan species included *Enchylaena tomentosa* (ruby saltbush) and *Sarcocornia quinqueflora* (beadweed). Mangrove species included *Avicennia marina* (grey mangrove), *Rhizopohra stylosa* (spotted mangrove) *Exoecaria agallocha* (milky mangrove), and *Lumnitzera racemosa* (black mangrove). Refer to Section 8.4.4 for further details on mangrove communities.

2.2.4 Weeds of Concern

Of the 30 exotic weed species described in this survey of the LNG facility study area, four were identified as being of management concern (Table 2-4). These species are listed as pest species under the Queensland *Land Protection (Pest and Stock Route Management) Act, 2002.* Three of these species, rubber vine and the lantana spp., are also listed as Weeds of National Significance (WONS). Developed by the Australian and New Zealand Environment Conservation Council (ANZECC), WONS are exotic weed species identified as causing significant environmental damage on a national scale (Thorp and Lynch, 2000). All exotic weed species identified in this study are listed within the full flora species list in Appendix A.5.

Table 2-4 Declared exotic weed species identified at the proposed LNG facility

Species	Common Name	Declared Status [1]	Regional Ecosystems affected
*Cryptostegia grandiflora**	rubber vine	Class 2	12.11.14, 12.3.3
*Lantana camara**	lantana Class	3	12.2.2, 12.11.6, 12.11.14
*Lantana montevidensis**	creeping lantana	Class 3 12.11.6;	12.11.14
*Opuntia stricta var. stricta**	prickly pear	Class 2	12.2.2, 12.11.6, 12.11.6, 12.11.14

[1] Declared under the Queensland *Land Protection (Pest and Stock Route Management) Act, 2002*

Rubber Vine

*Cryptostegia grandiflora** (rubber vine) was found in several isolated locations across the study area, predominantly within or close to riparian vegetation associated with ephemeral waterways. Rubber vine is a Weed of National Significance and is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts. Rubber vine is a native of south-west Madagascar, although the exact date of its introduction into Australia is not known.

Rubber vine is a woody perennial vine that colonises areas aggressively forming impenetrable thickets which smother vegetation. It prefers areas where annual rainfall is between 400 mm and 1400 mm, and is well adapted to a monsoonal climate. Rubber vine was declared a noxious weed in Queensland in 1955. It is now present across 20 per cent of the state and densely infests over 700 000 hectares (DNRME, 2004).

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Lantana

*Lantana camara** (lantana) was widespread over the LNG facility study area in the drier vegetation communities, with its abundance generally low. Lantana is a Weed of National Significance and is regarded as one of the worst weed in Australia. Lantana forms dense, impenetrable thickets that take over native bushland and pastures throughout the east coast of Australia. It competes for resources with, and reduces the productivity of, pastures and forestry plantations. It adds fuel to fires, and is toxic to stock (Weed Management CRC, 2003).

Creeping Lantana

*Lantana montevidensis** (creeping lantana) was uncommon over the proposed LNG facility study area but was identified in the drier vegetation communities in the more modified environments. The species is a popular ornamental plant but is considered a weed when in natural ecosystems. Creeping lantana occurs in coastal and sub-coastal Queensland and as far south as Sydney. It is similar to lantana but does not have thorns, has mainly pink or purple flowers and trails along the ground, only growing to a height of half a metre. It is known to be toxic to sheep and cattle if ingested (Parsons and Cuthbertson, 2001) and readily displaces native vegetation (Anderson, 1993).

Prickly pear

*Opuntia stricta var. stricta** (prickly pear) was found in a number of vegetation communities across the study area, although densities were consistently low. Prickly pears were introduced into pastoral districts in the 1840's and by 1925 had invaded over 24 million hectares. The introduction of the moth, *Cactoblastis cactorum*, in the 1920's controlled the pest, and by the mid-1930's, prickly pear was no longer a major problem (DNRW, 2007).

2.2.5 Vegetation of Significance

Conservation Significant Species

The desktop literature review (Appendix A.1) identified eight flora species of conservation significance as potentially present on-site. Despite extensive targeted surveys, no significant flora species were identified from the surveys as being present within the LNG facility study area. None of the species identified (Appendix A.5) are listed as threatened species under the Queensland *Nature Conservation Act, 1992* or the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act, 1999*.

Culturally Significant Species

Within the proposed LNG facility site many flora species of cultural significance were identified including species traditionally utilised for food or medicinal purposes, painting or decoration. Common bush tucker foods identified include *Avicennia marina* (grey mangrove), *Carissa ovata* (currant bush), *Dianella* species, *Eustrephus latifolius* (wombat berry), *Ficus* species, *Livistonia decipiens* (cabbage palm), *Lomandra multiflora* (many-flowered mat rush), *Marsilea hirsuta* (short-fruit nardoo), *Melaleuca* species, *Myoporum acuminatum* (coastal boobialla), *Planchonia careya* (cocky apple), *Portulaca oleracea* (pigweed) and *Sarcocornia quinqueflora* (beadweed). Species of cultural value to the indigenous traditional owners of the area are discussed within Section 8.13. (Reference to cultural heritage chapter).

Commercially Significant Species

Many of the woodland species identified over the LNG facility study area are considered a potential commercial resource as suitable timber for flooring, telephone poles and other wood products. Where clearing of vegetation is required, the on-selling of timber may provide a financial off-set to be used for future rehabilitation of the site. Commercial timber sources found within the LNG facility study area include *Corymbia citriodora* subsp. *citriodora* (lemon-scented gum), used for saw logs, fencing material, firewood, turnery, power poles and house poles; *Eucalyptus crebra* (narrow-leaved ironbark), used for

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power poles, house poles, fencing, and firewood; and *Eucalyptus tereticornis* (forest red gum), used for saw logs, power poles, posts, fencing material and firewood (Taylor & Williamson, 2000).

Conservation Significant Vegetation Communities

Three vegetation communities are identified as having either "Of Concern" or "Endangered" conservation status (as listed under the *Vegetation Management Act, 1999*) and "Of Concern" or "Endangered" status (as per the EPA Biodiversity Status listing). The conservation status of these communities is detailed in Table 2-5.

Table 2-5 Regional Ecosystems of Conservation Significance

Regional Ecosystem (RE)	Community Description	Vegetation Management Act Status	Biodiversity Status	EPBC Act Status
12.3.3	*Eucalyptus tereticornis* open forest to woodland on Cainozoic alluvial plains	Endangered	Endangered	Not Listed
12.2.2	Microphyll/notophyll vine forest on beach ridges	Of Concern	Endangered	Critically Endangered
12.11.14	*Eucalyptus crebra, E. tereticornis* grassy woodland on Mesozoic to Proterozoic moderately to strongly deformed and metamorphosed sediments and interbedded volcanics	Of Concern	Of Concern	Not Listed

Regional Ecosystem Status

Not of Concern at Present

Regional Ecosystems are listed as 'Not of Concern' under the Queensland *Vegetation Management Act, 1999* if the remnant vegetation for the community is over 30 per cent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares.

Of Concern

Regional Ecosystems are listed as 'Of Concern' under the Queensland *Vegetation Management Act, 1999* if the remnant vegetation for the community is 10 to 30 per cent of its pre-clearing extent across the bioregion; or more than 30 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares.

Endangered

Regional Ecosystems are listed as 'Endangered' under the Queensland *Vegetation Management Act 1999* if the remnant vegetation for the community is less than 10 per cent of its pre-clearing extent across the bioregion; or 10 to 30 per cent of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares.

Biodiversity Status

Biodiversity status is defined by the EPA and is based upon 'an assessment of the condition of remnant vegetation in addition to the pre-clearing and remnant extent of a regional ecosystem' (EPA, 2006).

Not of Concern/No Concern at Present

A regional ecosystem is listed as 'Not of concern' when remnant vegetation is over 30 per cent of its pre-clearing extent across the bioregion the remnant area is greater than 10,000 hectares. and the degradation criteria listed above for endangered or of concern regional ecosystems are not met.

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Of Concern

A regional ecosystem is listed as having an 'Of concern' biodiversity status when remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 30 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, and if 10-30 per cent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.

Endangered

A regional ecosystem is listed as having an 'Endangered' biodiversity status when less than 10 per cent of the pre-clearing extent of remnant remains unaffected by severe degradation and/or biodiversity loss; or 10-30 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or it is a rare regional ecosystem subject to a threatening process.

2.2.6 Regional Connectivity

At a local scale, the LNG facility study area is located within a broad contiguous tract of vegetation that covers Curtis Island, south of Graham Creek. On a broader scale, the majority of the island is densely vegetated, largely due to 8,500 hectares being National Park (EPA, 2008b). Curtis Island State Forest and Curtis Island Conservation Park also play a significant role representing large areas of core habitat in proximity to the proposed LNG facility site. The proposed LNG facility site provides a habitat link from the west shore of China Bay with the contiguous woodland covering the majority of the island, and in particular, the core protected native vegetation within the National Park to the north east. Further description of faunal connectivity is provided in the Curtis Island Fauna Report Section 3.4.11.

In the overall sub-region, industrial development and tree clearing within the Gladstone region has greatly reduced the presence of integral continuous stands of vegetation. Significant gaps exist between dense stands of vegetation surrounding Gladstone, where remnant vegetation appears to be restricted to the Rundle Ranges and Mount Larcom Range in the north, and the Mount Stowe State Forest and Calliope Forest Reserve to the immediate south-west. The remnant vegetation of Curtis Island thus represents a significant area of integral habitat at a regional scale, although habitat connectivity to the mainland is significantly disrupted by The Narrows.

There are four nationally important wetlands associated with Curtis Island as listed by the Directory of Important Wetlands of Australia (DIWA). These are: Northeast Curtis Island; Port Curtis; The Narrows; and the Great Barrier Reef Marine Park (EPA, 2007). These wetlands are shown in Figure 3. The intertidal areas adjacent the proposed LNG facility therefore play an important role as a significant local ecosystem, providing habitat continuity between each wetland. The islands surrounding Curtis Island also act as vegetative corridors for local and migratory birdlife.

Section 3 Potential Impacts and Mitigation Measures

3.1 Potential Impacts

3.1.1 Vegetation Disturbance

An area of up to approximately 127 ha will be impacted by proposed vegetation disturbance associated with construction of the LNG facility and associated infrastructure. A breakdown of the disturbance to vegetation communities as a result of clearing is presented below in Table 3-1. This indicates the disturbance to each community as a percentage of its extent on the LNG site and as a percentage of the community within the sub-region.

Table 3-1 Proposed area of vegetation communities to be removed at the proposed LNG facility

Regional Ecosystem (RE)	Community Description	VM Status[1]	Biodiversity Status[2]	EPBC Status[3]	Potential Disturbance		
					Ha	%[4]	Sub region[5] %
12.1.2	Saltpan vegetation comprising *Sporobolus virginicus* grassland and samphire herbland on Quaternary estuarine deposits	Not of Concern	No Concern at Present	Not Listed	2.8	5.9	0.02
12.1.3	Mangrove shrubland to low closed forest on Quaternary estuarine deposits	Not of Concern	No Concern at Present	Not Listed	0.5	6.3	<0.01
12.2.2	Microphyll/notophyll vine forest on beach ridges	Of Concern	Endangered	Critically Endangered	0.4	100	0.03
12.3.3	*Eucalyptus tereticornis* open forest to woodland on Cainozoic alluvial plains	Endangered	Endangered	Not Listed	39.8	87.3	0.14
12.11.6	*Corymbia citriodora* and *Eucalyptus crebra* open forest to woodland on Mesozoic to Proterozoic moderately to strongly deformed and metamorphosed sediments and interbedded volcanics	Not of Concern	No Concern at Present	Not Listed	63.6	63.7	0.04
12.11.14	*Eucalyptus crebra, E. tereticornis* grassy woodland on Mesozoic to Proterozoic moderately to strongly deformed and metamorphosed sediments and interbedded volcanics	Of Concern	Of Concern	Not Listed	19.5	22.4	0.47

[1] Refers to ' conservation status under the *Vegetation Management Act, 1999*

2 Refers to Biodiversity status as recognised by the EPA

[3] Refers to conservation status under the *Environment Protection and Biodiversity Conservation Act, 1999*

[4] Indicates disturbed % of vegetation community within the LNG Facility t area.

[5] Indicates disturbed % of vegetation community within the Burnett-Curtis Hills and Ranges province as per Accad *et. al.* (2006)

The vegetation community of *Corymbia citriodora, Eucalyptus crebra* open forest on metamorphics ± interbedded volcanics (Not of Concern RE 12.11.6) is to be subjected to the majority of proposed disturbance (63.6 ha). This represents 63.7% of this vegetation community found on the site. However, when viewed in the broader context of regional biodiversity, this disturbance represents only 0.04% of this

community within the sub-region. This vegetation community has no current conservation significance under state or commonwealth legislation.

The intertidal communities of Mangrove shrubland to low closed forest on Quaternary estuarine deposits (RE 12.1.3) and Saltpan vegetation comprising *Sporobolus virginicus* grassland and samphire herbland on Quaternary estuarine deposits (RE 12.1.2) are subject to the least disturbance in terms of a sub-regional context (0.02% and < 0.01 % respectively). Approximately 2.8 ha of RE 12.1.2 will be cleared, representing 5.9% of the overall area of this community on site; whereas 0.5 ha of RE 12.1.3 will be cleared, representing 6.3% of the overall area of this community on site. These communities have no current conservation significance under state or commonwealth legislation.

Significant Communities

The community subjected to the second highest area of clearing is *Eucalyptus tereticornis* open forest to woodland on Cainozoic alluvial plains (Endangered RE 12.3.3). This community is listed as 'Endangered' under state legislation. Occurring within the three alluvial plains found on site, approximately 39.8 ha of this community will potentially be cleared. This disturbance represents 87.3% of the overall extent of this community found on the site. However when viewed in the broader context of regional biodiversity, this disturbance represents 0.14% of this community found within the sub-region.

The vegetation community of Microphyll / notophyll vine forest on beach ridges (RE 12.2.2) is subject to the greatest disturbance when viewed as a percentage of the overall area found on site (100%). However, the community size to be disturbed is relatively small (0.4 ha) which represents 0.03% of this vegetation community within the sub-region. Nonetheless, this community is listed as 'Endangered' under state legislation and 'Critically Endangered' under commonwealth legislation.

The vegetation community of *Eucalyptus crebra, E. tereticornis* grassy woodland on Mesozoic to Proterozoic moderately to strongly deformed and metamorphosed sediments and interbedded volcanics (RE 12.11.14) is listed as 'Of Concern' under state legislation. This community occurs throughout the site on lower coastal slopes of the site and an area of 19.5 ha is proposed to be disturbed. Clearing represents 22.4% of the extent of this community found on site. When viewed in the broader context of regional biodiversity, this disturbance represents 0.47% of this community within the sub-region.

Ecological Integrity of Impacted Communities

Vegetation within LNG facility study area has a long history of disturbance including grazing, thinning and exotic weed invasion. The site supports remnant vegetation, modified woodlands and non-remnant shrubby regrowth. The majority of vegetation in the LNG facility study area is currently grazed and exhibits some degradation of ground-cover and mid-strata. Virtually all areas of remnant vegetation have undergone some past thinning or clearing, with the exception of the semi-evergreen vine-thicket found on Hamilton Point. Despite the relatively high degree of past disturbance, the ecological integrity of remnant communities within the study area was found to be moderate, with integral ecological processes intact.

Cumulative Impacts

Although the proposed overall clearing of vegetation communities within the LNG facility site appears not to be of severe consequence on a sub-regional scale, the cumulative impacts of external proposed development within the region must be taken into account. This issue is addressed in further detail in the Cumulative Impacts Section (refer Section 8.4.5).

3.1.2 Dust Impacts

Deposition of dust, sand and soil may have potential impacts on vegetation if excessive levels are sustained over extended periods. When dust settles on plant foliage, it can reduce the amount of light penetration on the leaf surface, block and damage stomata, and slow rates of gas exchange and water loss. Reduction in the ability to photosynthesise due to physical effects may result in reduced growth rates of vegetation and decreases in floral vigour and overall community health. The potential effects of dust deposition on vegetation are determined by a number of factors including:

Section 3 Potential Impacts and Mitigation Measures

- The characteristics of leaf surfaces, such as surface roughness, influencing the rate of dust deposition on vegetation;
- Concentration and size of dust particles in the ambient air and its associated deposition rates; and
- Local meteorological conditions and the degree of penetration of dust into vegetation;

The dominant woodland species of the vegetation communities in close proximity to the proposed LNG facility typically exhibit physiological qualities that are not sensitive to dust deposition. The sclerophyllous foliage of *Eucalypt* and *Corymbia* species is generally pendulous (i.e. points down), with a thick smooth cuticle that does not encourage particulate matter to remain on the surface. The dominant woodland species are also generally hardy and well adapted to adverse conditions (e.g. extended dry conditions and low nutrient soils).

There is evidence however, that carbon dioxide exchange in mangroves may be inhibited by increased dust deposition. The mangrove *Avicennia marina* (grey mangrove), as found in the study area intertidal zone, has been shown to demonstrate reduced carbon dioxide exchange of the upper and lower leaf surfaces and thus reduced photosynthetic performance of leaves coated in coal dust (Naidoo & Chirkoot, 2004). This result is exacerbated by the presence of sticky brine secreted by salt glands. Although no significant long term dust deposition is anticipated on-site, the vulnerability of mangroves to dust deposition should be highlighted.

It is not expected that potential effects of dust deposition on vegetation within close proximity to LNG operations will be significant.

3.2 Mitigation Measures

3.2.1 Clearing Scheme

Areas of vegetation to be cleared will be restricted to the minimum area required. The use of tape, pegs or other markers will be employed to clearly delineate areas to be cleared, prior to commencement. Particular attention will be paid when delineating clearing areas in proximity to 'Endangered' and 'Of Concern' vegetation communities that will not be disturbed.

Where clearing of vegetation is within or in close proximity to riparian communities, adequate erosion and sedimentation mitigation measures will be utilized to ensure waterways are not impacted and riparian vegetation is not unduly affected (refer to Soil Erosion and Stability chapter of the EIS, Section 8.3.2.6).

Any clearing involving the removal of expansive stands of woodland vegetation will be undertaken in stages to reduce disruption for fauna dispersal, thereby retaining habitat connectivity. That is, clearing will be undertaken towards the direction of any adjacent contiguous vegetation that is not to be cleared to ensure isolated stands of vegetation are not created.

3.2.2 Weed Control

The presence of weeds on the LNG facility site and surrounding areas was found to be relatively moderate for the region (Section 2.2.4). The introduction of vehicles and heavy machinery may potentially introduce new and declared weeds, and increase the risk of spreading existing weeds across the site and its surrounds. If weed problems are detected, appropriate weed management strategies will need to be implemented for eradication and continued weed monitoring. An effective weed control program will be implemented for the LNG facility and will include:

- Effective management strategies to control the spread of declared weed species in keeping with regional management practices or DNR&W pest control fact sheets;
- Ongoing monitoring of the project site to identify any new incidence of weed infestation;
- Provision of information for project staff on the identification of declared weeds and their dispersal methods; and

- Wash down protocols for any vehicles or machinery entering and leaving site.

3.2.3 Rehabilitation of Disturbed Areas

Rehabilitation will focus on areas that are disturbed during construction. Rehabilitation of the site will involve topsoil replacement over the final landform profile. Given the large quantity of topsoil to be removed, correct storage will be important to maximise its viability for use in revegetation. Topsoil stockpiles will be no greater than 3 m high to maintain soil structure, seeds and micro-organisms. It is generally recommended that topsoil should not be stockpiled for periods longer than 6 months to maintain viability (ACMER, 2005). Methods to maintain soil quality such as seeding of stockpile areas with grass species will be implemented.

Revegetation of the site will be in two stages; the initial stage following site establishment and the second stage following decommissioning of the LNG facility. Objectives for the initial site rehabilitation include stabilising all drainage lines and disturbed areas in order to minimise erosion and sedimentation. Site establishment may also include landscaping of the plant facility surrounding infrastructure.

The second stage of site rehabilitation will utilise a variety of native species of local provenance and the focus will be on returning ecosystem function. Rehabilitation of the area will include grass and shallow-rooted shrub species, as well as the introduction of native seedlings such as *Eucalyptus crebra* (narrow-leaved ironbark) and *Corymbia citriodora* subsp. *citriodora* (lemon-scented gum) to introduce vegetation structure and diversity. The final rehabilitation specification will target the re-establishment of current Regional Ecosystems. Rehabilitation methods will be in keeping with current best practice and will employ techniques involving direct seeding and / or tube stock to ensure a viable success rate of re-established vegetation.

3.2.4 Biodiversity Offsetting

A program to implement offsetting of cleared vegetation communities will be undertaken in accordance with current Commonwealth and State legislative criteria for the offsetting of significant vegetation communities. A biodiversity offset strategy and management plan will be developed. Criteria for offset suitability will be in accordance with EPA and DEWR guidelines and best practice. General suitability criteria will include:

- The offset strategy to include the acquisition of a remnant/regrowth community that is greater in area than that which will be impacted by the project;
- The offset(s) must support the same suite of plant species contained in RE types impacted by the project;
- Site selection will give consideration to maximising biodiversity gains, (e.g. habitat requirements for migratory species that will be impacted by loss of foraging trees and water sources);
- Offset locations will be preferentially closer (at least within the locality) to communities impacted by the project;
- Offset sites will be preferentially larger contiguous stands of vegetation with connectivity to other habitat types to increase viability of ecological processes; and
- Potential offset(s) parcels will be placed under a secure protection such as a conservation covenant to ensure that protection runs with title;
- The offset strategy will include management measures to ensure offset areas remain viable in perpetuity. Such measures may include the management of supplementary planting, weed, fire, feral animal, livestock management and restriction on access; and
- The offset strategy will include monitoring and maintenance activities to measure success and viability of the offset.

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Section 5 Limitations

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The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

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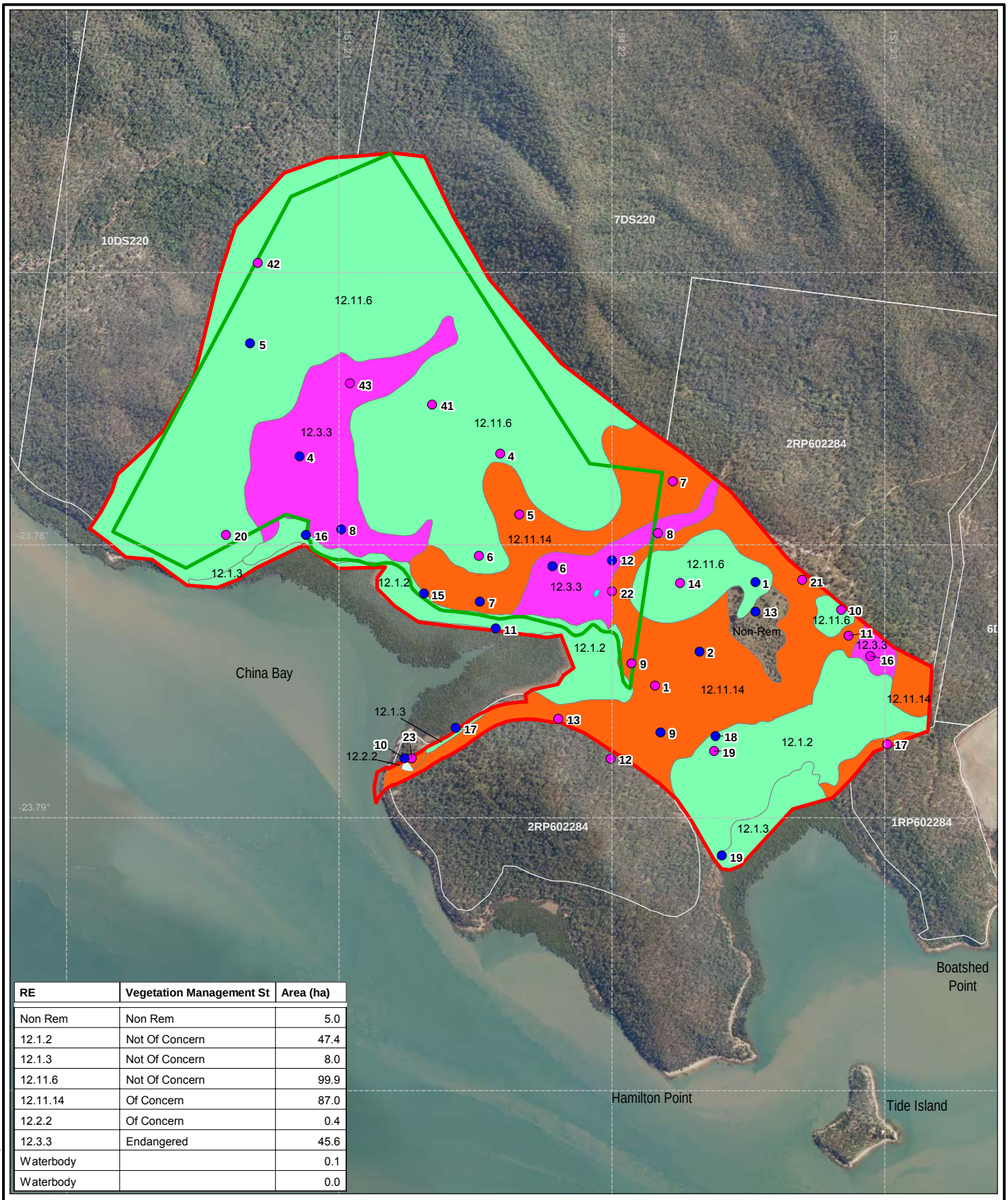

RE	Vegetation Management St	Area (ha)
Non Rem	Non Rem	5.0
12.1.2	Not Of Concern	47.4
12.1.3	Not Of Concern	8.0
12.11.6	Not Of Concern	99.9
12.11.14	Of Concern	87.0
12.2.2	Of Concern	0.4
12.3.3	Endangered	45.6
Waterbody		0.1
Waterbody		0.0

N
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0 250m 500m
Scale 1:20 000 (A4)
Datum: GDA94

Quarternary Sites
Secondary Transects
LNG Facility Site Boundary
Study Area
Endangered dominant RE
Of concern dominant RE
Not of concern RE
Waterbody

Client

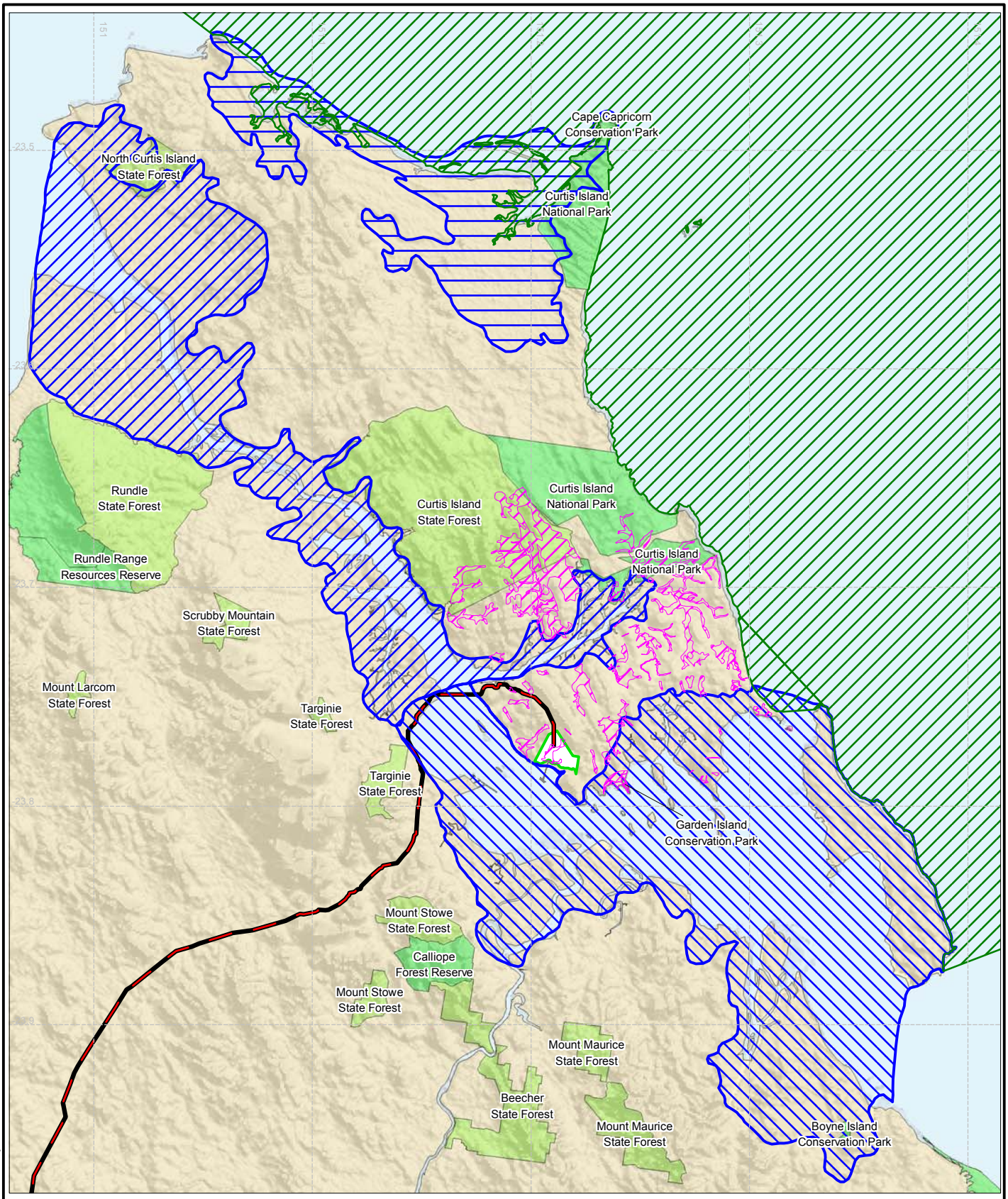
Project
GLADSTONE LNG PROJECT
TERRESTRIAL FLORA ASSESSMENT
LNG FACILITY SITE

Title
REGIONAL ECOSYSTEMS AND SURVEY LOCATIONS LNG FACILITY STUDY AREA

Drawn: CA	Approved: JB	Date: 11-02-2009
Job No: **4262 6220**	File No: 42626220-g-557b.wor	

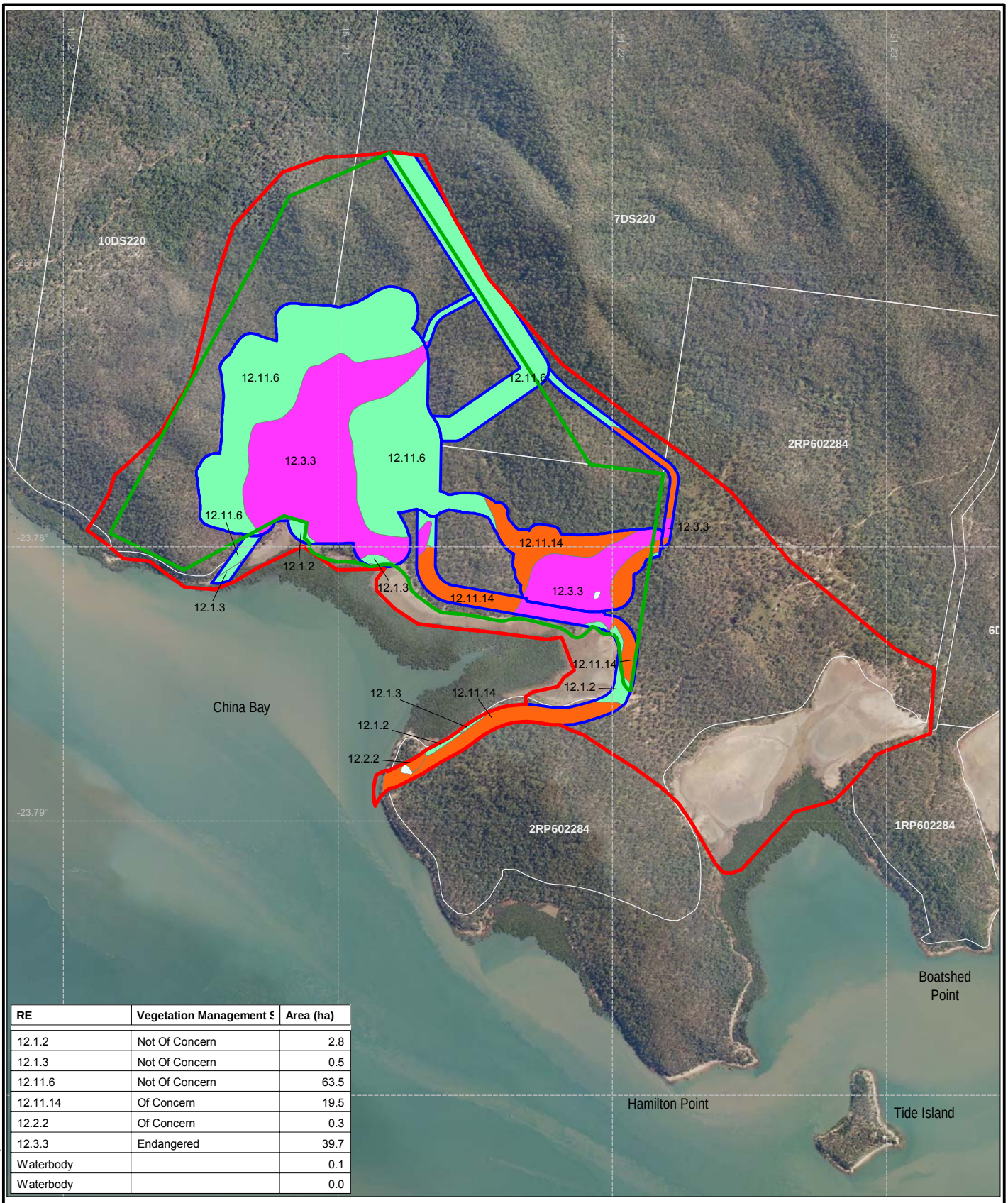
Figure: **1**

Rev: B
A4



Source: This map may contain data which is sourced and Copyright. Refer to Section 18.2 of the EIS for Ownership and Copyright.

Client	Project	Title	
	GLADSTONE LNG PROJECT TERRESTRIAL FLORA ASSESSMENT LNG FACILITY SITE	**ENVIRONMENTALLY SENSITIVE AREAS LNG FACILITY**	
Drawn: RG	Approved: JB	Date: 11-02-2009	Figure: **2**
Job No: **4262 6220**	File No: 42626220-g-556.wor		Rev:A **A4**



RE	Vegetation Management S	Area (ha)
12.1.2	Not Of Concern	2.8
12.1.3	Not Of Concern	0.5
12.11.6	Not Of Concern	63.5
12.11.14	Of Concern	19.5
12.2.2	Of Concern	0.3
12.3.3	Endangered	39.7
Waterbody		0.1
Waterbody		0.0

N
W E
S

0 250m 500m
Scale 1:20 000 (A4)
Datum: GDA94

LNG Facility Footprint
LNG Facility Site Boundary
Study Area

Endangered dominant RE
Of concern dominant RE
Not of concern RE
Waterbody

Client

Project
GLADSTONE LNG PROJECT
TERRESTRIAL FLORA ASSESSMENT
LNG FACILITY SITE

Title
BIODIVERSITY STATUS
LNG FACILITY
DISTURBANCE FOOTPRINT

Drawn: CA	Approved: JB	Date: 11-02-2009
Job No: **4262 6220**	File No: 42626220-g-558b.wor	

Figure: **3**

Rev: B
A4

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Potentially occurring significant species

Scientific Name (common name)	NC Act Status[1]	EPBC Act Status[2]	Distribution/Habitat[3]	Likelihood of presence	Data source[4]
Acacia storyi	R -		Shrub or tree to 6 m high, canopy sparse. Grows on sandstone plateaux in open forest.	Unlikely Herbrecs	
Actephila sessifolia	R -		Occurs in low microphyll vine forest.	Unlikely	Herbrecs, EPA Wildlife Online
Bosistoa selwynii (heart-leaved bosistoa)	-	V	Grows in rainforests up to 300 m in altitude. From Maryborough in Queensland south to the Tweed River district in north-east NSW.	Unlikely EPBC	
Bosistoa transversa (three-leaved bosistoa)	-	V	Grows in lowland subtropical rainforest up to 300 m in altitude. From Maryborough in Queensland south to the Nightcap Range north of Lismore in north-east NSW.	Unlikely EPBC	
Bulbophyllum globuliforme (miniature moss-orchid)	R V		Found in the McPherson Range, also Maleny and Noosa areas of the Wide Bay district. Appears to grow only on *Araucaria cunninghamii*.	Unlikely EPBC	
Cupaniopsis shirleyana (wedge-leaf tuckeroo)	V V		Small tree up to 10 m tall; usually seen as large bushy shrub. Endemic to Queensland, ranging from Carina, Brisbane to Bundaberg. Occurs in dry rainforest.	Unlikely	Herbrecs, EPBC
Indigofera baileyi (Bailey's indigo)	R -		Widespread in south-east Queensland. Found in open woodlands on granite or basalt soils.	Possible Herbrecs	
Quassia bidwillii (quassia)	V V		Shrub or small tree to 6 m that occurs from Gympie to Mackay. Grows in rainforest communities, or on the margins of these communities.	Unlikely EPBC	

1 – NC Act Status: Indicates the conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are; Extinct in the wild (PE), Endangered (E), Vulnerable (V), Rare (R), Near threatened (NT) Least concern (C).
2 - EPBC Act Status: Indicates the conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act, 1999*. The codes are: Marine (M), Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX).
3 - Information based on a number of sources including: Anderson (1993); DEWHA (2008b); Milson (2000); PlantNET (2008)
4 - EPA(i): Queensland Herbarium records retrieved 04/03/08. EPA (ii): Queensland Environmental Protection Agency Wildlife Online database records retrieved 25/01/08. DEWHA: Commonwealth DEWHA EPBC online MNES search generated 30/04/08.

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Regional Ecosystems

Community Description	Landzone	Regional Ecosystem (RE)	Area within study area (ha)	Biodiversity Status	Secondary Transects	Quaternary Sites
Saltpan vegetation comprising *Sporobolus virginicus* grassland and samphire herbland on Quaternary estuarine deposits	Marine tidal clay plains	12.1.2	47.4	Not of Concern	15,16,18 19	
Mangrove shrubland to low closed forest on Quaternary estuarine deposits		12.1.3	8	Not of Concern	11,17,19	
Microphyll/notophyll vine forest on beach ridges	Coastal sand deposits	12.2.2	0.4	Endangered	10	
Eucalyptus tereticornis open forest to woodland on Cainozoic alluvial plains	Alluvial plains	12.3.3	45.7	Endangered	4,8,12 8,16	
Corymbia citriodora and *Eucalyptus crebra* open forest to woodland on Mesozoic to Proterozoic moderately to strongly deformed and metamorphosed sediments and interbedded volcanics	Hills moderate soil fertility	12.11.6	99.9	Not of Concern	1,3,5	
Eucalyptus crebra, E. tereticornis grassy woodland on Mesozoic to Proterozoic moderately to strongly deformed and metamorphosed sediments and interbedded volcanics		12.11.14	87	Of Concern	2,7,9	3,5,7,9,11,12, 13,17,21
Non-remnant		n/a	5		13	
TOTAL 293.4						

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Vegetation Communities

Sporobolus virginicus grassland on marine clay plains (RE 12.1.2)

Description: This marine grassland community was identified at the south and west of the LNG facility site within the intertidal zone associated with Gladstone Harbour. This community is generally found in close proximity to high water mark and is characterised by the dominance of *Sporobolus virginicus* (saltwater couch). Species also recorded include *Enchylaena tomentosa* (ruby saltbush) and *Sarcocornia quinqueflora* (bead weed).

Secondary Transect 15 **Curtis Island 08/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	Saltpan
R.E	12.1.2
Transect Start	317928 mE; 7368789 mN
Transect End (50m)	317969 mE; 7368748 mN
Bearing	0
Aspect	-
Slope	0°
Soil	Fine grained marine sediments.
Weeds	-
Notes	-
Strata	**Dominant Species**
Ground (G): <1 m	*Enchylaena tomentosa*
FPC: 50%	*Epaltes australis*
Litter: 8%	*Fimbristylis polytrichoides*
Bare: 42%	*Sporobolus virginicus*

Secondary Transect 16 **Curtis Island 08/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	Saltpan
R.E	12.1.2
Transect Start	317484 mE; 7369021 mN
Transect End (50m)	317509 mE; 7368974 mN
Bearing	143° SW
Aspect	-
Slope	0°
Soil	Sand/fines, small metamorphosed rocks, medium hardness.

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Secondary Transect 16 **Curtis Island 08/04/08** **GPS Location UTM WGS '84**	
Weeds	-
Notes	-
Strata	**Dominant Species**
Ground (G):	*Enchylaena tomentosa*
FPC: 30%	*Epaltes australis*
Litter: 7%	*Sporobolus virginicus*
Bare: 63%	*Suaeda australis*

Secondary Transect 18 **Curtis Island 09/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	Saltpan
R.E	12.1.2
Transect Start	319024 mE; 7368224 mN
Transect End (50m)	319070 mE; 7368247 mN
Bearing	58 NE
Aspect	-
Slope	0°
Soil	Fine grained marine mud.
Weeds	-
Notes	-
Strata	**Dominant Species**
Ground (G): <1 m	*Fimbristylis polytrichoides*
FPC: 10%	*Sporobolus virginicus*
Litter: 90%	*Sarcocornia quinqueflora*
Bare: 0%	

Mangrove shrubland to low closed forest on Quaternary estuarine deposits (RE 12.1.3)

Description: The mangrove communities lie adjacent to RE 12.1.2 in the south-west section of the proposed plant site in the intertidal zone associated with Gladstone Harbour. This community is also found in the northern section of the pipeline fringing Graham Creek and the proposed bridge site. This community is characterised by a dense canopy cover dominated by *Rhizophera stylosa* (spotted

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mangrove), *Avicennia marina* (grey mangrove) and *Ceriops tagal* (yellow mangrove) (with the absence of any shrub or ground layer.

Secondary Transect 11 **Curtis Island 07/04/08** **GPS Location UTM WGS '84**:	
Vegetation Community	Mangroves
R.E	12.1.3
Transect Start	318198 mE; 7368650 mN
Transect End (50m)	n/a
Bearing	-
Aspect	-
Slope	0°
Soil	Marine sediments and sub-angular rocks
Weeds	-
Notes	-
Strata	**Dominant Species**
Shrub (S1): 2-4 m	*Avicennia marina*
FPC: 90%	*Ceriops tagal*
	Rhizophora stylosa
Ground (G):	No groundcover species present
FPC: 0%	
Litter: 0%	
Bare: 100%	

Secondary Transect 17 **Curtis Island 08/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	Mangroves
R.E	12.1.3
Transect Start	318053 mE; 7368245 mN
Transect End (50m)	-
Bearing	-
Aspect	0
Slope	0°
Soil	Marine mud/gravel, brown
Weeds	-

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Secondary Transect 17 **Curtis Island 08/04/08** **GPS Location UTM WGS '84**	
Notes	-
Strata	**Dominant Species**
Shrub (S1): 3-6 m	*Avicennia marina*
FPC: 90%	*Ceriops tagal*
	Exoecaria agallocha
	Rhizophora stylosa
Ground (G):	No ground cover species present
FPC: 15% (roots)	
Litter: 0%	
Bare: 85%	

Secondary Transect 19 **Curtis Island 09/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	Mangroves
R.E	12.1.3
Transect Start	319054 mE; 7367738 mN
Transect End (50m)	-
Bearing	81° E
Aspect	-
Slope	0°
Soil	Marine sediments, fine grained.
Weeds	-
Notes	-
Strata	**Dominant Species**
Shrub (S1): 2-3 m	*Avicennia marina*
FPC: 95%	*Ceriops tagal*
	Rhizophora stylosa
Ground (G):	*Ipomoea pes-caprae*
FPC: 5%	*Sesuvium portulacastrum*

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Secondary Transect 19 **Curtis Island 09/04/08** **GPS Location UTM WGS '84**	
Litter: %	*Sporobolus virginicus*
Bare: 95%	

Microphyll/notophyll vine forest on beach ridges (R.E. 12.2.2)

This vegetation community was identified along the north-west coast of Hamilton Point, and found as a discrete and isolated ecosystem. The canopy was dominated by *Corymbia tessellaris* (Moreton Bay ash), *Eucalyptus crebra* (narrow-leaved ironbark), and *Pleiogynium timorense* (Burdekin plum) with a relatively low mid-storey consisting of native dry rainforest species such as *Alectryon diversifolius* (scrub boonaree), *Cupaniopsis anacardioides, Mallotus philippensis* (kamala), and *Pouteria sericea* (mongo). The shrub layer was comparatively sparse and included *Alchornea ilicifolia, Carissa ovata* (currant bush), and *Pouteria sericea* (mongo). Introduced grass species such as *Megathyrsus maximus* var. *maximus* * (Guinea grass) and *Sida rhombifolia** (common flannel weed) dominated the ground layer.

Secondary Transect 10 **Curtis Island 07/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	Microphyll/notophyll vine forest on beach ridges
R.E	12.2.2
Transect Start	317864 mE; 7368119 mN
Transect End (50m)	317888 mE; 7368168 mN
Bearing	11° N
Aspect	-
Slope	Slight undulation
Soil	Dark brown, fine grained
Weeds	*Lantana camara* and *Opuntia stricta*
Notes	Near fauna transect 5
Strata	**Dominant Species**
Canopy (T1): 10-19 m	*Corymbia tessellaris*
FPC: 60%	*Eucalyptus crebra*
	Pleiogynium timorense
Mid-Storey (T2): 3-7 m	*Alectryon diversifolius*
	Cupaniopsis anacardioides
	Mallotus philippensis
	Petalostigma pubescens
	Pouteria sericea

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Secondary Transect 10 **Curtis Island 07/04/08** **GPS Location UTM WGS '84**	
Shrub (S1): 1-3 m	*Alchornea ilicifolia*
FPC: 15%	*Carissa ovata*
	Pouteria sericea
Ground (G): <1m	*Eustrephus latifolius*
FPC: 19%	*Megathyrsus maximus* var. *maximus* *
Litter: 78%	*Sida rhombifolia* *
Bare: 3%	

Eucalyptus tereticornis open forest to woodland on Cainozoic alluvial plains (R.E. 12.3.3)

Description: This vegetation community occurs on the alluvial plains and was found particularly on lower slopes. The extent of alluvium was determined through both field assessment and reference to the geology map. The community is characterised by *Eucalyptus tereticornis* (forest red gum) as the dominant canopy species with a mid-storey primarily comprised of *Lophostemon suaveolens* (swamp box) and *Acacia disparrima* (hickory wattle). The shrub layer is relatively dense and supports *Acacia concurrens* (black wattle), *Acacia disparrima* (hickory wattle), *Planchonia careya* (cocky apple), *Pogonolobus reticulatus* (medicine bush) and a large amount of *Sida hackettiana* in places. The ground cover is dominated by native grass and herb species including *Bothriochloa decipiens* var. *decipiens* (pitted bluegrass), *Eragrostis brownii* (Brown's lovegrass), and *Heteropogon contortus* (giant speargrass).

Structural and floristic descriptions of the dominant species in each strata for secondary sites surveyed within this vegetation unit are described in the table below.

Secondary Transect 4 **Curtis Island 05/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	*E. tereticornis* grassy woodland on alluvium
R.E	12.3.3
Transect Start	317456 mE; 7369339 mN
Transect End (50m)	317503 mE; 7369363 mN
Bearing	61° ENE
Aspect	SW
Slope	3°
Soil	Dark brown alluvium
Weeds	-
Notes	Near fauna transect 3
Strata	**Dominant Species**

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Secondary Transect 4 **Curtis Island 05/04/08** **GPS Location UTM WGS '84**	
Canopy (T1): 10-18 m	*Eucalyptus tereticornis*
FPC: 61%	
Mid-Storey (T2): 6-10 m	*Lophostemon suaveolens*
Shrub (S1): 1-2 m	*Planchonia careya*
FPC: 5%	*Pogonolobus reticulatus*
Ground (G): <1 m	*Bothriochloa decipiens var decipiens*
FPC: 56%	*Chrysopogon fallax*
Litter: 28%	*Heteropogon contortus*
Bare: 16%	

Secondary Transect 8 **Curtis Island 06/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	*E. tereticornis* woodland on alluvium
R.E.	12.3.3
Transect Start	317616 mE; 7369045 mN
Transect End (50m)	317649 mE; 7369047 mN
Bearing	107° E
Aspect	NW
Slope	2°
Soil	Grey/brown, fines, fairly hard, alluvial
Weeds	*Cryptostegia grandiflora*
Notes	Weedy understorey. Large *E. tereticornis*.
Strata	**Dominant Species**
Canopy (T1): 14-25 m	*Eucalyptus tereticornis*
FPC: 61%	
Mid-Storey (T2): 7-12 m	*Acacia disparrima*
	Lophostemon suaveolens

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Secondary Transect 8 **Curtis Island 06/04/08** **GPS Location UTM WGS '84**	
Shrub (S1): 1-3 m	*Acacia concurrens*
FPC: 15%	*Gomphocarpus physocarpus* *
	Sida hackettiana
Ground (G): <1 m	*Commelina diffusa*
FPC: 46%	*Oplisemus aemulus*
Litter: 48%	*Passiflora suberosa* *
Bare: 6%	*Sida hackettiana*

Secondary Transect 12 **Curtis Island 07/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	*E. tereticornis* & *E. crebra* woodland on alluvium
R.E.	12.3.3
Transect Start	318628 mE; 7368932 mN
Transect End (50m)	318581 mE; 7368922 mN
Bearing	240° SW
Aspect	-
Slope	0°
Soil	Alluvial, grey/brown fine grained
Weeds	*Cryptostegia grandiflora* *
Notes	Near drainage line.
Strata	**Dominant Species**
Canopy (T1): 18-24 m	*Eucalyptus crebra*
FPC: 50%	*Eucalyptus tereticornis*
Mid-Storey (T2): 8-12 m	*Lophostemon suaveolens*
Shrub (S1): 1-2 m	*Acacia disparrima*
FPC: 2%	*Pogonolobus reticulatus*
Ground (G): <1 m	*Eragrostis brownii*
FPC: 73%	*Heteropogon contortus*
Litter: 24%	*Leptochloa decipiens subsp. decipiens*

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Secondary Transect 12 **Curtis Island 07/04/08** **GPS Location UTM WGS '84**	
Bare: 3%	*Sida rhombifolia* *

Corymbia citriodora, Eucalyptus crebra open forest on metamorphics ± interbedded volcanics (RE 12.11.6)

Description: This vegetation community is dominant throughout the study site and occurs on the rocky slopes of the surrounding hills and ridges. This community is characterised by the co-dominance of *Corymbia citriodora* subsp. *citriodora* (lemon-scented gum) and *E. crebra* (narrow-leaved ironbark) in the canopy. These areas are more prone to fire and as a result the shrub layer is generally sparse to absent. The groundcover is also sparse and includes native grass and forb species, and introduced agricultural weeds. Structural and floristic descriptions of the dominant species in each strata surveyed within this vegetation unit are described in the table below.

Secondary Transect 1 **Curtis Island 04/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	*C. citriodora* & *E. crebra* woodland on metamorphics
R.E.	12.11.6
Transect Start	319165 mE; 7368851 mN
Transect End (50m)	319154 mE; 7368848 mN
Bearing	74° SSE
Aspect	SW
Slope	8°
Soil	Light grey, hard
Weeds	*Opuntia stricta**, *Lantana montevidensis**
Notes	Adjacent to fauna transect 4.
Strata	**Dominant Species**
Canopy (T1): 12-18 m	*Corymbia citriodora subsp. citriodora*
FPC: 75%	*Corymbia clarksoniana*
	Eucalyptus crebra
	Eucalyptus exserta
Mid-Storey (T2): 3-6 m	*Eucalyptus crebra*
	Corymbia citriodora subsp. citriodora

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Secondary Transect 1 **Curtis Island 04/04/08** **GPS Location UTM WGS '84**	
Shrub (S1): 1-3 m	*Acacia disparrima*
FPC: 10%	*Clerodendrum floribundum*
	Pogonolobus reticulatus
Ground (G): <1 m	*Bothriochloa decipiens var decipiens*
FPC: 25%	*Lantana montevidensis* *
Litter: 72%	*Sida cordifolia*
Bare: 3%	

Secondary Transect 5 **Curtis Island 05/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	*C. citriodora* open forest on metamorphics
R.E.	12.11.6
Transect Start	317266 mE; 7369797 mN
Transect End (50m)	317256 mE; 7369843 mN
Bearing	325° NNW
Aspect	SE
Slope	26°
Soil	Dark brown/black, hard, fine grained, numerous small metamorphosed rocks
Weeds	-
Notes	Evidence of fire in the past 5 years. Site on side of gully.
Strata	**Dominant Species**
Canopy (T1): 14-20 m	*Corymbia citriodora subsp. citriodora*
FPC: 52%	*Corymbia intermedia*
Mid-Storey (T2): 8-10 m	*Corymbia citriodora subsp. citriodora*
	Corymbia intermedia
Shrub (S1): 1-5 m	*Acacia falciformis*
FPC: 15%	*Acacia leiocalyx*
Ground (G): <1 m	*Cymbopogon refractus*
FPC: 9%	*Lomandra confertifolia subsp. pallida*

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Secondary Transect 5 **Curtis Island 05/04/08** **GPS Location UTM WGS '84**	
Litter: 90%	*Themeda triandra*
Bare: 1%	

***Eucalyptus crebra, E. tereticornis* grassy woodland on metamorphosed sediments and interbedded volcanics (RE 12.11.14).**

Description: This vegetation community is prevalent over most the lower slopes across the site and is characterised by a tall canopy of *Eucalyptus tereticornis* (forest red gum) and *E. crebra* (narrow-leaved ironbark) with occasional *Corymbia tessellaris* (Moreton Bay ash). The sub-canopy is dominated by *Corymbia intermedia* (pink bloodwood) and *Acacia disparrima* (hickory wattle), with a shrub layer including *Pogonolobus reticulatis* (medicine bush), *Planchonia careya* (cocky apple) and *Acacia leiocalyx* (black hickory wattle). The ground layer of this community includes a mix of native grasses, herbs and introduced agricultural weed species.

Secondary Transect 2 **Curtis Island 04/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	*E. tereticornis* & *E. crebra* open woodland on metamorphics
R.E.	12.11.14
Transect Start	318961 mE; 7368565 mN
Transect End (50m)	318924 mE; 7368543 mN
Bearing	42° NE
Aspect	SW
Slope	6°
Soil	Light brown, fine, hard
Weeds	*Lantana camara*, Lantana montevidensis**
Notes	Near small dam
Strata	**Dominant Species**
Canopy (T1): 13-20 m	*Eucalyptus crebra*
FPC: 53%	*Eucalyptus tereticornis*
Mid-Storey (T2): 4-7 m	*Acacia disparrima*
	Corymbia intermedia
Shrub (S1):1-3 m	*Acacia disparrima*
FPC: 6%	*Pogonolobus reticulatus*

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Secondary Transect 2 **Curtis Island 04/04/08** **GPS Location UTM WGS '84**	
Ground (G):<1 m	*Heteropogon contortus*
FPC: 26%	*Sida hackettiana*
Litter: 68%	
Bare: 6%	

Secondary Transect 6 **Curtis Island 06/04/08** **GPS Location UTM WGS '84**:	
Vegetation Community	*E. tereticornis* & *E. crebra* open woodland on metamorphics
R.E.	12.11.14
Transect Start	318406 mE; 7368905 mN
Transect End (50m)	318439 mE; 7368939 mN
Bearing	43° NE
Aspect	-
Slope	Minor undulations
Soil	Dark brown, fairly hard, quite fine sediment, small metamorphosed rocks.
Weeds	*Lantana camara**
Notes	-
Strata	**Dominant Species**
Canopy (T1): 16-20 m	*Eucalyptus crebra*
FPC: 57%	*Eucalyptus tereticornis*
Mid-Storey (T2): 8-12 m	*Lophostemon suaveolens*
Shrub (S1): 1-3 m	*Acacia disparrima*
FPC: 1%	*Alphitonia excelsa*
Ground (G): <1 m	*Heteropogon contortus*
FPC: 56%	*Malvastrum americanum*
Litter: 35%	*Sida hackettiana*
Bare: 9%	

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Secondary Transect 7 **Curtis Island 06/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	*E. crebra* and *E. tereticornis* open woodland on metamorphics
R.E.	12.11.14
Transect Start	318137 mE; 7368758 mN
Transect End (50m)	318185 mE; 7368761 mN
Bearing	78° E
Aspect	NW
Slope	6°
Soil	Light brown, very hard
Weeds	*Opuntia stricta*, Lantana camara**
Notes	Adjacent to fauna transect 2
Strata	**Dominant Species**
Canopy (T1): 14-16 m	*Eucalyptus crebra*
FPC: 65%	*Eucalyptus tereticornis*
Shrub (S1): 1-3 m	*Acacia leiocalyx*
FPC: 10%	*Pogonolobus reticulatus*
Ground (G): <1 m	*Bothriochloa decipiens var decipiens*
FPC: 23%	*Cymbopogon refractus*
Litter: 56%	*Lomandra confertifolia subsp. pallida*
Bare: 21%	*Rhynchosia minima*

Secondary Transect 9 **Curtis Island 07/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	*E. tereticornis* & *E. crebra* grassy open woodland
R.E.	12.11.14
Transect Start	318819 mE; 7368235 mN
Transect End (50m)	318819 mE; 7368266 mN
Bearing	300° NW
Aspect	-

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Secondary Transect 9 **Curtis Island 07/04/08** **GPS Location UTM WGS '84**	
Slope	0°
Soil	Dark brown, hard
Weeds	-
Notes	-
Strata	**Dominant Species**
Canopy (T1): 10-16 m	*Eucalyptus crebra*
FPC: 36%	*Eucalyptus tereticornis*
Mid-Storey (T2): 6-8 m	*Eucalyptus crebra*
	Eucalyptus tereticornis
Shrub (S1): 1-3 m	*Acacia disparrima*
FPC: 5%	
Ground (G): <1 m	*Bothriochloa decipiens var decipiens*
FPC: 55%	*Eragrostis brownii*
Litter: 40%	*Gomphrena celosioides*
Bare: 5%	*Leptochloa decipiens subsp. decipiens*

Non remnant community

Description: The non-remnant areas are located surrounding the homestead in the north-east of the proposed site, and alongside the track within the adjacent alluvial community. These communities now support a mixture of native grasses and herbs (e.g. *Bothriochloa decipiens* var *decipiens* (pitted bluegrass), *Heteropogon contortus* (giant speargrass) and *Cyperus gracilis* (slender sedge)) and exotic grass species (e.g. *Cenchrus ciliaris** (buffel grass) and *Melinis repens** (red Natal grass)). The canopy layer is very sparse and includes both *Corymbia erythrophloia* (gum-topped bloodwood) and *Corymbia tessellaris* (Moreton Bay ash) and a low shrub layer consisting of *Sida rhombifolia** (common flannel weed), *Sida hackettiana,* and *Acacia disparrima* (hickory wattle).

Secondary Transect 13 **Curtis Island 08/04/08** **GPS Location UTM WGS '84**	
Vegetation Community	*C. tessellaris* & *C. erythrophloia* regrowth
R.E.	Non remnant
Transect Start	319167 mE; 7368730 mN
Transect End (50m)	319186 mE; 7368730 mN
Bearing	12° N
Aspect	NW

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Secondary Transect 13 **Curtis Island 08/04/08** **GPS Location UTM WGS '84**	
Slope	8°
Soil	Dark brown, fine grained
Weeds	*Opuntia stricta**
Notes	-
Strata	**Dominant Species**
Canopy (T1): 4-6 m	*Corymbia erythrophloia*
FPC: <1%	*Corymbia tessellaris*
Shrub (S1): 1-3 m	*Acacia disparrima*
FPC: 30%	*Sida hackettiana*
	*Sida rhombifolia **
Ground (G): <1 m	*Bothriochloa decipiens var decipiens*
FPC: 79%	*Cynodon dactylon*
Litter: 12%	*Heteropogon contortus*
Bare: 9%	*Melinis repens **

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Curtis Island Flora Species List

	A	B	E	F	G	H	I	J	K	L	M	N	O	P	Q
1			**Secondary Transects**												
2	***Species***	**Common Name**	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**15**
3	*Acacia concurrens*	Black Wattle					I		U						
4	*Acacia disparrima*	Hickory Wattle	U	C					U	U	U		U	U	
5	*Acacia falciformis*	Broad-leaved Hickory				U									
6	*Acacia irrorata subsp. irrorata*	Green Wattle												I	
7	*Acacia leiocalyx*	Black Hickory Wattle			I	U		U						I	
8	*Acacia salicina*	Sally Wattle						I							
9	*Achyranthes aspera*	Farmers Friend									I				
10	*Aegialitis annulata*	Club Mangrove										I			
11	*Aeschynomene indica*	Buddha pea													
12	*Aeschynomene micranthos*							U							
13	*Agave americana* *	American Aloe												I	
14	*Ageratum houstonianum* *	blue billy goat weed		U											
15	*Alchornea ilicifolia*	Native Holly									U				
16	*Alectryon diversifolius*	Scrub Boonaree									U				
17	*Allocasuarina torulosa*	Forest She-oak													
18	*Alloteropsis semialata*	Cockatoo Grass					U								
19	*Alphitonia excelsa*	Red Ash	U				O				U			U	
20	*Alternanthera pungens* *	Khaki Weed												U	
21	*Alysicarpus bupleurifolius* *	sweet alys													
22	*Alyxia ruscifolia subsp. ruscifolia*	Chainfruit									U				
23	*Ammannia multiflora*	jerry-jerry							U						
24	*Aristida personata*	Purple Wiregrass	U												
25	*Aristida queenslandica var. dissimilis*	Queensland Wiregrass	U			U		U							
26	*Arundinella nepalensis*	Reed Grass			U		U								
27	*Asclepias curassavica* *	Redhead Cotton Bush							U						
28	*Avicennia marina*	Grey Mangrove										R			
29	*Bidens pilosa var. pilosa* *	Cobblers Pegs									U				
30	*Bothriochloa bladhii subsp. bladhii*	forest bluegrass													
31	*Bothriochloa decipiens var decipiens*	Pitted Bluegrass	C	C	C		U	C		A			U	A	
32	*Bougainvillea sp.*	Bougainvillea												I	
33	*Breynia oblongifolia*	Coffee Bush						R							
34	*Bruguiera gymnorhiza*	Orange Mangrove										I			
35	*Brunoniella australis*	Blue Trumpet													

	A	B	E	F	G	H	I	J	K	L	M	N	O	P	Q
1			**Secondary Transects**												
2	***Species***	**Common Name**	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**15**
36	*Bursaria incana*	Prickly Pine						I							
37	*Calyptocarpus vialis **	creeping Cinderella weed													
38	*Capillipedium parviflorum*	scented top			U										
39	*Capparis ornans*										U				
40	*Cassytha filiformis*	Dodder Laurel			U										
41	*Catharanthus roseus **	Pink Periwinkle												I	
42	*Centella asiatica*	Asiatic pennywort							U						
43	*Ceriops tagal*	Yellow Mangrove										I			
44	*Chamaecrista mimosoides*	five-leaf cassia					U								
45	*Chamaesyce bifida*				U										
46	*Cheilanthes nudiuscula*														
47	*Chloris divaricata*	Slender Chloris													U
48	*Chloris inflata **	purpletop chloris													
49	*Chloris truncata*	windmill grass													
50	*Chrysopogon fallax*	Golden Beard Grass			C										
51	*Clerodendrum floribundum*	Lolly Bush	R												
52	*Commelina diffusa*	Wandering Jew	U						U		U				
53	*Corymbia citriodora subsp. citriodora*	Lemon-scented Gum	O			O									
54	*Corymbia clarksoniana*	Clarkson's Bloodwood	I												
55	*Corymbia erythrophloia*	Gum-topped bloodwood												R	
56	*Corymbia intermedia*	Pink Bloodwood		O		O		I							
57	*Corymbia tessellaris*	Moreton Bay Ash			R			I	R				R	I	
58	*Crotalaria medicaginea var. neglecta,*	Trefoil Rattlepod												U	
59	*Crotalaria montana var. angustifolia*	Rattlepod		U			U	U							
60	*Crotalaria pallida **	Streaked Rattlepod													
61	*Cryptostegia grandiflora **	Rubber Vine							R				R		
62	*Cupaniopsis anacardioides*										U				
63	*Cyanthillium cinereum*			U			U	U							
64	*Cymbopogon refractus*	Barbwire Grass	U	U	U	U	U	C					U		
65	*Cynodon dactylon*	Couch												U	
66	*Cyperus difformis*	rice sedge			U										
67	*Cyperus fulvus*	sticky sedge	U												
68	*Cyperus gracilis*	Graceful Sedge	U		U			U	U	U	C				

	A	B	E	F	G	H	I	J	K	L	M	N	O	P	Q
1			**Secondary Transects**												
2	***Species***	**Common Name**	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**15**
69	*Cyperus javanicus*								U						
70	*Dactylocetium radulans*	Button Grass												I	
71	*Dactyloctenium aegyptium **	coast button grass	U												
72	*Dendrophthoe glabrescens*	orange mistletoe		U											
73	*Desmodium filiforme*					U	U								
74	*Desmodium heterocarpon var. strigosum*				U										
75	*Dichanthium sericeum subsp. sericeum*	Queensland blue grass	U												
76	*Dichondra repens*	Kidney Weed													
77	*Digitaria bicornis*	Finger Grass			U										
78	*Diospyros geminata*		U												
79	*Dodonaea lanceolata var. subsessilifolia*	Native Hop Bush													
80	*Echinochloa colona*	Awnless Barnyard Grass									U		U		
81	*Eleusine indica **													U	
82	*Emilia sonchifolia var. sonchifolia **	Emilia			U		U	U					U		
83	*Enchylaena tomentosa*	Ruby Saltbush													U
84	*Epaltes australis*			U									U		U
85	*Eragrostis brownii*	Brown's Lovegrass	U										U		
86	*Eragrostis sororia*	Woodland Lovegrass	U	U				U							
87	*Eremophila debilis*	Winter Apple						U							
88	*Erythrina vespertilio*	Batswing Coral Tree									I				
89	*Eucalyptus crebra*	Narrow-leaved Ironbark	O	O	O		O	O		O	O		I		
90	*Eucalyptus exserta*	Queensland Peppermint													
91	*Eucalyptus tereticornis*	Forest Red Gum		O	O		O	O	O	O	O		O		
92	*Eustrephus latifolius*	Wombat Berry	O	U	U	U		U	U		U				
93	*Evolvulus alsinoides*	Blue periwinkle					U	R		U					
94	*Exoecaria agallocha*	Milky Mangrove													
95	*Ficus rubiginosa*	Rock Fig									I				
96	*Fimbristylis bisumbellata*			U	U										
97	*Fimbristylis ferruginea*														
98	*Fimbristylis microcarya*						U								
99	*Fimbristylis polytrichoides*														U
100	*Flemingia parviflora*			U											
101	*Fuirena ciliaris*														

	A	B	E	F	G	H	I	J	K	L	M	N	O	P	Q
1			**Secondary Transects**												
2	***Species***	**Common Name**	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**15**
102	*Gahnia aspera*	Sawsedge													
103	*Galactia tenuiflora var. lucida*				U										
104	*Glossocardia bidens*	Native Cobbler's Pegs						I							
105	*Glycine tabacina*	Glycine Pea		U				U						U	
106	*Gomphocarpus physocarpus **	Balloon Cotton Bush	U	I			U	R	C					U	
107	*Gomphrena celosioides*	Gomphrena Weed	I							U					
108	*Hardenbergia violacea*	Native Sarsparilla				U									
109	*Helichrysum lanuginosum*	White Everlasting Daisy													
110	*Heteropogon contortus*	Giant Speargrass	U	C	U		C		U	U			A	U	
111	*Hibiscus divaricatus*						U								
112	*Hibiscus heterophyllus*	Native Hibiscus	I												
113	*Hypoxis pratensis*	golden weather grass					U								
114	*Imperata cylindrica*	Blady Grass			R				U						
115	*Indigofera hirsuta*	Hairy Indigo							U		I			U	
116	*Ipomoea pes-caprae*	Beach Morning Glory													
117	*Ipomoea plebeia*	Bellvine			I										
118	*Jacksonia scoparia*	Dogwood				U									
119	*Jasminum simplicifolium subsp. australiense*	Native Jasmine													
120	*Lantana camara **	Lantana		R			R	I			R				
121	*Lantana montevidensis **	Creeping Lantana	C												
122	*Leptochloa decipiens var. peacockii*														
123	*Leptochloa decipiens subsp. decipiens*	slender cane grass			O		C			A			C		
124	*Livistona decipiens*	Cabbage Palm													
125	*Lomandra confertifolia subsp. pallida*	Matrush	U	U		U		U							
126	*Lomandra multiflora*	Many-flowered Mat Rush													
127	*Lophostemon suaveolens*	Swamp Box			O		O		O				U		
128	*Ludwigia octovalvis*	Willow Primrose													
129	*Mallotus philippensis*	Kamala									U				
130	*Malvastrum americanum*	Spiked Malvastrum					U		U				U		
131	*Mangifera indica **	Mango Tree												I	
132	*Marsilea hirsuta*	Short-fruit Nardoo													
133	*Megathyrsus maximus**	Guinea Grass									C				
134	*Melaleuca quinquenervia*	Paper Tea-tree											I		

	A	B	E	F	G	H	I	J	K	L	M	N	O	P	Q
1			**Secondary Transects**												
2	***Species***	**Common Name**	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**15**
135	*Melaleuca viridiflora*	Broad Leaved Tea-tree													
136	*Melia azedarach*	White Cedar		I											
137	*Melinis repens* *	Red Natal Grass		I		I								U	
138	*Murdannia graminea*	Slug Herb					U						U		
139	*Myoporum acuminatum*	Coastal Boobialla													
140	*Myrsine variabilis*		I												
141	*Oplisemus aemulus*	Creeping Beard Grass							A						
142	*Opuntia stricta* *	Common Prickly Pear	U					I						I	
143	*Ottelia ovalifolia*	Water Poppy													
144	*Oxalis corniculata var. corniculata* *	Creeping Oxalis	U	U				U							
145	*Panicum effusum*	Hairy Panicum			U	U									
146	*Panicum decompositum*	Native Millet	U	U	U		U								
147	*Paspalidium distans*		U												
148	*Paspalum dilatatum* *	Paspalum							U						
149	*Paspalum vaginatum*	Saltwater Couch													
150	*Passiflora suberosa* *	Corky Passion Flower	U	U	U		U	U	C	U	U		U		
151	*Petalostigma pubescens*	Bitter Bark									U				
152	*Phyllanthus virgatus*		U					U		U					
153	*Planchonia careya*	Cocky Apple	U	U	R		U	U	U						
154	*Pleiogynium timorense*	Burdekin Plum									U				
155	*Pogonolobus reticulatus*	Medicine Bush	U	U	U	U	U	U		U			U		
156	*Polygala linariifolia*							U							
157	*Portulaca oleracea*	Pigweed	U												
158	*Portulaca pilosa*	Pigweed	U							U					
159	*Potamogeton javanicus* *	Javan Pondweed													
160	*Pouteria sericea*	Mongo									U				
161	*Rhizophora stylosa*	Spotted Mangrove										A			
162	*Rhynchosia minima*	Rhynchosia	U	U				U							
163	*Rostellularia obtusa*		U	U				U							
164	*Sarcocornia quinqueflora*	Bead Weed													
165	*Sarga leiocladum*	wild sorghum	U												
166	*Scleria brownii*				U			U					U		
167	*Secamone elliptica*							U							

	A	B	E	F	G	H	I	J	K	L	M	N	O	P	Q
1			**Secondary Transects**												
2	***Species***	**Common Name**	**1**	**2**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**15**
168	*Sehima nervosum*	whitegrass													
169	*Sesuvium portulacastrum*	Sea Purslane													
170	*Sida cordifolia*	Flannel Weed	C	C						U	I		U	C	
171	*Sida hackettiana*		C	C	U		U	A						A	
172	*Sida rhombifolia* *	Common Flannel Weed	U				U	U	U				U		
173	*Sigesbeckia orientalis*	Indian Weed													
174	*Solanum seaforthianum* *	Brazilian Nightshade									U				
175	*Solanum stelligerum*														
176	*Sorghum nitidum forma. aristatum*	Brown Sorghum													
177	*Spermacoce brachystema*														
178	*Spirodela punctata*	Common Duckweed													
179	*Sporobolus caroli*	Fairy Grass						U							
180	*Sporobolus virginicus*	Saltwater Couch										I			A
181	*Stachytarpheta jamaicensis* *	Jamacian Snake Vine					U								
182	*Suaeda australis*	Seablite													
183	*Tephrosia filipes*							U							
184	*Tephrosia juncea*						U								
185	*Themeda triandra*	Kangaroo Grass	U	U	R	U	U	U					I		
186	*Tridax procumbens* *	Tridax Daisy												I	
187	*Triumfetta rhomboidea* *	Chinese burr							U						
188	*Uraria lagopodioides*				U										
189	*Verbena incompta* *								U						
190	*Vitex trifolia var. trifolia*	Coastal Vitex									I				
191	*Wahlenbergia communis*	bluebells													
192	*Xanthorrhoea johnsonii*	Grass Tree				I									
193	*Ziziphus mauritiana* *	chinee apple												I	

	A	B	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1								**Quaternary Sites**							
2	***Species***	**Common Name**	**16**	**17**	**18**	**19**		**1**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
3	*Acacia concurrens*	Black Wattle								U	U				
4	*Acacia disparrima*	Hickory Wattle	R					U							U
5	*Acacia falciformis*	Broad-leaved Hickory													
6	*Acacia irrorata subsp. irrorata*	Green Wattle													
7	*Acacia leiocalyx*	Black Hickory Wattle							O			U	U	U	U
8	*Acacia salicina*	Sally Wattle													
9	*Achyranthes aspera*	Farmers Friend													
10	*Aegialitis annulata*	Club Mangrove													
11	*Aeschynomene indica*	Buddha pea	U												
12	*Aeschynomene micranthos*														
13	*Agave americana **	American Aloe													
14	*Ageratum houstonianum **	blue billy goat weed													
15	*Alchornea ilicifolia*	Native Holly													
16	*Alectryon diversifolius*	Scrub Boonaree													
17	*Allocasuarina torulosa*	Forest She-oak													
18	*Alloteropsis semialata*	Cockatoo Grass												U	
19	*Alphitonia excelsa*	Red Ash							O						
20	*Alternanthera pungens **	Khaki Weed													
21	*Alysicarpus bupleurifolius **	sweet alys										U			
22	*Alyxia ruscifolia subsp. ruscifolia*	Chainfruit													
23	*Ammannia multiflora*	jerry-jerry													
24	*Aristida personata*	Purple Wiregrass													
25	*Aristida queenslandica var. dissimilis*	Queensland Wiregrass									C				
26	*Arundinella nepalensis*	Reed Grass													
27	*Asclepias curassavica **	Redhead Cotton Bush													
28	*Avicennia marina*	Grey Mangrove		R		U									
29	*Bidens pilosa var. pilosa **	Cobblers Pegs													
30	*Bothriochloa bladhii subsp. bladhii*	forest bluegrass													U
31	*Bothriochloa decipiens var decipiens*	Pitted Bluegrass						U				U			
32	*Bougainvillea sp.*	Bougainvillea													
33	*Breynia oblongifolia*	Coffee Bush													
34	*Bruguiera gymnorhiza*	Orange Mangrove													
35	*Brunoniella australis*	Blue Trumpet						I							

	A	B	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1								**Quaternary Sites**							
2	***Species***	**Common Name**	**16**	**17**	**18**	**19**		**1**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
36	*Bursaria incana*	Prickly Pine													
37	*Calyptocarpus vialis* *	creeping Cinderella weed													
38	*Capillipedium parviflorum*	scented top													
39	*Capparis ornans*														
40	*Cassytha filiformis*	Dodder Laurel													
41	*Catharanthus roseus* *	Pink Periwinkle													
42	*Centella asiatica*	Asiatic pennywort													
43	*Ceriops tagal*	Yellow Mangrove		C		U									
44	*Chamaecrista mimosoides*	five-leaf cassia													
45	*Chamaesyce bifida*														
46	*Cheilanthes nudiuscula*											U			
47	*Chloris divaricata*	Slender Chloris										U			
48	*Chloris inflata* *	purpletop chloris	U						U						
49	*Chloris truncata*	windmill grass													
50	*Chrysopogon fallax*	Golden Beard Grass													
51	*Clerodendrum floribundum*	Lolly Bush													
52	*Commelina diffusa*	Wandering Jew													
53	*Corymbia citriodora subsp. citriodora*	Lemon-scented Gum							O		O				O
54	*Corymbia clarksoniana*	Clarkson's Bloodwood													
55	*Corymbia erythrophloia*	Gum-topped bloodwood													
56	*Corymbia intermedia*	Pink Bloodwood													
57	*Corymbia tessellaris*	Moreton Bay Ash								U			U		
58	*Crotalaria medicaginea var. neglecta,*	Trefoil Rattlepod							U						
59	*Crotalaria montana var. angustifolia*	Rattlepod													
60	*Crotalaria pallida* *	Streaked Rattlepod	I												
61	*Cryptostegia grandiflora* *	Rubber Vine													
62	*Cupaniopsis anacardioides*														
63	*Cyanthillium cinereum*														
64	*Cymbopogon refractus*	Barbwire Grass								U				U	
65	*Cynodon dactylon*	Couch													
66	*Cyperus difformis*	rice sedge													
67	*Cyperus fulvus*	sticky sedge													
68	*Cyperus gracilis*	Graceful Sedge												U	

	A	B	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1								**Quaternary Sites**							
2	***Species***	**Common Name**	**16**	**17**	**18**	**19**		**1**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
69	*Cyperus javanicus*														
70	*Dactylocetium radulans*	Button Grass													
71	*Dactyloctenium aegyptium* *	coast button grass													
72	*Dendrophthoe glabrescens*	orange mistletoe													
73	*Desmodium filiforme*														
74	*Desmodium heterocarpon var. strigosum*														
75	*Dichanthium sericeum subsp. sericeum*	Queensland blue grass													
76	*Dichondra repens*	Kidney Weed													
77	*Digitaria bicornis*	Finger Grass													
78	*Diospyros geminata*														
79	*Dodonaea lanceolata var. subsessilifolia*	Native Hop Bush									U				
80	*Echinochloa colona*	Awnless Barnyard Grass													
81	*Eleusine indica* *														
82	*Emilia sonchifolia var. sonchifolia* *	Emilia													
83	*Enchylaena tomentosa*	Ruby Saltbush													
84	*Epaltes australis*														
85	*Eragrostis brownii*	Brown's Lovegrass												U	
86	*Eragrostis sororia*	Woodland Lovegrass													
87	*Eremophila debilis*	Winter Apple													
88	*Erythrina vespertilio*	Batswing Coral Tree													
89	*Eucalyptus crebra*	Narrow-leaved Ironbark						O	U	R	U	U		O	U
90	*Eucalyptus exserta*	Queensland Peppermint						I							
91	*Eucalyptus tereticornis*	Forest Red Gum						O		O		O	O	O	
92	*Eustrephus latifolius*	Wombat Berry													
93	*Evolvulus alsinoides*	Blue periwinkle													
94	*Exoecaria agallocha*	Milky Mangrove		R											
95	*Ficus rubiginosa*	Rock Fig													
96	*Fimbristylis bisumbellata*														
97	*Fimbristylis ferruginea*		U												
98	*Fimbristylis microcarya*														
99	*Fimbristylis polytrichoides*				R										
100	*Flemingia parviflora*														
101	*Fuirena ciliaris*											U			

	A	B	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1								**Quaternary Sites**							
2	***Species***	**Common Name**	**16**	**17**	**18**	**19**		**1**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
102	*Gahnia aspera*	Sawsedge							U						
103	*Galactia tenuiflora var. lucida*														
104	*Glossocardia bidens*	Native Cobbler's Pegs													
105	*Glycine tabacina*	Glycine Pea													
106	*Gomphocarpus physocarpus* *	Balloon Cotton Bush													
107	*Gomphrena celosioides*	Gomphrena Weed													
108	*Hardenbergia violacea*	Native Sarsparilla													
109	*Helichrysum lanuginosum*	White Everlasting Daisy													
110	*Heteropogon contortus*	Giant Speargrass							U	U		U	U	U	
111	*Hibiscus divaricatus*							U							
112	*Hibiscus heterophyllus*	Native Hibiscus													
113	*Hypoxis pratensis*	golden weather grass													
114	*Imperata cylindrica*	Blady Grass													
115	*Indigofera hirsuta*	Hairy Indigo							U						
116	*Ipomoea pes-caprae*	Beach Morning Glory				I									
117	*Ipomoea plebeia*	Bellvine													
118	*Jacksonia scoparia*	Dogwood													
119	*Jasminum simplicifolium subsp. australiense*	Native Jasmine											U		
120	*Lantana camara* *	Lantana								U					
121	*Lantana montevidensis* *	Creeping Lantana													
122	*Leptochloa decipiens var. peacockii*								U						
123	*Leptochloa decipiens subsp. decipiens*	slender cane grass						U	A						
124	*Livistona decipiens*	Cabbage Palm													
125	*Lomandra confertifolia subsp. pallida*	Matrush													
126	*Lomandra multiflora*	Many-flowered Mat Rush									U				
127	*Lophostemon suaveolens*	Swamp Box											U		
128	*Ludwigia octovalvis*	Willow Primrose													
129	*Mallotus philippensis*	Kamala													
130	*Malvastrum americanum*	Spiked Malvastrum													
131	*Mangifera indica* *	Mango Tree													
132	*Marsilea hirsuta*	Short-fruit Nardoo													
133	*Megathyrsus maximus**	Guinea Grass													
134	*Melaleuca quinquenervia*	Paper Tea-tree													

	A	B	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1								**Quaternary Sites**							
2	***Species***	**Common Name**	**16**	**17**	**18**	**19**		**1**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
135	*Melaleuca viridiflora*	Broad Leaved Tea-tree						U							
136	*Melia azedarach*	White Cedar													
137	*Melinis repens* *	Red Natal Grass							U						
138	*Murdannia graminea*	Slug Herb													
139	*Myoporum acuminatum*	Coastal Boobialla													
140	*Myrsine variabilis*														
141	*Oplisemus aemulus*	Creeping Beard Grass													
142	*Opuntia stricta* *	Common Prickly Pear									U				
143	*Ottelia ovalifolia*	Water Poppy													
144	*Oxalis corniculata var. corniculata* *	Creeping Oxalis							U						
145	*Panicum effusum*	Hairy Panicum													
146	*Panicum decompositum*	Native Millet													
147	*Paspalidium distans*														
148	*Paspalum dilatatum* *	Paspalum													
149	*Paspalum vaginatum*	Saltwater Couch	U												
150	*Passiflora suberosa* *	Corky Passion Flower													
151	*Petalostigma pubescens*	Bitter Bark													
152	*Phyllanthus virgatus*														
153	*Planchonia careya*	Cocky Apple						U				U	U		
154	*Pleiogynium timorense*	Burdekin Plum													
155	*Pogonolobus reticulatus*	Medicine Bush												U	
156	*Polygala linariifolia*														
157	*Portulaca oleracea*	Pigweed													
158	*Portulaca pilosa*	Pigweed													
159	*Potamogeton javanicus* *	Javan Pondweed													
160	*Pouteria sericea*	Mongo													
161	*Rhizophora stylosa*	Spotted Mangrove	I	A		A									
162	*Rhynchosia minima*	Rhynchosia													
163	*Rostellularia obtusa*														
164	*Sarcocornia quinqueflora*	Bead Weed			I										
165	*Sarga leiocladum*	wild sorghum													
166	*Scleria brownii*														
167	*Secamone elliptica*														

	A	B	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1								**Quaternary Sites**							
2	***Species***	**Common Name**	**16**	**17**	**18**	**19**		**1**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
168	*Sehima nervosum*	whitegrass													
169	*Sesuvium portulacastrum*	Sea Purslane				I									
170	*Sida cordifolia*	Flannel Weed									U				
171	*Sida hackettiana*								U	U		U		U	
172	*Sida rhombifolia* *	Common Flannel Weed								U					
173	*Sigesbeckia orientalis*	Indian Weed							U						
174	*Solanum seaforthianum* *	Brazilian Nightshade													
175	*Solanum stelligerum*								U						
176	*Sorghum nitidum forma. aristatum*	Brown Sorghum								I					
177	*Spermacoce brachystema*							U							
178	*Spirodela punctata*	Common Duckweed													
179	*Sporobolus caroli*	Fairy Grass													
180	*Sporobolus virginicus*	Saltwater Couch	A		C	I									
181	*Stachytarpheta jamaicensis* *	Jamacian Snake Vine													
182	*Suaeda australis*	Seablite	U												
183	*Tephrosia filipes*														
184	*Tephrosia juncea*														
185	*Themeda triandra*	Kangaroo Grass						U			U				U
186	*Tridax procumbens* *	Tridax Daisy													
187	*Triumfetta rhomboidea* *	Chinese burr													
188	*Uraria lagopodioides*														
189	*Verbena incompta* *														
190	*Vitex trifolia var. trifolia*	Coastal Vitex			I										
191	*Wahlenbergia communis*	bluebells							U						
192	*Xanthorrhoea johnsonii*	Grass Tree													
193	*Ziziphus mauritiana* *	chinee apple													

	A	B	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1															
2	***Species***	**Common Name**	**11**	**12**	**13**	**14**	**16**	**17**	**19**	**20**	**21**	**22**	**23**	**41**	**42**
3	*Acacia concurrens*	Black Wattle													
4	*Acacia disparrima*	Hickory Wattle	U	U		C		C			U			C	
5	*Acacia falciformis*	Broad-leaved Hickory													
6	*Acacia irrorata subsp. irrorata*	Green Wattle													
7	*Acacia leiocalyx*	Black Hickory Wattle			U										C
8	*Acacia salicina*	Sally Wattle													
9	*Achyranthes aspera*	Farmers Friend		U											
10	*Aegialitis annulata*	Club Mangrove													
11	*Aeschynomene indica*	Buddha pea													
12	*Aeschynomene micranthos*														
13	*Agave americana **	American Aloe													
14	*Ageratum houstonianum **	blue billy goat weed													
15	*Alchornea ilicifolia*	Native Holly													
16	*Alectryon diversifolius*	Scrub Boonaree													
17	*Allocasuarina torulosa*	Forest She-oak								I					
18	*Alloteropsis semialata*	Cockatoo Grass		U											
19	*Alphitonia excelsa*	Red Ash						U							
20	*Alternanthera pungens **	Khaki Weed													
21	*Alysicarpus bupleurifolius **	sweet alys													
22	*Alyxia ruscifolia subsp. ruscifolia*	Chainfruit													
23	*Ammannia multiflora*	jerry-jerry													
24	*Aristida personata*	Purple Wiregrass													
25	*Aristida queenslandica var. dissimilis*	Queensland Wiregrass	U		U	U				U				C	C
26	*Arundinella nepalensis*	Reed Grass													
27	*Asclepias curassavica **	Redhead Cotton Bush													
28	*Avicennia marina*	Grey Mangrove													
29	*Bidens pilosa var. pilosa **	Cobblers Pegs												U	U
30	*Bothriochloa bladhii subsp. bladhii*	forest bluegrass													
31	*Bothriochloa decipiens var decipiens*	Pitted Bluegrass	U		U						U				
32	*Bougainvillea sp.*	Bougainvillea													
33	*Breynia oblongifolia*	Coffee Bush													
34	*Bruguiera gymnorhiza*	Orange Mangrove													
35	*Brunoniella australis*	Blue Trumpet													

	A	B	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1															
2	***Species***	**Common Name**	**11**	**12**	**13**	**14**	**16**	**17**	**19**	**20**	**21**	**22**	**23**	**41**	**42**
36	*Bursaria incana*	Prickly Pine													
37	*Calyptocarpus vialis **	creeping Cinderella weed				U									
38	*Capillipedium parviflorum*	scented top													
39	*Capparis ornans*														
40	*Cassytha filiformis*	Dodder Laurel													
41	*Catharanthus roseus **	Pink Periwinkle													
42	*Centella asiatica*	Asiatic pennywort													
43	*Ceriops tagal*	Yellow Mangrove													
44	*Chamaecrista mimosoides*	five-leaf cassia													
45	*Chamaesyce bifida*														
46	*Cheilanthes nudiuscula*														
47	*Chloris divaricata*	Slender Chloris													
48	*Chloris inflata **	purpletop chloris													
49	*Chloris truncata*	windmill grass				U									
50	*Chrysopogon fallax*	Golden Beard Grass													
51	*Clerodendrum floribundum*	Lolly Bush													
52	*Commelina diffusa*	Wandering Jew													
53	*Corymbia citriodora subsp. citriodora*	Lemon-scented Gum								C				U	U
54	*Corymbia clarksoniana*	Clarkson's Bloodwood													
55	*Corymbia erythrophloia*	Gum-topped bloodwood													
56	*Corymbia intermedia*	Pink Bloodwood		U	U										U
57	*Corymbia tessellaris*	Moreton Bay Ash			U		O								
58	*Crotalaria medicaginea var. neglecta,*	Trefoil Rattlepod													
59	*Crotalaria montana var. angustifolia*	Rattlepod								U					
60	*Crotalaria pallida **	Streaked Rattlepod													
61	*Cryptostegia grandiflora **	Rubber Vine											I		
62	*Cupaniopsis anacardioides*														
63	*Cyanthillium cinereum*														
64	*Cymbopogon refractus*	Barbwire Grass						C							U
65	*Cynodon dactylon*	Couch													
66	*Cyperus difformis*	rice sedge													
67	*Cyperus fulvus*	sticky sedge													
68	*Cyperus gracilis*	Graceful Sedge													

	A	B	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1															
2	***Species***	**Common Name**	**11**	**12**	**13**	**14**	**16**	**17**	**19**	**20**	**21**	**22**	**23**	**41**	**42**
69	*Cyperus javanicus*								U						
70	*Dactylocetium radulans*	Button Grass													
71	*Dactyloctenium aegyptium* *	coast button grass													
72	*Dendrophthoe glabrescens*	orange mistletoe													
73	*Desmodium filiforme*														
74	*Desmodium heterocarpon var. strigosum*														
75	*Dichanthium sericeum subsp. sericeum*	Queensland blue grass				U									
76	*Dichondra repens*	Kidney Weed										I			
77	*Digitaria bicornis*	Finger Grass													
78	*Diospyros geminata*														
79	*Dodonaea lanceolata var. subsessilifolia*	Native Hop Bush													
80	*Echinochloa colona*	Awnless Barnyard Grass													
81	*Eleusine indica* *														
82	*Emilia sonchifolia var. sonchifolia* *	Emilia													
83	*Enchylaena tomentosa*	Ruby Saltbush													
84	*Epaltes australis*														
85	*Eragrostis brownii*	Brown's Lovegrass													
86	*Eragrostis sororia*	Woodland Lovegrass													
87	*Eremophila debilis*	Winter Apple		U											
88	*Erythrina vespertilio*	Batswing Coral Tree													
89	*Eucalyptus crebra*	Narrow-leaved Ironbark	U	O		O		O		R	C			U	U
90	*Eucalyptus exserta*	Queensland Peppermint													
91	*Eucalyptus tereticornis*	Forest Red Gum	O		O		O	O			R			U	
92	*Eustrephus latifolius*	Wombat Berry													U
93	*Evolvulus alsinoides*	Blue periwinkle													
94	*Exoecaria agallocha*	Milky Mangrove													
95	*Ficus rubiginosa*	Rock Fig													
96	*Fimbristylis bisumbellata*														
97	*Fimbristylis ferruginea*														
98	*Fimbristylis microcarya*														
99	*Fimbristylis polytrichoides*														
100	*Flemingia parviflora*														
101	*Fuirena ciliaris*														

	A	B	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1															
2	***Species***	**Common Name**	**11**	**12**	**13**	**14**	**16**	**17**	**19**	**20**	**21**	**22**	**23**	**41**	**42**
102	*Gahnia aspera*	Sawsedge													
103	*Galactia tenuiflora var. lucida*					U									
104	*Glossocardia bidens*	Native Cobbler's Pegs													
105	*Glycine tabacina*	Glycine Pea													
106	*Gomphocarpus physocarpus **	Balloon Cotton Bush					C								
107	*Gomphrena celosioides*	Gomphrena Weed													
108	*Hardenbergia violacea*	Native Sarsparilla													
109	*Helichrysum lanuginosum*	White Everlasting Daisy								U					
110	*Heteropogon contortus*	Giant Speargrass	U								U			A	A
111	*Hibiscus divaricatus*														
112	*Hibiscus heterophyllus*	Native Hibiscus													
113	*Hypoxis pratensis*	golden weather grass													
114	*Imperata cylindrica*	Blady Grass													
115	*Indigofera hirsuta*	Hairy Indigo													
116	*Ipomoea pes-caprae*	Beach Morning Glory													
117	*Ipomoea plebeia*	Bellvine													
118	*Jacksonia scoparia*	Dogwood								U					
119	*Jasminum simplicifolium subsp. australiense*	Native Jasmine													
120	*Lantana camara **	Lantana													
121	*Lantana montevidensis **	Creeping Lantana													
122	*Leptochloa decipiens var. peacockii*														
123	*Leptochloa decipiens subsp. decipiens*	slender cane grass	U					C			U				
124	*Livistona decipiens*	Cabbage Palm										I			
125	*Lomandra confertifolia subsp. pallida*	Matrush													
126	*Lomandra multiflora*	Many-flowered Mat Rush													
127	*Lophostemon suaveolens*	Swamp Box													
128	*Ludwigia octovalvis*	Willow Primrose										U			
129	*Mallotus philippensis*	Kamala													
130	*Malvastrum americanum*	Spiked Malvastrum			U										
131	*Mangifera indica **	Mango Tree													
132	*Marsilea hirsuta*	Short-fruit Nardoo										C	U		
133	*Megathyrsus maximus**	Guinea Grass													
134	*Melaleuca quinquenervia*	Paper Tea-tree					U								

	A	B	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
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2	***Species***	**Common Name**	**11**	**12**	**13**	**14**	**16**	**17**	**19**	**20**	**21**	**22**	**23**	**41**	**42**
135	*Melaleuca viridiflora*	Broad Leaved Tea-tree													
136	*Melia azedarach*	White Cedar													
137	*Melinis repens* *	Red Natal Grass													
138	*Murdannia graminea*	Slug Herb													
139	*Myoporum acuminatum*	Coastal Boobialla					I								
140	*Myrsine variabilis*														
141	*Oplisemus aemulus*	Creeping Beard Grass													
142	*Opuntia stricta* *	Common Prickly Pear													
143	*Ottelia ovalifolia*	Water Poppy										C	C		
144	*Oxalis corniculata var. corniculata* *	Creeping Oxalis													
145	*Panicum effusum*	Hairy Panicum													
146	*Panicum decompositum*	Native Millet		U											
147	*Paspalidium distans*														
148	*Paspalum dilatatum* *	Paspalum													
149	*Paspalum vaginatum*	Saltwater Couch													
150	*Passiflora suberosa* *	Corky Passion Flower													
151	*Petalostigma pubescens*	Bitter Bark													
152	*Phyllanthus virgatus*														
153	*Planchonia careya*	Cocky Apple		U	U										
154	*Pleiogynium timorense*	Burdekin Plum													
155	*Pogonolobus reticulatus*	Medicine Bush		U				U		U					O
156	*Polygala linariifolia*														
157	*Portulaca oleracea*	Pigweed													
158	*Portulaca pilosa*	Pigweed													
159	*Potamogeton javanicus* *	Javan Pondweed										C	C		
160	*Pouteria sericea*	Mongo													
161	*Rhizophora stylosa*	Spotted Mangrove													
162	*Rhynchosia minima*	Rhynchosia													
163	*Rostellularia obtusa*														
164	*Sarcocornia quinqueflora*	Bead Weed													
165	*Sarga leiocladum*	wild sorghum													
166	*Scleria brownii*														
167	*Secamone elliptica*														

	A	B	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1															
2	***Species***	**Common Name**	**11**	**12**	**13**	**14**	**16**	**17**	**19**	**20**	**21**	**22**	**23**	**41**	**42**
168	*Sehima nervosum*	whitegrass				U									
169	*Sesuvium portulacastrum*	Sea Purslane													
170	*Sida cordifolia*	Flannel Weed		U											
171	*Sida hackettiana*		U		U	U					U			C	C
172	*Sida rhombifolia* *	Common Flannel Weed													
173	*Sigesbeckia orientalis*	Indian Weed													
174	*Solanum seaforthianum* *	Brazilian Nightshade													
175	*Solanum stelligerum*														
176	*Sorghum nitidum forma. aristatum*	Brown Sorghum													
177	*Spermacoce brachystema*														
178	*Spirodela punctata*	Common Duckweed											C		
179	*Sporobolus caroli*	Fairy Grass													
180	*Sporobolus virginicus*	Saltwater Couch													
181	*Stachytarpheta jamaicensis* *	Jamacian Snake Vine													
182	*Suaeda australis*	Seablite													
183	*Tephrosia filipes*														
184	*Tephrosia juncea*														
185	*Themeda triandra*	Kangaroo Grass													
186	*Tridax procumbens* *	Tridax Daisy													
187	*Triumfetta rhomboidea* *	Chinese burr													
188	*Uraria lagopodioides*														
189	*Verbena incompta* *														
190	*Vitex trifolia var. trifolia*	Coastal Vitex													
191	*Wahlenbergia communis*	bluebells													
192	*Xanthorrhoea johnsonii*	Grass Tree													
193	*Ziziphus mauritiana* *	chinee apple													

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2	***Species***	**Common Name**	**43**			
3	*Acacia concurrens*	Black Wattle				
4	*Acacia disparrima*	Hickory Wattle				
5	*Acacia falciformis*	Broad-leaved Hickory				
6	*Acacia irrorata subsp. irrorata*	Green Wattle				
7	*Acacia leiocalyx*	Black Hickory Wattle	U			
8	*Acacia salicina*	Sally Wattle				
9	*Achyranthes aspera*	Farmers Friend				
10	*Aegialitis annulata*	Club Mangrove				
11	*Aeschynomene indica*	Buddha pea				
12	*Aeschynomene micranthos*					
13	*Agave americana **	American Aloe				
14	*Ageratum houstonianum **	blue billy goat weed				
15	*Alchornea ilicifolia*	Native Holly				
16	*Alectryon diversifolius*	Scrub Boonaree				
17	*Allocasuarina torulosa*	Forest She-oak				
18	*Alloteropsis semialata*	Cockatoo Grass				
19	*Alphitonia excelsa*	Red Ash				
20	*Alternanthera pungens **	Khaki Weed				
21	*Alysicarpus bupleurifolius **	sweet alys				
22	*Alyxia ruscifolia subsp. ruscifolia*	Chainfruit				
23	*Ammannia multiflora*	jerry-jerry				
24	*Aristida personata*	Purple Wiregrass				
25	*Aristida queenslandica var. dissimilis*	Queensland Wiregrass				
26	*Arundinella nepalensis*	Reed Grass				
27	*Asclepias curassavica **	Redhead Cotton Bush				
28	*Avicennia marina*	Grey Mangrove				
29	*Bidens pilosa var. pilosa **	Cobblers Pegs				
30	*Bothriochloa bladhii subsp. bladhii*	forest bluegrass				
31	*Bothriochloa decipiens var decipiens*	Pitted Bluegrass				
32	*Bougainvillea sp.*	Bougainvillea				
33	*Breynia oblongifolia*	Coffee Bush	U			
34	*Bruguiera gymnorhiza*	Orange Mangrove				
35	*Brunoniella australis*	Blue Trumpet				

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2	***Species***	**Common Name**	**43**			
36	*Bursaria incana*	Prickly Pine				
37	*Calyptocarpus vialis* *	creeping Cinderella weed				
38	*Capillipedium parviflorum*	scented top				
39	*Capparis ornans*					
40	*Cassytha filiformis*	Dodder Laurel				
41	*Catharanthus roseus* *	Pink Periwinkle				
42	*Centella asiatica*	Asiatic pennywort				
43	*Ceriops tagal*	Yellow Mangrove				
44	*Chamaecrista mimosoides*	five-leaf cassia				
45	*Chamaesyce bifida*					
46	*Cheilanthes nudiuscula*					
47	*Chloris divaricata*	Slender Chloris				
48	*Chloris inflata* *	purpletop chloris				
49	*Chloris truncata*	windmill grass				
50	*Chrysopogon fallax*	Golden Beard Grass				
51	*Clerodendrum floribundum*	Lolly Bush				
52	*Commelina diffusa*	Wandering Jew				
53	*Corymbia citriodora subsp. citriodora*	Lemon-scented Gum	I			
54	*Corymbia clarksoniana*	Clarkson's Bloodwood				
55	*Corymbia erythrophloia*	Gum-topped bloodwood				
56	*Corymbia intermedia*	Pink Bloodwood				
57	*Corymbia tessellaris*	Moreton Bay Ash				
58	*Crotalaria medicaginea var. neglecta,*	Trefoil Rattlepod				
59	*Crotalaria montana var. angustifolia*	Rattlepod				
60	*Crotalaria pallida* *	Streaked Rattlepod				
61	*Cryptostegia grandiflora* *	Rubber Vine				
62	*Cupaniopsis anacardioides*					
63	*Cyanthillium cinereum*					
64	*Cymbopogon refractus*	Barbwire Grass				
65	*Cynodon dactylon*	Couch				
66	*Cyperus difformis*	rice sedge				
67	*Cyperus fulvus*	sticky sedge				
68	*Cyperus gracilis*	Graceful Sedge				