Appendix H

Vegetation and Flora Study
prepared by EcOz Environmental Services



Environmental Impact Statement for the proposed Trans Territory Pipeline

Vegetation and Flora Study

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(iii) each company engaged by any one or more of an Alcan Group Company, Woodside Energy Limited or Eni Australia BV,

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(d) "**Gove Operations**" means the alumina refinery operations of the Alcan Group of Companies in Nhulunbuy (Gove) in the Northern Territory.

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(g) "**Gas Transportation Project**" means the project to develop a natural gas pipeline to transport natural gas to the Gove Operations.

EXECUTIVE SUMMARY

This report investigates the existing vegetation and flora and potential environmental impacts of the construction and operation of a gas pipeline and associated above-ground facilities to transport gas from the proposed Blacktip gas plant near Wadeye to the Alcan Alumina Refinery on the Gove Peninsula in north-east Arnhem Land. This report does not include an assessment of the vegetation and flora along proposed access tracks to the pipeline corridor, which were being surveyed at the time this report was prepared.

Methods

A desktop literature review and consultation with government management agencies was undertaken to identify flora species of conservation significance, vegetation types and environmental constraints present in the TTP project area. The information collated in the desktop study was verified and supplemented by field surveys, involving continuous field traverses of all except 50 km of the TTP corridor, and site assessments at 334 sites in the pipeline corridor, 4 sites proposed for compressor stations and 5 sites proposed for construction camps. The surveys were undertaken over an 8 week period from October to December in 2003, and another 8 week period in July to September 2004. The purpose of the surveys was to:

- *identify an environmentally acceptable project area;*
- *identify environmentally sensitive areas and make recommendations for their protection;*
- *document the existing floral environment; and*
- *gain a wider understanding of the environment in the project area to inform an assessment of the potential local and regional impacts.*

Existing Vegetation and Flora

The vegetation traversed by the pipeline corridor is characterised by 16 Vegetation Groups within 10 Broad Vegetation Groups as defined by Fox et al. (2001) in their classification of the vegetation of the Australian tropical savannas (see Table below). Woodlands to forests dominated by Eucalyptus miniata and E. tetrodonta, which are the most common vegetation associations in the Top End of the Northern Territory, characterise over 60% of the current pipeline corridor. Woodlands dominated by associations of Eucalyptus tectifica and Corymbia spp. are the next most common vegetation in the project area, comprising over 20% of the current pipeline corridor. Communities that are typically restricted in areal extent, such as riparian corridors, rainforest patches, Melaleuca woodlands and swamps, were not accurately identified in the vegetation classification. However, the locations and characteristics of these communities were identified during the field surveys and are recorded in this report so that appropriate management and mitigation of impacts can be implemented.

Broad Vegetation Groups and Vegetation Units traversed by the current pipeline corridor.

Broad Vegetation Groups*	***Vegetation Units****	***Total Distance Traversed (km)***
Woodlands and open-woodlands dominated by Eucalyptus tetrodonta and E. miniata (5)	*Eucalyptus miniata and E. tetrodonta open forest with Sarga spp. tussock grasses (D4)*	*323*
	Eucalyptus tetrodonta and E. miniata woodland with or without Corymbia bleeseri with Sarga spp. tall grasses (H6)	*167*
	Eucalyptus tetrodonta and E. miniata woodland with or without Corymbia spp. and/or Livistona spp with a ground layer of tussock grasses and Triodia bitextura (D14)	*50*
	Eucalyptus tetrodonta and/or Melaleuca viridiflora woodland with or without Callitris intratropica, with Triodia bitextura hummock grasses (D13)	*32*
Open forests and woodlands dominated by Eucalyptus spp. and Corymbia spp. on drainage lines and alluvial plains (3)	*Eucalyptus camaldulensis and/or Eucalyptus spp. woodland on channels and levees (C7)*	*9*
	Eucalyptus spp. grassy low woodland on alluvial plains with or without Excoecaria parvifolia (C10)	*12*
Woodlands dominated by Eucalyptus tectifica and	*Eucalyptus tectifica and\or Corymbia spp. woodland with Sarga spp. tussock grasses*	*212*

*Broad Vegetation Groups**	*Vegetation Units**	*Total Distance Traversed (km)*
Corymbia spp. (4)	*(D10)*	
Low woodlands to open woodlands dominated by Corymbia dichromophloia (10)	*Corymbia dichromophloia, Eucalyptus miniata open woodland with or without E. tetrodonta, with Triodia bitextura and Sarga spp. grasses (H9 and D5)*	*39*
Low woodlands dominated by Melaleuca spp. on depositional plains or alluvium (20)	*Melaleuca viridiflora or M. nervosa grassy low open woodland with or without a shrub layer and\or emergent trees (C13)*	*24*
Low open woodlands dominated by Corymbia terminalis (8)	*Corymbia terminalis low open woodland with Triodia pungens hummock grasses with or without tussock grasses (D25)*	*5*
Woodlands dominated by Eucalyptus pruinosa and Bauhinia cunninghamii (9)	*Eucalyptus pruinosa low open woodland with or without Bauhinia cunninghamii, with a sparse understorey of tussock grasses or Triodia spp. hummock grasses (D29)*	*43*
Acacia shirleyi and Acacia spp. associations on dissected residual surfaces and sandstone hills (17)	*Acacia shirleyi and\or other Acacia spp. and\or Eucalyptus spp. low woodland with short tussock grasses and\or Triodia spp. hummock grasses (E1)*	*17*
Tussock grasslands (23)	*Tussock grassland sparsely wooded with low trees (C18)*	*8*
Open forests and woodlands of Melaleuca spp. associated with rivers, lagoons and swamps (19)	*Melaleuca spp. open forest (C3)*	*2*
		943 km

**BVG's and Map Units taken from Vegetation of Australian Tropical Savannas map (Fox et al. 2001). Numbers in brackets refer to BVG and Map Unit numbers used in the map and in the maps produced in this report.*

Weeds

Fifteen weed species were recorded during the field surveys, and further 16 weeds of potential concern were identified from published information and consultations with the Weeds Branch of the Department of Infrastructure, Planning and Environment (DIPE). Weeds were most prevalent on land under pastoral lease, and on the freehold properties in the Katherine region. In these areas infestations are generally concentrated around infrastructure such as water points, fence lines and tracks, and also along the banks of watercourses where cattle and feral animals tend to congregate. Nineteen of the species identified from the field surveys and desktop review are 'declared' weeds under the NT Weeds Management Act. Weeds of National Significance (WONS) recorded in the project area include Prickly Acacia Acacia nilotica and Parkinsonia Parkinsonia aculeata, both of which were recorded on Mainoru Station. The WONS Mimosa Mimosa pigra occurs on the floodplains in the western coastal areas of the Northern Territory including at sites on the Moyle River floodplain, however, no infestations were observed during the field surveys.

Vegetation Communities of Conservation Significance

Vegetation communities of conservation significance including riparian corridors, wetlands (swamps and floodplains), monsoon vine forests and sandstone communities occur in proximity to the project area. Most communities of notable conservation significance were avoided during the design phase through a process of negotiations between the pipeline engineer, environmental scientist and traditional owners while in the field. The locations and characteristics of communities of conservation significance that could be affected by construction and operation are summarised in the table below along with recommendations on management and mitigation measures to minimise impacts. All communities of conservation significance that were avoided during the design phase are identified in this report.

Communities and species of conservation significance

LOCATION (KP)	*COMMUNITY*	*RECOMMENDATIONS*
Riparian Corridors		
75, 266, 309, 370, 401, 424, 550, 600, 701, 852, 881, 913, 922	*Riparian corridor over major, permanent rivers/creeks*	*Horizontal Directional Drilling*
74, 92, 217, 231, 444, 499, 506, 509, 570, 579,658, 685, 873, 929, Mainoru Bypass (x 1)	*Riparian corridor over permanent/semi-permanent watercourse*	*Management measures for wet watercourse crossings*
55, 63, 323, 390, 463, 538, Mainoru Bypass (x4)	*Riparian corridor over seasonal watercourse*	*Management measures for dry watercourse crossings*
Wetlands of Regional Significance		
107, 111, 167, 734, 856, 934, Mainoru Bypass (x1)	*Semi-permanent and seasonally inundated swamps*	*Management measures for saturated soils*
Mainoru Bypass	*Spring*	*Move route if bypass used*
Mainoru Bypass	*Semi-permanent waterhole*	*Move route if bypass used*
Wetlands of National Significance		
17-82	*Moyle Floodplain and Hyland Bay Wetlands*	*HDD Moyle River crossing* *Management measures for wet watercourse crossing at KP74*
699-781	*Arafura Swamp and Catchment*	*HDD Goyder River crossing* *Management measures for saturated soils at KP734*
Monsoon Rainforest		
60-80, 834-840, 850, 912-925	*Spring-fed rainforest*	*Avoid direct impact on patches* *Maintain a 500 m vegetation buffer* *Manage watercourse crossings to avoid downstream impacts*
348-356, 912-925	*Dry monsoon rainforest*	*Avoid direct impact on patches* *Maintain a 500 m vegetation buffer*
Sandstone		
75-85, 210-220, 430-530, 760-785	*Sandstone communities*	*Develop and implement a fire management plan*

Flora Species of Conservation Significance

Pternandra coerulescens is the only 'threatened' plant species that possibly occurs in the pipeline corridor, although others have been recorded in the region. P. coerulescens has previously been recorded from a location 750m south-east of where the pipeline corridor will cross the Latram River (KP922), however, surveys of the Latram River at the proposed pipeline crossing did not identify any specimens of this species. HDD techniques are proposed for constructing the Latram River crossing, therefore, it is considered unlikely that the project will impact on P. coerulescens.

Other species of conservation interest are the Northern Cypress Pine Callitris intratropica, a species that currently occupies only a fraction of its potential range and has experienced a widespread collapse due to the impact of contemporary fire regimes (Bowman and Panton 1993), and Cycads which are endemic to the Northern Territory and of potential of commercial value.

Impacts and Management

The potential impacts of the proposed TTP project on vegetation and flora have been minimised during the design phase of the project by locating the pipeline corridor and permanent and temporary above ground infrastructure so that vegetation communities of high conservation value, and\or that play a regional role in maintaining ecosystems, are avoided. In addition, horizontal directional drilling construction techniques have been recommended for constructing a number of the major watercourse crossings in order to avoid ecologically

important riparian vegetation corridors and minimise the potential for downstream impacts. By taking into account the regional role of vegetation in maintaining ecosystem processes, and the conservation values of vegetation communities and flora, during the design process, the potential impacts of the project will be minimised as long as appropriate management measures are implemented for the duration of construction and operation.

The main potential impacts of construction and operation of the proposed pipeline are:

- *clearing of vegetation – clearing of vegetation will be required for the pipeline corridor, above ground facilities such as compressor stations, access tracks, and temporary facilities such as construction camps, borrow pits and laydown areas;*

- *degradation of sensitive vegetation communities and habitats – this could occur through direct or indirect disturbance of communities as a result of inadequate management of construction and operation activities near to sensitive areas;*

- *introduction and spread of exotic species – disturbance and increased access during construction and operation may introduce and spread weed species with associated potential for adverse impacts on the ecological integrity of vegetation communities.*

The potential impacts of construction and operation are discussed in detail in this report and management measures to mitigate the adverse impacts of the project are recommended for before, during and after construction. Additional measures for minimisation of site specific impacts should be developed following determination of the final design specifications.

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ACKNOWLEDGEMENTS

We would like to thank Chris Brady, Ron Firth and Daniel Banfai for their contribution to botanical surveys, and the NT Herbarium, especially Ian Cowie and Raelee Kerrigan, for their assistance in identifying key issues and identification of voucher specimens. The Department of Infrastructure, Planning and Environment is acknowledged for the provision of data to the project. Specifically, Peter Krause is acknowledged for collating the data for us. Renee Bartolo and Josh Forner of Gecoz are acknowledged for their contribution to the development of a vegetation classification for the project.

The environmental surveys were conducted by Kylie Harvey and Noel Preece. Surveys on Aboriginal Land were facilitated by Dehne McGlaughlin and his team at the Northern Land Council. We would also like to thank the Traditional Owners and various field assistants from communities across the Northern Territory who showed us the way through their country. Field survey logistics were managed by the team at the TTP office in Darwin. We would especially like to thank Des Stones, Jim Dalton and Katie Tchia for their role.

1 INTRODUCTION

EcOz Environmental Services was contracted by Alcan Engineering Pty. Ltd. to undertake studies of the terrestrial vegetation and flora in the areas proposed for development of the Trans Territory Pipeline (TTP). The TTP will traverse 940 km in an east-west direction across the Northern Territory. The pipeline will transport gas brought ashore near Wadeye from the Blacktip gas field to the Alcan Alumina Refinery on the Gove Peninsula in north-eastern Arnhem Land. The proposal has been declared a controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act* (*EPBC Act*) because it was considered likely to have significant impacts on listed threatened species and communities, and listed migratory species. The proposal is also subject to assessment under the Northern Territory *Environmental Assessment Act*. An Environmental Impact Statement (EIS) is required to assess the potential impacts of the project and to develop environmental management strategies. This report on the vegetation and flora that occur in the TTP project area has been prepared to provide information to guide the assessment of potential impacts of the project on vegetation and flora, and will be included as a technical appendix to the EIS.

This report is primarily concerned with documenting baseline information on the vegetation and flora that occur along the proposed TTP corridor, and the alternative Mainoru Bypass route, and assessing the potential impacts of clearing of a 30 m 'Right of Way' (ROW) and constructing a pipeline. Preliminary assessment of the vegetation and flora that occur at locations proposed for construction camps and compressor stations has been included where the design details of these aspects were sufficient to conduct a field assessment prior to preparation of this report. Locations of other above-ground facilities and access tracks were being subject to field surveys at the time this report was being prepared and therefore will be addressed in a separate document. For the purpose of this report the pipeline corridor, above ground facilities and all other areas where project related activities will take place are collectively referred to as the 'project area'. The proponent has indicated a commitment to conducting baseline surveys and assessing the potential impacts associated with all parts of the project area not assessed as part of this study prior to construction. Areas that have not been subject to surveys to date are identified and discussed in the body of this report.

The "Guidelines for Preparation of a Draft Environmental Impact Statement on the Trans Territory Underground Pipeline (Department of Infrastructure, Planning and Environment, January 2004)" detail the specific requirements of the EIS document that is to be prepared for the TTP proposal in accordance with Clause 8 of the Environmental Assessment Administrative Procedures of the *Environmental Assessment Act* and Chapter 4 Division 6 of the *EPBC Act*. The vegetation and flora study was undertaken to satisfy the requirements of the Guidelines, and more specifically to provide baseline information to guide an assessment of the potential impacts of the proposal and the development of appropriate management strategies for the project. This report documents the findings of field surveys, consultations with management agencies and reviews of existing information, and identifies the potential effects of the TTP proposal on vegetation and flora.

2 STATUTORY OBLIGATIONS

The TTP proposal requires approval under the *Environmental Assessment Act* and *EPBC Act*. As part of this process the Northern Territory and Commonwealth Governments will set conditions of approval relating to the management of potential environmental impacts of the proposal. These conditions will be included in permit, lease or license conditions and in relevant management procedures (e.g. Environmental Management Plans) for the construction and operation of the project.

Other Northern Territory and Commonwealth legislation establishes statutory obligations for the protection of native vegetation, protection of 'threatened' species and management of weeds. The implications of these Acts for the TTP proposal are discussed below.

2.1 CLEARING NATIVE VEGETATION

2.1.1 Planning Act NT 1999

Interim Development Control Order No.12 declared under the *NT Planning Act 1999* prohibits clearing of more than 1 hectare of land without a Development Permit. These controls apply to all Freehold and Crown land of 2 ha or more outside of existing towns and current Control Plan areas. To ensure compliance with this legislation the proponents of the TTP should consult with Development Assessment Services (DIPE) regarding requirements for a permit prior to any land clearing activities.

2.2 PROTECTED VEGETATION COMMUNITIES AND FLORA SPECIES

2.2.1 Territory Parks and Wildlife Conservation Act 2000 (TPWC Act)

The *TPWC Act* protects declared 'threatened wildlife' and 'areas of essential habitat'. There are no declared 'areas of essential habitat' in the TTP project area and a search of the flora species lists compiled from field survey data and NT Herbarium records did not identify any 'threatened' flora species. There are, however, a number of declared 'threatened' species that, based on their habitat preferences and distribution, may occur in or near TTP project area. These species are identified and discussed in **Section 5** of this report.

2.2.2 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The *EPBC Act* establishes lists of nationally threatened species and ecological communities which are 'Matters of Environmental Significance' protected by the Act. A search of the *EPBC Act* Online Search Tool found that none of the flora species or communities listed under this Act have a range that extends to the TTP project area.

2.3 MANAGEMENT OF WEEDS

2.3.1 Weeds Management Act 2001

Weed management in the Northern Territory is controlled under the *NT Weeds Management Act (2001)*. This legislation declares certain plants to be weeds, classifies weeds according to management requirements, and places obligations on land owners and occupiers to manage weeds. Section 9 of the Act establishes the responsibilities of land owners and occupiers for managing 'declared weeds'.

Plants declared as weeds under the Act were recorded during field surveys conducted for the TTP. In some areas significant infestations of declared weeds were present. The distribution of declared weed species in the TTP project area is summarised in **Section 4.5**. The proponent of the TTP will be responsible for the implementation of measures to ensure that 'declared weeds' are not introduced and\or spread by activities associated with the project, and that appropriate reporting strategies are in place.

3 METHODOLOGY

The methodologies used in the assessment of vegetation and flora for the TTP project were developed with the aim of adequately identifying and addressing the range of potential environmental issues associated with the proposal, and collating sufficient information to inform an assessment that satisfies the requirements of the Draft EIS Guidelines. Areas of potential botanical interest and field survey methodologies were identified and developed in consultation with the NT Parks and Wildlife Service and were provided to the NT Office of Environment and Heritage for review and comment prior to field survey work being conducted. The key data sources utilised in conducting desktop reviews, the methodologies employed in the conduct of field surveys and any limitations of our approach are discussed below.

3.1 DESKTOP STUDIES AND CONSULTATION

A desktop literature review and consultation with government management agencies was undertaken to identify the range of flora species, vegetation types and environmental constraints present in the TTP project area.

The main data sources reviewed were:

- NT Herbarium database records within a 10 km radius if the proposed TTP centreline.
- Commonwealth Department of Environment and Heritage *EPBC Act* (1999) online database (www.environment.gov.au) search. This database provides a list of species under the provisions of the *EPBC Act* that occur, or are likely to occur, in the project area.
- The Vegetation of the Australian Tropical Savannas (Fox et al. 2001).
- Biodiversity Assessment – Northern Territory (National Land and Water Resources Audit [online] Accessed 2004 April).
- NT Parks and Wildlife Service Threatened Species Information (Parks and Wildlife Service [online] Accessed 2004 October 11).
- NT Rainforest Database (Parks and Wildlife Service NT) polygons within a 10 km radius of the proposed pipeline centreline. This dataset classifies and maps the boundaries of rainforest patches.
- Various scientific publications relating to NT flora.
- Lists of species protected under the *EPBC Act* and T*erritory Parks and Wildlife Conservation Act*.

The management agency representatives consulted are listed in **Table 1**.

Table 1 Consultation with management agency representatives.

Agency	Representative\s	Issues
Northern Territory Herbarium	Ian Cowie Raelee Kerrigan	Patches of rainforest and ferns near Gove Sandstone country in Wingate Mountains of potential botanical interest Protected species, *Sticherus flabellatus var. compactus* and *Pternandra coerulescens*, in Gove area
NT Parks and Wildlife Service	Peter Krause	Herbarium database records for project area
Northern Territory Office of Environment and Heritage	Rod Johnson Juanita Croft	Survey methodology
NT Weeds Branch	Steve Wingrave	Declared weeds spread and management

3.2 VEGETATION MAPPING

The vegetation in the pipeline corridor was characterised according to Broad Vegetation Groups (BVG) and Vegetation Units classified in the Vegetation Map of the Australian Tropical Savannas (Fox et al. 2001). A limitation of the BVG classification is that it does not adequately map communities that are typically restricted in areal extent such as riparian corridors, rainforest patches,

Melaleuca woodlands and swamps. At the 1:2 000 000 scale that the classification was developed these communities are absorbed into the more dominant vegetation associations. To ensure that these community types, which can be sensitive to disturbance, were identified in the vegetation assessment, the aerial extent was identified and verified using a classification developed from Landsat TM satellite imagery as described below.

A map of vegetation associations that occur within a 10 km radius of the pipeline corridor was derived through an unsupervised classification of Landsat TM satellite imagery. The draft vegetation map was developed based primarily on spectral information contained within the imagery. This map was then refined based on field data collected in October to December 2003 to produce the final vegetation map.

Minor alterations were made to the vegetation association descriptions used in the Vegetation Map of the Australian Tropical Savannas (Fox et al. 2001) to better fit the nature of the vegetation in the pipeline corridor. The changes made are as follows:

- Vegetation Unit D5 was amalgamated with H9 because *Corymbia capricornia* does not occur in the region but is related to *C. dichromophloia*.
- Vegetation Unit C18 was changed to include all tussock grasslands, not just *Dichanthium fecundum* and *Chrysopogon fallax*.

3.3 FIELD SURVEYS

Field surveys of vegetation and flora in the pipeline corridor and at locations proposed for construction camps, and above ground facilities, were undertaken over an 8 week period from October to December in 2003, and another 8 week period in July to September 2004. The purpose of these surveys was:

- to identify an environmentally acceptable construction corridor for the pipeline route;
- to identify environmentally acceptable locations for additional project infrastructure;
- to identify environmentally sensitive areas and make recommendations on specific construction techniques;
- to document and describe the vegetation and flora that occur in the areas proposed for development; and
- to gain a wider understanding of the environment of the pipeline corridor so that the potential local and regional impacts can be assessed.

The surveys undertaken in 2004 filled in the gaps in information left following the 2003 surveys, which were cut short by the onset of the wet season. The surveys undertaken in 2004 also provided the opportunity to revisit those sections of the proposed route that were realigned as a result of issues identified in the earlier surveys. Approximately 50 km of the TTP corridor (KP685 to KP701 and KP744 to KP775) was not surveyed due to lack of permissions to access the land. The environment traversed by these sections was assessed as part of the desktop study.

A botanist and environmental scientist traversed the proposed pipeline corridor in a 4WD vehicle as part of a larger team comprised of a pipeline engineer, geotechnicians, archaeologists, anthropologists and Traditional Owners. Vegetation community descriptions and floristic data were recorded in distinct vegetation communities traversed by the proposed pipeline route, and at five sites proposed for accommodation camps, four sites proposed for compressor stations and two sites proposed for scraper facilities. The linear nature of the pipeline corridor necessitated a flexible survey methodology allowing for increased sampling where complex vegetation patterns occurred and decreased sampling where vegetation was relatively homogenous over a long distance. Identification and sampling was generally undertaken at intervals of 5 km in a continuous traverse, unless a community of specific interest to the survey team was identified, and then additional site information was recorded.

At each of the survey sites the following data were recorded:

- GPS Coordinates.
- Community description.
- Dominant and other identifiable flora species in each stratum.
- Site photo.
- Soil type.
- Time since last fire.
- Weed species present.
- Evidence of feral animals.
- Sensitive areas such as riparian habitats, wetlands, rainforest patches etc.
- Specific construction techniques recommended for river and creek crossings.

The structural classification used in the surveys generally followed the Australian Soil and Land Survey Field Handbook (McDonald et al. 1998). Species that could not be identified in the field, and species that were considered to be of potential conservation significance, were sampled and preserved for later identification by the NT Herbarium.

The data were tabulated and incorporated into the Geographic Information System developed for the TTP project, and into shape files for use with ArcView GIS v3.2. From these data sets, the relative locations of recorded sites and vegetation boundaries were determined. Locations along the pipeline were recorded as distances from the western point of origin at the proposed Blacktip Gas Plant site, known to the project as KP0 (kilometre point zero), and extending to the easternmost point, known as KP 940 at Nhulunbuy.

3.4 ASSESSMENT OF CONSERVATION SIGNIFICANCE

The conservation significance of vegetation and flora in and surrounding the project area was assessed with reference to the following:

- Species classified as 'threatened' and\or 'protected' in accordance with the *Territory Parks and Wildlife Conservation Act 2000*

- Species classified as 'threatened' in accordance with the *Environment Protection and Biodiversity Conservation Act 1999.*

- Near-threatened and regionally endemic species.

- Habitats of 'threatened' species and habitats with outstanding biodiversity values.

The conservation significance of vegetation and flora in the TTP project area is discussed in **Section 5**.

3.5 LIMITATIONS

The field surveys were conducted during the late 'dry' season in 2003 and during the mid 'dry' season in 2004. As a result of the dry conditions at the time that the surveys were conducted many of the annual species that typically occur in the understorey of the vegetation communities surveyed were absent. One-fifth of the surveyed communities had been burnt within the six month period prior to the field surveys and some communities had been burnt so recently that no understorey species remained for identification. Both the dry conditions and fire reduced the likelihood of locating plant species of conservation significance.

The vegetation groups identified from the mapping approach described in *Section 3.2* above were found to adequately characterise the vegetation recorded in the corridor during the field surveys. However, the vegetation community type recorded at each survey site did not always relate directly to the vegetation groups mapped at that location. For example, vegetation communities related to BVG 4 were often located in areas mapped as BVG 5. Also, the mapped vegetation groups representing

riparian corridors and swamps (BVG 19), grasslands (BVG 23) and Melaleuca woodlands (BVG 20) did not accurately reflect the distribution of these communities in the pipeline corridor. This result was expected and is due to the different scales of the mapping and field datasets i.e. those communities that are small in aerial extent are not visible at a smaller scale. This has limited implications for the results of the vegetation assessment as the most sensitive vegetation communities have been adequately identified from the satellite image classification and field surveys.

4 VEGETATION COMMUNITIES AND FLORA SPECIES

4.1 FIELD SURVEY RESULTS

During the two field survey periods the proposed pipeline corridor was traversed by 4WD vehicle. Approximately 50 km of the TTP corridor (KP685 to KP701 and KP744 to KP775) remained unsurveyed at the time that this report was prepared due to lack of permissions to access the land. These sections were assessed as part of the desktop study.

Botanical data and environmental parameters (see list in **Section 3.3**) were collected at 334 sites generally at intervals of no more than 5 km along the pipeline corridor. Four proposed compressor station sites, five proposed construction camp sites and two scraper facility sites were also surveyed. The field survey data are summarised at **Appendix 1** and site photos are included in **Appendix 3.**

4.2 VEGETATION COMMUNITIES IN THE PIPELINE CORRIDOR

The vegetation traversed by the pipeline corridor is characterised by 16 Vegetation Groups within 10 BVG's as defined by Fox *et al*. (2001) in their classification of the vegetation of the Australian tropical savannas. The location and extent of each of the BVG's and Vegetation Units in relation to the pipeline corridor is summarised in **Table 2** and shown in **Figure 1.** As discussed in **Section 3.2** communities that are typically restricted in areal extent such as riparian corridors, rainforest patches, Melaleuca woodlands and swamps are not accurately identified in the vegetation classification. These communities were identified during the field surveys and are recorded at **Appendix 1** and discussed in **Section 5**. The vegetation patterns observed along the corridor from west to east during the field surveys are briefly described below.

KP0 to KP70

Broad gently undulating coastal plains dominated by *Eucalyptus miniata* and *E. tetrodonta* forest with *Sarga spp*. tussock grasses in the understorey. Between KP17 and KP21 the corridor traverses low stony hills through the Sugarloaf Range dominated by *Eucalyptus miniata* and *E. tetrodonta* open woodland with a sparse understorey of tussock grasses. The coastal sand plains are dissected by a number of minor stream lines and floodplain associated with the Moyle River where the vegetation is dominated by woodlands to forests of *Melaleuca spp*., *Corymbia polycarpa, Eucalyptus miniata* and *E. tetrodonta*.

KP70 to KP90

Sandstone slopes and ridges of the Macadam Range dominated by *Eucalyptus tetrodonta* and *E. miniata* woodland often with *Eucalyptus tectifica* and *Corymbia latifolia* and tussock grasses in the understorey.

KP90 to KP210

Elevated lateritic plains on a plateau with fairly uniform vegetation dominated by *Eucalyptus tetrodonta* and *E. miniata* open forest with *Sarga spp*. tussock grasses in the understorey. The open forest communities are dissected by a number of broad shallow drainage floors dominated by *Melaleuca spp*. open woodland swamps with *Grevillea pteridifolia* and *Banksia dentata* in the mid storey, emergent Eucalyptus\Corymbia trees, and sedges in the understorey.

KP210 to KP230

Sandstone slopes and ridges along the edge of the tablelands dominated by *Eucalyptus tectifica* and *Corymbia latifolia* open woodland with tussock grasses in the understorey.

KP230 (Bradshaw Creek) to KP267 (Daly River)

Gently undulating sandy plains dominated by *Eucalyptus tectifica* and *Corymbia latifolia* with *Themeda triandra* and *Heteropogon contortus* grasses in the understorey. Riverine plains adjacent to Bradshaw Creek and Daly River are dominated by woodlands to forests of *Corymbia bella, Corymbia porrecta, Terminalia spp.* and *Acacia spp.*

KP267 (Daly River) to KP310 (Katherine River)

Gently undulating sandy plains dominated by *Eucalyptus miniata* and *E. tetrodonta* open woodland to woodland often with *Corymbia bleeseri*. *Triodia sp.* hummock grasses typically dominate the understorey to KP290. Tussock grasses become more dominant in the understorey from KP290 east to the Katherine River.

KP310 (Katherine River) to KP350

Undulating clay soil plains dominated by *Eucalyptus tectifica* and *Corymbia latifolia* open woodland to woodland with *Themeda triandra, Heteropogon contortus* and *Sarga spp.* tussock grasses in the understorey.

KP350 to KP400

Gently undulating sandy plains dominated by *Eucalyptus tetrodonta* open forest often with *Corymbia bleeseri, Corymbia dichromophloia, Corymbia latifolia* and *Erythrophleum chlorostachys,* and tussock grasses in the understorey.

KP400 to KP424 (Waterhouse River)

Undulating plains dominated by *Eucalyptus tectifica* and *Corymbia latifolia* open woodland to woodland with T*hemeda triandra, Heteropogon contortus* and *Sarga spp.* tussock grasses in the understorey. The plains are dissected by channels of Beswick Creek and Waterhouse River with fringing forests dominated by *Melaleuca spp.* and *Eucalyptus camaldulensis* and a dense mid storey of species such as *Pandanus aquaticus* and *Barringtonia acutangula.*

KP424 (Waterhouse River) to KP460

Low sandstone hills and rises with areas of rugged dissected plateaux and rocky ridges dominated by either *Eucalyptus miniata* and *E. tetrodonta* forest with *Eucalyptus phoenicea* and *Corymbia bleeseri,* or *Corymbia latifolia, Eucalyptus tectifica* and *Corymbia foelscheana* open woodland, both with tussock grasses in the understorey. The broad fluvial corridor associated with the Chambers River meanders through the hills and is dominated by a fringing forest of *Eucalyptus camaldulensis*.

KP460 to KP540

Level to gently undulating plains with clay soils dominated by *Eucalyptus tectifica* and *Corymbia latifolia* woodland with a variety of co-dominant species in the understorey including *Mnesithea rottboellioides, Arundinella nepalensis, Heteropogon contortus* and *Schizachyrium fragile*. The plains are dissected by broad fluvial corridors and low hills and rises on siltstone which are dominated by *Melaleuca spp.* and *Eucalyptus pruinosa* open woodland with a sparse understorey of tussock grasses and *Eriachne spp.*

KP540 to KP570

Gently undulating to hilly terrain on basalt, and low hills and rises on siltstone, both dominated by open woodlands of *Eucalyptus patellaris, Corymbia confertiflora, Corymbia terminalis, Corymbia bella* and *Eucalyptus tectifica,* with tussock grasses in the understorey. *Melaleuca spp.* open woodlands with *Triodia spp.* and *Sarga spp.* grasses in the understorey occur in wetter areas. Broad fluvial corridors are associated with the Mainoru River and Wilton River. The fringing forests are dominated by *Melaleuca cajuputi* closed forest and *Casuarina cunninghamiana* and *Lophostemon lactifluus* respectively.

KP570 to KP772

Undulating slopes with rises and low hills, dominated by *Eucalyptus miniata* and *E. tetrodonta* woodlands to open forests with *Petalostigma quadriloculare, Triodia spp., Sarga spp.* and *Eriachne spp.* in the understorey. East of the Wilton River the country grades into gently undulating sand plains dominated by *Eucalyptus miniata* and *E. tetrodonta* woodlands to open forests, sometimes with *Callitris intratropica*. The vegetation has a notably dense shrubby understorey dominated by a variety of species including *Pachynema complanatum, Acacia spp., Fimbristylis spp., Hibbertia dealbata, Schizachyrium fragile* and *Triodia spp*. (Spinifex). Isolated swamp depressions and alluvial floodplains associated with the Annie Creek and Goyder River systems typically support *Melaleuca spp.* closed forests with *Eriachne sp* in the understorey. The fringing riparian forests are dominated by *Melaleuca spp*. with *Pandanus aquaticus, Acacia leptocarpa* and *Barringtonia acutangula.*

KP772 to KP782 (Mitchell Ranges) **(unsurveyed – data source Lynch and Wilson 1998)**

Elevated rocky plateaux and rolling to steep hills dominated by open woodland of *Eucalyptus tetrodonta, E. miniata, E. phoenicea* and *Callitris intratropica*.

KP782 to KP880 (Cato River)

Gently undulating sandy plains dominated by *Eucalyptus tetrodonta* and *E. miniata* woodlands to forests with tussock grasses in the understorey. The sandy plains are dissected by floodplains and channels associated with the Goromuru River, Boggy Creek and the Cato River, which are dominated by forests of *Melaleuca viridiflora* and *Lophostemon lactifluus* with *Imperata cylindrica* and other sedge species in the understorey.

KP880 (Cato River) to KP943 (Alcan Refinery)

Gently undulating plains associated with bauxite, dominated by *Eucalyptus tetrodonta* woodland to forest with *Sarga spp.* tussock grasses in the understorey. *Eucalyptus miniata* is notably absent as a co-dominant in the vegetation east of the Cato River. The plains are dissected by narrow floodplains and channels associated with the Giddy River, Latram River and coastal inlets on the east coast of the Gove Peninsula, which are typically dominated by closed forest of *Melaleuca spp., Corymbia polycarpa* and *Lophostemon lactifluus* with *Imperata cylindrica* in the understorey.

Vegetation communities were assessed and described, including structure and species composition, at 334 sites during the field surveys. **Appendix 1** documents each of the vegetation communities recorded during the field surveys along with the BVG and Vegetation Unit that the community represents.

Table 2 Broad Vegetation Groups and Vegetation Units traversed by the pipeline corridor.
See **Appendix 1** for vegetation communities identified in the field that represent each vegetation unit.

Broad Vegetation Groups*	Vegetation Units*	KP Ranges		Total Distance Traversed
Woodlands and open-woodlands dominated by *Eucalyptus tetrodonta* and *E. miniata* (5)	*Eucalyptus miniat*a and *E. tetrodonta* open forest with *Sarga spp.* tussock grasses (D4)	0-41 84-127 263-293 623-626 624-637 692-695	703-737 740-749 784-836 838-851 853-912 920-943	323
	Eucalyptus tetrodonta and *E. miniata* woodland with or without *Corymbia bleeseri* with *Sarga spp.* tall grasses (H6)	78-84 127-220 597-607 626-634	647-681 769-777 912-920	167
	*Eucalyptus tetrodont*a and *E. miniata* woodland with or without *Corymbia spp.* and/or *Livistona spp* with a ground layer of tussock grasses and *Triodia bitextura* (D14)	256-263 293-309 355-366	367-374 383-389 391-394	50
	Eucalyptus tetrodonta and/or *Melaleuca viridiflora* woodland with or without *Callitris intratropica*, with *Triodia bitextura* hummock grasses (D13)	737-740 749-769	777-784 851-853	32
Open forests and woodlands dominated by *Eucalyptus spp.* and *Corymbia spp*. on drainage lines and alluvial plains (3)	*Eucalyptus camaldulensis* and/or *Eucalyptus spp.* woodland on channels and levees (C7)	462-471		9
	Eucalyptus spp. grassy low woodland on alluvial plains with or without *Excoecaria parvifolia* (C10)	574-586		12
Woodlands dominated by *Eucalyptus tectifica* and *Corymbia spp.* (4)	*Eucalyptus tectifica* and\or *Corymbia spp.* woodland with *Sarga spp.* tussock grasses (D10)	65-74 220-256 314-355 405-416 423-433 509-530	536-574 586-597 607-623 681-692 695-703	212
Low woodlands to open woodlands dominated by *Corymbia dichromophloia* (10)	*Corymbia dichromophloia, Eucalyptus miniata* open woodland with or without *E. tetrodonta*, with *Triodia bitextura* and *Sarga spp.* grasses (H9 and D5)	74-78 389-391 394-405 366-367	374-383 433-440 457-462	39
Low woodlands dominated by *Melaleuca spp.* on depositional plains or alluvium (20)	*Melaleuca viridiflora or M. nervosa* grassy low open woodland with or without a shrub layer and\or emergent trees (C13)	41-65		24
Low open woodlands dominated by *Corymbia terminalis* (8)	*Corymbia terminalis* low open woodland with *Triodia pungens* hummock grasses with or without tussock grasses (D25)	309-314		5
Woodlands dominated by *Eucalyptus pruinosa* and *Bauhinia cunninghamii* (9)	*Eucalyptus pruinosa* low open woodland with or without *Bauhinia cunninghamii*, with a sparse understorey of tussock grasses or *Triodia spp.* hummock grasses (D29)	416-423 471-507		43
Acacia shirleyi and *Acacia spp.* associations on dissected residual surfaces and sandstone hills (17)	*Acacia shirleyi* and\or other *Acacia spp.* and\or *Eucalyptus spp.* low woodland with short tussock grasses and\or *Triodia spp.* hummock grasses (E1)	440-457		17
Tussock grasslands (23)	Tussock grassland sparsely wooded with low trees (C18)	507-509 530-536		8
Open forests and woodlands of Melaleuca spp. associated with rivers, lagoons and swamps (19)	*Melaleuca spp.* open forest (C3)	836-838		2
			Total	**943**

*BVG's and Map Units taken from Vegetation of Australian Tropical Savannas map (Fox *et al.* 2001). Numbers in brackets refer to BVG and Map Unit numbers used in the map and in the maps produced in this report.

4.3 VEGETATION COMMUNITIES AT ABOVE GROUND FACILITIES

The vegetation that occurs at locations proposed for construction camps and above ground facilities that were assessed during the field surveys is described in **Table 3**. More detailed site descriptions and photos are provided in **Appendices 1 and 4**. Two construction camp locations, Dorisvale Station and east of Beswick, have not yet been surveyed. Surveys of proposed access tracks were being conducted in October 2004, and the remaining construction camp locations will be assessed at the same time.

Table 3 Vegetation communities at sites proposed for construction and above ground facilities.

Facility	Location	Vegetation Communities at Site	Issues\Restrictions
Compressor Station (alternative to Victoria Hway)	Stuart Highway KP364	*Eucalyptus tetrodonta* and *Corymbia dichromophloia* open forest with *Heteropogon triticeus* and *Plectrachne sp.* understorey *Eucalyptus tetrodonta* and *Corymbia umbonata* open forest with *Heteropogon triticeus* understorey *Eucalyptus tectifica* and *Eucalyptus tetrodonta* open woodland with *Sehima nervosum* understorey *Eucalyptus miniata* and *E. tetrodonta* open forest with *Heteropogon triticeus* understorey	Site located in area that may be subject to inundation
Compressor Station	Wingate Mountains KP162-KP163	*Eucalyptus miniata* woodland with *Sarga intrans* and *Hetropogon triticeus* understorey	No specific issues
Compressor Station	Mainoru KP528	*Melaleuca citrolens woodland* with *Sarga plumosum* understorey *Melaleuca citrolens* open woodland with *Schizachyrium fragile* understorey	Management of weeds along roadside Site located on clay soils that will become boggy after rain
Compressor Station	Victoria Highway KP322	*Corymbia foelscheana* woodland with *Aristida sp.* understorey Riparian closed forest dominated by *Eucalyptus tectifica* and *Lophostemon grandiflorus* with a dense mid-storey dominated by *Acacia pellita* and *Heteropogon contortus* understorey along Chinaman Creek near south east corner of proposed site *Corymbia foelscheana* open woodland with *Sarga intrans* understorey *Corymbia umbonata* open woodland with *Aristida sp.* understorey	Site should be located in south east corner of surveyed area away from Chinaman Creek Existing access track from Victoria Highway along western edge of site should be utilised for access Management of weeds on site – *Hyptis suaveolens* and *Calotropis procera*

Table 3 Vegetation communities at sites proposed for construction and above ground facilities.

Facility	Location	Vegetation Communities at Site	Issues\Restrictions
Construction Camp	Moyle River KP69	*Grevillea pteridifolia* and *Melaleuca viridiflora* open woodland with *Heteropogon sp.* understorey.	Site located on clay soils that will be dusty and will become boggy after rain.
Construction Camp	Annie Creek 5.5 km north KP631	*Eucalyptus miniata* and *E. tetrodonta* open forest with *Sarga intrans* understorey	No specific issues
Construction Camp	Mainoru KP533	*Melaleuca citrolens* woodland with *Schizachyrium fragile* understorey	Management of weeds along roadside. Site located on clay soils that will be dusty and will become boggy after rain.
Construction Camp	Central Arnhem Highway 1km east of KP888	*Eucalyptus tetrodonta* and *E. miniata* tall open forest with *Sarga intrans* and *Sarga plumosum* understorey	Existing disturbed areas in gravel pit should be used where possible
Construction Camp	Central Arnhem Highway 1.5km south KP787	*Eucalyptus miniata* and *E. tetrodonta* open forest with *Sarga plumosum* and *Sauropus stenocladus ssp stenocladus* understorey	Site chosen to avoid potential impacts on waterholes adjacent to Buckingham River and stands of *Callitris intratropica* Avoid clearing *Callitris intratropica* trees
Scraper Facility	Moyle River KP77	*Eucalyptus miniata* open forest with *Sarga intrans* understorey	Site will potentially flood in some wet seasons Need to manage site to ensure no pollution to the environment
Scraper Facility	Annie Creek KP 637	*Eucalyptus miniata* and *E. tetrodonta* woodland with *Eriachne sp.* understorey.	No specific issues

4.4 FLORA SPECIES

Flora species recorded at locations in the pipeline corridor and at sites chosen for above ground facilities are documented in **Appendix 2**.

4.5 WEEDS

4.5.1 Weed Species

Fifteen weed species were recorded during the field surveys, and further 16 weeds of potential concern were identified from published information and consultations with the Weeds Branch of the Department of Infrastructure, Planning and Environment (DIPE) (**Table 4**). Nineteen of the species identified in **Table 3,** are 'declared' weeds under the *NT Weeds Management Act*.

Weeds of National Significance (WONS) recorded in the project area include Prickly Acacia *Acacia nilotica* and Parkinsonia *Parkinsonia aculeata*, both of which were recorded on Mainoru Station. The WONS Mimosa *Mimosa pigra* occurs on the floodplains in the western coastal areas of the Northern Territory including at sites on the Moyle River floodplain, however, no infestations were observed during the field surveys.

Table 4 Key weed species of potential concern to the TTP project.
Notes taken from various Agnotes (Weeds Branch 2004), Smith (2002) and Parsons and Cuthbertson (2001).

Weed species	Common name	Class	Notes	Recorded in corridor
Acacia nilotica	Prickly Acacia	A WONS	Once established forms dense, thorny thickets which become impenetrable to both man and large animals.	KP499 KP523 KP525 KP563
Acanthospermum hispidum	Goat's Head	B	Reduces pasture yield and, in dense patches, the area available for grazing.	Near KP421*
Andropogon gayanus	Gamba Grass	X	A highly productive annual grass that cures later in the dry season than native annual grasses and produces intense late dry season fires which can seriously damage native woody species.	No
Brachiaria mutica	Para Grass	X	Spreads quickly in seasonally flooded areas choking out native species and hindering the re-establishment of more desirable species.	No
Calotropis procera	Rubber Bush	B	Forms dense thickets, which compete with native plant species and transform the appearance of the savanna. Hinders pastoralism.	KP266-267 KP322 KP523 Old route near Velkerri Ck
Cenchrus echinatus	Mossman River Grass	B	The spiny burrs make it a major problem in urban areas used for recreation. The burrs injure feet and livestock.	Near KP935*
Cenchrus ciliaris	Buffel Grass	X	Can increase fire intensity along creek lines.	No
Chloris inflata	Purple Top Chloris	X	Aggressive invader of degraded land that out-competes native species.	Near KP935*
Crotalaria goreensis	Gambia Pea	X	Readily invades disturbed areas and prevents the regeneration of native species.	Near KP426*

* Denotes locations recorded from NT Herbarium database.

Class Key:
Class A – to be eradicated. Class B – growth and spread to be controlled. Class C – not to be introduced. Class D – not to be spread by human means. Class E – species under an approved strategy. X – not declared but considered an environmental weed by Smith & others. Note: No strategies are currently in place for the project lease area.
WONS – Weed of National Significance

Weed species	Common name	Class	Notes	Recorded in corridor
Hyptis suaveolens	Hyptis	B	Takes over improved and native pastures forming dense thickets, especially when overgrazed.	Numerous locations across entire corridor
Hymenachne amplexicaulis	Olive Hymenachne	X WONS	Has the ability to smother native vegetation and form dense monospecific stands on floodplains	No
Jatropha gossypifolia	Bellyache Bush	B	Forms dense thickets and renders land unsuitable for grazing.	No
Leonotis nepetifolia	Lions Tail	B	Dense thickets can form that can be difficult to penetrate due to spiky flowerheads.	No
Leucaena leucocephala	Coffee Bush	X	Forms dense thickets excluding native species.	No
Martynia annua	Devils Claw	A	Devil's claw is particularly invasive on disturbed ground and so is often found in high-use areas such as around stockyards, buildings and along roadsides.	No
Mimosa pigra	Mimosa, Giant Sensitive Plant	A & B WONS	Forms dense thickets making areas inaccessible to animals and man, and smothering pastures. Displaces vegetation and animals from large areas of land, seriously affecting use of the land for conservation, tourism and use by traditional owners.	No
Parkinsonia aculeata	Parkinsonia	B WONS	Forms impenetrable thickets that compete with and exclude native species. Thickets block access to creek lines and rivers.	Near KP553
Passiflora foetida	Wild Passionfruit	X	A fast growing species that spreads, choking native vegetation.	Numerous locations across entire corridor
Pennisetum polystachion *Pennisetum pedicellatum*	Mission Grass Annual Mission Grass	B	Competes with and displaces native species. By remaining green late into the dry season this grass provides fuel for much hotter fires than would normally occur at that time of year.	KP514 KP550
Senna alata *Senna obtusifolia* *Senna occidentalis*	Candle Bush Sicklepod Coffee Senna	B	Competes with and excludes native species. Degrades pastures and toxic to stock.	KP494 KP499 KP609 Near KP935*
Sida acuta *Sida cordifolia* *Sida rhombifolia*	Spiny Head Sida Flannel Weed Paddy's Lucerne	B	Competes with and excludes more desirable species. Competes strongly with crops and pastures and is one of the most serious weeds of crops and pastures in the Top End of the NT.	KP499 KP600
Stachytarpheta spp	Snake Weed	B	Not yet a major problem in the NT but increasing in importance.	KP929 KP934
Tribulus terrestris	Caltrop	B	Competes with and excludes native species.	2km north KP324* KP421*
Xanthium strumarium	Noogoora Burr	C	Thickets are quick to establish and difficult to eradicate. Exclude native shrub species and inhibits ground layers. Spines hinder pastoralism and toxic to stock.	KP266-267 KP309-310 KP317

* Denotes locations recorded from NT Herbarium database.

Class Key:

Class A – to be eradicated. Class B – growth and spread to be controlled. Class C – not to be introduced. Class D – not to be spread by human means. Class E – species under an approved strategy. X – not declared but considered an environmental weed by Smith & others. Note: No strategies are currently in place for the project lease area.
WONS – Weed of National Significance

Weed species	Common name	Class	Notes	Recorded previously
Themeda quadrivalvis	Grader Grass	B	Can invade native pastures or grassland and seriously reduce diversity.	KP495, KP506 KP509, KP511 KP529, KP532 KP550, KP560 KP600
Ziziphus mauritiana	Chinee Apple	A	Densely infested areas may become impenetrable to people and livestock, blocking access to watering points, interfering with mustering activities and competing with desirable pasture species.	No

* Denotes locations recorded from NT Herbarium database.

Class Key:

Class A – to be eradicated. Class B – growth and spread to be controlled. Class C – not to be introduced. Class D – not to be spread by human means. Class E – species under an approved strategy. X – not declared but considered an environmental weed by Smith & others. Note: No strategies are currently in place for the project lease area.

WONS – Weed of National Significance

Other exotic species of lesser concern that have been identified in proximity to the TTP project area include Yellow Oleander *Cascabela thevetia*, Caustic Plant *Chamaesyce hirta, Cyperus compressus, Elusine indica,* Emilia *Emilia sonchifolia, Eragrostis pilosa, Gomphrena celosioides*, Siratro *Macroptilium atropurpureum,* Phasey Bean *Macroptilium lathyroides, Triumfetta pternandra.*

4.5.2 Weed Distribution

Locations in the TTP project area where weed species have been recorded in recent and previous field surveys are shown in **Figure 1**. Weed distribution in the project area is generally related to environmental disturbances caused by the construction of roads and tracks, cattle grazing and feral animals. Weeds were most prevalent on land under pastoral lease, and on the freehold properties in the Katherine region. In these areas infestations are generally concentrated around infrastructure such as water points, fence lines and tracks, and also along the banks of watercourses where cattle and feral animals tend to congregate.

5 CONSERVATION SIGNIFICANCE

Activities associated with construction and operation of the TTP will occur in proximity to significant vegetation communities including riparian corridors, wetlands (swamps and floodplains), monsoon vine forests and sandstone communities. These vegetation communities are of conservation significance for reasons including that they:

- are typically rare, or restricted in distribution;
- contain species that do not occur in the surrounding savanna woodland communities;
- perform important ecological functions; and
- are often highly susceptible to degradation through disturbance.

The TTP corridor and locations proposed for construction camps and above ground facilities were designed through a process of negotiations between the pipeline engineer, environmental scientist and traditional owners while in the field with the aim of avoiding potential impacts on communities of conservation significance as much as possible. This process resulted in most communities of notable conservation significance being avoided. Where avoidance was not possible, for example at riparian corridors, construction techniques that will minimise impacts have been prescribed for inclusion in the EIS and EMP's being prepared for the project. Significant vegetation communities and species that occur in or near the pipeline corridor, and at sites proposed for above ground facilities and accommodation camps are discussed in the sections below.

5.1 SIGNIFICANT VEGETATION COMMUNITIES

5.1.1 Riparian Corridors

The TTP corridor crosses 16 permanent freshwater rivers and creeks, and numerous seasonal water courses many of which support distinct riparian vegetation communities. These vegetation communities are of conservation significance because they play an important ecological and hydrological role in maintaining the functioning of waterways and associated wetland environments. Riparian vegetation also provides essential habitat for terrestrial and aquatic fauna species, many of which are confined to riparian habitats for all or parts of their life cycle, or at times of adverse environmental conditions (i.e. late in the dry season).

The riparian corridors associated with permanent and semi-permanent watercourses that were surveyed were typically characterised by a canopy dominated by *Melaleuca spp*. with other riparian tree species including *Lophostemon lactifluus, Barringtonia acutangula, Terminalia platyphylla, Casuarina cunninghamiana, Eucalyptus camaldulensis* and *Nauclea orientalis*. A dense mid storey comprised of tree and shrub species including *Pandanus spiralis, Pandanus aquaticus, Grevillea pteridifolia, Banksia dentata, Livistona humilis and Acacia spp*. was often present with or without a grass\sedge understorey. Some of the seasonal watercourses traversed by the corridor also support distinct riparian vegetation corridors comprised of distinctly riparian species but with a higher proportion of *Eucalyptus spp.* and *Acacia spp.* that are more typical of areas subject to seasonal inundation. The characteristics of the major riparian corridors traversed by the pipeline corridor are described in **Table 5** along with the management measures recommended to protect these communities, which are further discussed in **Section 6**.

Table 5 Riparian vegetation corridors that occur in or near the proposed pipeline corridor and recommended management.

KP Location	Name	Lat	Long	Community description	Management*
55	Anopheles Creek	-14.3804	129.9132	Open forest dominated by *Lophostemon lactifluus, Barringtonia acutangula* and *Acacia auriculiformis* with a dense mid-storey of *Pandanus spiralis, Livistona humilis* and *Owenia vernicosa*	open trench crossing management (dry)
63	Chalanyi Creek	-14.3439	129.9766	*Barringtonia acutangula* and *Melaleuca viridiflora* closed forest with a dense mid-storey of *Pandanus aquaticus* and *Heteropogon contortus* and *Aristida sp* understorey	open trench crossing management (dry)
74	branch of Moyle River	-14.2859	130.0528	*Melaleuca leucadendra* and *Syzygium armstrongii* closed forest with *Arundinella nepalensis* understorey	open trench crossing management (wet)
75	Moyle River	-14.2770	130.0645	*Melaleuca leucadendra* open woodland with a dense mid storey of *Barringtonia acutangula*, and *Arundinella nepalensis* understorey	hdd
92	Moyle River upstream	-14.2828	130.2148	*Melaleuca leucadendra* and *Lophostemon lactifluus* open woodland with dense mid-storey dominated by *Grevillea pteridifolia* and *Banksia dentata,* and *Sarga plumosum* understorey	open trench crossing management (wet)
217	Whiskey Spring Creek	-14.4851	131.2282	Closed forest dominated by *Eucalyptus alba, Corymbia bella, Nauclea orientalis* and *Ficus coronulata* with *Heteropogon contortus* understorey	open trench crossing management (wet)
231	Bradshaw Creek	-14.4902	131.355	*Eucalyptus bella, Terminalia grandiflora and Terminalia platyptera* open woodland with *Heteropogon contortus* and *Sarga timorense* understorey	open trench crossing management (wet)
266	Daly River	-14.5067	131.6763	Closed forest dominated by *Casuarina cunninghamiana, Nauclea orientalis, Melaleuca leucadendra, Barringtonia acutangula, Eucalyptus camaldulensis, Melaleuca viridiflora, Corymbia bella* and *Erythrophleum chlorostachys* with a dense mid-storey of *Cycas canalis, Gardenia sp* and *Livistona humilis* and *Sarga sp* understorey	hdd
309	Katherine River	-14.5835	132.0506	Closed forest dominated by *Terminalia grandiflora, Melaleuca leucadendra* and *Eucalyptus camaldulensis* with *Flagellaria indica* and *Crinum sp.* understorey	hdd
323	Chinaman Creek	-14.5863	132.1732	*Eucalyptus tectifica* and *Lophostemon grandiflora* closed forest with a dense mid-storey dominated by *Acacia pellita*, and *Heteropogon contortus* understorey	open trench crossing management (dry)

KP Location	Name	Lat	Long	Community description	Management*
370	King River	-14.6085	132.6065	*Eucalyptus camaldulensis* and *Melaleuca leucadendra* open forest with *Brachyachne convergens* and *Lomandra sp* understorey	hdd
390	Maranboy Creek	-14.5999	132.7874	Eucalyptus\Corymbia species open woodland with a mid storey of *Terminalia platyphylla* and *Erythrophleum chlorostachys* and *Mnesithea rottboellioides* understorey	open trench crossing management (dry)
401	Beswick Creek	-14.5950	132.8964	*Melaleuca leucadendra* closed forest with a dense mid storey of *Pandanus aquaticus* and *Grevillea pteridifolia* and *Eriachne sp* understorey	hdd
424	Waterhouse River	-14.5784	133.1074	*Melaleuca argentea* and *Eucalyptus camaldulensis* closed forest with mid-storey of *Barringtonia acutangula* and *Mnesithea rottboellioides* understorey	hdd
444	Chambers River	-14.5212	133.2746	*Eucalyptus camaldulensis* closed forest with a grassy understorey	open trench crossing management (wet)
463	Unnamed drainage	-14.4774	133.4409	Closed forest dominated by *Lophostemon grandiflora, Eucalyptus camaldulensis, Eucalyptus patellaris* and *Corymbia latifolia* with *Mnesithea rottboellioides* and *Heteropogon contortus* understorey	open trench crossing management (dry)
499	Maiwok Creek	-14.3239	133.7273	*Eucalyptus camaldulensis* and *Melaleuca leucadendra* closed forest with a dense mid-storey dominated by *Diospyros humilis* and *Arundinella nepalensis* understorey	open trench crossing management (wet)
506	Flying Fox Creek	-14.2868	133.7733	*Melaleuca leucadendra* closed forest with a dense mid-storey dominated by *Acacia pellita*, and *Heteropogon contortus* understorey	open trench crossing management (wet)
509	Derim Derim Creek	-14.2642	133.7935	*Eucalyptus camaldulensis* and *Melaleuca leucadendra* closed forest with dense mid-storey dominated by *Antidesma ghesaembilla,* and *Arundinella nepalensis* understorey	open trench crossing management (wet)
538	Quibobikwi Creek	-14.0850	133.9765	*Acacia umbellata* and *Acacia holosericea* open woodland with *Excoecaria parvifolia* understorey	open trench crossing management (dry)
550	Mainoru River	-14.0225	134.0682	*Melaleuca cajuputi* closed forest with a dense midstorey of *Pandanus spiralis* and *Barringtonia acutangula*, and mixed grass\sedge species understorey	hdd
570	Horse Creek	-13.8769	134.1773	*Lophostemon grandiflora* and *Terminalia platyphylla* open woodland with *Heteropogon contortus* understorey	open trench crossing management (wet)

KP Location	Name	Lat	Long	Community description	Management*
579	Branch of Horse Creek	-13.8247	134.2386	*Lophostemon grandiflorus* and *Terminalia platyphylla* closed forest with *Pandanus spiralis* mid-storey and *Heteropogon contortus* understorey	open trench crossing management (wet)
600	Wilton River	-13.6931	134.3808	*Casuarina cunninghamiana* and *Lophostemon lactifluus* closed forest with *Mnesithea rottboellioides* understorey	hdd
658	Branch of Annie Creek	-13.3576	134.7859	Closed forest dominated by *Melaleuca viridiflora, Acacia auriculiformis* and *Corymbia polycarpa* with a dense mid-storey of *Melaleuca acacioides, Pandanus spiralis, Acacia holosericea* and *Barringtonia acutangula* with *Heteropogon contortus* and *Mnesithea rottboellioides* understorey	open trench crossing management (wet)
685	Annie Creek	-13.2040	134.9780	*Melaleuca argentea* closed forest with a dense mid-storey of *Pandanus aquaticus* and *Melaleuca acacioides*	open trench crossing management (wet)
701	Goyder River	-13.1238	135.1036	*Melaleuca leucadendra* closed forest with dense midstorey of *Pandanus aquaticus,* and *Cymbopogon refractus* and *Imperata cylindrica* understorey	hdd
786	Unnamed waterhole	-12.6855	135.6965	*Lophostemon lactifluus* and *Corymbia polycarpa* open forest with grassy understorey	avoid - route moved 200m north
838	Goromuru River	-12.7074	136.1768	*Melaleuca viridiflora* and *Lophostemon lactifluus* closed forest with *Imperata cylindrica* and *Sarga plumosum* understorey	avoid - route moved 800m south
900m north KP851	Boggy Creek	-12.6530	136.2807	Closed forest dominated by *Lophostemon lactifluus, Nauclea orientalis* and *Acacia auriculiformis*	avoid - route moved 800m south
852	Boggy Creek	-12.6551	136.2895	Closed forest dominated by *Melaleuca viridiflora, Lophostemon lactifluus, Pandanus aquaticus, Barringtonia acutangula* and *Syzygium suborbiculare*	hdd
873	branch of Cato River	-12.5639	136.4487	*Corymbia polycarpa* and *Corymbia porrecta* woodland with dense midstorey of *Acacia auriculiformis, Lophostemon lactifluus* and *Grevillea pteridifolia*, and *Themeda triandra* understorey	open trench crossing management (wet)
881	Cato River	-12.5103	136.4935	Closed forest dominated by *Eucalyptus tetrodonta , Carpentaria acuminata, Calophyllum inophyllum, Terminalia grandiflora, Melaleuca cajuputi, Melaleuca viridiflora, Xanthostemon paradoxus, Grevillea pteridifolia, Alphitonia excelsa* and *Nauclea orientalis* with a dense mid storey of *Hydriastele wendlandiana, Buchanania obovata, Lophostemon lactifluus, Pandanus aquaticus* and *Pogonolobus reticulatus*	hdd

KP Location	Name	Lat	Long	Community description	Management*
913	Giddy River	-12.3593	136.7072	*Melaleuca leucadendra* and *Lophostemon lactifluus* tall forest with a dense mid-storey of *Pandanus aquaticus* and *Grevillea pteridifolia*, and *Lomandra tropica* and *Smilax australis* understorey	hdd
922	Latram River	-12.3008	136.7654	*Melaleuca viridiflora* and *Pandanus aquaticus* closed forest with sedge sp. and *Themeda triandra* understorey	hdd
929	Unnamed creek	-12.2408	136.7882	Open forest dominated by *Corymbia alba*, *Lophostemon lactifluus*, *Melaleuca cajuputi* and *Corymbia polycarpa* with dense midstorey of *Acacia leptocarpa* and *Lophostemon lactifluus*, and mixed grass\sedge understorey	open trench crossing management (wet)
Mainoru bypass	Unnamed creek	-12.2045	136.7697	Open forest dominated by *Lophostemon grandiflora*, *Bauhinia cunninghamii* and *Eucalyptus tectifica* with a dense mid-storey of *Hakea arborescens*, *Terminalia platyphylla* and *Leptospermum madidum* with *Heteropogon contortus* understorey	open trench crossing management (dry)
Mainoru bypass	Jasper Creek	-13.9054	134.4401	*Casuarina cunninghamiana* open forest with *Eriachne sp* understorey	open trench crossing management (dry)
Mainoru bypass	Unnamed drainage	-13.6805	134.6286	Open forest dominated by *Lophostemon lactifluus* and *Terminalia platyphylla* with *Heteropogon contortus* understorey	open trench crossing management (dry)
Mainoru bypass	Unnamed drainage	-13.4950	134.7160	*Melaleuca viridiflora* closed forest with a mixed species grass\sedge understorey	open trench crossing management (dry)
Mainoru bypass	Branch of Annie Creek	-13.3727	134.7774	*Melaleuca viridiflora* and *Acacia leptocarpa* closed forest with a dense mid-storey of *Corymbia polysciada*, *Pandanus spiralis* and *Barringtonia acutangula* with *Eriachne sp* understorey	open trench crossing management (wet)

*Management recommendations are further discussed in Section 6.

5.1.2 Wetlands of Regional Significance

The pipeline corridor traverses well south of the extensive and highly productive coastal floodplain wetlands that are characteristic of the near coastal environments of the Top End. However, scattered isolated billabongs and seasonally inundated swamps that are floristically similar to the coastal floodplains occur as far inland as Lake Woods (Cowie *et al*. 2000) which is about 300 km south of the TTP corridor. Wetlands were identified at 15 locations during the field surveys (**Table 6**). These included permanent and semi-permanent swamps, permanent springs, permanent and semi-permanent waterholes and a lagoon. Eleven of the wetlands identified were within the proposed TTP corridor and five of those were assessed as significant and therefore required changes to the corridor design to avoid impacts. Two of the wetlands occur on the alternative Mainoru bypass route and two were outside of the TTP corridor. These wetlands are of regional conservation significance as they provide a niche for aquatic and semi-aquatic vegetation communities that are uncommon in the drier inland regions of the Northern Territory.

The vegetation that characterises each of the wetlands identified during the field surveys is described in **Table 6** along with identification of the potential for the project to impact on the wetland and recommended management. The vegetation is typically relatively simple in structure and has low species richness, however, the conservation value of these communities lies in the strong interactions that exist between fauna and flora, especially where aquatic communities add dimension to the habitat value (Cowie *et al*. 2000).

Table 6 Wetlands of regional significance that occur in or near the pipeline corridor.

KP Range	Lat	Long	Habitat description	Water	Potential impact	Management
KP107	-14.3234	130.3468	*Corymbia ptychocarpa* and *Melaleuca viridiflora* open woodland with a dense mid-storey of *Banksia dentata* and *Grevillea pteridifolia*, and sedge spp. understorey	semi-permanent swamp	yes	open trench management for wet areas
KP111	-14.3344	130.3754	*Corymbia ptychocarpa* and *Lophostemon lactifluus* open woodland with dense mid-storey of *Banksia dentata* and *Grevillea pteridifolia*, and *Pseudopogonatherum contortum* understorey	semi-permanent swamp	yes	open trench management for wet areas
1.4km west KP 141	-14.4057	130.5873	Open grassland with scattered *Melaleuca leucadendra* trees	semi-permanent swamp	no	corridor moved 6km south during design
KP167	-14.4979	130.7883	*Grevillea pteridifolia* closed forest with emergent *Corymbia latifolia* and *E. tetrodonta*, and *Ectrosia leporina* understorey	semi-permanent swamp	yes	open trench management for wet areas
2km north KP413	-14.5694	133.0001	Spring surrounded by *Melaleuca spp.* and *Pandanus* in dry country	permanent spring	no	none required – corridor avoids this location
1.2 km south-east KP 577	-13.845	134.2285	Spring surrounded by *Melaleuca spp.* and *Pandanus spp.* adjacent to Horse Creek	permanent spring	no	none required – corridor avoids this location
KP629	-13.5238	134.5772	*Melaleuca nervosa* closed forest with grass\sedge understorey of *Cyperus haspan, Limnophila australis/brownii, Pseudoraphis spinescens* and *Commelina sp.*	semi-permanent swamp	no	corridor moved 100 m north during design
600m north of KP711	-13.0889	135.1873	Lagoon surrounded by tall *Melaleuca spp*. trees with large area of open water	permanent lagoon	no	corridor moved 500 m south during design
KP734	-12.9617	135.3418	*Platyzoma microphyllum* and *Aristida sp.* open grassland with emergent *Eucalyptus tetrodonta, Pandanus*	semi-permanent swamp	yes	corridor moved south to minimise crossing distance -

KP Range	Lat	Long	Habitat description	Water	Potential impact	Management
			spiralis and *Lophostemon lactifluus*			open trench management for wet areas
100m south of KP786	-12.6855	135.6965	*Lophostemon lactifluus* and *Corymbia polycarpa* open forest with grassy understorey on a permanent waterhole away from main Buckingham River channel	semi-permanent waterhole	no	corridor moved 200m north in design
100m south KP788	-12.6869	135.7169	*Corymbia polycarpa, Melaleuca viridiflora, M. nervosa* and *Pandanus spiralis* open forest with *Themeda triandra* and *Sarga plumosum* understorey on waterhole	semi-permanent waterhole	no	corridor moved 100m north during design
KP856	-12.6430	136.3236	*Corymbia polycarpa, Melaleuca viridiflora* and *Lophostemon lactifluus* open woodland with dense mid-storey of *Pandanus spiralis* and *Banksia dentata* and *Grevillea pteridifolia* with *Imperata cylindrica, Eriachne sp.* and *Cymbopogon refractus* understorey	seasonally inundated swamp	yes	open trench management for wet areas
KP 934	-12.2045	136.7697	*Melaleuca viridiflora* and *Acacia leptocarpa* closed forest swamp with *Eriachne stipacea* and *Mnesithea rottboellioides* understorey	seasonally inundated swamp	yes	open trench management for wet areas
Mainoru bypass	-12.2045	136.7697	Spring surrounded by P*andanus aquaticus, Melaleuca viridiflora* and *Eucalyptus alba* closed forest with *Eriachne sp* understorey	permanent spring	yes – if bypass route used	move route to avoid permanently wet area
Mainoru bypass	-13.9355	134.2752	Small (2 m x 2 m) rock hole with permanent water surrounded by *Corymbia latifolia* and *Eucalyptus bigalerita* open woodland with *Eriachne sp* understorey	semi-permanent waterhole	yes – if bypass route used	move route to avoid rock hole

5.1.3 Wetlands of National Importance

The Directory of Important Wetlands in Australia identifies and describes wetlands which are considered to be of national importance based on six natural and cultural heritage criteria (Environment Australia 2001). The pipeline corridor traverses through the catchments of the following wetlands included in the Directory:

Moyle Floodplain and Hyland Bay Wetlands

The proposed pipeline corridor between KP17 and KP82 traverses the upstream section of the Moyle Floodplain and Hyland Bay System, which satisfies five of the six 'importance' criteria for listing as a wetland of national importance. This wetland system supports 27 of the 36 described Top End floodplain vegetation communities including *Echinochloa praestens* and *Leersia hexandra* grassland, which is one of the rarest floodplain communities in the Top End (Whitehead and Chatto 1995). The pipeline traverses the headwaters of the Moyle system where the country is dominated by *Eucalyptus spp.* woodlands to open forests with an understorey of tussock grasses. The woodlands are dissected by seasonally inundated floodplain communities and riparian corridors associated with Anopheles Creek and Chalanyi Creek, which are the main surface water inflows to the southern part of the wetland system. The notable flora in the Moyle Hyland Bay system described in the Australian Wetlands Database (Department of Environment and Heritage [online] Accessed 2004 September 28) are associated with the grassland\sedgeland communities and paperbark swamps that occur on the extensive floodplains to the north of the proposed pipeline corridor. The potential for the pipeline to impact on the conservation value of the Moyle floodplain is considered to be low as the pipeline corridor has been chosen to avoid permanent floodplain swamps and horizontal directional drilling techniques will be used to bore under the Moyle River.

Arafura Swamp Wetlands

The proposed pipeline corridor traverses the Goyder River at KP701. This watercourse is the main surface inflow to Arafura Swamp which is included in the Directory of Important Wetlands and also listed on the Register of the National Estate for its natural and cultural heritage values. The pipeline corridor traverses the Goyder River catchment between KP699 and KP781, which is approximately 25 km south of the Arafura Swamp.

Two isolated wetland communities were identified within the part of the Goyder River catchment traversed by the pipeline corridor, a large lagoon near KP711 and a seasonally inundated swamp near KP734. The pipeline corridor was redesigned during the field surveys to avoid the lagoon and to traverse the narrowest section of the seasonally inundated swamp, and horizontal directional drilling techniques have been recommended to bore under the Goyder River (as long as this is considered to be culturally appropriate by the Traditional Owners of the country). As long as appropriate management measures are in place for constructing watercourse crossings and trenching through areas of waterlogged soils, the potential for the pipeline corridor to negatively impact on the conservation values of the Arafura Swamp and the Goyder River catchment is considered to be low.

5.1.4 Rainforest

Monsoon rainforests in northern Australia occur as scattered patches in a landscape dominated by Eucalypt savannas (Bach *et al*. 1999). Rainforests are not uncommon, however, they are generally small in area and contain distinct plant species assemblages that warrant conservation measures (PWCNT 2000). The TTP corridor does not directly impact on any rainforest vegetation community (riparian communities with rainforest elements are discussed in **Section 5.1.1**). Earlier corridors investigated for the pipeline did directly impact on spring-fed rainforest communities at two locations, the western edge of the Macadam Ranges (south of current KP60-80) and Boggy Creek (north of KP850). At each of these locations the pipeline corridor has been redesigned to avoid both direct and indirect impacts on rainforest vegetation.

A further three sections of the proposed pipeline corridor (KP348-356, KP834-840 and KP912-925) traverse within 2-5 km of monsoon rainforest communities. Each of these communities is described in **Table 7** along with an indication of whether or not there is potential for the project to impact on the communities and recommended management measures. Only the Boggy Creek rainforest patch was assessed during the field surveys.

Table 7 Rainforest patches that occur in or near the proposed pipeline route.

KP Range	Community Description	Potential impact	Management
KP 60 - 80	Spring-fed rainforest patches are common in the deeply dissected sandstone terrain in the Macadam Ranges to the south of the proposed pipeline route. The original route proposed for the pipeline traversed near to one of these patches, however, the route has subsequently been revised and now traverses 13 km to the north through steep rocky boulder slopes.	No	avoid
KP 348-356	Numerous dry rainforest patches occur 2-4 km north of the proposed pipeline corridor in association with limestone sinkholes near the Cutta Cutta Caves	No	avoid
KP 834-840	Numerous spring-fed rainforest patches occur 2-5 km north of the proposed corridor in association with the Goromuru River floodplain	No	avoid
KP 850	Large spring-fed rainforest patch on Boggy Creek. The original route proposed for the pipeline traversed through this rainforest patch, however, the route has subsequently been revised and now traverses 800m south through Melaleuca woodland.	No	avoid
KP 912-925	Numerous spring-fed and dry rainforest patches occur 2-4km north of the proposed pipeline route in associated with the Giddy River and Latram River systems and coastline	No	avoid

Many rainforest species are rare, including 34 species which have been recorded from no more than one of the 1245 patches surveyed in the NT. Thirty percent of rainforest flora species have been recorded from fewer than 10 patches (Russell-Smith and Bowman 1992). In the country traversed by the proposed pipeline corridor through north-east Arnhem Land, monsoon rainforest is known to be the primary habitat of the 'threatened' flora species *Pternandra coerulescens* and *Sticherus flabellatus var. compactus*. These species are discussed in **Section 5.2** below.

5.1.5 Sandstone Communities

Rugged sandstone terrain often supports vegetation communities and species that typically do not occur elsewhere. For instance, heath vegetation is a community that is restricted in distribution to the rugged sandstone terrain of north and north-west Australia (Keith *et al.* 2002). It is a community that is becoming more restricted due to high susceptibility to the frequent and intense fire regimes that dominate the Top-End (Yates *et al*. 2000). Studies have found that a great majority of fire sensitive plant species are also restricted to rugged sandstone landforms (Yates and Russell-Smith 2003). The rugged terrain provides topographical protection from fire and therefore can support communities and plants species that typically do not occur in habitats that experience more frequent exposure to fire.

The pipeline corridor traverses rugged sandstone terrain at the locations described below. The landforms traversed are characterised by rocky sandstone slopes, hills and ridges. No heath vegetation communities were identified in the pipeline corridor.

Macadam Ranges between KP75 and KP85

Rocky slopes dominated by *Corymbia confertiflora* and *Eucalyptus tetrodonta* open woodland with tussock grasses in the understorey. Deeply dissected terrain with sandstone cliffs and gorges that support evergreen rainforest patches occur in the Macadam Ranges to the south of the pipeline corridor.

Wingate Mountains between KP210 and KP220

Rocky slopes dominated by *Eucalyptus miniata* and *Corymbia bleeseri* open forest with tussock grasses in the understorey.

Hills east of Beswick between KP430 and KP530

Undulating rocky hills and slopes dominated by Eucalyptus\Corymbia woodland\forests with tussock grasses in the understorey. Common canopy species include *Eucalyptus tectifica, Corymbia latifolia, Eucalyptus ferruginea, Eucalyptus phoenicea, Eucalyptus pruinosa* and *Corymbia bleeseri*. Many of the hill tops through this area are vegetated with *Acacia shirleyii* closed forest.

Mitchell Ranges between KP760 and KP785

Not yet surveyed.

None of these areas have been subject to formal botanical studies prior to the field surveys conducted along the proposed pipeline corridor. No species of notable conservation significance were identified in the sandstone habitats encountered during the field surveys. This does not preclude significant flora from being present, however, it does indicate that it is unlikely that significant populations of species of high conservation significance occur in the pipeline corridor. Based on the current state of knowledge of sandstone communities that occur elsewhere in Arnhem Land and Kakadu, and further west towards the NT\WA border, it is likely that species of botanical interest occur in sandstone habitats (Cowie and Kerrigan, pers. comm. 2003).

5.2 SIGNIFICANT FLORA

Flora species of conservation significance for the purpose of this assessment included only those species that are classified as 'threatened' and\or protected under NT and Commonwealth legislation that occur, or are likely to occur in or near the pipeline corridor. There were a number of known regionally endemic flora species recorded along the corridor, but a complete list of these species could

not be developed due to lack of evaluation of the endemism on many of the species. Only endemic species that satisfy IUCN criteria for listing as 'threatened' species have been included in our assessment.

5.2.1 Threatened Species

A total of 13 'threatened' plant species are known to occur in the bioregions traversed by the TTP corridor. These are listed in **Table 8** below, along with an indication of the likelihood of each species occurring in the project area.

Table 8 Threatened flora.

Species	Status#	Preferred habitat and distribution	Likelihood of occurring in corridor*
Acacia praetermissa	NT(V)	Hillsides in lateritic soil or in sand silt in Eucalypt woodland An NT endemic known from 3 locations near Emerald Springs, Hayes Creek and near the western boundary of Litchfield	Unlikely Reasons: Known populations over 100km away from corridor\not recorded during field surveys.
Alyogyne cravenii	NT(V)	Sandy soils at the base of sandstone escarpment Endemic to the NT known only from Keep River National Park near WA\NT border	Unlikely Reasons: Known populations over 200km away from corridor\not recorded during field surveys
Gleichenia microphylla	NT(V)	Seepage areas at the base of sandstone scarps and rock overhangs Known in the NT from Twin Falls in Kakadu and Victoria River Gorge in Gregory National Park	Unlikely Reason: No habitat in corridor\not recorded in field surveys
Hernandia nymphaeifolia	NT (V)	Seashore in littoral forests and coastal swamps Known in NT from Groote Eylandt and Port Bradshaw	Unlikely Reason: No habitat in corridor\not recorded in field surveys
Mapania macrocephala	NT (V)	Wet spring-fed rainforests Known in the NT from Melville Island, Bathurst Island and 1 locality in north-east Arnhem Land	Highly unlikely Reasons: No habitat in corridor\not identified in surveys
Nervilia plicata	NT(E)	Open forest along rainforest margins and in thickets of monsoonal rainforest Known in NT from one locality on Stuart Highway north of Pine Creek	Highly unlikely Reason: No habitat in corridor\no further plants located despite considerable survey effort
Platysace saxatilis	NT(V)	Sandstone cliff faces Known in the NT from Keep River National Park	Unlikely Reason: No habitat in corridor\not identified in field surveys
Pternandra coerulescens	NT(V)	Spring-fed rainforests and riparian forests Known from four localities in north-east Arnhem Land	Possible Reason: Previous record 750m south-east of KP922 in similar habitat on Latram River
Schoutenia ovata	NT(V)	Monsoon vine thickets on granite and limestone outcrops Known in the NT from Mt Goyder area and near Tipperary Station	Highly unlikely Reason: No habitat in corridor\not identified in field surveys
Solanum carduiforme	Com (E) NT (DD)	Sandstone, at the base of columns and half way up a sandstone escarpment, and has been collected with Triodia and *Grevillea dryandri* Known in the NT from two places at Nathan River Station.	Highly unlikely Reasons: No habitat in corridor\known populations over 250km south of corridor

Species	Status#	Preferred habitat and distribution	Likelihood of occurring in corridor*
Sticherus flabellatus var. compactus	NT(V)	On damp banks along creeks and rivers, river flats or among rocks and boulders in wet places Known in the NT from one location in north-east Arnhem Land	Unlikely Reason: Known from only 1 location over 10km away from corridor\not identified in field surveys
Triodia D62418 Matt Wilson	NT(V)	Rocky cliff tops A potential NT endemic known from one area on the edge of a plateau 2-3km north of Mt Wilson Lookout in Gregory National Park	Unlikely Reason: Known populations over 200km away from corridor\not identified in field surveys
Zeuxine oblonga	NT(V)	Dark moist situations on the floor of rainforests and usually occurs in colonies. Also, in small swampy areas adjacent to streams. Known in the NT from 5 widely spaced localities from Keep River to near Adelaide River	Unlikely Reason: No habitat in corridor\not recorded in field surveys

 # Status codes: E = Endangered, V = Vulnerable, DD = Data Deficient

**Likelihood definitions:*
Highly unlikely – No preferred habitat in corridor and known populations a large distance away from corridor.
Unlikely – Preferred habitat or similar available in corridor but known populations a large distance away from the corridor.
Possible – Preferred habitat or similar available in corridor and known populations in close proximity to the corridor.
Likely – Preferred habitat or similar available in corridor and known populations in close proximity to the corridor.

Pternandra coerulescens is the only 'threatened' plant species that possibly occurs in the pipeline corridor. This plant is typically a medium tree to 15 m tall or a several stemmed erect rambling shrub to 6 m tall that inhabits spring-fed rainforests and riparian forest communities (Kerrigan *et al*. 2002). In the Northern Territory it is known from approximately four localities in north-east Arnhem Land. *P. coerulescens* has previously been recorded from a location 750m south-east of where the pipeline corridor will cross the Latram River (KP922), however, surveys of the Latram River at the proposed pipeline crossing did not identify any specimens of this species. HDD techniques are proposed for constructing the Latram River crossing, therefore, it is considered unlikely that the project will impact on *P. coerulescens.*

5.2.2 Others Species of Interest

Northern Cypress Pine (Callitris intratropica)

The Northern Cypress Pine *Callitris intratropica* currently occupies only a fraction of its potential range and has experienced a widespread collapse due to the impact of contemporary fire regimes (Bowman and Panton 1993). This species has been the subject of a number of scientific studies looking at contemporary fire regimes and Aboriginal burning practices. *C. intratropica* was observed at a number of locations during field surveys, along the proposed pipeline corridor and at a site near the Buckingham River proposed for a construction camp. These locations are documented in **Table 9**. Observations ranged from large *C. intratropica* trees scattered through Eucalyptus woodland\forest communities to small homogenous patches of *C. intratropica* consisting of both mature individuals and juveniles. Dead *C. intratropica* trees were observed at a number of locations mainly in flat Eucalyptus woodland\forest communities on sandy soils.

Table 9 Northern Cypress Pine locations.

Lat	Long	KP	Notes	Management
-14.5982	132.8258	394	Large patches of dead *Callitris intratropica* trees	None
-14.5150	131.8497	285	*Callitris intratropica* trees scattered throughout woodland	Conserve individual trees where possible
-14.6215	132.4833	357	Stand of *Callitris intratropica* 50m east of this site. Young trees to 2 metres tall.	Avoid
-12.7142	135.6088	775	*Callitris intratropica* trees scattered throughout woodland west of Buckingham River	Conserve individual trees where possible
-12.6990	135.7042	construction camp Buckingham River	Small stands (<10 trees) of *Callitris intratropica* scattered through Eucalyptus woodland	Avoid
-14.6085	132.6065	370 King River	Juvenile *Callitris intratropica* trees on western bank of King River	Avoid
-13.4384	134.7513	Mainoru bypass	*Callitris intratropica* trees scattered throughout *Eucalyptus tetrodonta, E. miniat*a dominated woodland to the west of this site	Conserve individual trees where possible

Cycads

Cycads are typically slow growing, have a localised distribution and little is know about their ecology, which gives rise to concerns about their sustainable management in the face of threats such as land clearing, contemporary fire regimes and illegal harvesting in some areas (Parks and Wildlife Service NT 2003). The Northern Territory Government through the Draft Plan of Management for Cycads has committed to taking the potential local and regional effects on the status of cycad populations into account in considering land clearing and other development applications. A permit is required to take *Cycas* plants or plant material, for commercial use by landholders.

Eight out of the ten species of Cycad that occur in the Northern Territory are endemic to the region in which they are found. Four of these species were identified in the pipeline corridor during field surveys, *Cycas maconochei ssp. maconochiei, Cycas canalis, Cycas orientis* and *Cycas arnhemica*. The distribution and status of each of these species is discussed below.

- *C. maconochiei ssp. maconochiei* was observed as a common understorey plant in Eucalyptus woodlands in the western most section of the corridor between KP0 and approximately KP50. The status of this species has been assessed as locally common, however, it is under substantial threat of population decline through land clearing and contemporary fire regimes (Parks and Wildlife Service NT 2003).

- *C. canalis* was commonly observed scattered through Eucalyptus woodland\forest communities from the Moyle River east to around KP90. The status of this species has been assessed as locally very abundant (Parks and Wildlife Service NT 2003).

- *Cycas orientis* and *Cycas arnhemica* were observed scattered through Eucalyptus woodland\forest communities east of the Goyder River through north-east Arnhem Land where they commonly formed a significant component of the understorey vegetation in some communities. The status of both species has been assessed as locally abundant (Parks and Wildlife Service NT 2003).

None of the Cycads that occur or are likely to occur in the pipeline corridor are classified as 'threatened' species.

5.3 INDIGENOUS VALUES

Many of the plant species that occur in and around the project area are of significance to local Aboriginal people. It was not within the scope of this study to document Aboriginal uses and values for flora, however, it is important to recognise that Aboriginal people may value the flora in different ways to those considered in this report. Local people use parts of plants for a variety of purposes including as food, medicines, materials for tool making etc., and some plants may also have spiritual significance. The uses and significance of plants changes from place to place.

6 POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT RECOMMENDATIONS

The potential impacts of the proposed TTP project on vegetation and flora have been minimised during the design phase of the project by locating the pipeline corridor and permanent and temporary above ground infrastructure so that vegetation communities of high conservation value, and\or that play a regional role in maintaining ecosystems, are avoided. In addition, horizontal directional drilling construction techniques have been recommended for constructing a number of the major watercourse crossings in order to avoid ecologically important riparian vegetation corridors and minimise the potential for downstream impacts. The original corridor proposed for the pipeline was redesigned at a number of locations during the route selection and verification field surveys undertaken (October to November 2003 and July to September 2004) to avoid potentially unacceptable impacts to sensitive vegetation communities and ecosystems. By taking into account the regional role of vegetation in maintaining ecosystem processes, and the conservation values of vegetation communities and flora, during the design process, the potential impacts of the project will be minimised as long as appropriate management measures are implemented for the duration of construction and operation.

The main potential impacts of construction and operation of the proposed pipeline are:

- clearing of vegetation – clearing of vegetation will be required for the pipeline corridor, above ground facilities such as compressor stations, access tracks, and temporary facilities such as construction camps, borrow pits and laydown areas;
- degradation of sensitive vegetation communities and habitats – this could occur through direct or indirect disturbance of communities as a result of inadequate management of construction and operation activities near to sensitive areas;
- introduction and spread of exotic species – disturbance and increased access during construction and operation may introduce and spread weed species with associated potential for adverse impacts on the ecological integrity of vegetation communities.

Other potential impacts, such as those associated with changes to hydrology, water quality, effluent and waste management, hazardous substances and increased risk of fire, are considered to have a lower potential impact on vegetation, and therefore are not discussed in detail in this report.

There is significant scope for reducing the potential ecological impacts of the project by incorporating specific management measures into construction specifications that aim to minimise the impact of the project on vegetation communities and habitats. There are also opportunities to mitigate some of the potential adverse effects by implementing management actions before, during and after construction. Recommendations on management measures that should be implemented to minimise impacts on vegetation and flora are also identified in this section. Additional measures for minimisation of site specific impacts should be developed following determination of the final design specifications.

6.1 CLEARING OF NATIVE VEGETATION

6.1.1 Potential Impacts

Construction in areas of intact native vegetation will cause loss of native vegetation communities, and may cause a decline in the physical condition of vegetation and habitats beyond the actual zone of disturbance, or other changes that reduce the suitability of surrounding habitat. The extent and nature of such effects is influenced by the following factors, each of which was considered in our assessment of the potential impacts of the project:

- sensitivity and initial condition of affected vegetation and flora;
- the extent of the area disturbed;

- the regional context of vegetation and flora in the project area (i.e. fragmentation and isolation of habitat); and
- management of construction and operational activities.

The vegetation clearing that will be associated with the project proposal as it currently stands is summarised below along with an assessment of the potential impacts on vegetation communities and flora species in general. Potential impacts on communities and species with special conservation values that were identified in **Section 5** are discussed in **Section 6.2**.

Clearing of vegetation will be required for the:

- pipeline corridor;
- above ground facilities including meter stations, mainline valves, scraper stations and compressor stations;
- temporary construction camps; and
- temporary and permanent access tracks.

Permanent Clearing

The pipeline corridor is 940 km long and will be constructed within a 30 m 'Right of Way' (ROW) that will be permanently cleared of trees and shrubs, but will be revegetated with ground layer grasses and herbs. Assuming a common corridor width of 30 m, the approximate area of vegetation that will be cleared for the pipeline corridor is 2820 ha. The proposed area of a compressor station is 25 ha, with 2.25 ha of vegetation clearing required to accommodate the required infrastructure. Initially, one compressor station will be built, however, locations have been chosen for an additional two compressor stations which may be required during the operational lifetime of the pipeline. The two above ground meter stations, seven mainline valves (each 12 m x 16 m) and six scraper stations (each 20 m x 30 m) will be located within the 30 m ROW already cleared for the pipeline corridor. Therefore, the total area that will be permanently cleared of vegetation (excepting ground layer grasses and herbs) for the pipeline ROW and compressor station will initially be 2822 ha with a further 4.5 ha of clearing should the two additional compressor stations be required. This figure does not include the vegetation clearing required for access tracks, which were being surveyed at the time this report was prepared and therefore will be addressed in a separate document.

The vegetation that occurs in the pipeline corridor and at locations selected for compressor stations during the field surveys is summarised in **Table 2** and **Table 3** and documented in detail in **Appendix 1**. The vegetation group that will be most affected is woodlands to forests dominated by *Eucalyptus miniata* and *E. tetrodonta.* Associations of this vegetation type are the most common in the Top End of the Northern Territory, and they characterise over 60% of the pipeline corridor. None of the communities identified from the vegetation mapping or during the field surveys are considered to be 'threatened', however, there were a number of riparian corridors, rainforest communities and wetlands encountered that are likely to be sensitive to disturbance and that play an important role in maintaining ecosystem health (see **Section 5**). The vegetation communities that are most restricted in areal extent and most sensitive to disturbance have been avoided by changes to the pipeline design, and where this was not possible potential impacts have been minimised by prescribing horizontal directional drilling construction techniques that minimise surface disturbance. At other sensitive areas, for example where the pipeline traverses permanently saturated soils (see **Table 7**), specific mitigation and management measures will be required to minimise the potential impacts. Overall, the permanent vegetation clearing that will be associated with the project is considered unlikely to have a significant impact on vegetation and flora as long as the mitigation and management measures recommended in this report are developed, implemented and monitored.

Temporary Clearing

Temporary clearing of 9 ha of vegetation will be required for eight construction camps (4 camps 80 m x 200 m and 4 camps 65 m x 100 m). It is proposed that these sites will be rehabilitated and revegetated when construction is complete. The vegetation communities present at the camp sites selected during the field surveys are documented in **Table 3**, excluding the Dorisvale and Beswick

camps that had not been surveyed at the time that this report was prepared. The camp locations near the Buckingham River and Moyle River were moved during the design phase to avoid indirect impacts on nearby watercourses, and to avoid clearing Northern Cypress Pine *Callitris intratropica* stands that occur near the Buckingham River. Each of the vegetation communities encountered at the camp site locations are well represented in the regions surrounding the project area, and none are considered to be 'threatened'. Therefore, the extent of clearing that will be associated with this aspect of the project is unlikely to have a significant impact on vegetation and flora, as long as the mitigation and management measures recommended in this report are developed, implemented and monitored.

6.1.2 Management

The following management measures should be considered to minimise the effects of vegetation clearing activities associated with the project:

- Keep the extent of the planned working width to the minimum area necessary for construction activities. This is particularly important at watercourse crossings and semi-permanent swamps that are likely to be sensitive to disturbance.

- Clearly mark the working width using construction pegs or other temporary measures, and cross check the peg locations with the environmental datasets to ensure that all sensitive vegetation communities are avoided as recommended during the design phase.

- Stage clearing of vegetation in accordance with the construction schedule to minimise the time between clearing and rehabilitation.

- Develop a rehabilitation plan prior to construction. Include a rehabilitation schedule, proposed techniques, species proposed for use, and the following general principles:

    - Stockpile top soil and suitable vegetative matter near to the area from which it was taken so that it can be respread over the area during rehabilitation.

    - Locate stockpiles within the marked working width.

    - Store excavated soil on-site in an area previously cleared of vegetation, or remove to an appropriate area off-site. Any on-site or off-site location will be approved by DIPE prior to dumping.

    - Clearly mark appropriate locations for dumping of spoil.

- Design additional project infrastructure, including access routes, vehicle and plant storage and turn-around areas, borrow pits etc. so that:

    - previously disturbed areas are used where possible;

    - areas of sensitive vegetation are avoided; and

    - low impact construction techniques are used in environmentally sensitive areas.

- Assess the environment and heritage values of routes chosen for access roads, and locations where other project related activities will take place i.e. sourcing of construction materials, prior to construction.

- Brief all construction staff about their environmental responsibilities.

6.2 DEGRADATION OF COMMUNITIES AND SPECIES OF CONSERVATION SIGNIFICANCE

6.2.1 Potential Impacts

Activities associated with construction and operation of the TTP will occur in proximity to vegetation communities deemed to be of high conservation value, including riparian corridors, wetlands (swamps and floodplains), monsoon vine forests and sandstone communities, as identified in **Section 5.** The project area does not directly impact on any communities deemed to have a high conservation value where potential impacts on those values could not be managed. However, some communities in proximity to the project area are typically sensitive to disturbance and therefore it is necessary to consider the potential for their conservation values to be degraded through indirect impacts such as changes to hydrology and increased sedimentation in watercourses that could occur if environmental management of the project was inadequate. This section reiterates the vegetation communities identified in **Section 5** that should be avoided and makes recommendations on where specific attention to management of construction and operational activities should be focussed to ensure that adverse impacts do not occur.

Riparian Corridors and Watercourses

The type and integrity of the vegetation at each major watercourse crossing was assessed in conjunction with the aspects listed in **Table 10** to determine the potential for unacceptable adverse impacts on the riparian corridors, and on wetland environments downstream of the proposed pipeline route.

Table 10 Environmental considerations for construction of major watercourse crossings.

Considerations
Type and integrity of riparian vegetation
Susceptibility to erosion and potential to cause downstream sedimentation impacts
Ability to stabilise and rehabilitate in short time frame between construction and the following wet season (dependent on various factors including soil type, vegetation, stream flow)
Type and integrity of in-stream habitat
Declared Beneficial Uses of water
Threatened fauna and flora

Table 6 in **Section 5** of this report summarises broad management recommendations for each of the riparian vegetation corridors traversed by the pipeline corridor. At three of the watercourses crossings the location of the proposed crossing was redesigned in order to avoid direct and indirect impacts on the sensitive riparian vegetation communities encountered. For the remaining crossings, recommendations for management of construction activities can be divided into three categories as follows:

- Horizontal directional drilling.
- Open trench management for wet crossings.
- Open trench management for dry crossings.

At 13 of the watercourse crossings it was decided that disturbance of the riparian vegetation communities could create potential for unacceptable adverse impacts on the conservation significance of downstream environments, and therefore, horizontal directional drilling is recommended as a way

to minimise disturbance of the riparian vegetation communities at these locations. Fourteen of the crossings are likely to be wet during pipeline construction. At these crossings there will be increased potential for vehicles and plant to sink in the soils on the banks, creating high levels of disturbance beyond the pipeline trench and therefore making rehabilitation more difficult. There will also be high potential for mobilisation of sediments, which could cause negative impacts on downstream environments in the absence of appropriate erosion and sediment control measures. At the crossings that are dry during construction the potential for downstream impacts will be greatly reduced as long as rehabilitation is sufficiently advanced at the onset of the wet season to minimise damage to bank vegetation and mobilisation of sediments.

Wetlands

Six semi-permanent to permanent swamp communities will be directly impacted by the pipeline corridor as described in **Table 6**. A further two small wetlands would be directly impacted if the Mainoru Bypass route is used. It was decided during the field surveys of the pipeline corridor that the potential impacts on these communities could be adequately managed, and so redesign of the route was not considered necessary.

The wetlands typically occur on permanently wet black soils that are likely to be very boggy during pipeline construction. Where the pipeline corridor crosses these communities, digging of the pipeline trench and high levels of traffic during construction are likely to cause significant disturbance of the soil profile, potentially making the areas difficult to rehabilitate. The wetlands are on broad drainage floors that feed into nearby watercourses, therefore, if rehabilitation is not sufficiently advanced prior to onset of the wet season there will be potential for downstream impacts as a result of mobilisation of sediments into those watercourses.

Monsoon Rainforest

There are no monsoon rainforest communities in the project area. The rainforest communities encountered during the field surveys that are listed in **Table 7** have been avoided by an 800 m vegetated buffer, which is more than the 500 m minimum distance recommended by Price *et al*. (1998) in their guidelines for rainforest conservation. Therefore, it is considered unlikely that the project will impact on these rainforest communities. This said, rainforest communities on the Goromuru River and Boggy Creek do occur within 1 km downstream of the pipeline corridor, and therefore appropriate management of construction of the crossings at these locations will be important to avoid creating any potential for negative impacts on the downstream communities.

Individual Species

The only 'threatened' species that potentially occurs in the project area is *Pternandra coerulescens.* Field surveys in the pipeline corridor where it crosses the Latram River did not encounter this species. The project is unlikely to impact on *P. coerulescens* as horizontal directional drilling is proposed for the crossing of the Latram River. Using this technique will avoid destruction of *P. coerulescens* habitat.

It is likely that individuals of the Northern Cypress Pine *Callitris intratropica*, a species of interest that is not protected under legislation, will be destroyed during construction. However, the impact of the project on the regional distribution of this species is likely to be minimal as no large stands of this species were encountered in surveys of the project area. The impacts of the project on this species could be reduced even further by avoiding *C. intratropica* where it is encountered, especially where small stands of juveniles occur. Specific locations where this is recommended are identified in **Table 9** in **Section 5.2.2**.

Cycads will inadvertently be destroyed during construction. None of the species with a range extending to the project area are listed as 'threatened' species under NT or Commonwealth legislation. The Draft NT Cycad Management Plan (Parks and Wildlife Service of the Northern Territory 2003, p.7) states that where land clearing has been approved under the procedures of the Northern Territory Government, no permit will be required to take unprotected cycads for non-commercial purposes on areas designated to be cleared. However, the conservation value of these plants as commercial species

is recognised, and therefore the potential for salvaging plants that will be destroyed should be considered in consultation with land owners.

Weed incursion and fire are possibly the greatest threats to communities of conservation significance, especially monsoon vine forests, riparian communities and freshwater wetlands. Woinarski (2002) observes that the monsoon rainforest patch network in the Darwin Coastal bioregion is being degraded by incursion of weeds and the impacts of more frequent hot late dry season fires. The project, if not properly managed, has the potential to create conditions for weed invasion and increased fire frequency. Weed issues are discussed in **Section 6.3** below.

6.2.2 Management

The following management measures should be considered, in addition to measures recommended in Section 6.1, to minimise impacts on communities and species of conservation significance:

- Prior to construction, verify that the pegged alignment does not impact on any of the sensitive communities identified above as intended in the project design.

- Develop a watercourse crossing construction management plan that:

    - specifies criteria to be used in final selection of the watercourse crossing points;
    - identifies where temporary and permanent culverts are required, and specifies appropriate culvert types for each crossing;
    - documents specific construction techniques and management measures required at hdd crossings, wet crossings and dry crossings;
    - documents during and post construction erosion and sediment control requirements; and
    - documents a rehabilitation and revegetation plan.

- Use horizontal directional drilling to construct crossings of the 13 watercourse crossings identified in **Table 5**.

- Construct temporary culverts at watercourse crossings that will receive a high level of traffic during construction.

- Implement specific construction management strategies and rehabilitation plans for areas of saturated soils identified in **Table 6**.

- Prohibit any disturbance of the riparian corridor at the Latram River where the 'threatened' species *Pternandra coerulescens* could occur.

- Construct all watercourse and wetland crossings as early as possible in the dry season and aim to ensure that rehabilitation and revegetation is sufficiently advanced at the onset of the wet season to stabilise the watercourse banks.

- Ensure that all watercourse banks are sufficiently stabilised prior to the onset of the first wet season rains.

- Clearly mark sensitive vegetation communities that occur in the vicinity of areas where construction activities will take place, and ensure that these areas are avoided by a sufficient distance to minimise disturbance.

- Maintain a 500 m vegetated buffer zone around any wet rainforest communities (Price *et al*. 1998) encountered.

- Minimise impacts on natural drainage patterns where possible.

- Implement a monitoring and maintenance program to regularly check the condition of each watercourse crossing for the duration of operation, and repair damage caused by erosion as necessary.

- Consult with Traditional Owners and the Northern Territory Parks and Wildlife Service about potential for salvage of Cycad plants that will otherwise be destroyed during construction.

- Brief all construction staff on recognising and protecting sensitive vegetation communities, specifically, monsoon vine forests, wetlands and riparian forests.

6.3 INTRODUCTION AND SPREAD OF WEEDS

6.3.1 Potential Impacts

The potential for the introduction of weed species, and the spread of existing species, will be a critical environmental management issue for the TTP project. Of concern is the potential that exists for the project to transport weed species to areas that are currently mostly weed free, especially in the Wingate Mountains and in areas through north-east Arnhem Land. The greatest risk of weeds being introduced and spread will occur during the construction phase of the project when there will be high levels of disturbance associated with vegetation clearing and large numbers of vehicles, plant and construction materials being transported in and out of the project area. Activities that involve disturbance of native vegetation create suitable conditions for weeds to rapidly establish and develop into infestations that are then difficult to manage. Once weeds become established they compete with native vegetation, and in the case of the grassy weeds, can create conditions for hot, intense fires that have adverse impacts on ecological integrity. On land used for pastoral or agricultural production weed infestations can adversely affect land use by causing injury to animals and invading pastures.

6.3.2 Management

The *Weeds Management Act 2001* places obligations on land owners and occupiers to manage the introduction and spread of weeds declared under the Act, and to comply with approved weed management plans relating to declared weeds that occur on their land. The proponent of the project must take all reasonable measures to prevent the spread of Class D weeds, and to ensure that declared weeds of any class are not introduced into the project area during construction and operation of the project. Management of weed species not declared under the *Weeds Management Act 2001* is also encouraged in order to minimise the potential impacts of these species on the environment. Management of the grass weeds, Gamba Grass *Andropogon gayanus* and Mission Grasses *Pennisetum polystachion* and *P. pedicellatum*, is especially recommended, as these species provide fuel for hot, late season fires, which have the potential to negatively impact on the environment and to place project personnel and infrastructure at risk. A list of weeds that are declared under the *Weeds Management Act 2001* and are likely to occur in the project area is provided in **Table 4**.

Priority areas for weed management from east to west along the proposed TTP route are identified in **Table 11** and are shown on **Figure 1**. These areas were identified based on observations of weeds encountered during surveys of the pipeline corridor and also consultations with the NT Weeds Branch regarding areas and species of concern. The species listed are only those that were encountered during field surveys of the project area, however, other species listed in **Table 4** are likely to be present and will need to be included in management and control strategies. The priority for weed management is to prevent the spread of weeds from the infected areas listed in **Table 11** into areas that are less infected or not at all infected with weed species.

Table 11 Priority areas for weed management.

Area	KP Range	Species encountered*
South of Wadeye and Palumpa, Wadeye Road, Moyle River and floodplain	KP0-KP75	Rubber Bush *Calotropis procera*, Hyptis *Hyptis suaveolens*
Dorisvale Station, Bradshaw Creek, Daly River, Florina Station, Katherine River, Manbullo Station, small properties to east of Manbulloo	KP215-375	Noogoora Burr *Xanthium strumarium*, Hyptis *Hyptis suaveolens*, Rubber Bush *Calotropis procera*, Noogoora Burr *Xanthium strumarium*, Yellow Oleander *Casabela thevetica*
Goondooloo Station, Mainoru Station and Mountain Valley Station	KP460-580	Hyptis *Hyptis suaveolens*, Parkinsonia *Parkinsonia aculeata*, Prickly Acacia *Acacia nilotica*, Flannel Weed *Sida cordifolia*, Mission Grass *Pennisetum polystachion*, Sicklepod *Senna obtusifolia*, Rubber Bush *Calotropis procera*
Bulman and Wilton River area	KP580-615	Hyptis *Hyptis suaveolens*, Sicklepod *Senna obtusifolia*, Spinyhead Sida *Sida acuta*, Grader Grass *Themeda quadrivalvis*
Gove Peninsula	KP910-end	Hyptis *Hyptis suaveolens*, Snakeweed *Stachytarpheta sp.*

*Note – other species of concern in addition to those encountered during the field surveys are likely to be present.

The following management measures should be considered to minimise the introduction and spread of weeds during project construction and operation:

- Identify and treat existing weed infestations at the project area, along access routes and at borrow pits, prior to construction activities.

- Develop a weed management programme for construction and operation, incorporating the following elements:

    - Wash-down and inspection of vehicles and plant at locations determined in consultation with the Weeds Branch.
    - Inspection of construction materials prior to entry to the project area or movement to a different location within the project area.
    - Requirements for providers of construction materials to certify their 'weed free' status.
    - Weed awareness training and inductions for all construction and operational staff.
    - A system for recording and reporting new weed infestations encountered during construction.

- Develop and implement a weed monitoring and treatment programme that commences immediately following construction and continues throughout the operation stage of the project. The most appropriate treatment and control techniques should be identified for each weed species.

- Incorporate monitoring of weed inspection and washdown points used during the design stage field surveys (see below) into the weed monitoring and treatment program.

- Only use species native to the area in rehabilitation and landscaping, and determine species suitability for use in consultation with experts in rehabilitation techniques.

Weed Inspection and Washdown Locations used in Field Surveys

During the field surveys undertaken for the TTP project all vehicles were fitted with weed screens to minimise the amount of weed propagules being transported on the vehicles. Inspections of vehicles were undertaken when moving out of weed infested areas into cleaner areas. Wash downs were undertaken where deemed necessary by the environmental scientist on the field survey team. Potential wash down locations were determined in consultation with the NT Weeds Branch prior to the field surveys and actual locations were chosen in the field based on weed distribution. **Table 11** identifies

locations where wash downs and\or inspections were conducted so that the sites can be checked for weed establishment as part of an ongoing monitoring and treatment program.

Table 12 Field survey weed washdown\inspection locations.

Location	Type	Coordinates	Date
Wadeye beach	Inspection	-14.2400 129.4100	29/10/03 30/10/03
West edge of Dorisvale west to plateau/escarpment	Washdown	-14.49734 131.34292	8/11/03 3/8/04
Out of Bradshaw Ck. (either direction)	Inspection	-14.49734 131.34292	5/11/03
East of Bradshaw Ck to Manbulloo	Inspection	-14.49734 131.34292	5/11/03
Out of Manbulloo	Inspection	Several locations	21/11/03
Beswick (Water House River) (either direction)	Washdown	-14.57843 133.10742	25/10/03
Mainoru	Inspection	- 13.9384 134.2589	11/10/03
	Inspection	-14.0423 134.0946	11/7/04

7 REFERENCES AND BIBLIOGRAPHY

Bach C., Price O., Shapcott A. & Palmer C. (1999) Fruit resources, frugivore movements and landscape scale conservation in monsoon rainforests of northern Australia. In: *Australian Wildlife Management Society Conference*, Darwin, Australia.

Bowman D.J.M.S. and Panton W.J. (1993) *Callitris intratropica* in the Northern Territory: implications for pre- and post-colonisation fire regimes. *Journal of Biogeography* 20: 373-381.

Cowie I. and Kerrigan R. (2003) [NT Herbarium, Darwin] Personal Communication, 9th October 2003.

Cowie I., Armstrong M., Woinarski J., Brocklehurst P., Short P. and Dunlop C. (2000) An Overview of the Floodplains. In: I. Cowie, P. Short and M. Osterkamp Madsen (eds) *Floodplain Flora: A flora of the coastal floodplains of the Northern Territory*. Flora of Australia Supplementary Series Number 10. Commonwealth of Australia.

Department of Environment and Heritage (2004) *Australian Wetlands Database* [online] www.deh.gov.au/cgi-bin/wetlands [Accessed 2004 September 28].

Environment Australia (2001) *A Directory of Important Wetlands in Australia 3rd Edition* [online] www.deh.gov.au/cgi-bin/wetlands [Accessed 22 April 2004].

I.D. Fox, V.J. Neldner, G.W. Wilson and P. J. Bannink (2001) *Technical report to accompany the map of the Vegetation of the Australian Tropical Savannas*. Queensland Government Environmental Protection Agency, Brisbane.

Keith D. A., McCaw L. W. & Whelan R. J. (2002) Fire regimes in Australian heathlands and their effects on plants and animals. In: *Flammable Australia - The Fire Regimes and Biodiversity of a Continent* (eds. R. A. Bradstock, J. E. Williams & M. A. Gill) pp. 199-237. Cambridge University Press, Cambridge.

Kerrigan R. (2004) [NT Herbarium, Darwin] Personal Communication, 14th October 2004.

Kerrigan R., Cowie I. and Baker B. (2002) *Pternandra coerulescens.* Threatened Species of the Northern Territory Information Sheet [online] http://www.nt.gov.au/ipe/pwcnt/plants/pternandra_ coerulescens_vu.pdf [Accessed 2004 January].

Lynch B.T. and Wilson T.L. (1998) *Landsystems of Arnhem Land.* Technical Report R97\1, Natural Resources Division, Department of Lands Planning and Environment, Darwin.

McDonald R., Isbell R., Speight J., Walker J. & Hopkins M. (1998) A*ustralian Soil and Land Survey - Field Handbook.* CSIRO.

National Land and Water Resources Audit (2004) *Biodiversity* [online] http://audit.ea.gov.au/ANRA/ vegetation [Accessed 2004 April].

Parks and Wildlife Service Northern Territory (2003) *Draft Management Programme for Cycads in the Northern Territory*. Northern Territory Government, Palmerston.

Parks and Wildlife Service Northern Territory, *Threatened Species Information Sheets* [online] http://www.nt.gov.au/ipe/pwcnt/plants [Accessed April 20 2004].

Parsons W.T. and Cuthbertson E.G. (2001) *Noxious weeds of Australia.* CSIRO Publishing.

Price O., Bach C., Shapcott A. & Palmer C. (1998) *Design of Reserves for Mobile Species in Monsoon Rainforests*. Parks and Wildlife Commission of the Northern Territory, Darwin.

Russell-Smith J. & Bowman D. (1992) Conservation of monsoon rainforest isolates in the Northern Territory, Australia. *Biological Conservation* 59: 51-63

Smith, N. (2002) *Weeds of the wet\dry tropics of Australia – A field guide*. Environment Centre NT, Darwin, 2002.

Weeds Branch (2004) *Weeds in the Northern Territory* [online] http://www.ipe.nt.gov.au/whatwedo/weeds/weedswehave/info-byregion [Accessed 2004 July 29].

Whitehead P. & Chatto R. (2001) Chapter 7 Northern Territory. In: Environment Australia (eds) A *Directory of Important Wetlands in Australia Third Edition*. Environment Australia, Canberra.

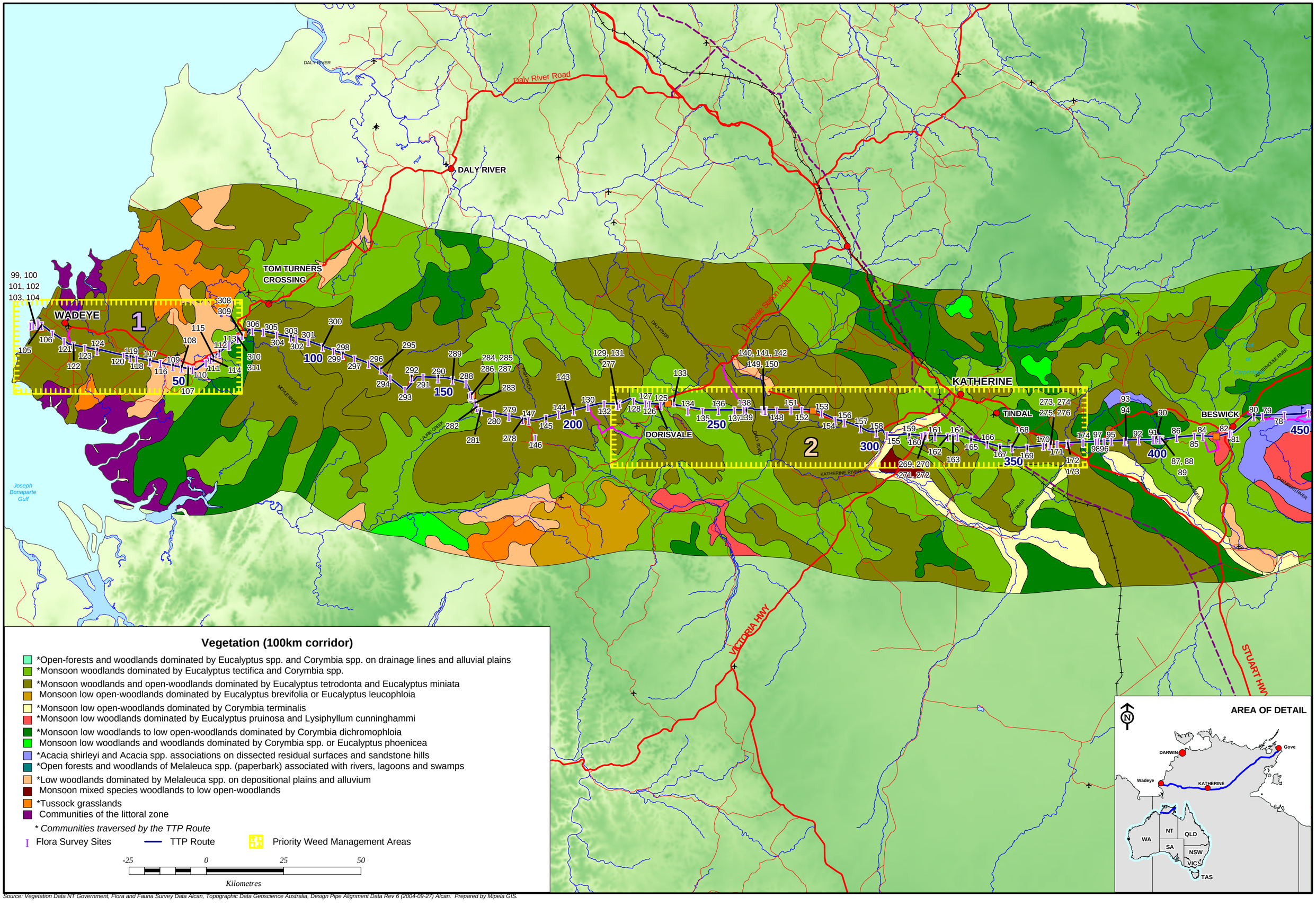
Wingrave S. (2004) [Weeds Branch, Darwin] Personal Communications, 2003, 2004.

Yates C. and Russell-Smith J. (2003) Fire regimes and vegetation sensitivity analysis: an example from Bradshaw Station, monsoonal northern Australia. *International Journal of Wildland Fire* 12(4) 349 – 358.

Yates C., Russell-Smith J. and May T. (June 2000) *Monitoring and assessment of fire regimes and their effects on habitat for long-term management of Bradshaw Field Training Area*, Northern Territory. Final Report to the Department of Defence pp. 58. Bushfires Council NT, Darwin

Figures

Figure 1: Vegetation communities, survey sites and priority weed management areas (Map 1 of 2)



Vegetation (100km corridor)

- *Open-forests and woodlands dominated by Eucalyptus spp. and Corymbia spp. on drainage lines and alluvial plains
- *Monsoon woodlands dominated by Eucalyptus tectifica and Corymbia spp.
- *Monsoon woodlands and open-woodlands dominated by Eucalyptus tetrodonta and Eucalyptus miniata
- Monsoon low open-woodlands dominated by Eucalyptus brevifolia or Eucalyptus leucophloia
- *Monsoon low open-woodlands dominated by Corymbia terminalis
- *Monsoon low woodlands dominated by Eucalyptus pruinosa and Lysiphyllum cunninghammi
- *Monsoon low woodlands to low open-woodlands dominated by Corymbia dichromophloia
- Monsoon low woodlands and woodlands dominated by Corymbia spp. or Eucalyptus phoenicea
- *Acacia shirleyi and Acacia spp. associations on dissected residual surfaces and sandstone hills
- *Open forests and woodlands of Melaleuca spp. (paperbark) associated with rivers, lagoons and swamps
- *Low woodlands dominated by Melaleuca spp. on depositional plains and alluvium
- Monsoon mixed species woodlands to low open-woodlands
- *Tussock grasslands
- Communities of the littoral zone

** Communities traversed by the TTP Route*

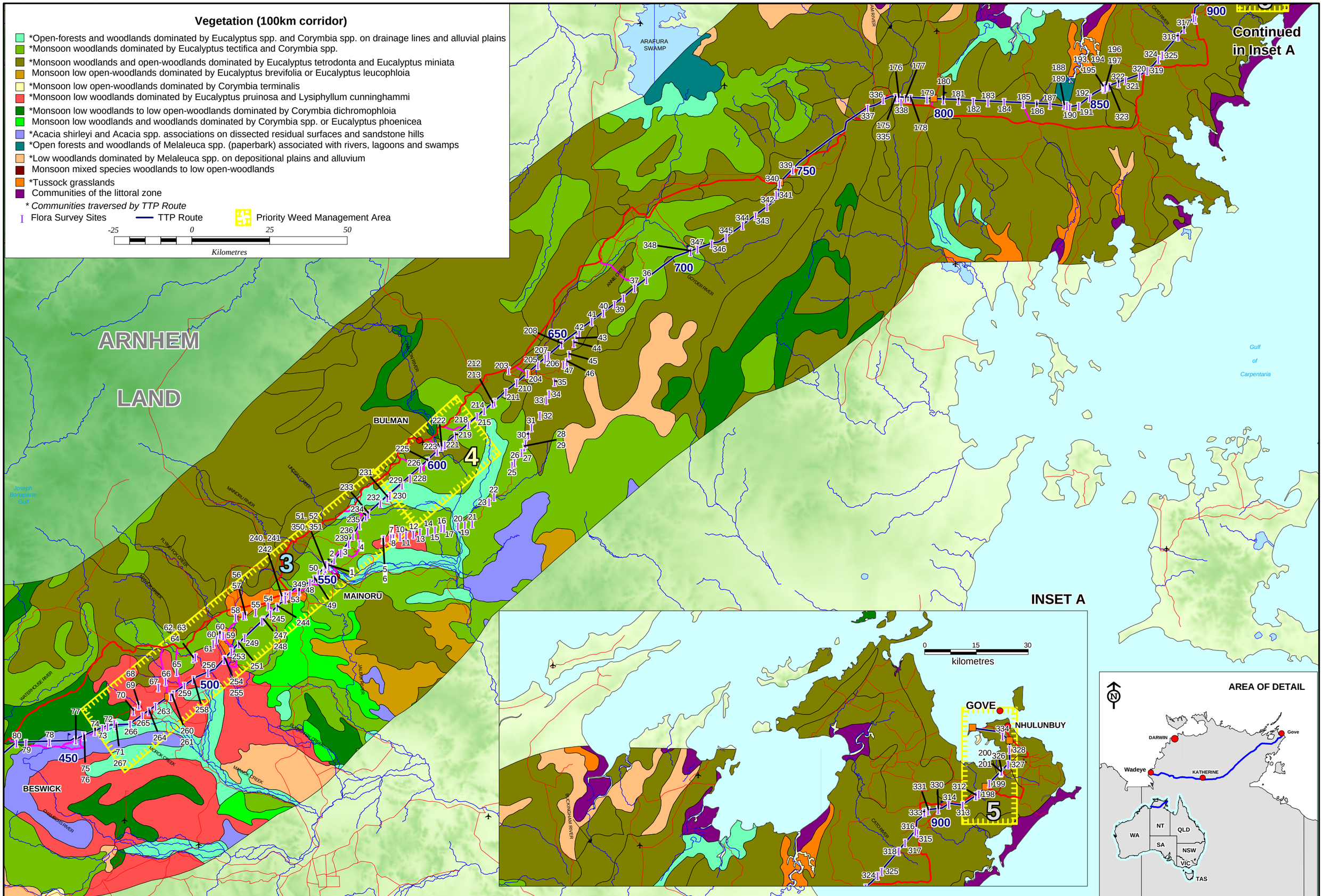
I Flora Survey Sites — TTP Route — Priority Weed Management Areas

-25 0 25 50

Kilometres

Source: Vegetation Data NT Government, Flora and Fauna Survey Data Alcan, Topographic Data Geoscience Australia, Design Pipe Alignment Data Rev 6 (2004-09-27) Alcan. Prepared by Mipela GIS.

Figure 1: Vegetation communities, survey sites and priority weed management areas (Map 2 of 2)



Source: Vegetation Data NT Government, Flora and Fauna Survey Data Alcan, Topographic Data Geoscience Australia, Design Pipe Alignment Data Rev 6 (2004-09-27) Alcan. Prepared by Mipela GIS.

Appendix 1
Field Survey Data – Environmental Variables

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
1	82	20031010	-14.01956	134.07245	1843	clay	basalt	large boulders up hill slope	~	not applicable	2+yrs	significant infestation of Hyptis suaveolens	minor pig damage, cattle abundant	OW	Corymbia confertiflora and Eucalyptus patellaris open woodland with Heteropogon contortus understorey
2	83	20031010	-14.00151	134.0872	1844-1845	clay	none	none	~	not applicable	2+yrs	significant infestation of Hyptis suaveolens and Parkinsonia aculeata	minor pig damage, cattle abundant	ST	Heteropogon contortus and Themeda triandra grassland with scattered Corymbia bella trees
3	84	20031010	-13.98289	134.10586	1846	clay loam	none	none	~	not applicable	1-2yrs	scattered Hyptis suaveolens plants	minor pig damage, cattle abundant	OW	Corymbia confertiflora and Erythrophleum chlorostachys open woodland with Themeda triandra and Heteropogon contortus understorey.
4	85	20031010	-13.95568	134.15899	1847	rocks	basalt	boulders (>2m)	~	not applicable	not recorded	scattered Hyptis suaveolens plants	~	ST	Heteropogon contortus grassland with scattered Cochlospermum fraseri trees
5	86	20031010	-13.94391	134.22627	1848	rocks	none	none	~	not applicable	1-2yrs	~	~	OW	Eucalyptus patellaris open woodland with a mixed species grass\shrub understorey
6	88	20031010	-13.94299	134.22844	1849	clay	sandstone	none	~	not applicable	6mths-1yr	~	~	W	Eucalyptus jensenii woodland with Petalostigma pubescens understorey
7	89	20031010	-13.93938	134.2487	1850	clay loam	none	none	evidence of sheet flows in wet season	not applicable	1-2yrs	~	~	OW	Eucalyptus pruinosa open woodland with Heteropogon contortus understorey
8	90	20031010	-13.9385	134.25737	1857	clay	none	none	~	not applicable	1-2yrs	~	~	OW	Eucalyptus jensenii woodland with Petalostigma pubescens understorey
10	91	20031011	-13.93551	134.27518	1853-1854	clay	slatey siltstone	rocks (20-60cm)	2 x 2m semi-permanent rock pool in dry country	avoid	1-2yrs	~	buffalo and donkey signs but minimal impact	OW	Corymbia latifolia and Eucalyptus bigalerita open woodland with Eriachne sp understorey
11	92	20031011	-13.93199	134.29189	1855	clay loam	none	pebbles (<0.6cm)	ephemeral creek	open trench	1-2yrs	~	~	W	Eucalyptus tectifica and Erythrophleum chlorostachys woodland with Petalostigma pubescens understorey
12	93	20031011	-13.92881	134.31255	1856	clay loam	none	none	ephemeral creek	open trench	2+ yrs	scattered Hyptis suaveolens plants	Buffalo wallows	OF	Open forest dominated by Lophostemon grandiflorus, Bauhinia cunninghamii and Eucalyptus tectifica with a dense mid-storey of Hakea arborescens, Terminalia platyphylla and Leptospermum madidum with Heteropogon contortus understorey
13	94	20031011	-13.92335	134.33221	1858	clay loam	sandstone	small stones (0.6-2cm)	~	not applicable	1-2yrs	~	~	W	Eucalyptus tectifica and Melaleuca viridiflora woodland with Sarga sp understorey
14	95	20031011	-13.92044	134.35426	1860	cracking clay	none	none	seasonally inundated	not applicable	1-2yrs	~	~	W	Melaleuca viridiflora and Erythrophleum chlorostachys woodland with a grassy understorey
15	96	20031011	-13.91676	134.3749	1861	clay	sandstone	small stones (0.6-2cm)	seasonally inundated	not applicable	1-2yrs	~	~	W	Eucalyptus tectifica, Erythrophleum chlorostachys and Corymbia terminalis woodland with a grassy understorey.
16	97	20031011	-13.91081	134.39249	1862	clay loam	none	none	ephemeral drainage line	open trench	1-2yrs	~	~	W	Erythrophleum chlorostachys and Eucalyptus tectifica woodland with Eriachne sp. understorey
17	98	20031011	-13.91254	134.40133	1866	clay loam	sandstone	small stones (0.6-2cm)	~	not applicable	6mths-1yr	~	~	OW	Eucalyptus tectifica open woodland with Sarga sp understorey
18	not recorded	20031011	not recorded	not recorded	1867	cracking clay	none	none	seasonally inundated	not applicable	6mths-1yr	~	buffalo and donkey tracks, wallows, dung. Area has been heavily impacted by ferals	OF	Excoecaria parvifolia open forest with sparse Aristida sp and Sarga sp understorey

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
19	99	20031012	-13.90268	134.46026	1868	clay loam	slatey mudstone	small rocks (6-20cm)	~	not applicable	6mths-1yr tree deaths have occurred.	~	~	W	Eucalyptus tintinnans and Erythrophleum chlorostachys woodland with Sarga plumosum and Petalostigma quadriloculare understorey
20	100	20031012	-13.90535	134.44013	1869-1870	sand loam	mudstone\ siltstone	small rocks (6-20cm)	ephemeral drainage line	open trench	1-2yrs	~	cattle\buffalo tracks along creek banks have caused erosion	OF	Casuarina cunninghamiana open forest with Eriachne sp understorey
21	101	20031012	-13.89891	134.48077	1871-1872	clay	siltstone	pebbles (<0.6cm)	~	not applicable	1-2yrs	~	~	CF	Acacia shirleyi closed forest with Sarga plumosum understorey
22	102	20031013	-13.82238	134.54316	1873	clay loam	none	none	ephemeral drainage line	open trench	1-2yrs	~	~	W	Corymbia latifolia and Melaleuca viridiflora woodland with Sarga plumosum understorey
23	103	20031013	-13.83737	134.52866	1847	clay loam	siltstone	not recorded	~	not applicable	1-2yrs	~	~	OW	Eucalyptus tectifica and Corymbia polycarpa open woodland with Sarga plumosum and Heteropogon contortus understorey
25	105	20031013	-13.73197	134.59524	1875	clay loam	none	none	~	not applicable	1-2yrs	~	~	OW	Eucalyptus tectifica open woodland with Themeda sp. understorey
26	106	20031013	-13.72508	134.60156	1876	loam	sandstone	outcrop	~	not applicable	2+ yrs	significant infestation of Hyptis suaveolens	buffalo tracks - medium level of disturbance	W	Eucalyptus tintinnans and Eucalyptus tectifica woodland with Heteropogon contorus understorey
27	108	20031013	-13.69668	134.62197	1877	cracking clay	sandstone	rocks (20-60cm)	seasonally inundated	not applicable	6mths-1yr	~	buffalo, donkey, pig tracks and wallows. Area highly disturbed by ferals	ST	Open grassland dominated by Mnesithea rottboellioides with scattered Corymbia bella trees
28	109	20031013	-13.68047	134.62855	1878	clay loam but sandy creek bed	none	none	ephemeral creek	open trench	1-2yrs	scattered Passiflora foetida and Hyptis suaveolens	buffalo tracks and dung along creek banks	OF	Open forest dominated by Lophostemon lactifluus and Terminalia platyphylla with Heteropogon contortus understorey
29	110	20031013	-13.66996	134.63346	1879	sand loam	none	none	~	not applicable	1-2yrs	~	~	W	Eucalyptus patellaris woodland with Heteropogon contortus understorey
30	111	20031013	-13.6456	134.6413	1880	sand	none	none	~	not applicable	6mths-1yr - tree deaths have occurred as a result of fire	~	~	OF	Eucalyptus tetrodonta and Erythrophleum chlorostachys open forest with Heteropogon triticeus and Sarga plumosum understorey.
31	112	20031013	-13.62425	134.64989	1882	sand	laterite	small stones (0.6-2cm)	~	not applicable	6mths-1yr - tree deaths have occurred as a result of fire	~	~	OF	Eucalyptus tetrodonta and E. miniata open forest with Sarga plumosum understorey
32	114	20031013	-13.59068	134.67364	1884	sand loam	none	none	~	not applicable	1-2yrs	~	~	OF	Eucalyptus tetrodonta and E. miniata open forest with Sarga plumosum understorey
33	115	20031014	-13.54634	134.69215	1885	sand loam	none	none	~	not applicable	6mths-1yr	~	none at site but numerous pig workings noted at seasonal swamp located approx. 2km west.	OF	Eucalyptus tetrodonta open forest with Sarga sp and Dapsilanthus spathaceus understorey
34	118	20031014	-13.52932	134.70002	1886	sand loam	none	none	seasonally inundated drainage depression	not applicable	1-2yrs	~	pig workings	CF	Grevillea pteridifolia closed forest with Dapsilanthus spathaceus sedge understorey

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
35	119	20031014	-13.49496	134.71596	1887-1888	clay loam	none	none	within 50m of perennial water pool	open trench	2+ yrs	~	numerous buffalo tracks and diggings	CF	Melaeuca viridiflora closed forest with a mixed species grass\sedge understorey
36	121	20031015	-13.20403	134.97802	1892-1891	sand	siltstone in creek bed	small rocks (6-20cm)	major seasonal creek with permanent waterholes	open trench	2+ yrs	~	~	CF	Melaleuca argentea closed forest with a dense mid-storey of Pandanus aquaticus and Melaleuca acacioides
37	122	20031015	-13.22753	134.94407	1892	sandy clay	laterite	pebbles (<0.6cm)	~	not applicable	1-2yrs	~	~	W	Eucalyptus tetrodonta woodland with Ericahne sp. understorey
38	123	20031015	-13.25468	134.91193	1893	clay loam	laterite	pebbles (<0.6cm)	~	not applicable	not recorded	~	~	W	Eucalyptus tetrodonta woodland with grassy understorey
39	124	20031015	-13.27332	134.88721	1894	clay loam	sandstone	big rocks (60cm-2m)	~	not applicable	1-2yrs	~	~	OW	Eucalyptus tectifica open woodland with a grassy understorey
40	125	20031015	-13.29808	134.85521	1895	clay loam	laterite	small stones (0.6-2cm)	~	not applicable	1-2yrs	~	~	OW	Open woodland dominated by Eucalyptus tetrodonta, Eucalyptus tectifica, Corymbia latifolia, Melaleuca viridiflora with Petalostigma quadriloculare understorey
41	126	20031016	-13.32148	134.82207	1896	clay	none	none	seasonally inundated	not applicable	1-2yrs	~	pig diggings	W	Melaleuca viridiflora woodland with Themeda sp understorey
42	128	20031016	-13.35757	134.78594	1899	sand loam	none	none	shallow semi-permnent waterholes	open trench	6mths-1yr	~	numerous pig and buffalo tracks through area	CF	Closed forest dominated by Melaleuca viridiflora, Acacia auriculiformis and Corymbia polycarpa with a dense mid-storey of Melaleuca acacioides, Pandanus spiralis, Acacia holosericea and Barringtonia acutangula with Heteropogon contortus and Mnesithea rottboellioides understorey
43	129	20031016	-13.37273	134.77738	1900	sand loam	none	none	shallow semi-permnent waterholes	open trench	1-2yrs	~	vegetation has been substantially grazed	CF	Melaleuca viridiflora and Acacia leptocarpa closed forest with a dense mid-storey of Corymbia polysciada, Pandanus spiralis and Barringtonia acutangula with Ericahne sp understorey
44	130	20031016	-13.38436	134.7705	1905-1906	clay	none	none	seasonnally inundated		6mths-1yr	~	~	ST	Open grassland dominated by Eriachne sp. with scattered Melaleuca viridiflora and Eucalyptus tectifica trees
45	131	20031016	-13.4175	134.7569	1907	sandy clay	none	none	~	not applicable	1-2yrs	~	~	W	Woodland dominated by Corymbia latifolia and Erythrophleum chlorostachys with Heteropogon sp understorey
46	132	20031016	-13.43844	134.75131	1908	sand	none	none	~	not applicable	1-2yrs	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Chrysopogon sp understorey
47	133	20031016	-13.44593	134.74095	1909-1911	clay loam	none	none	spring	avoid	1-2yrs	~	numerous buffalo tracks and wallows and likely good area for pigs as well	CF	Pandanus aquaticus, Melaleuca viridiflora and Eucalyptus alba closed forest with Eriachne sp understorey
48	134	20031020	-14.0673	134.01821	1916	clay loam	granite	big rocks (60cm-2m)	~	not applicable	1-2yrs	~	~	W	Eucalyptus patellaris woodland with Heteropogon contortus understorey
49	135	20031020	-14.056	134.03066	1917	clay loam	granite	big rocks (60cm-2m)	~	not applicable	2+ yrs	scattered Hyptis suaveolens plants	~	W	Eucalyptus patellaris woodland with Heteropogon contortus understorey
50	137	20031020	-14.04044	134.04232	1918	clay loam	granite	big rocks (60cm-2m)	~	not applicable	2+ yrs	significant infestation of Hyptis suaveolens	numerous horse and cattle tracks and dung	OW	Eucalyptus patellaris and Corymbia confertiflora open woodland with Heteropogon contortus understorey

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51	138	20031020	-14.03402	134.05846	1920	clay loam	granite	big rocks (60cm-2m)	~	not applicable	2+ yrs	scattered Hyptis suaveolens plants	~	OW	Corymbia terminalis open woodland with Heteropogon contortus understorey
52	139	20031020	-14.02621	134.06244	none	cracking clay	none	none	seasonally inundated	not applicable	2+ yrs	scatttered Hyptis suaveolens and Passiflora foetida	heavily grazed by cattle and buffalo	OW	Corymbia bella open woodland with Heteropogon contortus understorey
53	140	20031021	-14.1009	133.96122	1921	clay	none	none	seasonally inundated	not applicable	1-2 yrs	~	grazed by cattle	OW	Eucalyptus pruinosa open woodland with Sarga plumosum understorey
54	141	20031021	-14.13365	133.89926	1922	clay	none	none	seasonally inundated	not applicable	1-2 yrs	~	~	W	Melaleuca viridiflora woodland with a grassy understorey
55	142	20031021	-14.15108	133.86287	1923-1924	clay	mudstone\ siltstone	small stones (0.6-2cm)	seasonally inundated	not applicable	<6mths	scattered Hyptis suaveolens	cattle grazing nearby in yards	OW	Eucalyptus tectifica and Corymbia confertiflora open woodland with Schizachyrium sp understorey
56	143	20031021	-14.16099	133.83402	1925	clay loam	sandstone	stones (2-6cm)	~	not applicable	1-2yrs	scattered Hyptis suaveolens plants	~	W	Mixed Eucalyptus\Corymbia species woodland with a grassy understorey
57	144	20031021	-14.16027	133.82778	1926	clay loam	sandstone	small stones (0.6-2cm)	~	not applicable	1-2 yrs	~	~	W	Eucalyptus tectifica and Corymbia grandifolia woodland with Heteropogon contortus understorey
58	145	20031021	-14.16585	133.80604	1927	clay loam	granite	big rocks (60cm-2m)	~	not applicable	<6mths	scattered Hyptis suaveolens plants	cattle grazing in area, moderate impact	W	Eucalyptus tectifica, Erythrophleum chlorostachys and Brachychiton diversifolius woodland with Heteropogon contortus and Aristida sp understorey
59	146	20031021	-14.21669	133.77076	1928	clay loam	granite	big rocks (60cm-2m)	~	not applicable	<6mths	scattered Hyptis suaveolens plants	cattle grazing in area, moderate impact	W	Eucalyptus patellaris and Corymbia latifolia woodland with Heteropogon contortus understorey
60	147	20031021	-14.21379	133.76087	1929-1930	sand loam	none	none	major permenent creek	open trench	1-2yrs	scattered Hyptis suaveolens plants	cattle tracks along creek banks	OF	Eucalyptus patellaris and Corymbia bella open forest with Heteropogon contortus understorey
60	148	20031022	-14.22925	133.75078	1935	black soil	none	none	~	not applicable	2+ yrs	scattered Hyptis suaveolens plants	heavily grazed by cattle.	OF	Eucalyptus patellaris and Melaleuca leucadendra open forest with Heteropogon contortus understorey
61	149	20031022	-14.24085	133.74175	1936	clay loam	sandstone	big rocks (60cm-2m)	~	not applicable	1-2yrs	~	~	OF	Cochlospermum fraseri open forest with Sarga sp understorey
62	150	20031022	-14.28261	133.68533	1937	clay loam	none	none	~	not applicable	1-2yrs	~	moderate to heavily grazed by cattle	W	Mixed species Eucalyptus\Corymbia woodland with Heteropogon contortus understorey
63	151	20031022	-14.27931	133.69129	1938	sand loam	sandstone	small rocks (6-20cm)	~	not applicable	1-2yrs	~	~	OF	Mixed species Eucalyptus\Corymbia open forest with Sarga sp. understorey
64	152	20031022	-14.2785	133.69148	1940-1941	sand	sandstone	small rocks (6-20cm)	~	not applicable	2+yrs	small infestation of Hyptis suaveolens	~	CF	Eucalyptus camaldulensis and Corymbia bella closed forest with a Heteropogon contortus and Mnesithea rottboellioides understorey
65	153	20031022	-14.32097	133.63785	1941	red clay loam	sandstone	pebbles (<0.6cm)	ephemeral drainage line	open trench	1-2yrs	Calotropis procera on creek and small infestation of Hyptis suaveolens	~	OW	Corymbia terminalis, Eucalyptus tectifica and Grevillea dimidiata open woodland with Heteropogon contortus and Sarga sp understorey
66	154	20031023	-14.34812	133.60576	1943	clay	sandstone	small stones (0.6-2cm)	~	not applicable	<6mths	scattered Hyptis suaveolens plants	cattle tracks through area - moderately grazed	OW	Eucalyptus pruinosa open woodland with Heteropogon contortus and Sarga sp understorey
67	155	20031023	-14.36535	133.58587	1944	clay loam	sandstone	big rocks (60cm-2m)	~	not applicable	<6mths	~	~	OF	Mixed species open forest with Sarga plumosum understorey

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68	156	20031023	-14.41681	133.52902	1948	sand	none	none	seasonal creek with semi-permanent waterholes	open trench	2+ yrs	scattered Passiflora foetida	~	CF	Eucalyptus camaldulensis and Terminalia platyphylla closed forest with Mnesithea rottboellioides understorey
69	157	20031023	-14.41613	133.52965	1949	clay	sandstone	stones (2-6cm)	~	not applicable	1-2yeas	~	~	OF	Eucalyptus pruinosa open forest with a grassy understorey
70	158	20031023	-14.43289	133.51353	1950	clay loam	none	none	~	not applicable	<6mths	~	~	OW	Corymbia confertiflora and Corymbia terminalis open woodland with Heteropogon triticeus, H. contortus and Aristida sp understorey
71	159	20031023	-14.46891	133.46017	1951	sand loam	none	none	~	not applicable	<6mths	~	~	W	Eucalyptus tectifica woodland with Themeda sp understorey
72	160	20031023	-14.47738	133.44092	1952-1953	sand	none	none	seasonal creek	not applicable	2+ yrs	scattered Hyptis suaveolens plants	numerous cattle tracks along creek - area heavily grazed	CF	Closed forest dominated by Lophostemon gradiflorus, Eucalyptus camaldulensis, Eucalyptus patellaris and Corymbia latifolia with Mnesithea rottboellioides and Heteropogon contortus understorey
73	161	20031023	-14.48231	133.4264	1954	sand loam	none	none	~	not applicable	<6mths	~	donkeys sighted in area	W	Eucalyptus tectifica woodland with Aristida sp understorey
74	162	20031023	-14.49111	133.4049	1955	clay loam	sandstone	small stones (0.6-2cm)	~	not applicable	<6mths	~	donkeys sighted in area	OW	Eucalyptus tectifica open woodland with Sarga sp understorey
75	164	20031023	-14.50437	133.37361	1956	sand loam	laterite	pebbles (<0.6cm)	~	not applicable	<6mths	~	donkeys sighted in area	W	Corymbia latifolia woodland with Sarga sp understorey
76	165	20031023	-14.50267	133.37278	1957-1959	clay loam	sandstone	outcrop	~	not applicable	<6mths	~	donkeys sighted in area	CF	Eucalyptus umbonata closed forest with Sarga sp understorey
77	166	20031024	-14.51509	133.35039	1960	sand	laterite	pebbles (<0.6cm)	~	not applicable	<6mths	~	donkeys sighted in area - moderately grazed by donkeys	W	Eucalyptus tetrodonta and Eucalyptus miniata woodland with a grassy understorey
78	167	20031024	-14.52116	133.27464	1961-1963	sand	sandstone	small rocks (6-20cm)	major seasonal creek with permanent waterholes	open trench	2+ yrs	~	buffalo wallowing in river bed	CF	Eucalyptus camaldulensis closed forest with a grassy understorey
79	168	20031024	-14.52363	133.2075	1964	sand	laterite outcropping sandstone	pebbles (<0.6cm)	~	not applicable	6mths-1yr	~	~	OF	Eucalyptus miniata, Corymbia bleeseri and Eucalyptus phoenicea open forest with Sarga plumosum understorey
80	169	20031024	-14.52405	133.1812	1965	clay loam	laterite	pebbles (<0.6cm)	~	not applicable	<6mths	~	donkey dung - moderately grazed by donkeys	W	Eucalyptus tectifica and Corymbia foelscheana woodland with grassy understorey
81	170	20031024	-14.57839	133.11091	1967	sand loam	none	none	~	not applicable	6mths-1yr	~	~	OF	Eucalyptus miniata and Corymbia polycarpa open forest with Sarga plumosum understorey
82	171	20031024	-14.57843	133.10742	1968-1970	sand	none	none	major permanent river	hdd	lomg unburnt	scattered Passiflora foetida	~	CF	Melaleuca argentea and Eucalyptus camaldulensis closed forest with mid-storey of Barringtonia acutangula and Mnesithea rottboellioides understorey
83	not recorded	20031024	not recorded	not recorded	1972	cracking clay	laterite	pebbles (<0.6cm)	~	not applicable	<6mths	~	~	W	Eucalyptus tectifica woodland with Heteropogon contortus understorey

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
84	172	20031025	-14.58654	133.02376	1973	black soil	mudstone\ sandstone	small rocks (6-20cm)	~	not applicable	<6mths	~	donkey dung - moderately grazed by donkeys	OW	Mixed species open woodland with Aristida sp understorey
85	174	20031025	-14.58657	132.99752	1977	sand loam	laterite	pebbles (<0.6cm)	~	not applicable	<6mths	~	~	CF	Corymbia ferruginea and Eucalyptus miniata closed forest with Themeda sp understorey
86	175	20031025	-14.59021	132.9436	1978	clay loam	sandstone	pebbles (<0.6cm)	~	not applicable	<6mths	~	donkey dung - moderately grazed by donkeys	OW	Eucalyptus tectifica and Corymbia latifolia open woodland with a grassy understorey
87	176	20031025	-14.59457	132.89914	1979	clay	none	none	~	not applicable	<6mths	~	~	OF	Eucalyptus tectifica and Corymbia latifolia open woodland with Heteropogon contortus understorey
88	177	20031025	-14.59498	132.89641	1980-1981	sand loam	none	none	major permanent creek	hdd	2+yrs	~	buffalo and donkey tracks along creek banks	CF	Melaleuca leucadendra closed forest with a dense mid storey of Pandanus aquaticus and Grevillea pteridifolia and Eriachne sp understorey
89	178	20031025	-14.59486	132.89177	1982	clay	none	none	~	not applicable	<6mths	~	~	W	Eucalyptus tectifica and Corymbia latifolia woodland with a grassy understorey
90	179	20031025	-14.5956	132.87858	1983	sand loam	none	none	~	not applicable	<6mths	~	~	OF	Corymbia bleeseri open forest with Sarga plumosum understorey
91	180	20031025	-14.59586	132.87115	1984	black soil	none	none	seasonally inundated	not applicable	<6mths	~	~	ST	Open grassland dominated by Aristida sp with scattered trees
92	181	20031025	-14.5982	132.82583	1985	sand	none	none	~	not applicable	<6mths	~	~	CF	Corymbia bleeseri and Eucalyptus miniata closed forest with Themeda sp understorey
93	182	20031026	-14.59993	132.78744	1986	sand	none	none	ephemeral creek	open trench	<6mths	~	~	OW	Eucalyptus\Corymbia species open woodland with a mid storey of Terminalia platyphylla and Erythrophleum chlorostachys and Mnesithea rottboellioides understorey
94	183	20031026	-14.6001	132.78428	1987	sand loam	laterite	small stones (0.6-2cm)	~	not applicable	<6mths	~	donkey dung - moderately grazed by donkeys	W	Eucalyptus tectifica woodland with Sarga sp understorey
95	184	20031026	-14.60103	132.74155	1986	sand	none	none	~	not applicable	2+ yrs	~	~	CF	Eucalyptus\Corymbia species closed forest with Sarga sp understorey
96	185	20031026	-14.60251	132.71976	1989	clay	none	none	~	not applicable	2+ yrs	~	~	OW	Eucalyptus tectifica and Corymbia latifolia open woodland Sarga sp understorey
97	186	20031026	-14.60172	132.70165	1990	black soil	none	none	~	not applicable	<6mths	~	~	OF	Eucalyptus tetrodonta and Corymbia latifolia open forest with a grassy understorey
98	187	20031026	-14.60345	132.69362	1991	clay loam	laterite	pebbles (<0.6cm)	~	not applicable	<6mths	~	~	OF	Corymbia umbonata, Erythrophleum chlorostachys and Eucalyptus tetrodonta open forest with a grassy understorey
105	191	20031030	-14.24513	129.44804	none	sandy clay loam	none	none	~	not applicable	6mth-1yr	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum understorey
106	IP-800	20031028	-14.2706	129.481	2013	sandy clay loam (deep red earth)	none	none	~	not applicable	1-2yrs	~	~	OF	Eucalyptus miniata and E. tetrodonta forest with Sarga plumosum understorey
107	192	20031031	-14.3788	129.8994	2014	sandy clay	none	none	ephemeral waterhole	open trench	1-2 yrs	~	cattle	OW	Corymbia polycarpa and Grevillea pteridifolia low open woodland with Aristida sp and Sarga plumosum understorey
108	193	20031031	-14.37569	129.87876	2015, 2016	sand	none	none	~	not applicable	6mths-1yr	~	~	F	Lophostemon lactifluus, Eucalyptus miniata and Grevillea pteridifolia forest
109	194	20031031	-14.3705	129.85174	2017	sandy loam	none	none	~	not applicable	2+yrs	~	cattle, horse	OW	Lophostemon lactifluus, Melaleuca nervosa, Pandanus spiralis low open woodland with Aristida sp understorey

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110	195	20031031	-14.38038	129.91318	2018, 2019	sandy loam	none	none	major seasonal creek	open trench	<6 mths	~	pig	OF	Open forest dominated by Lophostemon lactifluus, Barringtonia acutangula and Acacia auriculiformis with a dense mid-storey of Pandanus spiralis, Livistona humilis and Owenia vernicosa
111	196	20031031	-14.3603	129.95373	2020	sand	none	none	~	not applicable	<6 mths	~	~	OW	Acacia auriculiformis and Erythrophleum chlorostachys low open woodland
112	197	20031031	-14.32871	129.99521	2021	sandy clay loam	none - sandstone to north 100m	none	~	not applicable	6mths-1yr	~	cattle	OW	Acacia auriculiformis and Pandanus spiralis low open woodland with Melaleuca dealbata and Aristida sp understorey
113	198	20031031	-14.30692	130.02499	2022	sand over gravelly sand	quartzite & sandstone	small stones (0.6-2cm)	~	not applicable	6mths-1yr	~	~	OF	Corymbia polycarpa and Eucalyptus tetrodonta open forest with Sarga plumosum understorey
114	199	20031031	-14.34987	129.96806	none	sand over gravelly sand	none	none	~	not applicable	6mths-1yr	~	~	OF	Corymbia polycarpa and Eucalyptus miniata tall open forest
115	200	20031031	-14.34393	129.97658	2023, 2024, 2025	sand	none	none	major seasonal creek	open trench	6mths-1yr	~	~	CF	Barringtonia acutangula and Melaleuca viridiflora closed forest with a dense mid-storey of Pandanus aquaticus and Heteropogon contortus and Aristida sp understorey
116	201	20031101	-14.36146	129.81354	2026-2030	sandy clay loam	none	none	~	not applicable	6mths-1yr	~	~	OW	Lophostemon lactifluus and Melaleuca viridflora open woodland with Paspalum sp and Sarga plumosum understorey
117	202	20031101	-14.35548	129.78122	2032-2035	sand	none	none	~	not applicable	2+yrs in patches	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum, Pachynema sp and Boronia sp understorey
118	203	20031101	-14.34708	129.74018	2036	clayey sand	none	none	~	not applicable	1-2yrs	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum understorey
119	204	20031101	-14.34415	129.72144	2037, 2038	clayey sand	none	none	semi-permanent creek	open trench	<6mths	~	pig	F	Eucalyptus tetrodonta and Corymbia confertiflora open forest with Brachychiton megaphyllus understorey
120	205	20031101	-14.33825	129.70092	2039	clayey sand	none	none	~	not applicable	1 -2 yrs	~	~	OF	Eucalyptus miniata, Eucalyptus tetrodonta and Erythrophleum chlorostachys open forest with Sarga plumosum understorey and Cycas maconochiei
121	206	20031102	-14.29376	129.517	2040, 2041	sandy clay loam	laterite	pebbles (<0.6cm)	~	not applicable	1 -2 yrs	~	~	OF	Eucalyptus miniata, Eucalyptus tetrodonta and Erythrophleum chlorostachys open forest with Sarga plumosum and Grewia breviflora understorey
122	207	20031102	-14.30685	129.54601	2042	sandy clay loam	laterite & sandstone	pebbles (<0.6cm)	~	not applicable	1-2 yrs	~	~	W	Eucalyptus miniata and E. tetrodonta woodland with Cymbopogon sp, Boronia sp, Cycas maconochiei and Aristida sp understorey
123	208	20031102	-14.31427	129.58087	2043	sandy clay loam	Fine sandstone & shale at footslope	<1% on site	~	not applicable	<6mths	~	~	OW	Eucalyptus tetrodonta and E. miniata open woodland with Aristida sp understorey
124	209	20031102	-14.32259	129.61899	2044-2047	sandy clay loam	none	none	~	not applicable	2+yrs	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum understorey

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125	214	20031105	-14.49023	131.35497	2053-2054	claey sand	none	none	major permanent creek	open trench	2+yrs	scattered Hyptis suaveolens plants	cattle	OW	Eucalyptus bella, Terminalia grandiflora and Terminalia platyptera open woodland with Heteropogon contortus and Sarga timorense understorey
126	215	20031105	-14.48666	131.32012	2055	sandy loam	none, near laterite hill	none	~	not applicable	<6mths	~	pigs common	F	Lophostemon lactifluus, Corymbia bella and Corymbia porrecta open forest with Sarga sp understorey
127	216	20031105	-14.48473	131.30695	2056, 2057	sandy clay loam	none	none	~	not applicable	1-2 yrs	~	pig	OW	Corymbia latifolia, Eucalyptus tectifica and Corymbia porrecta open woodland with Themeda triandra understorey
128	217	20031105	-14.47823	131.27109	2058	sandy clay loam	minor gravel	not recorded	~	not applicable	<6mths	~	~	OW	Corymbia latifolia, Eucalyptus miniata and Corymbia porrecta open woodland
129	218	20031105	-14.4851	131.22821	2059-2061	sand	none on site, but between hills	none	major permanent creek	open trench	6mths-1yr	scattered Hyptis suaveolens plants	pigs, donkey, cattle	CF	Riparian closed forest dominated by Eucalyptus alba and Corymbia bella, Nauclea orientalis and Ficus coronulata with Heteropogon contortus understorey
130	219	20031106	-14.49493	131.13009	2062	sandy loam	sandstone	small stones (0.6-2cm)	~	not applicable	<6mths	~	~	F	Eucalyptus miniata, Eucalyptus tetrodonta and Erythrophleum chlorostachys forest with Sarga plumosum understorey
131	223	20031106	-14.48926	131.21854	2063	sand, skeletal	sandstone	outcrop	~	not applicable	1-2yrs	~	~	OF	Eucalyptus miniata and Corymbia blesseri open forest with Aristida sp and Sarga plumosum understorey
132	225	20031106	-14.48714	131.18019	2084	sandy clay loam	Pisolitic sandstone	small stones (0.6-2cm)	~	not applicable	<6mths	~	Horse, Cattle	OF	Eucalyptus miniata, Eucalyptus tetrodonta and Corymbia latifolia open forest with Themeda triandra understorey
133	226	20031107	-14.48052	131.39479	2087-2088	sandy clay loam	minor gravel	none	~	not applicable	<6mths	scattered Hyptis suaveolens plants	cattle	OW	Eucalyptus tectifica and Corymbia latifolia open woodland with Themeda triandra and Heteropogon contortus understorey
134	227	20031107	-14.50775	131.43818	2089	sandy laterite gravel	none	none	~	not applicable	<6mths	~	cattle	OW	Corymbia latifolia and Eucalyptus tectifica low open woodland with Themeda triandra, Heteropogon contortus and Sarga sp understorey
135	229	20031107	-14.50896	131.48305	2090	sandy clay loam over laterite	none	none	~	not applicable	2+yrs	~	cattle	OW	Eucalyptus tectifica and Corymbia latifolia open woodland with Themeda triandra and Heteropogon contortus understorey
136	231	20031107	-14.50654	131.5323	2093	sandy laterite gravel	none	none	~	not applicable	1-2yrs	~	cattle	OW	Eucalyptus tetrodonta and Corymbia latifolia open woodland with Pterocaulon serrulatum understorey
137	232	20031107	-14.50643	131.58093	2094	sandy laterite gravel	laterite	not recorded	~	not applicable	1-2yrs	~	~	OW	Eucalyptus\Corymbia open woodland with Sarga plumosum and Themeda triandra understorey
138	233	20031107	-14.50578	131.61139	2095	clay loam	limestone	not recorded	~	not applicable	1-2yrs	~	~	OW	Eucalyptus tectifica and Corymbia latifolia low open woodland with Themeda triandra understorey
139	235	20031107	-14.50501	131.6177	2096	clay loam	limestone	none	~	not applicable	6mths-1yr	~	~	OW	Hakea arborescens, Bauhinia cunninghamii and Corymbia polysciada low open woodland with Grewia retusifolia understorey
140	237	20031107	-14.50575	131.66729	2097	sand	none	none	~	not applicable	1-2 yrs	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Triodia sp understorey

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141	238	20031107	-14.50663	131.67207	2098	sandy clay loam	none	none	within 500 m of major permanent river	open trench	1-2 yrs	significant infestation of Xanthium strumarium	cattle prominent	OF	Terminalia sp and Eucalyptus tectifica open forest with Xanthium strumarium* understorey
142	239	20031107	-14.50567	131.67514	2099	sandy clay loam	none	none	major permanent river	hdd	2+yrs	significant infestation of Xanthium strumarium	cattle prominent	CF	Closed forest dominated by Casuarina cunninghamiana, Nauclea orientalis, Melaleuca leucadendra, Barringtonia acutangula, Eucalyptus camaldulensis, Melaleuca viridiflora, Corymbia bella and Erythrophleum chlorostachys with a dense mid-storey of Cycas canalis, Gardenia sp and Livistona humilis and Sarga sp understorey
143	240	20031108	-14.50763	131.08554	2101, 2102	sandy clay loam	none	none	~	not applicable	<6mths	~	horse	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Eragrostis sp understorey
144	241	20031108	-14.51912	131.04041	2103	sandy laterite gravel	laterite	small stones (0.6-2cm)	~	not applicable	<6mths	~	~	W	Corymbia bleeseri, Eucalyptus miniata, and Eucalyptus tetrodonta woodland with Triodia sp understorey
145	242	20031108	-14.53063	131.00127	2104, 2105	sandy laterite gravel	laterite	small stones (0.6-2cm)	~	not applicable	<6mths	~	~	OF	Eucalyptus miniata, E. tetrodonta and Corymbia bleeseri open forest with Sarga plumosum understorey
146	243	20031108	-14.59094	130.96792	2106	sandy laterite gravel	sandstone & laterite	not recorded	~	not applicable	<6mths	~	~	F	Eucalyptus miniata, E. tetrodonta Corymbia bleeseri and Corymbia latifolia open forest with Sarga plumosum understorey
147	244	20031108	-14.53738	130.94768	2107-2109	sandy clay loam	none	none	~	not applicable	1-2yrs	~	~	OF	Eucalyptus miniata and Eucalyptus tetrodonta forest with Eriachne sp understorey
148	250	20031119	-14.50605	131.71173	2110, 2111	clayey sand to sandy clay	none	none	~	not applicable	6mths-1yr	~	~	OW	Corymbia bella and Eucalyptus tectifica open woodland with mixed grass species understorey
149	253	20031119	-14.50575	131.67806	2112	sandy laterite gravel	Occasional laterite outcrop	none	~	not applicable	1-2 yrs	small infestation of Hyptis suaveolens and Calotropis procera	cattle, pigs	W	Petalostigma pubescens and Acacia sp low woodland with Sarga plumosum understorey
150	254	20031119	-14.50672	131.67629	2113-2118	sand	sandstone	exposed in sections of the river	major permanent river	hdd	2+yrs	significant infestation of Xanthium strumarium (Noogoora burr), Hyptis suaveolens, Calotropis procera	pigs, cattle	CF	Closed forest dominated by Nauclea orientalis, Casuarina cunninghamiana, Barringtonia acutangula with Brachyachne convergens understorey
151	256	20031119	-14.50552	131.75551	2119	sand	none	none	~	not applicable	2+yrs	~	cattle	W	Eucalyptus miniata and E. tetrodonta woodland with Triodia sp and Sarga sp understorey
152	257	20031119	-14.50565	131.78914	2120	sand	minor laterite	none	~	not applicable	<6mths	~	~	OW	Open woodland dominated by Eucalyptus miniata and E. tetrodonta with Triodia sp understorey
153	258	20031119	-14.51496	131.84969	2121	sand	none	none	~	not applicable	<6mths	~	cattle	W	Eucalyptus miniata and Corymbia bleeseri woodland with Triodia sp understorey
154	261	20031119	-14.53718	131.89183	2122	sand	none	none	~	not applicable	<6mths	~	~	OF	Eucalyptus miniata, Corymbia bleeseri and Eucalyptus tetrodonta open forest with Triodia sp and Aristida sp understorey

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155	262	20031120	-14.58348	132.05059	not recorded	sandy clay loam	sandstone at depth	not recorded	major permanent river	hdd	2+yrs	significant infestation of Xanthium strumarium, Hyptis suaveolens, Passiflora foetida	pig, cattle	CF	Closed forest dominated by Terminalia grandiflora, Melaleuca leucadendra, and Eucalyptus camaldulensis with Flagellaria indica and Crinum sp. understorey
156	263	20031120	-14.54304	131.91967	2123	clayey sand to sandy clay	laterite	small stones (0.6-2cm)	~	not applicable	not recorded	~	~	W	Corymbia bleeseri and Eucalyptus tetrodonta woodland with Sarga plumosum and Aristida sp understorey
157	264	20031120	-14.56173	131.97026	2124, 2125	sandy clay loam	none	none	~	not applicable	<6mths	significant infestation of Hyptis suaveolens	road verge disturbed	OF	Eucalyptus miniata and Terminalia grandiflora open forest with Sarga plumosum understorey
158	265	20031120	-14.57487	132.01756	2126	sandy clay loam	none	none	perennial creek	open trench	1-2yrs	significant infestation of Calotropis procera and Hyptis suaveolens	disturbed site	OF	Eucalyptus miniata and E. tetrodonta open forest with Heteropogon contortus, Themeda triandra and Sarga plumosum understorey
159	267	20031121	-14.58577	132.11895	2127, 2128	silty clay	none	none	~	not applicable	<6mths	small infestation of Xanthium strumarium and Hyptis suaveolens	pig common	OW	Erythrophleum chlorostachys and Terminalia grandiflora open woodland with Sarga plumosum understorey
160	269	20031121	-14.58638	132.15847	2129	sandy clay loam	sandstone, limestone, Conglomerate	minor	~	not applicable	<6mths	~	~	OW	Corymbia latifolia and Eucalyptus tectifica open woodland with Themeda triandra understorey
161	271	20031121	-14.58628	132.19919	2130	skeletal sands	limestone & sandstone	not recorded	~	not applicable	<6mths	scattered Hyptis suaveolens plants	~	OW	Eucalyptus tectifica and Corymbia bleeseri low open woodland with grassy understorey
162	274	20031122	-14.58759	132.2383	2131	skeletal silty clays	limestone	not recorded	~	not applicable	2+ yrs	scattered Hyptis suaveolens plants	pig, cattle	W	Eucalyptus tectifica and Corymbia latifolia woodland with Heteropogon contortus understorey
163	276	20031122	-14.58802	132.25401	2132-2134	sand	none	none	~	not applicable	2+yrs	~	~	W	Eucalyptus tetrodonta and Corymbia latifolia woodland with Aristida latifolia understorey
164	277	20031122	-14.58753	132.26827	2135	sand	none	none	~	not applicable	2+yrs	~	~	W	Erythrophleum chlorostachys and Eucalyptus tetrodonta woodland with Sarga plumosum and Triodia sp understorey
165	278	20031122	-14.59628	132.30979	nil	clay	limestone & minor sandstone	not recorded	~	not applicable	2+ yrs	~	~	OW	Eucalyptus tectifica and Corymbia latifolia open woodland with Themeda triandra understorey
166	280	20031123	-14.60991	132.35982	2136, 2137	silty clay	none	none	~	not applicable	2+yrs	~	cattle	OW	Corymbia latifolia and Eucalyptus tectifica open woodland with Themeda triandra understorey
167	283	20031123	-14.61946	132.39883	2138	silty clay	none	none	~	not applicable	2+ yrs	~	cattle	W	Corymbia latifolia and Eucalyptus tectifica woodland with Themeda triandra and Heteropogon contortus understorey
168	284	20031123	-14.62119	132.43646	2139, 2140	silty fine sand	weathered conglomerate at depth	none	~	not applicable	long unburnt	~	cattle	OW	Corymbia latifolia and Eucalyptus tintinnans open woodland with Astrebla sp understorey
169	287	20031123	-14.62145	132.48333	2141	silty clay	none	none	~	not applicable	2+yrs	~	cattle	W	Corymbia bleeseri and Erythrophleum chlorostachys woodland with Sarga sp understorey
170	290	20031124	-14.61576	132.53268	2142	sand	none	none	~	not applicable	long unburnt	~	cattle	OF	Eucalyptus tetrodonta and Corymbia bleeseri open forest with Sarga plumosum and Triodia sp understorey

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171	291	20031124	-14.61099	132.57517	2143	sandy clay loam	none	none	~	not applicable	<6mths	~	disturbed forest, adjacent highway	F	Eucalyptus tetrodonta and Erythrophleum chlorostachys forest with Sarga plumosum and Heteropogon contortus understorey
172	292	20031124	-14.60849	132.60654	2144 - 2151	sand	minor gravel in river bed	small stones (0.6-2cm)	major permanent creek	hdd	not recorded	scattered Hyptis suaveolens plants	cattle, pigs	F	Eucalyptus camaldulensis and Melaleuca leucadendra open forest with Brachyachne convergens and Lomandra sp understorey
173	293	20031124	-14.6085	132.60853	2152, 2153	clay loam	none	none	~	not applicable	long unburnt	~	cattle	F	Corymbia bleeseri and Eucalyptus tetrodonta forest with Heteropogon contortus and Eragrostis sp understorey
174	294	20031124	-14.60614	132.65467	2160, 2161	sandy clay loam	none	none	~	not applicable	long unburnt	~	~	OW	Erythrophleum chlorostachys and Corymbia bleeseri low open woodland with Triodia sp understorey
175	295	20031205	-12.68763	135.69015	2162, 2163, 2164	sandy gravel	weathered siltstone, claystone, covered	not recorded	seasonal river with shallow permanent waterholes	open trench	6mths-1yr	~	buffalo, possibly bullock	OF	Corymbia confertiflora and Erythrophleum chlorostachys open forest with Sarga plumosum understorey
176	296	20031205	-12.68545	135.69654	2165, 2166, 2167	clayey sand, minor laterite gravel	laterite	small stones (0.6-2cm)	semi-permanent waterhole	avoid	1-2yrs	~	~	OF	Lophostemon lactifluus and Corymbia polycarpa open forest with grassy understorey
177	297	20031205	-12.68691	135.71694	2168	clayey sand, minor laterite gravel	none	none	semi-permanent waterhole	avoid	6mths-1yr	~	~	OF	Corymbia polycarpa, Melaleuca viridiflora, M. nervosa and Pandanus spiralis open forest with Themeda triandra and Sarga plumosum understorey
178	298	20031205	-12.68631	135.73095	2169	sand (deep red)	none	none	~	not applicable	6mths-1yr	~	buffalo tracks	OF	Eucalyptus tetrodonta and Grevillea pteridifolia open forest with Sarga plumosum understorey
179	299	20031205	-12.68961	135.7778	2170, 2171	silty sand	laterite	small stones (0.6-2cm)	~	not applicable	long unburnt	~	~	F	Eucalyptus miniata and E. tetrodonta open forest with Alloteropsis semialata understorey
180	300	20031205	-12.692	135.825	2172	sandy clay	laterite	small stones (0.6-2cm)	~	not applicable	<6mths	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum understorey
181	301	20031206	-12.69242	135.86793	2173	clayey lateritic gravel, weakly cemented	sandstone & ironstone at depth	not recorded	~	not applicable	<6mths	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Alloteropsis semialata understorey
182	302	20031206	-12.69502	135.90992	2174	clayey sand over clayey gravel	none	none	~	not applicable	<6mths	~	~	F	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Alloteropsis semialata understorey
183	303	20031206	-12.69751	135.95208	2175	fine sandy gravel	laterite	small stones (0.6-2cm)	~	not applicable	<6mths	~	~	F	Eucalyptus tetrodonta and Xanthostemon paradoxus forest with grassy understorey

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
184	305	20031206	-12.69726	135.99771	2176	Fine sandy gravel	laterite	small stones (0.6-2cm)	~	not applicable	<6mths	~	~	W	Eucalyptus tetrodonta woodland with Sarga plumosum understorey
185	307	20031208	-12.70205	136.05341	2177	clayey gravel	laterite	small stones (0.6-2cm)	~	not applicable	2+yrs	~	~	W	Eucalyptus tetrodonta and E. miniata woodland with Sarga plumosum, Eragrostis sp and Astrebla sp understorey
186	308	20031208	-12.70283	136.0914	2178, 2179, 2180	sandy gravel	none	none	~	not applicable	<6mths	~	~	OW	Eucalyptus tetrodonta and E. miniata open woodland with Sarga plumosum understorey
187	309	20031208	-12.70463	136.12851	2182	sandy gravel	weathered siltstone at 1m	none	~	not applicable	1-2yrs	~	~	F	Eucalyptus tetrodonta and E. miniata open woodland with Sarga plumosum understorey
188	310	20031208	-12.7064	136.16905	2183	sand	laterite	none	~	not applicable	long unburnt	~	~	OW	Eucalyptus tetrodonta and Corymbia confertiflora open woodland with sedge and Sarga plumosum understorey
189	311	20031208	-12.70738	136.17684	2184	sandy clay	none	none	seasonal creek with permanent waterholes	avoid	long unburnt	~	pig, bufffalo	CF	Melaleuca viridiflora and Lophostemon lactifluus closed forest with Imperata cylindrica and Sarga plumosum understorey
190	313	20031208	-12.71344	136.18549	2192, 2193	silty clay	none	none	~	avoid	long unburnt	~	pig, bufffalo	OW	Melaleuca viridiflora and Lophostemon lactifluus open woodland with sedge understorey
191	314	20031208	-12.70866	136.21112	2194	silty clay (Yellow Earth)	none, but laterite rise 100m south	none	~	open trench	long unburnt	~	Cane toad, pig, buffalo	OW	Melaleuca nervosa and M. viridflora open woodland with sedge understorey
192	315	20031209	-12.68479	136.24205	2195, 2196	sandy gravel with lateritic rocks	weathered siltstone & sandstone	none	~	not applicable	6mths-1yr	~	~	F	Eucalyptus miniata and E. tetrodonta tall open forest with Sarga plumosum and Alloteropsis semialata understorey
193	316	20031209	-12.65365	136.27994	2197, 2198, 2199	sand	none	none	~	not applicable	long unburnt	~	buffalo, pig	F	Eucalyptus miniata, E. tetrodonta and Erythrophleum chlorostachys tall open forest with sparse grass understorey
194	317	20031209	-12.65302	136.28068	2200, 2201, 2202	Humic	none	none	~	not applicable	long unburnt	~	pig	CF	Closed forest dominated by Lophostemon lactifluus, Nauclea orientalis and Acacia auriculiformis
195	318	20031209	-12.65965	136.28283	2210	sand	none	none	~	not applicable	long unburnt	~	pig, buffalo	F	Eucalyptus tetrodonta and E. miniata open forest with Imperata cylindrica and Sarga plumosum understorey
196	320	20031209	-12.65047	136.28766	2205, 2206, 2207	sandy clay	none	none	major permanent creek	hdd	long unburnt	~	~	CF	Closed forest dominated by Melaleuca viridiflora, Lophostemon lactifluus, Pandanus aquaticus, Barringtonia acutangula and Syzygium suborbiculare
197	322	20031209	-12.65574	136.28633	2208, 2209	sandy	laterite gravel	none	~	not applicable	1-2yrs	~	buffalo, pig	OW	Eucalyptus tetrodonta low open woodland with grassy understorey

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
198	323	20031210	-12.35926	136.70717	2211, 2212, 2213, 2214	clayey sand	none	none	major permanent river	hdd	1-2yrs	~	~	F	Melaleuca leucadendra and Lophostemon lactifluus tall forest with a dense mid-storey of Pandanus aquaticus and Grevillea pteridifolia, and Lomandra tropica and Smilax australis understorey
199	324	20031210	-12.3304	136.73501	2215	silty gravel	sandstone rocks at surface; ferruginous siltstone at depth	none	~	not applicable	1-2yrs	~	~	F	Eucalyptus tetrodonta tall forest with Sarga plumosum understorey
200	325	20031210	-12.30109	136.76466	2216 and 591	clay	none (minor laterite gravel on surface)	none	~	not applicable	1-2yrs	~	~	F	Eucalyptus tetrodonta tall forest with Sarga plumosum understorey
201	326	20031210	-12.30078	136.76538	2217, 2218	clay	sandstone on banks up higher	none	major permanent river, approx 20m wide with steep sandy banks	hdd	long unburnt	~	buffalo	CF	Melaleuca viridiflora and Pandanus aquaticus closed forest with sedge sp. and Themeda triandra understorey
203	2	20040706	-13.46196	134.585077	427	sand	laterite	pebbles <0.6cm	~	not applicable	6mths-1yr	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga intrans understorey
204	3	20040706	-13.470528	134.638475	429	sand	none	none	~	not applicable	6mths-1yr	~	~	W	Eucalyptus miniata and E. tetrodonta woodland with Eriachne sp. understorey.
205	4	20040707	-13.446192	134.667787	430\431\432	sandy clay	none	none	numerous ephemeral channels dissecting floodplain, large perennial waterhole within survey corridor	open trench	1-2yrs	~	~	OW	Melaleuca nervosa open woodland with Heteropogon contortus understorey
206	5	20040707	-13.427918	134.68855	433	clayey sand	none	none	~	not applicable	1-2yrs	~	~	W	Melaleuca nervosa open woodland with Sarga intrans understorey
207	6	20040707	-13.419162	134.69835	434	sand	laterite	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Heteropogon triticeus
208	7	20040707	-13.387782	134.736052	435	sandy clay	laterite	pebbles <0.6cm	seasonal drainage line	not applicable	6mths-1yr	~	~	W	Eucalyptus tetrodonta woodland with Eriachne avenacea understorey
209	none	20040708	-13.487845	134.618188	436	not recorded	none	none	seasonal drainage line	open trench	not recorded	not recorded	not recorded	not recorded	No flora survey
210	10	20040708	-13.497393	134.607533	438	sand	none	none	~	not applicable	6mths-1yr	~	~	OF	Eucalyptus tetrodonta and E. miniata open forest with Heteropogon triticeus understorey
211	11	20040708	-13.523773	134.577198	439/440	black soil	laterite	outcrop	semi-permanent swamp	avoid	1-2yrs	~	buffalo and donkey tracks - area used heavily by ferals	CF	Melaleuca nervosa closed forest with grassy understorey

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
212	12	20040708	-13.552093	134.544563	441/442	sand	none	none	ephemeral drainage line	open trench	1-2yrs	~	buffalo tracks	W	Melaleuca nervosa and Corymbia latifolia woodland with Eriachne sp understorey
213	13	20040708	-13.556598	134.538752	443	clay	sandstone	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	W	Melaleuca nervosa low woodland with Shizachyrium fragile understorey
214	14	20040708	-13.57687	134.515127	444	sandy clay	laterite	stones 2-6cm	~	not applicable	1-2yrs	~	~	W	Eucalytpus tetrodonta and Erythrophleum chlorostachys woodland with Sarga intrans understorey
215	15	20040708	-13.593595	134.494767	445	sand	sandstone	outcrop	~	not applicable	6mths-1yr	~	~	W	Eucalyptus miniata woodland with Triodia sp understorey
218	18	20040708	-13.61623	134.470097	449	not recorded	quartzite	rocks 20-60cm	~	not applicable	6mths-1yr	~	~	W	Eucalyptus tetrodonta woodland with Petalostigma quadroculare understorey
219	19	20040709	-13.647082	134.433457	450	red sand	none	none	~	not applicable	6mths-1yr	~	buffalo tracks	OF	Eucalyptus tetrodonta open forest with Eriachne sp understorey
221	20	20040709	-13.674038	134.402845	451	clay	none	none	seasonal drainage line	open trench	<6 mths	scattered Hyptis suaveolens plants	~	OF	Eucalytptus miniata and E. tetrodonta open forest with Petalostigma quadriloculare understorey.
222	21	20040709	-13.679512	134.393475	453\454	clay	sandstone	rocks 20-60cm	~	not applicable	6mths-1yr	~	~	W	Eucalyptus jensenii woodland with Petalostigma quadriloculare understorey.
223	22	20040709	-13.693068	134.380838	455	sand	mudstone	small rocks 6-20cm	permanent river	hdd	long unburnt	small infestations of Hyptis suaveolens, Sida acuta and Themeda quadrivalvis	~	CF	Casuarina cunninghamiana and Lophostemon lactifluus closed forest with Mnesithea rottboellioides understorey
225	24	20040709	-13.720753	134.353792	458	black soil	none	none	~	not applicable	<6 mths	scattered Hyptis suaveolens plants	large numbers of horses, donkeys and buffalo present - area signigicantly disturbed	W	Eucalyptus tetifica woodland with Heteropogon contortus understorey.
226	25	20040709	-13.741613	134.333285	459	sand	quartzite	small rocks 6-20cm	~	not applicable	<6 mths	~	~	OF	Eucalyptus miniata open forest with Eriachne sp. understorey.
228	27	20040710	-13.769865	134.303863	462	red sand	quartzite	outcrop	~	not applicable	6mths-1yr	~	~	W	Eucalyptus tetrodonta woodland with Triodia sp. understorey.
229	28	20040710	-13.7892	134.281018	463/464	sand loam	quartzite	outcrop	ephemeral drainage line	open trench	1-2yrs	small infestation of Hyptis suaveolens	large numbers of cattle use area	OW	Corymbia ferruginea and Petalostigma pubescens low open woodland with Triodia sp. understorey.
230	29	20040710	-13.81859	134.245578	465	clay	none	none	ephemeral drainage line	open trench	1-2yrs	~	~	W	Eucalyptus tectifica woodland with Sarga plumosum understorey.
231	30	20040710	-13.824657	134.238572	466	sandy loam	none	none	seasonal creek with semi-permanent waterholes	open trench	1-2yrs	scattered Hyptis suaveolens plants	~	CF	Riparian closed forest dominated by Lophostemon grandiflorus and Terminalia platyphylla with Pandanus spiralis mid-storey and Heteropogon contortus understorey

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
232	32	20040710	-13.840743	134.21872	467/468	red sand	sandstone	outcrop	~	not applicable	6mths-1yr	significant infestation of Hyptis suaveolens	large numbers of cattle use area	W	Eucalyptus miniata woodland with Triodia sp. understorey.
233	33	20040710	-13.870783	134.184386	469	clay	none	none	~	not applicable	1-2yrs	~	~	W	Corymbia latifolia and Eucalyptus tectifica woodland with Themeda triandra understorey
234	34	20040711	-13.876933	134.177304	470	clayey sand	mudstone	rocks 20-60cm	seasonal creek with semi-permanent waterholes	open trench	long unburnt	small infestation of Hyptis suaveolens	~	OW	Lophostemon grandiflorus and Terminalia platyphylla open woodland with Heteropogon contortus understorey
235	35	20040711	-13.902952	134.159838	471	clay	none	none	~	not applicable	1-2yrs	~	~	OW	Eucalyptus tectifica open woodland with Heteropogon contortus understorey
236	37	20040711	-13.932837	134.141467	472	clay	basalt	boulders >200cm	~	not applicable	1-2yrs	~	buffalo sighted in drainage line	ST	Open Heteropogon contortus grassland with scattered Grevillea dimidiata
239	40	20040711	-13.9559	134.128947	473	clay	none	none	~	open trench	1-2yrs	~	~	OW	Eucalyptus tectifica open woodland with Heteropogon contortus and Themeda triandra understorey
240	42	20040712	-14.10471	133.947595	474 north side of site. 475 south side of site.	clay	none	none	seasonally inundated	not applicable	<6 mths	small infestation of Themeda quadrivalvis present along roadside	area grazed by cattle, pig diggings present	W	Melaleuca citrolens woodland with Schizachyrium fragile understorey
241	44	20040713	-14.1068	133.936775	476	clay	none	none	seasonally inundated	not applicable	<6 mths	~	pig diggings present	OW	Melaleuca citrolens open woodland with Schizachyrium understorey
242	45	20040713	-14.114017	133.948178	477	clay loam	none	none	seasonally inundated	not applicable	<6 mths	~	pig diggings present	W	Melaleuca citrolens woodland with Sarga plumosum understorey
244	47	20040714	-14.13591	133.92537	none recorded	clay	none	none	~	not applicable	not recorded	scattered Themeda quadrivalvis and Hyptis suaveolens plants	~		Melaleuca citrolens open woodland with Eriachne sp. understorey
245	48	20040714	-14.15517	133.906	none recorded	clay	none	none	~	not applicable	not recorded	~	~	OW	Corymbia confertiflora open woodland with Themeda triandra understorey.

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
247	50	20040714	-14.17356	133.88459	none recorded	clay	siltstone	stones 2-6cm	~	not applicable	not recorded	significant infestation of Calotropis procera, Acacia nilotica, Hyptis suaveolens and Themeda quadrivalvis along fenceline 100m north of route	~	OW	Eucalyptus tectifica and Erythrophleum chlorostachys open woodland with Schizachyrium fragile understorey
248	51	20040714	-14.17617	133.88148	none recorded	sandy loam	none	none	~	not applicable	not recorded	~	~	OF	Eucalyptus tetrodonta and E. miniata open forest with Heteropogon triticeus understorey
249	52	20040715	-14.224097	133.832323	483	clay	silstone	pebbles <0.6cm	seasonally inundated	not applicable	6mths-1yr	~	~	W	Melaleuca nervosa woodland with Eriachne sp understorey.
250	53	20040715	-14.230593	133.825803	none recorded	not recorded	not recorded	not recorded	seasonal drainage line	open trench	not recorded	small infestation of Pennisetum polystachion, Hyptis suaveolens and Passiflora foetida	~		No flora survey conducted.
251	54	20040715	-14.241223	133.815339	484	clay	none	none	~	not applicable	long unburnt	~	~	CF	Eucalyptus pruinosa closed forest with Themeda triandra understorey
252	55	20040715	-14.254345	133.801352	none recorded	not recorded	not recorded	not recorded	ephemeral drainage line	open trench	not recorded	significant infestation of Themeda quadrivalvis	not recorded		No flora survey conducted.
253	56	20040715	-14.264228	133.79354	485	sand	none	none	semi-permanent creek	open trench	long unburnt	significant infestation of Themeda quadrivalvis over the floodplain	cattle observed in area	CF	Eucalyptus camaldulensis and Melaleuca leucadendra closed forest with dense mid-storey dominated by Antidesma ghaesembilla, and Arundinella nepalensis understorey
254	57	20040715	-14.284597	133.774605	486	sandy clay	none	none	seasonal drainage line	open trench	long unburnt	significant infestation of Themeda quadrivalvis	~	OW	Eucalyptus tectifica open woodland with Heteropogon contortus understorey
255	58	20040716	-14.286775	133.773288	489	sandy clay	none	none	permanent creek	open trench	long unburnt	scattered Themeda quadrivalvis plants	~	CF	Melaleuca leucadendra closed forest with a dense mid-storey dominated by Acacia pellita, and Hetropogon contortus understorey
256	none	20040716	-14.323912	133.727286	490	sandy clay	none	none	semi-permanent creek	open trench	long unburnt	significant infestation of Sida sp, Senna obtusifolia and Hyptis suaveolens	heavily grazed by cattle	CF	Eucalyptus camaldulensis and Melaleuca leucadendra closed forest with a dense mid-storey dominated by Diospyros humilis and Arundinella nepalensis understorey
257	58	20040716	-14.34171	133.688802	none recorded	not recorded	not recorded	not recorded	ephemeral drainage lines	open trench	not recorded	small infestation of Hyptis suaveolens, Themeda quadrivalvis and Acacia nilotica.	~		No flora survey conducted.
258	59	20040716	-14.343278	133.686385	491	clay	sandstone	small rocks 6-20cm	~	not applicable	long unburnt	small infestation of Senna obtusifolia	~	OW	Eucalyptus pruinosa open woodland with Sarga intrans understorey
259	60	20040716	-14.361862	133.660227	492	yellow clay	none	none	~	not applicable	long unburnt	~	~	OW	Eucalyptus pruinosa open woodland with Eriachne sp understorey

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
260	61	20040718	-14.384822	133.627857	493	yellow clay	quartzite	small rocks 6-20cm	seasonally inundated	not applicable	1-2yrs	~	~	OW	Eucalyptus pruinosa open woodland with Eriachne sp understorey
261	62	20040718	-14.391873	133.621127	494	red sandy clay	sandstone	rocks 20-60cm	~	not applicable	long unburnt	~	~	OW	Eucalyptus tectifica open woodland with Themeda triandra understorey
262	63	20040718	-14.405228	133.598433	495	not recorded	not recorded	not recorded	seasonal drainage line	open trench	not recorded	not recorded	not recorded		No flora survey conducted.
263	64	20040718	-14.419687	133.578025	496	sandy clay	sandstone	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	OW	Eucalyptus umbrawarrensis open woodland with Aristida sp understorey
264	65	20040718	-14.433233	133.558513	497	clay	none	none	ephemeral drainage line	open trench	long unburnt	~	area heavily grazed by cattle	OF	Eucalyptus tectifica open forest with Arundinella nepalensis understorey
265	none	20040718	-14.446017	133.540347	498	clay	none	none	seasonal creek with semi-permanent waterholes	open trench	long unburnt	~	~	OF	Eucalyptus tectifica open forest with Mnesithea rottboellioides understorey.
266	66	20040719	-14.470658	133.504877	499	sandy clay	none	none	ephemeral creek	open trench	1-2yrs	~	~	OW	Corymbia latifolia and Eucalyptus tectifica open woodland with Heteropogon contortus understorey
267	67	20040719	-14.474637	133.464865	500	clay	none	none	~	not applicable	1-2yrs	~	numerous pig diggings and cattle sighted	W	Corymbia latifolia and Eucalyptus pruinosa woodland with Sarga intrans understorey
269	69	20040720	-14.58606	132.168652	501	red sandy clay	none	none	~	not applicable	long unburnt	scattered Calotropis procera plants	area heavily grazed by cattle	W	Corymbia foelsheana woodland with Aristida sp understorey
270	none	20040720	-14.586368	132.173195	507	clay	none	none	~	not applicable	long unburnt	scattered Hyptis suaveolens plants	area heavily grazed by cattle	CF	Eucalyptus tectifica and Lophostemon grandiflorus closed forest with a dense mid-storey dominated by Acacia pellita, and Heteropogon contortus understorey
271	70	20040720	-14.583048	132.17292	504	sandy clay	limestone	outcrop	~	not applicable	long unburnt	small infestation of Calotropis procera and Hyptis suaveolens	area heavily grazed by cattle	OW	Corymbia foelsheana open woodland with Sarga intrans understorey
272	71	20040720	-14.583042	132.168382	505	sandy clay	none	none	~	not applicable	long unburnt	~	area heavily grazed by cattle	OW	Corymbia umbonata open woodland with Aristida sp understorey
273	72	20040721	-14.61376	132.55533	507	clayey sand	none	none	~	not applicable	6mths-1yr	~	~	OF	Eucalyptus tetrodonta and Corymbia dichromophloia open forest with Heteropogon triticeus understorey.

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EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
274	73	20040721	-14.6144	132.55057	508	clayey sand	none	none	~	not applicable	6mths-1yr	~	~	OF	Eucalyptus tetrodonta and Corymbia umbonata open forest with Heteropogon triticeus understorey
275	74	20040721	-14.61001	132.55004	509	clayey sand	none	none	~	not applicable	6mths-1yr	~	~	OW	Eucalyptus tectifica and Eucalyptus tetrodonta open woodland with Sehima nervosum understorey
276	75	20040721	-14.6095	132.55434	510	clayey sand	none	none	~	not applicable	6mths-1yr	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Heteropogon triticeus understorey
277	none	38201	-14.492012	131.22235	None	sandy clay gravel	sandstone	rocks 20-60cm	~	not applicable	<6 mths	~	~	OF	Eucalyptus miniata and Corymbia bleeseri open forest with Sarga intrans understorey
278	76	38203	-14.534287	130.928818	511	sandy clay loam	laterite	small stones 0.6-2cm	~	not applicable	<6 mths	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with grassy understorey
279	77	38203	-14.525038	130.88667	512	sandy clay loam	none	none	~	not applicable	<6 mths	~	cattle tracks and donkey dung	OF	Eucalyptus tetrodonta and E. miniata open forest with grassy understorey
280	78	38203	-14.516895	130.840032	513	clayey sand	laterite	small stones 0.6-2cm	~	not applicable	<6 mths	~	cattle tracks	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga intrans and Hetropogon triticeus understorey
281	79	38203	-14.508705	130.798652	514	clayey sand	laterite	small stones 0.6-2cm	~	not applicable	6mths-1yr	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga intrans understorey
282	80	38204	-14.497903	130.788324	515	sandy loam	none	none	broad drainage permanently wet	open trench	6mths-1yr	~	~	CF	Grevillea pteridifolia closed forest with emergent Eucalyptus latifolia and E. tetrodonta and Ectrosia leporina understorey
283	81	38204	-14.4855	130.783408	516	sandy clay	laterite	pebbles <0.6cm	~	not applicable	6mths-1yr	~	scattered pig diggings	W	Eucalyptus tetrodonta and E. miniata woodland with Triodia sp understorey
284	82	38204	-14.463522	130.773267	517	sandy clay	laterite	small stones 0.6-2cm	~	not applicable	<6 mths	~	~	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga intrans understorey
285	83	38204	-14.465273	130.768824	518	sandy clay gravel	laterite	small stones 0.6-2cm	~	not applicable	<6 mths	~	~	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga intrans understorey
286	84	38204	-14.461008	130.767323	519	sandy clay gravel	laterite	small stones 0.6-2cm	~	not applicable	<6 mths	~	~	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga intrans understorey
287	85	38204	-14.459557	130.771605	520	sandy clay	laterite	small stones 0.6-2cm	~	not applicable	<6 mths	~	~	W	Eucalyptus miniata and E. tetrodonta woodland with Hetropogon triticeus understorey
288	86	38205	-14.422685	130.75459	527	sandy clay gravel	laterite	small stones 0.6-2cm	~	not applicable	<6 mths	~	~	W	Eucalyptus miniata and Corymbia greeniana woodland with grassy understorey
289	87	38205	-14.412695	130.713483	528	sandy clay gravel	laterite	pebbles <0.6cm	~	not applicable	6mths-1yr	~	~	W	Eucalyptus tetrodonta woodland with Sarga plumosum understorey
290	88	38205	-14.407158	130.669287	529	sandy clay gravel	laterite	pebbles <0.6cm	~	not applicable	6mths-1yr	~	~	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga plumosum understorey
291	89	38205	-14.404878	130.623375	530	sandy clay gravel	laterite	pebbles <0.6cm	~	not applicable	6mths-1yr	~	~	OW	Eucalyptus miniata and E. tetrodonta open woodland with Sarga plumosum understorey
292	90	38205	-14.405673	130.587285	531-532	sandy clay loam	none	none	broad drainage permanently wet	open trench	long unburnt	~	~	ST	Open grassland with scattered Melaleuca leucadendra trees
293	91	38205	-14.44383	130.56706	533	clayey sand	laterite	small stones 0.6-2cm	~	not applicable	6mths-1yr	~	sign of cattle	OW	Eucalyptus miniata and E. tetrodonta open woodland with Sarga intrans understorey
294	92	38206	-14.406455	130.521482	534	sandy clay	laterite	pebbles <0.6cm	~	not applicable	6mths-1yr	~	~	OF	Eucalyptus miniata, Corymbia greeniana open forest with grassy understorey

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Field Survey Data - Environmental Variables

EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
295	93	38206	-14.380055	130.493057	535	sandy clay gravel	laterite	small stones 0.6-2cm	~	not applicable	6mths-1yr	~	~	OW	Eucalyptus miniata and E. tetrodonta open woodland with Schizachyrium fragile understorey
296	94	38206	-14.362898	130.455015	537	sandy clay gravel	laterite	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	W	Eucalyptus miniata, E. tetrodonta and E. greeniana woodland with Sarga plumosum understorey
297	95	38206	-14.347277	130.411477	538	sandy clay	laterite	stones 2-6cm	~	not applicable	6mths-1yr	~	~	W	Eucayptus miniata and E. tetrodonta woodland with Hetropogon triticeus understorey
298	96	38208	-14.33441	130.375364	539-540	loamy sand	none	none	semi-permanent swamp	open trench	6mths-1yr	~	~	OW	Corymbia ptycocarpa and Lophostemon lactifluus open woodland with dense mid storey of Banksia dentata and Grevillea pteridifolia and Pseudopogon contortum understorey
299	none	38209	-14.323442	130.346822	542-543	loamy sand	none	none	semi-permanent swamp	open trench	1-2yrs	~	~	OW	Corymbia ptychocarpa and Melaleuca viridiflora open woodland swamp with dense mid storey of Banksia dentata and Grevillea pteridifolia and sedge understorey
300	97	38209	-14.311125	130.312542	550	clayey sand gravel	laterite	stones 2-6cm	~	not applicable	6mths-1yr	~	~	OW	Eucalyptus miniata and E. tetrodonta open woodland with Eulalia mackinlayi understorey
301	98	38209	-14.295353	130.268908	551	sandy clay	laterite	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	W	Eucalyptus miniata woodland with Pseudopogonatherum contortum understorey
302	99	38211	-14.286447	130.231582	555	sandy clay gravel	laterite	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Eulalia mackinlayi understorey
303	none	38212	-14.282813	130.214846	557	loamy sand	sandstone	outcrop	semi-permanent river	open trench	<6 mths	~	~	OW	Melaleuca leucadendra and Lophostemon lactifluus open woodland with dense mid-storey dominated by Grevillea pteridifolia and Banksia dentata, and Sarga plumosum understorey
304	100	38212	-14.273597	130.171853	558	sandy clay	laterite	stones 2-6cm	~	not applicable	6mths-1yr	~	~	OW	Eucalyptus miniata open woodland with Sarga intrans understorey
305	none	38212	-14.264073	130.130907	559	sandy clay gravel	sandstone	outcrop	~	not applicable	6mths-1yr	~	~	OW	Corymbia polysciada and Eucalyptus tetrodonta open woodland with Sarga intrans understorey
306	101	38212	-14.261292	130.096717	560	sandy clay loam	laterite	small rocks 6-20cm	~	not applicable	1-2yrs	~	~	W	Eucalyptus tetrodonta woodland with Sarga intrans understorey
308	102	38213	-14.275752	130.066184	565	sandy clay	none		~	not applicable	<6 mths	~	~	OF	Eucalyptus miniata open forest with Sarga intrans inderstorey
309	103	38213	-14.27697	130.064528	566	sand	none	none	permanent river 100m wide with braided channels	hdd	long unburnt	~	~	OW	Melaleuca leucadendra open woodland with a dense mid storey of Barringtonia acutangula, and Arundinella nepalensis understorey
310	104	38213	-14.285947	130.052789	567	sandy clay loam	none	none	semi-permanent creek	open trench	<6 mths	scattered Hyptis suaveolens	~	CF	Melaleuca leucadendra and Syzygium armstrongii closed forest with Arundinella nepalensis understorey
311	104	38213	-14.2857	130.0523		clay	none	none	adjacent to perennial creek that flows into Moyle River	not applicable	<6 mths	~	Heavily worked by pigs and grazed by buffalo	OW	Corymbia latifolia and Eucalyptus tectifica open woodland with Hetropogon triticeus understorey
312	1	38228	-12.363727	136.699493	569	clayey sand	sandstone	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	W	Eucalyptus tetrodonta tall woodland with Sarga plumosum understorey

Appendix 1
Field Survey Data - Environmental Variables

EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
313	none	38228	-12.388408	136.663888	570	clayey sand gravel	laterite	small stones 0.6-2cm	~	not applicable	long unburnt	~	~	W	Eucalyptus tetrodonta woodland with Sarga intrans understorey
314	2	38228	-12.38604	136.62656	571	sandy surface with clay below	none	none	~	not applicable	1-2yrs	~	~	OF	Eucalyptus tetrodonta tall open forest with Heteropogon triticeus and Hibbertia dealbata understorey
315	3	38229	-12.462627	136.543978	572\573	clayey sand gravel	laterite	pebbles <0.6cm	~	not applicable	1-2yrs	~	~	OF	Eucalyptus tetrodonta and E. miniata tall open forest with Sarga intrans and Saraga plumosum understorey
316	4	38229	-12.457225	136.537892	574	gravel	laterite	stones 2-6cm	ephemeral drainage line	open trench	1-2yrs	~	~	W	Eucalyptus tetrodonta woodland with Pachynema complanatum and Fimbristylis sp. understorey
317	6	38229	-12.489012	136.511457	575	clay loam	none	none	seasonally inundated swamp	not applicable	1-2yrs	~	~	W	Corymbia ptycocarpa and Melaleuca viridiflora woodland with Imperata cylindrica, Eriachne sp. Cymbopogon refractus understorey
318	none	38229	-12.510322	136.493502	578-579	sand	none	none	permanent river	hdd	long unburnt	~	~	CF	Closed forest dominated by Eucalyptus tetrodonta , Carpentaria acuminata, Calophyllum inophyllum, Terminalia grandiflora, Melaleuca cajuputi, Melaleuca viridiflora, Xanthostemon paradoxus, Grevillea pteridifolia, Alphitonia excelsa and Nauclea orientalis with a dense mid storey of Hydriastele wendlandiana, Buchanania obovata, Lophostemon lactifluus, Pandanus aquaticus and Pogonolobus reticulatus
319	8	38230	-12.607673	136.405728	580	sandy clay loam with gravel	laterite	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	W	Eucalyptus tetrodonta and Erthrophleumm chlorostachys tall woodland with Sarga plumosum understorey
320	9	38230	-12.621475	136.384413	581	sandy clay gravel	laterite	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	W	Eucalyptus tetrodonta tall woodland with Sarga plumosum understorey
321	none	38230	-12.635578	136.3442	582	sandy clay loam with gravel	laterite	small stones 0.6-2cm	~	not applicable	6mths-1yr	~	~	OW	Eucalyptus tetrodonta and E. miniata open woodland with Sarga plumosum understorey
322	10	38230	-12.643018	136.32364	583	black soil	none	none	seasonlly inundated swamp	open trench	6mths-1yr	~	~	OW	Cormbia polycarpa, Melaleuca viridiflora and Lophostemon lactifluus open woodland with dense mid storey of Pandanus spiralis and Banksia dentata and Grevillea pteridifolia with Imperata cylindrica, Eriachne sp. and Cymbopogon refractus understorey
323	11	38230	-12.652203	136.297622	584	sandy gravel	laterite	stones 2-6cm	~	not applicable	6mths-1yr	~	~	W	Eucalyptus tetrodonta and E. miniata woodland with Sarga plumosum and Heteropogon triticeus understorey
324	13	38231	-12.575275	136.437762	589	sandy clay gravel	laterite	small stones 0.6-2cm	~	not applicable	6mths-1yr	~	~	W	Eucalyptus tetrodonta and Erythrophleum chlorostachys woodland with Sarga plumosum understorey
325	14	38231	-12.56387	136.448682	590	sand	laterite	outcrop	permanent billabongs	open trench	long unburnt	~	~	OW	Corymbia polycarpa and Corymbia porrecta woodland with dense midstorey of Acacia auriculiformis, Lophostemon lactifluus and Grevillea pteridifolia, and Themeda triandra understorey
326	15	38232	-12.298143	136.76726	592	sandy clay loam	none	none	~	not applicable	6mths-1yr	~	~	OW	Euclayptus tetrodonta open woodland with Ischaemum sp. understorey

Appendix 1
Field Survey Data - Environmental Variables

EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
327	none	38232	-12.279915	136.784768	593	gravel	laterite	small rocks 6-20cm	~	not applicable	6mths-1yr	scattered plants	~	OF	Eucalyptus tetrodonta open forest with Exocarpus latifolius and Sarga plumosum understorey
328	16	38232	-12.240902	136.788202	594	sandy gravel	laterite	small stones 0.6-2cm	~	not applicable	6mths-1yr	~	~	OW	Eucalyptus tetrodonta open woodland with Hibbertia dealbata, Templetonia hookeri and Fimbristylis sp. Understorey
329	none	38232	-12.240815	136.788182	595-596	sandy clay loam	none	none	braided creek with semi permanent billabongs	open trench	long unburnt	scattered Hyptis suaveolens, Stachytarpheta sp. and Passiflora foetida plants	~	OF	Open forest dominated by Corymbia alba, Lophostemon lactifluus, Melaleuca cajuputi and Corymbia polycarpa with dense midstorey of Acacia leptocarpa and Lophostemon lactifluus, and mixed grass\sedge understorey
330	none	38233	-12.399632	136.599095	597	sandy clay loam with gravel	laterite	small stones 0.6-2cm	~	not applicable	1-2yrs	~	~	OF	Eucalyptus tetrodonta open forest with dense mid storey of Erythrophleum chlorostachys, Planchonia careya and Livistona humilis with Sarga plumosum understorey
331	17	38233	-12.402598	136.572075	598	sandy clay loam with gravel	laterite	small stones 0.6-2cm	~	not applicable	1-2yrs	scattered Hyptis suaveolens plants	~	W	Eucalyptus tetrodonta and E. miniata woodland with dense mid storey of Livistona humilis and E. miniata seedlings and Sarga plumosum and Sebastiania chamaelea understorey
332	18	38233	-12.407295	136.56234	599	rocks	sandstone	stones 2-6cm	ephemeral drainage lines	open trench	6mths-1yr	~	~	W	Eucalyptus tetrodonta woodland with mixed species shrub understorey dominated by Eucalyptus tetrodonta seedlings and Petalostigma quadriloculare
333	18	38234	-12.407347	136.56237	600\601	sandy gravel	laterite	pebbles <0.6cm	~	open trench	long unburnt	small infestation of Hyptis suaveolens	~	ST	Open Eriachne sp. grassland with emergent Eucalyptus tetrodonta
334	19	38234	-12.204462	136.769712	602-604	sand with black soil below	none	none	seasonally inundated swamp	open trench	long unburnt	small infestation of Stachytarpheta sp. And Hyptis suaveolens	~	CF	Melaleuca viridiflora and Acacia leptocarpa closed forest swamp with Eriachne stipacea and Mnesithea rottboellioides understorey
335	20	38236	-12.683998	135.688222	606	black soil	none	none	seasonal watercourse with semi-permanent billabongs	open trench	6mths-1yr	~	buffalo and pig tracks and workings	OW	Melaleuca viridiflora, Eucalyptus bigalerita and Lophostemon lactifluus open woodland with Cymbopogon refractus understorey
336	21	38236	-12.690633	135.652668	607	sandy clay	quartzite	outcrop	~	not applicable	6mths-1yr	scattered Hyptis suaveolens plants	~	OW	Eucalytpus miniata and E. tetrodonta open woodland with Sarga plumosum understorey
337	23	38236	-12.71423	135.608837	608	sandy loam	none	none	~	not applicable	1-2yrs	~	~	W	Corymbia polycarpa and Eucalyptus tetrodonta woodland with Sarga plumosum understorey
338	24	38236	-12.698983	135.704158	609	clayey sand	none	none	~	not applicable	1-2yrs	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Sauropus stenocladus ssp stenocladus understorey
339	25	38237	-12.890523	135.39471	612	sand	none	none	~	not applicable	<6 mths	~	~	OF	Eucalyptus miniata and E. tetrodonta open forest with mixed species herb\shrub understorey
340	27	38237	-12.929368	135.357458	617	sand	none	none	~	not applicable	1-2yrs	~	~	CF	Eucalyptus miniata and E. tetrodonta open forest with Hibbertia dealbata understorey
341	29	38237	-12.96168	135.348105	618	black soil	none	none	spring fed open swamp	open trench	long unburnt	~	~	ST	Platyzoma microphyllum and Aristida sp. open swamp with emergent Eucalyptus tetrodonta, Pandanus spiralis and Lophostemon lactifluus

Appendix 1
Field Survey Data - Environmental Variables

EcOz Site Number	Waypt	Date	Lat	Long	Photo	Soil	Rock Type	Rock Size	Water	Crossing type	Last fire	Weeds	Feral Animals	Structural Formation	Community description
342	30	38238	-12.996353	135.322455	619	sand	none	none	~	not applicable	1-2yrs	~	~	W	Eucalyptus tetrodonta and E. miniata woodland with dense mixed shrub species mid storey and Pachynema complanatum and Finbristylis sp. understorey
343	31	38238	-13.02184	135.288582	620	sand	none	none	~	not applicable	6mths-1yr	~	~	OW	Eucalyptus tetrodonta and E. miniata open woodland with mixed species grass\shrub understorey dominated by Pachynema complanatum understorey
344	32	38238	-13.048885	135.252313	621	sand	none	none	~	not applicable	1-2yrs	~	~	W	Eucalyptus tetrodonta and Eucalyptus miniata woodland with mixed species shrub mid storey and Pachynema complanatum and Sauropus stenocladus ssp stenocladus understorey
345	34	38238	-13.082717	135.2047	623	sand loam	none	none	~	not applicable	1-2yrs	~	~	OF	Eucalyptus tetrodonta and E. miniata open forest with dense mid storey of Hibbertia dealbata and Acacia latescens and Schizachyrium sp. and Triodia sp. understorey
346	38	38238	-13.101518	135.163652	625	sand loam	none	none	~	not applicable	6mths-1yr	~	pigs sighted	W	Corymbia polycarpa and Corymbia latifolia woodland with Sarga plumosum
347	39	38238	-13.116615	135.122988	626	sand loam	none	none	~	not applicable	1-2yrs	~	~	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga intrans understorey
348	none	38239	-13.123763	135.10363	627-628	sand loam	none	none	permanent river	hdd	long unburnt	scattered Hyptis suaveolens plants	buffalo\cattle tracks abundant along river, cane toads present	CF	Melaleuca leucadendra closed forest with dense midstorey of Pandanus aquaticus, and Cymbopogon refractus and Imperata cylindrica understorey
349	epic128	37176	-14.092	133.987	656	not recorded	not recorded	not recorded	seasonal creek	open trench	not recorded	~	~	OW	Acacia umbellata and Acacia holosericea open woodland with Excoecaria understorey
350	epic129	37177	-14.019	134.06	657,658	not recorded	not recorded	not recorded	permanent river	hdd	not recorded	~	~	CF	Melaleuca cajuputi closed forest with a dense midstorey of Pandanus spiralis, and mixed grass\sedge species understorey
351	epic133	37177	-14.015	134.063	665, 666	not recorded	not recorded	not recorded	permanent river	hdd	not recorded	significant infestation Themeda quadrivalvis, Hyptis suaveolens and Pennisetum polystachion	heavily grazed	CF	Melaueca cajuputi closed forest with dense mid storey of Barringtonia acutangula, and mixed spcies grass\sedge understorey

Appendix 2
Field Survey Data – Flora Species

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
1	-14.0196	134.0725	OW	Corymbia confertiflora and Eucalyptus patellaris open woodland with Heteropogon contortus understorey	Corymbia confertiflora (d), Eucalyptus patellaris (d), Brachychiton diversifolius, Corymbia confertiflora	Acacia heliospermum (d), Eucalyptus patellaris (d), Ficus aculeata, Hakea arborescens, Cochlospermum fraseri	Heteropogon contortus (d), Grewia retusifolia, Hyptis suaveolens*	C10
2	-14.0015	134.0872	ST	Heteropogon contortus and Themeda triandra grassland with scattered Corymbia bella trees	Corymbia bella (d), Atalaya hemiglauca	Terminalia carpentariae (d), Parkinsonia aculeata*, Hyptis suaveolens*	Themeda triandra (d), Heteropogon contortus (d)	C18
3	-13.9829	134.1059	OW	Corymbia confertiflora and Erythrophleum chlorostachys open woodland with Themeda triandra and Heteropogon contortus understorey.	Corymbia confertiflora (d), Erythrophleum chlorostachys (d), Corymbia latifolia/foelscheana	Melaleuca viridiflora (d), Grewia retusifolia, Hakea arborescens	Themeda triandra (d), Heteropogon contortus (d)	C10
4	-13.9557	134.1590	ST	Heteropogon contortus grassland with scattered Cochlospermum fraseri trees	Cochlospermum fraseri (d), Brachychiton diversifolius, Gyrocarpus americanus	Corymbia confertiflora (d), Ficus aculeata, Grevillea dimidiata	Heteropogon contortus (d), Hyptis suaveolens*, Grewia retusifolia	C18
5	-13.9439	134.2263	OW	Eucalyptus patellaris open woodland with a mixed species grass\shrub understorey	Eucalyptus patellaris (d), Brachychiton diversifolius, Corymbia confertiflora	Erythrophleum chlorostachys (d), Hakea arborescens (d), Gardenia megasperma	Heteropogon contortus (d), Grevillea dimidiata, Grewia retusifolia	D10
6	-13.9430	134.2284	W	Eucalyptus jensenii woodland with Petalostigma pubescens understorey	Eucalyptus jensenii (d), Corymbia latifolia	Petalostigma pubescens (d)		D10
7	-13.9394	134.2487	OW	Eucalyptus pruinosa open woodland with Heteropogon contortus understorey	Eucalyptus pruinosa (d), Erythrophleum chlorostachys	Sarga sp. (d), Petalostigma pubescens, Corymbia latifolia, Atalaya hemiglauca	Heteropogon contortus (d)	D29
8	-13.9385	134.2574	OW	Eucalyptus jensenii woodland with Petalostigma pubescens understorey	Eucalyptus jensenii (d), Erythrophleum chlorostachys (d), Eucalyptus tectifica	Corymbia latifolia (d), Acacia ditricha (d), Atalaya hemiglauca (d), Eucalyptus tectifica (juv) (d), Hakea arborescens (d),	Petalostigma pubescens (d)	D10
10	-13.9355	134.2752	OW	Corymbia latifolia and Eucalyptus bigalerita open woodland with Eriachne sp understorey	Corymbia latifolia (d), Eucalyptus bigalerita (d), Eucalyptus jensenii	Grevillea heliosperma (d), Melaleuca viridiflora, Petalostigma pubescens	Eriachne sp. (d), Petalostigma quadriloculare	D10
11	-13.9320	134.2919	W	Eucalyptus tectifica and Erythrophleum chlorostachys woodland with Petalostigma pubescens understorey	Eucalyptus tectifica (d), Erythrophleum chlorostachys (d), Corymbia confertiflora	Hakea arborescens (d), Brachychiton paradoxus	Petalostigma quadriloculare (d), Indigofera sp., Hibbertia sp.	D10
12	-13.9288	134.3126	OF	Open forest dominated by Lophostemon grandiflorus, Bauhinia cunninghamii and Eucalyptus tectifica with a dense mid-storey of Hakea arborescens, Terminalia platyphylla and Leptospermum madidum with Heteropogon contortus understorey	Lophostemon grandiflorus (d), Bauhinia cunninghamii (d), Eucalyptus tectifica (d)	Hakea arborescens (d), Terminalia platyphylla (d), Leptospermum madidum (d), Acacia ditricha	Heteropogon contortus (d), Heteropogon triticeus, Hyptis suaveolens*, Sarga sp.	D10
13	-13.9234	134.3322	W	Eucalyptus tectifica and Melaleuca viridiflora woodland with Sarga sp understorey	Eucalyptus tectifica (d)	Melaleuca viridiflora (d), Petalostigma pubescens, Calytrix exstipulata, Brachychiton paradoxus	Sarga sp. (d), Hakea arborescens	D10
14	-13.9204	134.3543	W	Melaleuca viridiflora and Erythrophleum chlorostachys woodland with a grassy understorey	Melaleuca viridiflora (d), Erythrophleum chlorostachys (d)	Hakea arborescens (d), Corymbia latifolia (d)	Melaleuca viridiflora (juv), Hakea arborescens (juv)	C13
15	-13.9168	134.3749	W	Eucalyptus tectifica, Erythrophleum chlorostachys and Corymbia terminalis woodland with a grassy understorey	Eucalyptus tectifica (d), Erythrophleum chlorostachys (d), Corymbia terminalis (d), Corymbia polysciada (d)	Hakea arborescens		D10
16	-13.9108	134.3925	W	Erythrophleum chlorostachys and Eucalyptus tectifica woodland with Eriachne sp. understorey	Erythrophleum chlorostachys (d), Eucalyptus tectifica (d), Melaleuca viridiflora (d), Brachychiton diversifolius, Corymbia confertiflor	Hakea arborescens (d), Petalostigma pubescens (d), Calytrix exstipulata, Helicteres sp., Haemodorum sp	Eriachne sp. (d), Heteropogon contortus, Sarga sp., Grewia sp.	D10
17	-13.9125	134.4013	OW	Eucalyptus tectifica open woodland with Sarga sp understorey	Eucalyptus tectifica (d)	Petalostigma pubescens (d), Calytrix exstipulata (d), Hakea arborescens (d)	Sarga sp. (d), Dapsilanthus spathaceus, Petalostigma pubescens	D10
18			OF	Excoecaria parvifolia open forest with sparse Aristida sp and Sarga sp understorey	Excoecaria parvifolia (d)	Cathormion umbellatum (d), Casuarina cunninghamiana	Aristida sp., Sarga sp.	C10
19	-13.9027	134.4603	W	Eucalyptus tintinnans and Erythrophleum chlorostachys woodland with Sarga plumosum and Petalostigma quadriloculare understorey	Eucalyptus tintinnans (d), Erythrophleum chlorostachys (d), Corymbia confertiflora, Corymbia ferruginea	Corymbia confertiflora	Sarga plumosum (d), Petalostigma quadriloculare (d)	D10
20	-13.9054	134.4401	OF	Casuarina cunninghamiana open forest with Eriachne sp understorey	Casuarina cunninghamiana (d), Excoecaria parvifolia, Melaleuca sp., Eucalyptus patellaris	Hakea arborescens (d), Leptospermum madidum sp. (d), Melaleuca viridiflora (d)	Eriachne sp.	C7
21	-13.8989	134.4808	CF	Acacia shirleyi closed forest with Sarga plumosum understorey	Acacia shirleyi (d), Eucalyptus tectifica, Erythrophleum chlorostachys	Petalostigma pubescens, Eucalyptus tectifica (juv), Melaleuca viridiflora, Calytrix exstipulata, Hakea arborescens	Sarga plumosum (d), Schizachymim sp.	E1
22	-13.8224	134.5432	W	Corymbia latifolia and Melaleuca viridiflora woodland with Sarga plumosum understorey	Corymbia latifolia (d), Melaleuca viridiflora (d), Eucalyptus tectifica	Melaleuca viridiflora (juv) (d), Hakea arborescens (d), Petalostigma pubescens, Calytrix exstipulata, Brachychiton paradoxus,	Sarga plumosum (d), Heteropogon contortus, Eriachne sp., Themeda sp.	C13
23	-13.8374	134.5287	OW	Eucalyptus tectifica and Corymbia polycarpa open woodland with Sarga plumosum and Heteropogon contortus understorey	Eucalyptus tectifica (d), Corymbia polycarpa (d), Corymbia terminalis	Erythrophleum chlorostachys (d), Eucalyptus tectifica (d), Corymbia polycarpa (d), Brachychiton diversifolius, Hakea arborescens, Ficus opposita var. aculeata, Terminalia pterocarya	Sarga plumosum (d), Heteropogon contortus (d), Petalostigma quadriloculare, Waltheria indica	D10
25	-13.7320	134.5952	OW	Eucalyptus tectifica open woodland with Themeda sp. understorey	Eucalyptus tectifica (d), Corymbia foelscheana, Corymbia polycarpa	Hakea arborescens (d), Acacia ditricha (d), Melaleuca viridiflora, Brachychiton paradoxus	Themeda sp. (d), Heteropogon contortus, Grewia sp.	D10
26	-13.7251	134.6016	W	Eucalyptus tintinnans and Eucalyptus tectifica woodland with Heteropogon contorus understorey	Eucalyptus tectifica (d), Eucalyptus tintinnans (d), Corymbia foelscheana, Corymbia polycarpa, Brachychiton diversifoliu	Grevillea dimidiata (d), Atalaya hemiglauca (d), Terminalia platyphylla (d), Ficus aculeata (d)	Heteropogon contortus (d), Heteropogon triticeus, Setaria apliculata, Mnesithea rottboellioides	D10
27	-13.6967	134.6220	ST	Open grassland dominated by Mnesithea rottboellioides with scattered Corymbia bella trees	Corymbia bella (d)	absent	Mnesithea rottboellioides (d)	C18
28	-13.6805	134.6286	OF	Open forest dominated by Lophostemon lactifluus and Terminalia platyphylla with Heteropogon contortus understorey	Lophostemon lactifluus (d), Terminalia platyphylla (d)	Leptospermum madidum (d), Atalaya hemiglauca (d), Pandanus aquaticus, Acacia heliosperma	Heteropogon contortus (d), Passiflora foetida*, Hyptis suaveolens*, Calotis breviseta	C7
29	-13.6700	134.6335	W	Eucalyptus patellaris woodland with Heteropogon contortus understorey	Eucalyptus patellaris (d), Corymbia latifolia, Corymbia confertiflora, Brachychiton diversifolius	Eucalyptus patellaris (juv)	Heteropogon contortus (d), Grewia sp., Themeda sp.	D10
30	-13.6456	134.6413	OF	Eucalyptus tetrodonta and Erythrophleum chlorostachys open forest with Heteropogon triticeus and Sarga plumosum understorey.	Eucalyptus tetrodonta (d), Erythrophleum chlorostachys (d), Corymbia ferruginea	No dominant - mixed species - Owenia vernicosa (d), Pogonolobus reticulatus (d), Terminalia grandiflora (d),	Heteropogon triticeus (d) (d), Sarga plumosum, Alphitonia excelsa, Denhamia obscura, Planchonia careya	D4
31	-13.6243	134.6499	OF	Eucalyptus tetrodonta and E. miniata open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Terminalia carpentariae	Erythrophleum chlorostachys (d), Corymbia ferruginea (d), Buchanania obovata, Terminalia carpentariae (juv), Grevillea pteridifolia, Coelospermum reticulatum	Sarga plumosum (d), Themeda sp., Pouteria falcata, Boronia sp, Acacia nuperima, Pachnema sp, Alphitonia excelsa	D4
32	-13.5907	134.6736	OF	Eucalyptus tetrodonta and E. miniata open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Callitris intratropica	Buchanania obovata (d), Acacia leptocarpa, Planchonia careya	Sarga plumosum (d), Acacia nuperima, Hakea arborescens, Pachynema sp. Alphitonia excelsa	D4
33	-13.5463	134.6922	OF	Eucalyptus tetrodonta open forest with Sarga sp and Dapsilanthus spathaceus understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata	Buchanania obovata (d), Eucalyptus tetrodonta (juv) (d)	Sarga sp. (d), Dapsilanthus spathaceus (d), Alphitonia excelsa, Hakea arborescens, Pachynema sp., Petalostigma quadriloculare, Hibbertia dealbata	D4
34	-13.5293	134.7000	CF	Grevillea pteridifolia closed forest with Dapsilanthus spathaceus sedge understorey	Grevillea pteridifolia (d), Melaleuca nervosa (d), Lophostemon lactifluus, Acacia auriculiformis, Acacia gonocarpa, Eucalyptus tetrodonta	Verticordia cunninghamii (d), Planchonia careya	Dapsilanthus spathaceus (d), Melaleuca nervosa (juv), Melaleuca viridiflora (juv)	none

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
35	-13.4950	134.7160	CF	Melaleuca viridiflora closed forest with a mixed species grass\sedge understorey	Melaleuca viridiflora (d), Terminalia carpentariae, Lophostemon lactifluus, Callitris intratropica, Melaleuca cajuputi	Pandanus aquaticus (d), Pandanus spiralis (d), Verticordia cunninghamii, Acacia leptocarpa, Grevillea pteridifolia, Planchonia careya, Petalostigma pubescens	Water lillies	C3
36	-13.2040	134.9780	CF	Melaleuca argentea closed forest with a dense mid-storey of Pandanus aquaticus and Melaleuca acacioides	Melaleuca argentea (d), Eucalyptus camaldulensis, Acacia leptocarpa, Eucalyptus patellaris	Pandanus aquaticus (d), Melaleuca acacioides (d), Barringtonia acutangula, Grevillea pteridifolia		C3
37	-13.2275	134.9441	W	Eucalyptus tetrodonta woodland with Ericahne sp. understorey	Eucalyptus tetrodonta (d), Corymbia ferruginea, Xanthostemon paradoxus	Grevillea decurrens (d), Grevillea parallela (d), Erythrophleum chlorostachys (d), Calytrix exstipulata (d), Pouteria falcata (d), Stenocarpus acacioides (d), Petalostigma pubescens (d), Grevillea megasperma (d),	Eriachne sp. (d), Sarga plumosum, Petalostigma quadriloculare	D4
38	-13.2547	134.9119	W	Eucalyptus tetrodonta woodland with grassy understorey	Eucalyptus tetrodonta (d), Corymbia latifolia, Corymbia bleeseri	Xanthostemon paradoxus (d), Gardenia megasperma (d), Calytrix exstipulata, Acacia platyphylla, Erythrophleum chlorostachy	unidentified grass (d), Petalostigma quadriloculare, Grevillea parallela (juv)	D4
39	-13.2733	134.8872	OW	Eucalyptus tectifica open woodland with a grassy understorey	Eucalyptus tectifica (d), Corymbia latifolia	Erythrophleum chlorostachys (d), Petalostigma pubescens (d), Calytrix exstipulata, Grevillea decurrens	unidentified grass (d), Petalostigma quadriloculare, Grevillea parallela (juv), Sarga plumosum, Stenocarpus acacioides, Acacia platycarpa	D10
40	-13.2981	134.8552	OW	Open woodland dominated by Eucalyptus tetrodonta, Eucalyptus tectifica, Corymbia latifolia, Melaleuca viridiflora with Petalostigma quadriloculare understorey	Eucalyptus tetrodonta (d), Eucalyptus tectifica (d), Corymbia latifolia (d), Melaleuca viridiflora (d), Acacia platycarpa, Erythrophleum chlorostachys, Stenocarpus acacioides	Petalostigma pubescens (d), Grevillea parallela, Grevillea decurrens, Calytrix exstipulata	Petalostigma quadriloculare, Acacia platycarpa (juv)	D13
41	-13.3215	134.8221	W	Melaleuca viridiflora woodland with Themeda sp understorey	Melaleuca viridiflora (d), Corymbia latifolia, Erythrophleum chlorostachys, Eucalyptus tectifica	Petalostigma pubescens (d), Hakea arborescens, Acacia platycarpa, Acacia hemignosta	Themeda sp. (d)	C13
42	-13.3576	134.7859	CF	Closed forest dominated by Melaleuca viridiflora, Acacia auriculiformis and Corymbia polycarpa with a dense mid-storey of Melaleuca acacioides, Pandanus spiralis, Acacia holosericea and Barringtonia acutangula with Heteropogon contortus and Mnesithea rottboellioides understorey	Melaleuca viridiflora (d), Acacia auriculiformis (d), Corymbia polycarpa (d)	Melaleuca acacioides (d), Pandanus spiralis (d), Acacia holosericea (d), Barringtonia acutangula (d)	Heteropogon contortus (d), Mnesithea rottboellioides (d)	C3
43	-13.3727	134.7774	CF	Melaleuca viridiflora and Acacia leptocarpa closed forest with a dense mid-storey of Corymbia polysciada, Pandanus spiralis and Barringtonia acutangula with Ericahne sp understorey	Melaleuca viridiflora (d), Acacia leptocarpa (d)	Corymbia polysciada (d), Pandanus spiralis (d), Barringtonia acutangula (d)	Mnesithea rottboellioides, Heteropogon triticeus	C3
44	-13.3844	134.7705	ST	Open grassland dominated by Eriachne sp. with scattered Melaleuca viridiflora and Eucalyptus tectifica trees	Melaleuca viridiflora (d), Eucalyptus tectifica (d)	Petalostigma pubescens (d), Corymbia latifolia (d)	Eriachne sp. (d)	C18
45	-13.4175	134.7569	W	Woodland dominated by Corymbia latifolia and Erythrophleum chlorostachys with Heteropogon sp understorey	Corymbia latifolia (d), Erythrophleum chlorostachys (d)	Grevillea decurrens (d), Grevillea parallela	Heteropogon sp. (d), Melaleuca viridiflora (suckers)	D10
46	-13.4384	134.7513	OF	Eucalyptus miniata and E. tetrodonta open forest with Chrysopogon sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Callitris intratropica (dead)	Alphitonia excelsa (d), Acacia torulosa (d), Buchanania obovata, Acacia platycarpa, Coelospermum reticulatum, Acacia latescens, Gardenia sp., Planchonia careya	Chrysopogon sp. (d), Pachynema sp.	D4
47	-13.4459	134.7410	CF	Pandanus aquaticus, Melaleuca viridiflora and Eucalyptus alba closed forest with Eriachne sp understorey	Pandanus aquaticus (d), Melaleuca viridiflora (d), Eucalyptus alba (d), Lophostemon lactifluus	Pandanus aquaticus (d), Melaleuca acacioides (d), Grevillea pteridifolia	Eriachne sp. (d), Mnesithea rottboellioides, Melastoma malabathricum subsp malabathricum, Xerochloa sp.	C3
48	-14.0673	134.0182	W	Eucalyptus patellaris woodland with Heteropogon contortus understorey	Eucalyptus patellaris (d), Brachychiton diversifolius, Erythrina vespertilio, Corymbia confertiflora, Gyrocarpus americanus, Corymbia grandifolia	Eucalyptus tectifica (d), Grevillea dimidiata	Heteropogon contortus (d), Heteropogon triticeus	D10
49	-14.0560	134.0307	W	Eucalyptus patellaris woodland with Heteropogon contortus understorey	Eucalyptus patellaris (d), Erythrina vespertilio, Brachychiton diversifolius	Grevillea dimidiata (d), Eucalyptus patellaris (juv) (d), Acacia holosericea, Cochlospermum fraseri	Heteropogon contortus (d), Hyptis suaveolens*	D10
50	-14.0404	134.0423	OW	Eucalyptus patellaris and Corymbia confertiflora open woodland with Heteropogon contortus understorey	Eucalyptus patellaris (d), Corymbia confertiflora (d), Gyrocarpus americanus	Acacia holosericea (d), Eucalyptus patellaris (juv) (d), Ficus aculeata	Heteropogon contortus (d), Gardenia sp., Hyptis suaveolens*	C10
51	-14.0340	134.0585	OW	Corymbia terminalis open woodland with Heteropogon contortus understorey	Corymbia terminalis (d), Gyrocarpus americanus	Acacia holosericea (d), Ficus aculeata	Heteropogon contortus (d), Hyptis suaveolens*	D25
52	-14.0262	134.0624	OW	Corymbia bella open woodland with Heteropogon contortus understorey	Corymbia bella (d)	Terminalia platyphylla (d), Corymbia bella (juv) (d), Atalaya hemiglauca, Cathormion umbellatum, Dodonaea platyptera	Hyptis suaveolens*, Passiflora foetida*	D10
53	-14.1009	133.9612	OW	Eucalyptus pruinosa open woodland with Sarga plumosum understorey	Eucalyptus pruinosa (d), Melaleuca viridiflora	absent	Sarga plumosum (d)	D29
54	-14.1337	133.8993	W	Melaleuca viridiflora woodland with a grassy understorey	Melaleuca viridiflora (d), Eucalyptus pruinosa	Petalostigma pubescens (d)	unidentified grass (d)	C13
55	-14.1511	133.8629	OW	Eucalyptus tectifica and Corymbia confertiflora open woodland with Schizachyrium sp understorey	Eucalyptus tectifica (d), Corymbia confertiflora (d)	Petalostigma pubescens (d), Hakea arborescens, Calytrix exstipulata, Eucalyptus pruinosa, Hyptis suaveolens*	Schizachyrium sp. (d)	D10
56	-14.1610	133.8340	W	Mixed Eucalyptus\Corymbia species woodland with a grassy understorey	Eucalyptus tectifica (d), Corymbia grandifolia (d), Eucalyptus tintinnans (d), Erythrophleum chlorostachys (d	Erythrophleum chlorostachys (juv) (d)	Hyptis suaveolens*, unidentified grass (d)	D10
57	-14.1603	133.8278	W	Eucalyptus tectifica and Corymbia grandifolia woodland with Heteropogon contortus understorey	Eucalyptus tectifica (d), Corymbia grandifolia (d), Eucalyptus tintinnans	Hakea arborescens (d)	Heteropogon contortus (d), Heteropogon triticeus	D10
58	-14.1659	133.8060	W	Eucalyptus tectifica, Erythrophleum chlorostachys and Brachychiton diversifolius woodland with Heteropogon contortus and Aristida sp understorey	Eucalyptus tectifica (d), Erythrophleum chlorostachys (d), Brachychiton diversifolius (d), Corymbia latifolia	Petalostigma pubescens (d), Acacia holosericea (d), Eucalyptus pruinosa, Erythrina vespertilio, Gardenia sp., Terminalia latipes, Corymbia grandifolia	Heteropogon contortus (d), Aristida sp. (d), Hyptis suaveolens* (d), Calytrix exstipulata	D10
59	-14.2167	133.7708	W	Eucalyptus patellaris and Corymbia latifolia woodland with Heteropogon contortus understorey	Eucalyptus patellaris (d), Corymbia latifolia (d), Corymbia polycarpa	Acacia holosericea (d), Melaleuca viridiflora (d), Terminalia platyphylla	Heteropogon contortus (d), Hyptis suaveolens*	D10
60	-14.2293	133.7508	OF	Eucalyptus patellaris and Corymbia bella open forest with Heteropogon contortus understorey	Eucalyptus patellaris (d), Corymbia bella (d)	Corymbia bella (juv)	Heteropogon contortus (d), Hyptis suaveolens*	C7
60	-14.2138	133.7609	OF	Eucalyptus patellaris and Melaleuca leucadendra open forest with Heteropogon contortus understorey	Eucalyptus patellaris (d), Melaleuca leucadendra (d), Brachychiton diversifolius, Terminalia platyptera, Lophostemon grandiflorus, Corymbia latifolia, Corymbia bella, Eucalyptus camaldulensis	Melaleuca leucadendra (juv) (d), Barringtonia acutangula, Acacia holosericea, Buchanania obovata	Heteropogon contortus (d), Hyptis suaveolens*(d)	D10
61	-14.2409	133.7418	OF	Cochlospermum fraseri open forest with Sarga sp understorey	Cochlospermum fraseri, Eucalyptus pruinosa	Brachychiton paradoxus	Sarga sp.	D25
62	-14.2826	133.6853	W	Mixed species Eucalyptus\Corymbia woodland with Heteropogon contortus understorey	Corymbia latifolia (d), Erythrophleum chlorostachys (d), Eucalyptus patellaris (d), Corymbia grandifolia (d)	Terminalia pterocarya (d), Acacia sp. (d), Hakea arborescens (d)	Heteropogon contortus (d), Hyptis suaveolens* (d)	D10
63	-14.2793	133.6913	OF	Mixed species Eucalyptus\Corymbia open forest with Sarga sp. understorey	Eucalyptus phoenicea (d), Corymbia ferruginea (d), Corymbia latifolia (d), Erythrophleum chlorostachys (d)	Calytrix exstipulata (d), Grevillea parallela (d), Acacia difficilis (d), Terminalia pterocarya (d), Petalostigma pubescens, Atalaya hemiglauca, Denhamia obscura, Cochlospermum fraseri	Sarga sp. (d), Owenia vernicosa (juv)	D10

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
64	-14.2785	133.6915	CF	Eucalyptus camaldulensis and Corymbia bella closed forest with a Heteropogon contortus and Mnesithea rottboellioides understorey	Eucalyptus camaldulensis (d), Corymbia bella (d)	Acacia difficilis (d), Cathormion umbellatum (d), Lophostemon grandiflorus (d), Acacia holosericea, Barringtonia acutangula, Terminalia platycarpa, Acacia umbellata, Hyptis suaveolens*	Heteropogon contortus (d), Mnesithea rottboellioides (d)	C7
65	-14.3210	133.6379	OW	Corymbia terminalis, Eucalyptus tectifica and Grevillea dimidiata open woodland with Heteropogon contortus and Sarga sp understorey	Corymbia terminalis (d), Eucalyptus tectifica (d), Grevillea dimidiata (d)	Cochlospermum fraseri (d), Hakea arborescens (d), Acacia pachyphloia (d), Gyrocarpus americanus (d), Calotropis procera* (d), Sesamum indicum	Heteropogon contortus (d), Sarga sp. (d), Hyptis suaveolens* (d)	D10
66	-14.3481	133.6058	OW	Eucalyptus pruinosa open woodland with Heteropogon contortus and Sarga sp understorey	Eucalyptus pruinosa (d), Corymbia confertiflora	Bauhinia cunninghamii (d), Acacia ditricha (d), Atalaya hemiglauca (d),	Heteropogon contortus (d), Sarga sp. (d), Hyptis suaveolens* (d)	D29
67	-14.3654	133.5859	OF	Mixed species open forest with Sarga plumosum understorey	Corymbia confertiflora (d), Eucalyptus tectifica (d), Bauhinia cunninghamii (d), Terminalia pterocarya (d)	Hakea arborescens (d), Owenia vernicosa (d), Cochlospermum fraseri (d), Erythrophleum chlorostachys (d), Helicteres sp., Atalaya hemiglauca	Sarga plumosum (d)	D10
68	-14.4168	133.5290	CF	Eucalyptus camaldulensis and Terminalia platyphylla closed forest with Mnesithea rottboellioides understorey	Eucalyptus camaldulensis (d), Terminalia platyphylla (d), Eucalyptus patellaris, Corymbia latifolia	Acacia holosericea (d), Melaleuca viridiflora (d), Vitex glabrata, Planchonia careya, Barringtonia acutangula	Mnesithea rottboellioides (d), Heteropogon contortus, Passiflora foetida*	C7
69	-14.4161	133.5297	OF	Eucalyptus pruinosa open forest with a grassy understorey	Eucalyptus pruinosa (d), Erythrophleum chlorostachys, Terminalia platyptera	Cochlospermum fraseri (d), Acacia ditricha (d), Terminalia pterocarya (d)	unidentified grass (d)	D29
70	-14.4329	133.5135	OW	Corymbia confertiflora and Corymbia terminalis open woodland with Heteropogon triticeus, H. contortus and Aristida sp understorey	Corymbia confertiflora (d), Corymbia terminalis (d), Brachychiton diversifolius	Eucalyptus pruinosa (d), Hibiscus leptocladus	Heteropogon triticeus (d), Heteropogon contortus (d), Aristida sp. (d)	D10
71	-14.4689	133.4602	W	Eucalyptus tectifica woodland with Themeda sp understorey	Eucalyptus tectifica (d), Terminalia volucris, Eucalyptus pruinosa	Melaleuca viridiflora (d), Petalostigma pubescens (d), Hakea arborescens, Acacia ditricha , Brachychiton paradoxus	Themeda sp. (d)	D10
72	-14.4774	133.4409	CF	Closed forest dominated by Lophostemon gradiflorus, Eucalyptus camaldulensis, Eucalyptus patellaris and Corymbia latifolia with Mnesithea rottboellioides and Heteropogon contortus understorey	Lophostemon grandiflorus (d), Eucalyptus camaldulensis (d), Eucalyptus patellaris (d), Corymbia latifolia (d), Melaleuca viridiflora, Erythrophleum chlorostachys, Passiflora foetida*	Acacia holosericea (d), Helicteres sp. (d), Pandanus spiralis, Brachychiton diversifolius, Ficus aculeata, Hakea arborescens, Atalaya hemiglauca	Mnesithea rottboellioides (d), Hyptis suaveolens* (d), Heteropogon contortus (d), Verticordia cunninghamii	C7
73	-14.4823	133.4264	W	Eucalyptus tectifica woodland with Aristida sp understorey	Eucalyptus tectifica (d), Corymbia confertiflora	Corymbia latifolia (d), Acacia ditricha (d), Atalaya hemiglauca (d), Eucalyptus tectifica (juv) (d), Hakea arborescens (d), Grewia retusifolia	Aristida sp. (d), Heteropogon contortus	D10
74	-14.4911	133.4049	OW	Eucalyptus tectifica open woodland with Sarga sp understorey	Eucalyptus tectifica (d), Erythrophleum chlorostachys, Corymbia latifolia	Eucalyptus tectifica (juv) (d), Acacia ditricha, Atalaya variifolia, Grevillea parallela	Sarga sp. (d)	D10
75	-14.5044	133.3736	W	Corymbia latifolia woodland with Sarga sp understorey	Corymbia latifolia (d)	Terminalia ferdinandiana (d), Erythrophleum chlorostachys (d), Grevillea decurrens	Sarga sp. (d)	D10
76	-14.5027	133.3728	CF	Eucalyptus umbonata closed forest with Sarga sp understorey	Eucalyptus umbonata (d), Erythrophleum chlorostachys, Eucalyptus tintinanns	Acacia shirleyi, Gardenia megasperma	Sarga sp. (d), Eucalyptus latifolia (juv), Petalostigma quadriloculare, Melaleuca sp. (juv)	D10
77	-14.5151	133.3504	W	Eucalyptus tetrodonta and Eucalyptus miniata woodland with a grassy understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Eucalyptus tintinnans, Corymbia ferruginea, Erythrophleum chlorostachys, Corymbia latifolia	Terminalia ferdinandiana (d), Erythrophleum chlorostachys, Petalostigma pubescens, Melaleuca viridiflora, Corymbia ferruginea, Gardenia megasperma	unidentified grass (d)	D4
78	-14.5212	133.2746	CF	Eucalyptus camaldulensis closed forest with a grassy understorey	Eucalyptus camaldulensis (d)	Pandanus spiralis (d), Buchanania obovata (d), Bossiaea bossiaeoides (d), Owenia vernicosa (d), Alphitonia excelsa (d),	unidentified grass (d)	C7
79	-14.5236	133.2075	OF	Eucalyptus miniata, Corymbia bleeseri and Eucalyptus phoenicea open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Corymbia bleeseri (d), Eucalyptus phoenicea (d)	Buchanania obovata (d), Planchonia careya (d), Owenia vernicosa (d), Grevillea decurrens (d), Erythrophleum chlorostachys (d	Sarga plumosum (d), Bossiaea bossiaeoides, Petalostigma quadriloculare	H6
80	-14.5241	133.1812	W	Eucalyptus tectifica and Corymbia foelscheana woodland with grassy understorey	Eucalyptus tectifica (d), Corymbia foelscheana (d)	Hakea arborescens (d), Planchonia careya (d), Grevillea dimidiata (d), Eryhtrophleum chlorostachys (juv) (d), Brachychiton diversifolius (d),	unidentified grass (d)	D10
81	-14.5784	133.1109	OF	Eucalyptus miniata and Corymbia polycarpa open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Corymbia polycarpa (d)	Brachychiton diversifolius (d), Erythrophleum chlorostachys (d), Ficus aculeata, Acacia dimidiata, Acacia shirleyi, Terminalia grandiflora, Owenia vernicosa	Sarga plumosum (d), Heteropogon contortus, Acacia platyptera, Alphitonia excelsa, Planchonia careya	D14
82	-14.5784	133.1074	CF	Melaleuca argentea and Eucalyptus camaldulensis closed forest with mid-storey of Barringtonia acutangula and Mnesithea rottboellioides understorey	Melaleuca argentea (d), Eucalyptus camaldulensis (d), Lophostemon grandiflorus, Melaleuca leucadendra, Ficus coronulata, Terminalia platyphylla	Barringtonia acutangula (d), Acacia holosericea	Mnesithea rottboellioides, Passiflora foetida*	C7
83	not recorded	not recorded	W	Eucalyptus tectifica woodland with Heteropogon contortus understorey	Eucalyptus tectifica (d), Corymbia latifolia, Erythrophleum chlorostachys	Petalostigma pubescens (d), Melaleuca viridiflora (juv)	Heteropogon contortus (d)	D10
84	-14.5865	133.0238	OW	Mixed species open woodland with Aristida sp understorey	Terminalia platyptera (d), Eucalyptus tectifica (d), Corymbia terminalis (d), Corymbia confertiflora (d	Hakea arborescens (d), Terminalia platyphylla (d), Eucalyptus pruinosa, Melaleuca viridiflora	Aristida sp. (d)	D10
85	-14.5866	132.9975	CF	Corymbia ferruginea and Eucalyptus miniata closed forest with Themeda sp understorey	Corymbia ferruginea (d), Eucalyptus miniata (d), Erythrophleum chlorostachys, Corymbia latifolia	Erythrophleum chlorostachys (juv) (d), Croton arnhemicus (d), Gardenia sp. (d), Terminalia grandiflora, Buchanania obovata, Brachychiton paradoxus	Themeda sp. (d), Heteropogon triticeus, Heteropogon contortus, Atalaya variifolia	D14
86	-14.5902	132.9436	OW	Eucalyptus tectifica and Corymbia latifolia open woodland with a grassy understorey	Eucalyptus tectifica (d), Corymbia latifolia (d), Erythrophleum chlorostachys	Petalostigma pubescens (d), Gardenia megasperma, Acacia hammondii	unidentified grass (d), Wrightia pubescens	D10
87	-14.5946	132.8991	OF	Eucalyptus tectifica and Corymbia latifolia open woodland with Heteropogon contortus understorey	Eucalyptus tectifica (d), Corymbia latifolia (d), Erythrophleum chlorostachys	Petalostigma pubescens (d), Melaleuca dealbata (d), Terminalia ferdinandiana	Heteropogon contortus (d)	D10
88	-14.5950	132.8964	CF	Melaleuca leucadendra closed forest with a dense mid storey of Pandanus aquaticus and Grevillea pteridifolia and Eriachne sp understorey	Melaleuca leucadendra (d), Eucalyptus camaldulensis, Corymbia latifolia	Pandanus aquaticus (d), Grevillea pteridifolia (d)	Nymphoides sp., Eriachne sp.	C3
89	-14.5949	132.8918	W	Eucalyptus tectifica and Corymbia latifolia woodland with a grassy understorey	Eucalyptus tectifica (d), Corymbia latifolia (d)	Petalostigma pubescens (d), Melaleuca dealbata (d)	unidentified grass (d)	D10
90	-14.5956	132.8786	OF	Corymbia bleeseri open forest with Sarga plumosum understorey	Corymbia bleeseri, Eucalyptus miniata, Erythrophleum chlorostachys	Erythrophleum chlorostachys (juv) (d), Petalostigma pubescens, Grevillea decurrens, Grevillea refracta	Sarga plumosum	H6
91	-14.5959	132.8712	ST	Open grassland dominated by Aristida sp with scattered trees	Eucalyptus tectifica (d), Grevillea dealbata (d), Hakea arborescens (d), Corymbia confertiflora (d	Aristida sp. (d)		C18
92	-14.5982	132.8258	CF	Corymbia bleeseri and Eucalyptus miniata closed forest with Themeda sp understorey	Corymbia bleeseri (d), Eucalyptus miniata (d), Eucalyptus ferruginea, Brachychiton diversifolius, Erythrophleum chlorostachys, Callitris intratropica (dead)	Gardenia sp. (d), Croton arnhemicus, Owenia vernicosa, Petalostigma pubescens	Themeda sp. (d)	H6

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
93	-14.5999	132.7874	OW	Eucalyptus\Corymbia species open woodland with a mid storey of Terminalia platyphylla and Erythrophleum chlorostachys and Mnesithea rottboellioides understorey	Eucalyptus patellaris (d), Eucalyptus camaldulensis (d), Erythrophleum chlorostachys (d), Corymbia polycarpa (d), Terminalia platyphylla (d)	Acacia holosericea (d), Hakea arborescens, Gardenia sp., Pandanus aquaticus	Mnesithea rottboellioides (d)	C7
94	-14.6001	132.7843	W	Eucalyptus tectifica woodland with Sarga sp understorey	Eucalyptus tectifica (d)	Corymbia ferruginea (d), Gardenia aquaticus, Corymbia polycarpa, Brachychiton diversifolius, Owenia vernicosa, Petalostigma pubecens, Grevillea pteridifolia, Buchanania obovata, Acacia platyphylla, Croton arnhemicus, Terminalia canescens, Acacia oncinocarpa, Grevillea mimosoides	Sarga sp. (d)	D10
95	-14.6010	132.7416	CF	Eucalyptus\Corymbia species closed forest with Sarga sp understorey	Corymbia bleeseri (d), Erythrophleum chlorostachys (d), Corymbia ferruginea (d), Eucalyptus miniata (d), Terminalia grandiflora (d)	Croton arnhemicus (d), Atalaya varifolia, Brachychiton diversifolius, Acacia platycarpa, Ficus aculeata	Sarga sp. (d), Heteropogon triticeus	H6
96	-14.6025	132.7198	OW	Eucalyptus tectifica and Corymbia latifolia open woodland Sarga sp understorey	Corymbia latifolia (d), Eucalyptus tectifica	Corymbia latifolia (juv) (d), Eucalyptus tectifica (juv) (d)	Sarga sp. (d)	D10
97	-14.6017	132.7017	OF	Eucalyptus tetrodonta and Corymbia latifolia open forest with a grassy understorey	Eucalyptus tetrodonta (d), Corymbia latifolia (d), Corymbia umbonata	Erythrophleum chlorostachys (d), Petalostigma pubescens (d), Terminalia ferdinandiana	unidentified grass (d)	D14
98	-14.6035	132.6936	OF	Corymbia umbonata, Erythrophleum chlorostachys and Eucalyptus tetrodonta open forest with a grassy understorey	Corymbia umbonata (d), Erythrophleum chlorostachys (d), Eucalyptus tetrodonta (d)	Terminalia ferdinandiana (d), Buchanania obovata	unidentified grass (d), Grevillea decurrens (juv)	D14
99	-14.2370	129.4350	OF	Eucalyptus miniata and E. tetrodonta forest with Sarga sp understorey	Syzygium suborbiculare (d), Terminalia ferdinandiana (d), Tamarindus indica (d), Brachychiton diversifolius (d), Corymbia porrecta (d), Buchanania obovata (d), Erythrophleum chlorostachys (d), Bombax ceiba, Litsea glutinosa	Flagellaria indica (d), Grewia retusifolia (d), Exocarpos latifolius (d), Carissa lanceolata, Hyptis suaveolens*, Canarium australianum, Acacia auriculiformis, Brachychiton megaphyllus, Syzgium eucalyptoides ssp. bleeseri, Strychnos lucida, Gardenia megasperma, Sterculia quadrifida, Breynia cernua, Planchonia careya, Grevillea angulata, Petalostigma pubescens, Persoonia falcata, Livistona humilis, Cupaniopsis anacardioides, Ficus scobina	Smilax australis, Abrus precatorius, Crinum angustifolium, Protoasparagus racemosus, Ampelocissus acetosa, Trema aspera, Opilia amentacea, Grewia multiflora, Pachygone ovata, Cassytha filiformis	D4
100	-14.2430	129.4120	G	Sarga plumosum and Spinifex longifolius grassland	Sarga plumosum (d), Spinifex hirsutus (d), Ipomoea pes-caprae (d			C18
101	-14.2434	129.4129	W	Corymbia porrecta and Eucalyptus grandifolia woodland with grassy understorey	Corymbia porrecta (d), Corymbia grandifolia (d), Syzygium suborbiculare, Brachychition diversifolius	Terminalia ferdinandiana (d), Erythrophleum chlorostachys (d), Grevillea heliosperma (d), Brachychiton megasperma, Planchonia careya, Persoonia falcata, Ficus aculeata, Acacia auriculiformis, Livistona humilis, Pandanus spiralis, Trema aspera, Tinospora smilacina	unidentified grass (d), Hyptis suaveolens*	C10
102	-14.2419	129.4368	F	Eucalyptus miniata and Eucalyptus tetrodonta forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Terminalia ferdinandiana (d), Erythrophleum chlorostachys (d	Brachychiton diversifolius (d), Livistona humilis (d), Cycas maconochiei (d)	Sarga plumosum (d), Trifolium sp., juv Eucalyptus , Erythrophleum chlorostachys, Brachychiton megaphyllus	D4
103	-14.2433	129.4224	F	Eucalyptus miniata and Eucalyptus tetrodonta forest Sarga sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Terminalia ferdinandiana (d), Erythrophleum chlorostachys (d), Corymbia porrecta (d), Brachychiton diversifolius (d)	Cycas maconochiei (d), Planchonia careya (d), Brachychiton megaphyllus (d), Buchanania obovata, Grevillea angulata	Juv Erythrophleum chlorostachys (d), juv Terminalia ferdinandiana (d) Sarga plumosum (d), Heteropogon contortus (d), Grewia retusifolia, Persoonia falcata, Ampelocissus acetosa	D4
104	-14.2456	129.4126	CF	Closed monsoon vine forest dominated by Syzygium suborbiculare, Terminalia ferdinandiana, Tamarindus indica	Syzygium suborbiculare (d), Terminalia ferdinandiana (d), Tamarindus indica (d), Brachychiton diversifolius (d), Corymbia porrecta (d), Buchanania obovata (d), Erythrophleum chlorostachys (d), Bombax ceiba, Litsea glutinosa	Flagellaria indica (d), Grewia retusifolia (d), Exocarpos latifolius (d), Carissa lanceolata, Hyptis suaveolens*, Canarium australianum, Acacia auriculiformis, Brachychiton megaphyllus, Syzygium eucalyptoides ssp. bleeseri, Strychnos lucida, Gardenia megasperma, Sterculia quadrifida, Breynia cernua, Planchonia careya, Grevillea angulata, Petalostigma pubescens, Persoonia falcata, Livistona humilis, Cupaniopsis anacardioides, Ficus scobina	Smilax australis, Abrus precatorius, Crinum angustifolium, Protoasparagus racemosus, Ampelocissus acetosa, Trema tomentosa, Opilia amentacea, Grewia breviflora, Pachygone ovata, Cassytha filiformis	none
105	-14.2451	129.4480	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia polycarpa (d), Corymbia porrecta (d), Erythrophleum chlorostachys (d)	Acacia auriculiformis, Acacia dimidata, Brachychiton megaphyllus, Brachychiton diversifolia, Buchanania obovata, Croton arnhemicus, Cycas maconochiei, Denhamia obscura, Distichostemon hispidulus, Helicteres sp., Grevillea goodii ssp pluricaulis, Livistona humilis, Persoonia falcata, Planchonia careya, Petalostigma quadriloculare, Terminalia ferdinandiana, Tinospora smilacina	Sarga plumosum (d), Crinum angustifolium, Ampelocissus acetosa, Plectranthus scutellarioides, Eriosema chinense, Haemodorum coccineum, Heteropogon sp	D4
106	-14.2706	129.4810	OF	Eucalyptus miniata and E. tetrodonta forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia porrecta (d)	Livistona humilis (d), Cycas maconochiei (d), Persoonia falcata (d), Acaci auriculiformis (d), Buchanania obovata	Sarga plumosum (d), Brachychiton megaphyllus (d), Polymeria ambigua	D4
107	-14.3788	129.8994	OW	Corymbia polycarpa and Grevillea pteridifolia low open woodland with Aristida sp and Sarga plumosum understorey	Corymbia polycarpa (d), Grevillea pteridifolia (d), Syzygium eucalyptoides (d), Pandanus spiralis (d), Barringtonia acutangula, Corymbia confertiflora	Melaleuca cajuputi (d), Persoonia falcata (d), Canthium sp, Melaleuca dealbata,Terminalia ferdinandiana, Planchonia careya, Persoonia falcata, Gardenia megasperma, Calytrix exstipulata, Petalostigma pubescens, Acacia lamprocarpa	Aristida sp (d), Sarga plumosum (d)	none
108	-14.3757	129.8788	F	Lophostemon lactifluus, Eucalyptus miniata and Grevillea pteridifolia forest	Lophostemon lactifluus (d), Eucalyptus miniata (d), Grevillea pteridifolifa (d), Banksia dentata (d), Syzygium eucalyptoides (d), Buchanania obovata (d)	Pandanus spiralis (d), Planchonia careya (d), Livistona humilis (d), Acacia dimidiata (d), Cycas maconochiei (d), Erythrophleum chlorostachys (d), Calytrix brownii, Melaleuca cajuputi, Gardenia megasperma	Drosera sp. (d)	C10
109	-14.3705	129.8517	OW	Lophostemon lactifluus, Melaleuca nervosa, Pandanus spiralis low open woodland with Aristida sp understorey	Lophostemon lactifluus (d), Melaluca viridiflora (d)	Pandanus spiralis (d), Grevillea pteridifolia (d), Banksia dentata, Grevillea heliosperma	Aristida sp (d), Gomphrena canescens (d)	C13
110	-14.3804	129.9132	OF	Open forest dominated by Lophostemon lactifluus, Barringtonia acutangula and Acacia auriculiformis with a dense mid-storey of Pandanus spiralis, Livistona humilis and Owenia vernicosa	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia polycarpa (d), Corymbia confertiflora (d), Pandanus spiralis; creek species - Lophostemon lactifluus (d), Barringtonia acutangula (d), Acacia auriculiformis (d), Melaleuca viridiflora (d)	Pandanus spiralis (d), Livistona humilis (d), Owenia vernicosa (d), Buchanania obovata, Planchonia careya, Gardenia megasperma, Persoonia falcata, Petalostigma pubescens	C7
111	-14.3603	129.9537	OW	Acacia auriculiformis and Erythrophleum chlorostachys low open woodland	Acacia auriculiformis (d), Erythrophleum chlorostachys (d), Gardenia megasperma (d), Melaleuca dealbata (d), Pandanus spiralis (d), Corymbia polycarpa, Corimbia confertiflora, Livistona benthamii in floodway 400m east of site	Persoonia falcata, Planchonia careya	Gomphrena sp. (d)	E1
112	-14.3287	129.9952	OW	Acacia auriculiformis and Pandanus spiralis low open woodland with Melaleuca dealbata and Aristida sp understorey	Acacia auriculiformis (d), Pandanus spiralis (d), Melaleuca dealbata (d), Grevillea pteridifolia (d), Melaleuca cajuputi, Corymbia polycarp		Melaleuca dealbata (d), Aristida sp.	E1
113	-14.3069	130.0250	OF	Corymbia polycarpa and Eucalyptus tetrodonta open forest with Sarga plumosum understorey	Corymbia polycarpa (d), Eucalyptus tetrodonta (d), Erythrophleum chlorostachys (d)	Persoonia falcata (d), Livistona humilis (d), Owenia vernicosa (d), Gardenia megasperma (d), Acacia aurculiformis, Melaluca cajuput	Sarga plumosum (d), juv Buchanania obovata, Boronia languinosa	D14

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
114	-14.3499	129.9681	OF	Corymbia polycarpa and Eucalyptus miniata tall open forest	Eucalyptus miniata (d), Corymbia polycarpa (d), Erythrophleum chlorostachys (d), Corymbia confertiflora (d), Buchanania obovata (d), Lophostemon lactifluus	Planchonia careya (d), Livistona humilis (d), Syzygium eucalyptoides (d Acacia auriculiformis (d), Gardenia megasperma		D14
115	-14.3439	129.9766	CF	Barringtonia acutangula and Melaleuca viridiflora closed forest with a dense mid-storey of Pandanus aquaticus and Heteropogon contortus and Aristida sp understorey	Barringtonia acutangula (d), Melaleuca viridiflora (d), Corymbia polycarpa (d), Syzygium forte ssp. potamophilum (d), Corymbia confertiflora, Melaluc cajuputi, Vavaea australiana, Myristica insipida	Pandanus aquaticus (d),	Heteropogon contortus (d), Aristida sp. (d), Flagellaria indica	C3
116	-14.3615	129.8135	OW	Lophostemon lactifluus and Melaleuca viridflora open woodland with Paspalum sp and Sarga plumosum understorey	Lophostemon lactifluus (d), Melaleuca viridiflora (d), Corymbia polycarpa, Corymbia cofertifolia, Erythrophleum chlorostachys	Pandanus spiralis (d), Acacia auriculiformis (d), Banksia dentata, Buchanania obovata, Grevilea pteridifolia, Terminalia sp., Livistona humilis, Petalostigma pubescens, Planchonia careya, Cycas maconochiei, Melaluca cajuputi	sedges (d), Paspalum sp. (d), Sarga plumosum (d), Eriachne sp.	C13
117	-14.3555	129.7812	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum Pachynema sp and Boronia sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia porrecta, Erythrophleum chlorostachys	Cycas maconochiei (d), Petalostigma pubescens (d), Planchonia careya (d) Brachychiton megaphyllus (d), Buchanania obovata (d), Acacia lamprocarpa (d), Sterculia quadrifida (d), Ampelocissus sp	Pachynema sp. (d), Sarga plumosum (d), Boronia sp. (d), Erythrophleum chlorostachys, Grevillea goodii	D4
118	-14.3471	129.7402	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia porrecta (d), Brachychiton diversifolius	Cycas maconochiei (d), Livistona humilis, Pandanus spiralis, Ficus scobina, Sterculia quadrifida, Petelostigma pubescens, Brachychition megaphyllus, Buchanania obovata, Planchonia careya, Acacia lamprocarpa, Nauclea orientalis	Sarga plumosum (d), Juv Eucs and Erythrophleum chlorostachys (d), Grevillea goodii (d), Ampelocissus acetosa (d), Grewia breviflora (d), Indigofera sp., Boronia sp. Pachynema sp.	D4
119	-14.3442	129.7214	OF	Eucalyptus tetrodonta and Corymbia confertiflora open forest with Brachychiton megaphyllus understorey	Eucalyptus tetrodonta (d), Corymbia confertiflora (d), Corymbia polycarpa (d), Erythrophleum chlorostachys (d), Melaleuca viridflora (on creek) (d), Syzygium nervosum (d), Lophostemon lactifluus (d) Melaleuca sp., Barringtonia acutangula	Petalostigma pubescens (d), Terminalia ferdinandiana (d), Pandanus spiralis (d), Cycas maconochiei (d), Corymbia polycarpa (d), Banksia dentata (d), Planchonia careya (d), Barringtonia acutangula, Melaluca cajuputi, Persoonia falcata, Banksia denata, Grevillea pteridifolia, Buchanania arborescens	Brachychiton megaphyllus (d), Grewia breviflora, Protosparagus racemosa, Patersonia macrantha, Boronia sp.	D14
120	-14.3383	129.7009	OF	Eucalyptus miniata, Eucalyptus tetrodonta and Erythrophleum chlorostachys open forest with Sarga plumosum understorey and Cycas maconochiei	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Erythrophleum chlorostachys (d)	Livistona humilis (d), Cycas maconochiei (d), Erythrophleum chlorostachys (d), Brachychiton megaphyllus (d), Ampelocissus sp. (d), Planchonia careya, petalostigma pubescens, Persoonia falcata, Buchanania obovata, Hibbertia sp.	Sarga plumosum (d), Cycas maconochiei (d)	D4
121	-14.2938	129.5170	OF	Eucalyptus miniata, Eucalyptus tetrodonta and Erythrophleum chlorostachys open forest with Sarga plumosum and Grewia breviflora understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia polycarpa (d), Erythrophleum chlorostachys (d)	Livistona humilis (d), Terminalia ferdinandiana (d), Cycas maconochiei, Persoonia falcata, Acacia lamprocarpa, Petalostigma pubescens, Acacia dealbata, Pandanus spiralis	Sarga plumosum (d), Grewia breviflora (d), Lophostenom lactifluus seedlings., Ampelocissus sp. , Brachychiton megaphyllus, Pandanus spiralis	D4
122	-14.3069	129.5460	W	Eucalyptus miniata and E. tetrodonta woodland with Cymbopogon sp, Boronia sp, Cycas maconochiei and Aristida sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Callitris intratropica, Corymbia bleeseri, Corymbia porrecta, Erythrophleum chlorostachys, Eucalyptus tertifica	Grevillea heliosperma (d), Livistona humilis (d), Gardenia megasperma (d), Buchanania obovata (d), Planchonia careya, Persoonia falcata, Acacia dealbata, Buchanania obovata, Acacia lamprocarpa	Cymbopogon sp (d), Boronia sp. (d), Cycas maconochiei (d), Aristida sp. (d)	D4
123	-14.3143	129.5809	OW	Eucalyptus tetrodonta and E. miniata open woodland with Aristida sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia blesseri (d), Corymbia foelscheana (d), Corymbia confertiflora (d	Livistona humilis (d), Melaluca cajuputi	Aristida sp (d)	D4
124	-14.3226	129.6190	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia bleeseri (d), Corymbia foelscheana (d), Erythrophleum chlorostachys (d), Corymbia polycarpa (d), Corymbia papillosa	Livistona humilis (d), Cycas maconochiei (d), Buchanania obovata, Gardenia sp., Acacia sp.	Sarga plumosum (d), juv Eucs, Heteropogon sp.	D4
125	-14.4902	131.3550	OW	Eucalyptus bella, Terminalia grandiflora and Terminalia platyptera open woodland with Heteropogon contortus and Sarga timorense understorey	Eucalyptus bella (d), Terminalia grandiflora (d), Terminalia platyptera - in creek (d), Nauclea orientalis (d), Melaleuca leucadendra (d), Cymbidium canaliculatum, Amyema sp, Canarium australianam	Pandanus aquaticus (d), Melaleuca leucadendra (d), Terminalia ferdinandiana (d), Ficus racemosa (d), Ficus coronulata (d), Barringtonia acutangula (d), Planchonia careya, Croton arnhemicus	Heteropogon contortus (d), Sarga timorense (d), Hyptis suaveolens*, Grewia retusfolia , Neptunia sp.	D10
126	-14.4867	131.3201	OF	Lophostemon lactifluus, Corymbia bella and Corymbia porrecta open forest with Sarga sp understorey	Lophostemon lactifluus (d), Corymbia bella (d), Corymbia porrecta, Eucalyptus miniata, Eucalytptus tetrodonta, Corymbia polycarpa, Corymbia polysciada, Terminalia grandiflora, Melaleuca argentea, Eucalyptus tertifica	Pandanus spiralis (d), Meleaeuca nervosa (d), Buchanania obovata (d), Planchonia careya, Petalostigma pubescens, Acacia bidwillii, Excoecaria parvifolium, Atidesma parvifolia, Dodonaea platyptera	Sarga sp. (d), Passiflora foetida*	C10
127	-14.4847	131.3070	OW	Corymbia latifolia, Eucalyptus tectifica and Corymbia porrecta open woodland with Themeda triandra understorey	Corymbia latifolia (d), Eucalyptus tectifica (d), Corymbia porrecta (d), Eucalyptus tetrodonta, Corymbia confertiflora, Vitex glabrat	Planchonia careya (d),	Themeda triandra (d), Sarga sp.	D10
128	-14.4782	131.2711	OW	Corymbia latifolia, Eucalyptus miniata and Corymbia porrecta open woodland	Corymbia latifolia (d), Eucalyptus miniata (d), Corymbia porrecta (d)	Buchanania obovata (d), Grewia retusifolia (d)		D10
129	-14.4851	131.2282	CF	Riparian closed forest dominated by Eucalyptus alba and Corymbia bella, Nauclea orientalis and Ficus coronulata with Heteropogon contortus understorey	Eucalyptus alba, Corymbia bella (d), Nauclea orientalis (d), Ficus coronulata (d), Terminalia grandiflora (d), Corymbia latifolia (d), Corymbia polycarpa (d), Terminalia pterocarya, Erythrophleum chlorostachys, Eucalyptus tectifica	Hyptis suaveolens* (d), Pandanus spiralis	Heteropogon contortus (d)	C7
130	-14.4949	131.1301	F	Eucalyptus miniata, Eucalyptus tetrodonta and Erythrophleum chlorostachys forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Erythrophleum chlorostachys (d), Eucalyptus phoenicea, Corymbia blesseri, Eucalyptus jensenii	Livistona humilis (d), Buchanania obovata (d), Brachychiton megaphyllus (d), Acacia sp. (d), Persoonia falcata	Boronia sp. (d), Sarga plumosum (d)	D4
131	-14.4893	131.2185	OF	Eucalyptus miniata and Corymbia blesseri open forest with Aristida sp and Sarga plumosum understorey	Eucalyptus miniata (d), Corymbia blesseri, Cymbidium canaliculatum, Corymbia latifolia (d), Corymbia polysciada (d)	Buchanania obovata (d), Owenia vernicosa (d), Petalostigma pubescens (d), Acacia lamprocarpa (d), Planchonia careya (d), Livistona hmilis (d), Acacia dealbata (d), Persoonia falcata (d), Terminalia ferdinandiana, Ficus platypoda	Aristida sp (d), Sarga plumosum (d)	H6
132	-14.4871	131.1802	OF	Eucalyptus miniata, Eucalyptus tetrodonta and Corymbia latifolia open forest with Themeda triandra understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia latifolia (d), Corymbia blesseri (d), Eucalyptus tectifica	Buchanania obovata (d), Brachychiton megaphyllus (d), Persoonia falcata (d), Livistona humilis (d)	Themeda triandra (d), Sarga sp.	D14
133	-14.4805	131.3948	OW	Eucalyptus tectifica and Corymbia latifolia open woodland with Themeda triandra and Heteropogon contortus understorey	Eucalyptus tectifica (d), Corymbia latifolia (d), Erythrophleum chlorostachys (d), Corymbia confertiflora	Tinospora smilacina (d), Planchonia careya (d), Ficus scobina (d), Hakea arborescens (d), Bauhinia cunninghamii (d),	Themeda triandra (d), Hyptis suaveolens* (d), heteropogon contortus (d)	D10
134	-14.5078	131.4382	OW	Corymbia latifolia and Eucalyptus tectifica low open woodland with Themeda triandra, Heteropogon contortus and Sarga sp understorey	Corymbia latifolia (d), Eucalyptus tectifica (d), Erythrophleum chlorostachys (d), Corymbia confertiflora (d), Eucalyptus tetrodonta	Acacia dealbata (d), Ampelocissus sp., Grewia retusifolia, Persoonia falcata, Excoecaria parvifolia, Grevillea angulata, Acacia plectocarpa, Owenia vernicosa	Themeda triandra (d), Sarga sp. (d), Heteropogon contortus (d)	D10
135	-14.5090	131.4831	OW	Eucalyptus tectifica and Corymbia latifolia open woodland with Themeda triandra and Heteropogon contortus understorey	Eucalyptus tectifica (d), Corymbia confertiflora (d), Corymbia latifolia (d), Corymbia bleeseri (d)	Planchonia careya (d), Persoonia falcata (d), Erythrina variegata var. orientalis (d), Gardenia megasperma, Buchanania obovata	Themeda triandra (d), Sarga sp. (d)	D10
136	-14.5065	131.5323	OW	Eucalyptus tetrodonta and Corymbia latifolia open woodland with Pterocaulon serrulatum understorey	Eucalyptus tetrodonta (d), Corymbia latifolia (d), Eucalyptus tintinnans (d), Eucalyptus miniata (d), Eucalyptus tertifica, Terminalia grandiflora	Ampelocissus sp. (d), Persoonia falcata (d), Terminalia ferdinandia, Buchanania obovata, Brachychiton megaphyllus, Cochlospermum fraseri, Acaia dealbata, Brachychiton diversifolia	Pterocaulon serrulatum	D14

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
137	-14.5064	131.5809	OW	Eucalyptus\Corymbia open woodland with Sarga plumosum and Themeda triandra understorey	Corymbia latifolia (d), Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia ferruginea (d), Corymbia confertiflora, Terminalia grandiflora	Grevillea decurrens (d), Petalostigma pubescens (d), Gardenia megasperma (d), Owenia vernicosa (d), Acacia dealbata, Buchanania obovata, Persoonia falcata, Planchonia carey	Sarga plumosum (d), Themeda triandra (d)	D14
138	-14.5058	131.6114	OW	Eucalyptus tectifica and Corymbia latifolia low open woodland with Themeda triandra understorey	Eucalyptus tectifica (d), Corymbia latifolia (d), Erythrophleum chlorostachys (d)	Gardenia megasperma (d), Persoonia falcata, Brachychiton megaphyllus, Cochlospermum fraseri, Grevillea dimidiata	Themeda triandra (d)	D10
139	-14.5050	131.6177	OW	Hakea arborescens, Bauhinia cunninghamii and Corymbia polysciada low open woodland with Grewia retusifolia understorey	Hakea arborescens (d), Bauhinia cunninghamii (d), Corymbia polysciada (d)	Persoonia falcata, Brachychiton megaphyllus, Acacia bidwillii, Croton arnhemicus	Grewia retusifolia (d), Brachychiton diversifolius seedlings	C10
140	-14.5058	131.6673	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Triodia sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Brachychiton diversifolius (d)	Petalostigma pubescens (d), Acacia dealbata (d), Buchanania obovata (d), Owenia vericosa, Terminalia arostrata	Sarga plumosum (d), Triodia sp. (d), Erythrophleum chlorostachys juv. (d), Hibbertia sp.	D4
141	-14.5066	131.6721	OF	Terminalia sp and Eucalyptus tectifica open forest with Xanthium strumarium* understorey	Terminalia sp (d), Eucalyptus tectifica (d)	Casuarina cunninghamiana (d), Petalostigma pubescens (d), Atalaya hemiglauca (d), Ficus scobina, Hibiscus sp.	Xanthium strumarium* (d)	D10
142	-14.5057	131.6751	CF	Closed forest dominated by Casuarina cunninghamiana, Nauclea orientalis, Melaleuca leucadendra, Barringtonia acutangula, Eucalyptus camaldulensis, Melaleuca viridiflora, Corymbia bella and Erythrophleum chlorostachys with a dense mid-storey of Cycas canalis, Gardenia sp and Livistona humilis and Sarga sp understorey	Casuarina cunninghamiana (d), Nauclea orientalis (d), Melaleuca leucadendra (d), Barringtonia acutangula (d), Eucalyptus camaldulensis (d), Melaleuca viridiflora (d), Corymbia bella (d), Erythrophleum chlorostachys (d)	Hibiscus sp. (d), Pandanus aquaticus (d), Flagellaria indica (d), Bauhinia cunninghamii (d), Atalaya hemiglauca (d), Acacia sp.	Sarga sp. (d)	C7
143	-14.5076	131.0855	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Eragrostis sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Eucalyptus jensenii, Corymbia latifolia (d)	Cycas canalis (d), Gardenia sp. (d), Livistona humilis (d), Grevillea striata, Brachychiton megaphyllus	Sarga plumosum (d), Brachychiton megaphyllus (d), Eragrostis sp. (d),	D4
144	-14.5191	131.0404	W	Corymbia bleeseri, Eucalyptus miniata, and Eucalyptus tetrodonta woodland with Triodia sp understorey	Corymbia bleeseri (d), Eucalyptus miniata (d), Eucalyptus tetrodonta (d)	Brachychiton megaphyllus (d), Acacia mimula (d), Haemodorum sp.	Plectrachne sp. (d), Boronia sp.	H6
145	-14.5306	131.0013	OF	Eucalyptus miniata, E. tetrodonta and Corymbia bleeseri open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia bleeseri (d), Callitris intratropica	Livistona humilis (d), Petalostigma pubescens (d), Acacia mimula	Sarga plumosum (d)	H6
146	-14.5909	130.9679	F	Eucalyptus miniata, E. tetrodonta Corymbia bleeseri and Corymbia latifolia open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia blesseri (d), Corymbia latifolia (d)	Buchanania obovata (d), Acacia mimula (d), Persoonia falcata (d), Livistona humilis (d), Gardenia megasperma, Petalostigma pubescens, Grevillea pteridifolia, Acacia lamprocarpa, Callitris intratropica	Boronia sp (d), Sarga plumosum (d), Cycas canalis (d)	H6
147	-14.5374	130.9477	OF	Eucalyptus miniata and Eucalyptus tetrodonta forest with Eriachne sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Callitris intratropica (d), Corymbia bleeseri (d), Acacia mimula (d)	Livistona humilis (d), Brachychiton megaphyllus (d),	Boronia sp (d), Eriachne sp (d), Distichostemon hispidulus (d),	D4
148	-14.5061	131.7117	OW	Corymbia bella and Eucalyptus tectifica open woodland with mixed grass species understorey	Corymbia bella (d), Eucalyptus tectifica (d), Corymbia polycarpa (d), Corymbia bleeseri (d), Terminalia grandiflora, Canarium australianum, Corymbia latifolia	Grewia retusifolia (d), Ampelocissus acetosa (d), Planchonia careya (d), Pandanus spiralis, Ficus scobina, Brachychiton megaphyllus, Acacia holosericea	Heteropogon contortus (d), Eulalia aurea (d), Themeda triandra (d), Imperata cylindrica (d), Sarga plumosum (d), Platyzoma microphyllum (d), Crinum angustifolium, Cayratia trifolia	D10
149	-14.5058	131.6781	W	Petalostigma pubescens and Acacia sp low woodland with Sarga plumosum understorey	Petalostigma pubescens (d), Acacia sp. (d), Terminalia grandiflora (d), Ficus scobina (d), Brachychiton diversifolius, Buchanania obovata, Owenia vernicosa, Eucalyptus miniata (on rises)	Hyptis suaveolens* (d), Planchonia careya (d), Calotropis procera*	Sarga plumosum (d)	E1
150	-14.5067	131.6763	CF	Closed forest dominated by Nauclea orientalis, Casuarina cunninghamiana, Barringtonia acutangula with Brachyachne convergens understorey	Nauclea orientalis (d), Casuarina cunninghamiana (d), Barringtonia acutangula (d), Melaleuca leucadendra (d), Pandanus aquaticus (d), Acacia auriculiformis; bank top with Corymbia bella (d), Erythrophleum chlorostachys (d), Pandanus spiralis (d)	Ficus racemosa (d), Flagellaria indica (d), Atalaya hemiglauca (d), Hibiscus sp.	Brachyachne convergens	C7
151	-14.5055	131.7555	W	Eucalyptus miniata and E. tetrodonta woodland with Triodia sp and Sarga sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia bleeseri (d)	Gardenia sp (d), Bossiaea bossiaeoides (d), Petalostigma pubescens (d), Buchanania obovata (d)	Plectrachne sp. (d), Sarga sp (d), Haemodorum coccineum (d)	D4
152	-14.5057	131.7891	OW	Open woodland dominated by Eucalyptus miniata and E. tetrodonta with Triodia sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia bleeseri (d), dead Callitris intratropica (d)	Petalostigma pubescens (d), Acacia dealbata, Grevillea pteridifolia, Gardenia sp, Melaleuca nervosa	Plectrachne sp. (d), Haemodorum coccineum (d), Aristida latifolia	C3
153	-14.5150	131.8497	W	Eucalyptus miniata and Corymbia bleeseri woodland with Triodia sp understorey	Eucalyptus miniata (d), Corymbia bleeseri (d), dead Callitris intratropica (d)	Gardenia sp (d), Acacia sp. (d)	Plectrachne sp. (d), Haemodorum coccineum (d)	H6
154	-14.5372	131.8918	OF	Eucalyptus miniata, Corymbia bleeseri and Eucalyptus tetrodonta open forest with Triodia sp and Aristida sp understorey	Eucalyptus miniata (d), Corymbia bleeseri (d), Eucalyptus tetrodonta (d)	Petalostigma pubescens (d), Acacia dealbata (d), Bossiaea bossiaeoides (d), Grevillea pteridifolia (d), Calytrix exstipulata (d), Terminalia grandiflora	Plectrachne sp. (d), Aristida latifolia (d),	H6
155	-14.5835	132.0506	CF	Closed forest dominated by Terminalia grandiflora, Melaleuca leucadendra, and Eucalyptus camaldulensis with Flagellaria indica and Crinum sp. understorey	Terminalia grandiflora (d), Melaleuca leucadendra (d), Eucalyptus camaldulensis (d)	Barringtonia acutangula (d), Pandanus aquaticus (d), Ficus scobina (d), Xanthium strumarium, Hyptis suaveolens*, Passiflora foetida	Flagellaria indica (d), Crinum sp. (d)	C3
156	-14.5430	131.9197	W	Corymbia bleeseri and Eucalyptus tetrodonta woodland with Sarga plumosum and Aristida sp understorey	Corymbia bleeseri (d), Eucalyptus tetrodonta (d), Bauhinia cunninghamii	Petalostigma quadriloculare (d), Planchonia careya (d), Persoonia falcata	Sarga plumosum (d), Aristida sp. (d), Astrebla sp. (d), Dentella dioeca (d)	H6
157	-14.5617	131.9703	OF	Eucalyptus miniata and Terminalia grandiflora open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Terminalia grandiflora (d), Erythrophleum chlorostachys (d)	Grewia retusifolia (d), Planchonia careya (d), Brachychtion megaphyllus (d), Hyptis suaveolens* (d), Owenia vernicosa, Protasparagus racemosus, Hibiscus sp., Buchanania obovata, Syzygium suborbiculare, Grewia breviflora	Sarga plumosum (d), Dioscorea transversa (d), Ampelocissus sp.	H6
158	-14.5749	132.0176	OF	Eucalyptus miniata and E. tetrodonta open forest with Heteropogon contortus, Themeda triandra and Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Erythrophleum chlorostachys (d), Corymbia bella (d), Eucalyptus tectifica (d), Terminalia grandiflora (d), Corymbia bleeseri (d), Eucalyptus polysciada, Eucalyptus camaldulensis	Ampelocissus sp. (d), Bauhinia cunninghamii, Tinospora smilacina, Passiflora foetida*, Acacia auriculiformis, Pandanus aquaticus, Ficus coronulata	Heteropogon contortus (d), Themeda triandra (d), Sarga plumosum (d)	D4
159	-14.5858	132.1190	OW	Erythrophleum chlorostachys and Terminalia grandiflora open woodland with Sarga plumosum understorey	Erythrophleum chlorostachys (d), Terminalia grandiflora (d), Owenia vernicosa (d), Corymbia latifolia (d), Corymbia confertifolia (d), Eucalyptus tectifica (d), Buchanania obovata, Brachychiton diversifolius	Hibbertia dealbata (d), Pandanus spiralis, Brachychiton megaphyllus, Ampelocissus sp., Grewia retusifolia, Planchonia careya, Cochlospermum fraseri	Sarga plumosum (d), Dioscorea transversa (d)	D10
160	-14.5864	132.1585	OW	Corymbia latifolia and Eucalyptus tectifica open woodland with Themeda triandra understorey	Corymbia latifolia (d), Eucalyptus tectifica (d), Corymbia confertiflora	Brachychiton megaphyllus (d), Hakea arborescens (d), Acacia ditricha (d), Bauhinia cunninghamii (d), Grewia orientalis (d), Erythrophleum chlorostachys, Cochlospermum fraseri, Persoonia falcata, Dolichandrone filiformis, Gardenia megasperma	Ampelocissus sp. (d), Themeda triandra (d)	D10
161	-14.5863	132.1992	OW	Eucalyptus tectifica and Corymbia bleeseri low open woodland with grassy understorey	Corymbia bleeseri (d), Eucalyptus tectifica (d), Corymbia confertiflora (d), Gyrocarpus americanus	Brachychiton megaphyllus (d), Cochlospermum fraseri (d), Hakea arborescens (d), Owenia vernicosa (d), Dolichandrone filiformi	unidentifiable grass sp.	D10

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
162	-14.5876	132.2383	W	Eucalyptus tectifica and Corymbia latifolia woodland with Heteropogon contortus understorey	Eucalyptus tectifica (d), Corymbia latifolia (d), Corymbia polysciada (d), Corymbia confertiflora	Hakea arborescens (d), Hibiscus sp sturtii aff. (d), Grewia retusifolia (d), Cochlospermum fraseri (d), Bauhinia cunninghamii (d), Gyrocarpus americanum, Acacia ditricha, Hyptis suaveolens*, Owenia vernicosa, Grevillea dimidata, Buchanania obovata	Heteropogon contortus (d)	D10
163	-14.5880	132.2540	W	Eucalyptus tetrodonta and Corymbia latifolia woodland with Aristida latifolia understorey	Eucalyptus tetrodonta (d), Corymbia latifolia (d)	Denhamia obscura (d), Bauhinia cunninghamii (d), Brachychiton megaphyllus (d), Petalostigma quadriloculare (d), Grewia retusifolia (d), Carissa sp. (d)	Aristida latifolia (d)	D14
164	-14.5875	132.2683	W	Erythrophleum chlorostachys and Eucalyptus tetrodonta woodland with Sarga plumosum and Triodia sp understorey	Erythrophleum chlorostachys (d), Eucalyptus tetrodonta (d), Corymbia ferruginea (d), Terminalia grandiflora (d), Corymbia latifolia (d)	Malvastrum americanum (d), Grewia australis (d)	Sarga plumosum (d), Plectrachne sp. (d)	D14
165	-14.5963	132.3098	OW	Eucalyptus tectifica and Corymbia latifolia open woodland with Themeda triandra understorey	Eucalyptus tectifica (d), Corymbia latifolia (d), Erythrophleum chlorostachys (d), Corymbia foelscheana	Dolichandrone filiformis (d), Brachychiton megaphyllus (d)	Themeda triandra (d), Malvastrum americanum	D10
166	-14.6099	132.3598	OW	Corymbia latifolia and Eucalyptus tectifica open woodland with Themeda triandra understorey	Corymbia latifolia (d), Eucalyptus tectifica (d), Eucalyptus tetrodonta (d), Erythrophleum chlorostachys (d), Corymbia foelschean	Gardenia megasperma (d)	Themeda triandra (d)	D10
167	-14.6195	132.3988	W	Corymbia latifolia and Eucalyptus tectifica woodland with Themeda triandra and Heteropogon contortus understorey	Corymbia latifolia (d), Eucalyptus tectifica (d), Eucalyptus tetrodonta (d)	Gardenia megasperma	Themeda triandra (d), Heteropogon contortus (d)	D10
168	-14.6212	132.4365	OW	Corymbia latifolia and Eucalyptus tintinnans open woodland with Astrebla sp understorey	Corymbia latifolia (d), Eucalyptus tintinnans (d), Erythrophleum chlorostachys	Gardenia megasperma (d), Petalostigma pubescens (d), Grevillea decurrens (d), Terminalia ferdinandiana (d), Petalostigma quadriloculare (d), Dolichandrone filiformis (d), Melaleuca nervosa	Astrebla sp. (d)	D10
169	-14.6215	132.4833	W	Corymbia bleeseri and Erythrophleum chlorostachys woodland with Sarga sp understorey	Corymbia bleeseri (d), Erythrophleum chlorostachys (d), Eucalyptus tetrodonta (d), Eucalyptus tintinnans (d), Callitris intratropica	Gardenia sp (d), Calytrix exstipulata (d)	Sarga sp. (d)	D10
170	-14.6158	132.5327	OF	Eucalyptus tetrodonta and Corymbia bleeseri open forest with Sarga plumosum and Triodia sp understorey	Eucalyptus tetrodonta (d), Corymbia bleeseri (d), Corymbia porrecta (d)	Brachychiton megaphyllus (d), Grevillea striata (d), Acacia platycarpa (d), Ampelocissus acetosa, Pouteria sericea, Grevillea striata, Grewia orientalis, Dolichandrone filiformis, Gardenia megasperma, Buchanania obovata, Grewia retusifolia	Sarga plumosum (d), Triodia sp . (d)	H6
171	-14.6110	132.5752	OF	Eucalyptus tetrodonta and Erythrophleum chlorostachys forest with Sarga plumosum and Heteropogon contortus understorey	Eucalyptus tetrodonta (d), Erythrophleum chlorostachys (d), Corymbia bleeseri	Acacia platycarpa (d), Acacia dimidiata (d), Planchonia careya, Grewia orentalis, Brachychiton megaphyllus	Sarga plumosum (d), Heteropogon contortus (d)	D4
172	-14.6085	132.6065	OF	Eucalyptus camaldulensis and Melaleuca leucadendra open forest with Brachyachne convergens and Lomandra sp understorey	Eucalyptus camaldulensis (d), Melaleuca leucadendra (d), Melaleuca viridiflora (d), Erythrophleum chlorostachys	Acacia holosericea (d), Casuarina cunninghamiana (d), Pandanus aquaticus (d), Ficus coronulata (d), Hyptis suaveolens (d), Grevillea pteridifolia, Brachychiton diversifolius, Buchanania obovata, Carissa sp., Owenia vernicosa, Grewia retusifolia, Pandanus spiralis	native couch (d), Lomandra sp. (d), Imperata cylindrica, Themeda triandra, Crinum sp.	C7
173	-14.6085	132.6085	OF	Corymbia bleeseri and Eucalyptus tetrodonta forest with Heteropogon contortus and Eragrostis sp understorey	Corymbia bleeseri (d), Eucalyptus tetrodonta (d), Corymbia confertiflora (d), Erythrophleum chlorostachys (d), Petalostigma quadriloculare, Persoonia falcata, Acacia holosericea, Alphitonia excelsa, Gardenia megasperma	Petalostigma pubescens (d), Planchonia careya (d),	Heteropogon contortus (d), Eragrotis sp. (d)	H6
174	-14.6061	132.6547	OW	Erythrophleum chlorostachys and Corymbia bleeseri low open woodland with Triodia sp understorey	Erythrophleum chlorostachys (d), Corymbia bleeseri (d), Eucalyptus tetrodonta (d), Corymbia latifolia (d), Eucalyptus tintinnans, Eucalyptus tertifica	Petalostigma pubescens (d), Grevillea pteridifolia, Acacia platycarpa, Acacia hammondii	Plectrachne sp. (d), Sarga sp.	D10
175	-12.6876	135.6902	OF	Corymbia confertiflora and Erythrophleum chlorostachys open forest with Sarga plumosum understorey	Corymbia confertiflora (d), Erythrophleum chlorostachys (d), Eucalyptus tectifica (d), Eucalyptus tetrodonta (d), Callitris intratropica (50m sth, incl. juveniles), Corymbia porrecta, Melaleuca viridiflora, Terminalia platyphylla	Livistona humilis (d), Melaleuca nervosa (d), Brachychiton megaphyllus (d), Cycas arnhemica (d), Petalostigma pubescens, Pandanus sprialis, Grevillea pteridifolia	Sarga plumosum (d), Crinum sp, Ampelocissus acetosa	D10
176	-12.6855	135.6965	OF	Lophostemon lactifluus and Corymbia polycarpa open forest with grassy understorey	Lophostemon lactifluus (d), Corymbia polycarpa (d)	Pandanus spiralis (d), Erythrophleum chlorostachys (d), Cycas arnhemica (d), Buchanania obovata (d), Planchonia careya (d	unidentified grass (d), Lophostemon lactifluus juv. (d), Syzygium suborbiculare	C10
177	-12.6869	135.7169	OF	Corymbia polycarpa, Melaleuca viridiflora, M. nervosa and Pandanus spiralis open forest with Themeda triandra and Sarga plumosum understorey	Corymbia polycarpa (d), Melaleuca nervosa (d), Pandanus spiralis (d), Melaleuca viridiflora (d)		Themeda triandra (d), Sarga plumosum (d)	C3
178	-12.6863	135.7310	OF	Eucalyptus tetrodonta and Grevillea pteridifolia open forest with Sarga plumosum understorey	Eucalyptus tetrodonta (d), Grevillea pteridifolia (d), Callitris intratropica	Livistona humilis (d), Cycas arnhemica (d), Ampelocissus sp. (d), Hakea arborescens, Cissus sp., Brachychiton megaphyllus, Petalostigma pubescens, Acacia lamprocarpa, Brachychiton diversifolius, Verticordia cunninghamii	Sarga plumosum (d), Drosera sp (white flower)	D4
179	-12.6896	135.7778	OF	Eucalyptus miniata and E. tetrodonta open forest with Alloteropsis semialata understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Buchanania obovata	Livistona humilis (d), Buchanania obovata (d), Cycas arnhemica (d), Ampelocissus sp (d), Erythrophleum chlorostachys juv. (d), Brachychiton megaphyllus, Acacia sp., Acacia dimidiata	Eucalyptus tetrodonta juv (d), Alloteropsis semialata (d)	D4
180	-12.6920	135.8250	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia ferruginea	Livistona humilis (d), Buchanania obovata (d), Cycas arnhemica (d), Brachychiton megaphyllus (d), Erythrophleum chlorostachys juv. (d), Syzygium eucalyptoides, Ampelocissus sp., Xanthostemon paradoxus, Brachystelma glabriflorum	Sarga plumosum (d), Eriosema chinense	D4
181	-12.6924	135.8679	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Alloteropsis semialata understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Xanthostemon paradoxus	Livistona humilis (d), Cycas arnhemica (d), Erythrophleum chlorostachys juv. (d), Ampelocissus sp., Hibiscus sp, Hakea arborescens, Brachychiton megaphyllus, Bossiaea bossiaeoides	Sarga plumosum (d), Alloteropsis semialata (d), Sesbania benthamiana (d)	D4
182	-12.6950	135.9099	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Alloteropsis semialata understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d)	Livistona humilis (d), Cycas arnhemica (d), Erythrophleum chlorostachys (d), Brachychiton megaphyllus (d), Ampelocissus sp. (d), Petalostigma quadriloculare (d), Buchanania obovata	Sarga plumosum (d), Alloteropsis semialata (d) , several spp. pea	D4
183	-12.6975	135.9521	OF	Eucalyptus tetrodonta and Xanthostemon paradoxus forest with grassy understorey	Eucalyptus tetrodonta (d), Xanthostemon paradoxus (d)	Bossiaea bossiaeoides (d), Livistona humilis (d), Terminalia ferdinandiana Cycas arnhemica, Buchanania obovata, Grevillea striata, Persoonia falcata	thin grass cover (d), Sarga plumosum	D4
184	-12.6973	135.9977	W	Eucalyptus tetrodonta woodland with Sarga plumosum understorey	Eucalyptus tetrodonta (d), Xanthostemon paradoxus	Corymbia ferruginea (d), Persoonia falcata (d), Bossiaea bossiaeoides (d), Livistona humilis, Cycas arnhemica	Sarga plumosum (d)	D4
185	-12.7021	136.0534	W	Eucalyptus tetrodonta and E. miniata woodland with Sarga plumosum, Eragrostis sp and Astrebla sp understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia latifolia	Livistona humilis (d), Buchanania obovata (d), Grevillea heliosperma (d), Bossiaea bossiaeoides (d), Hibbertia dealbata (d), Jacksonia sp. (d), Terminalia ferdinandiana, Ampelocissus acetosa, Erythrophleum chlorostachys juv., Pandanus spiralis	Sarga plumosum (d), Eragrotis sp. (d), Astrebla sp. (d)	D4

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
186	-12.7028	136.0914	OW	Eucalyptus tetrodonta and E. miniata open woodland with Sarga plumosum understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Corymbia ferruginea	Livistona humilis (d), Cycas arnhemica (d), Bossiaea bossiaeoides (d), Buchanania obovata, Ampelocissus acetosa, Grevillea sp	Sarga plumosum (d)	D4
187	-12.7046	136.1285	OF	Eucalyptus tetrodonta and E. miniata open woodland with Sarga plumosum understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Erythrophleum chlorostachys (d), Corymbia confertiflora	Livistona humilis (d), Melaleuca nervosa (d), Syzygium eucalyptoides (d), Pandanus spiralis, Erythrophleum chlorostachys, Gardenia sp.	Sarga plumosum (d)	D4
188	-12.7064	136.1691	OW	Eucalyptus tetrodonta and Corymbia confertiflora open woodland with sedge and Sarga plumosum understorey	Eucalyptus tetrodonta (d), Corymbia confertiflora (d), Melaleuca viridflora, Pandanus spiralis, Planchonia careya, Syzygium eucalyptoides, Terminalia grandiflora, Corymbia polycarpa	Petalostigma pubescens (d), Cycas arnhemica, Livistona humilis, Ampelocissus sp., Erythrophleum chlorostachys, Dioscorea transversa, Brachychiton megaphyllus	unidentified sedge (d), Sarga plumosum (d), Drosera sp., Melaleuca cajuputi juv.	C10
189	-12.7074	136.1768	CF	Melaleuca viridiflora and Lophostemon lactifluus closed forest with Imperata cylindrica and Sarga plumosum understorey	Melaleuca viridiflora (d), Lophostemon lactifluus (d), Melaleuca leucadendra, Nauclea orientalis, Corymbia polycarpa, Corymbia bella, Macaranga tanarius	Pandanus spiralis (d), Livistona humilis on edges (d), Cycas arnhemica (d), Planchonia careya (d), Smilax australis (d), Flagellaria indica (d), numerous ground and climbing ferns (d), Blumea axillaris (d), Homalanthus novoguineenis, Macaranga tanarius	Imperata cylindrica (d), Sarga plumosum (d)	C3
190	-12.7134	136.1855	OW	Melaleuca viridiflora and Lophostemon lactifluus open woodland with sedge understorey	Melaleuca viridiflora (d), Lophostemon lactifluus (d), Corymbia polycarpa (d)	Banksia dentata (d), Grevillea pteridifolia (d), Pandanus sprialis (d), Cycas arnhemica (d)	Dense cover of unidentified sedge (d)	C13
191	-12.7087	136.2111	OW	Melaleuca nervosa and M. viridflora open woodland with sedge understorey	Melaleuca nervosa (d), Melaleuca viridflora (d), Petalostigma pubescens (d), Hakea arborescens (d)	Syzygium eucalyptoides	Dense cover of unidentified sedges (d), Sarga plumosum, Themeda sp.	C13
192	-12.6848	136.2421	OF	Eucalyptus miniata and E. tetrodonta tall open forest with Sarga plumosum and Alloteropsis semialata understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Corymbia ferruginea (d), Corymbia latifolia, Brachychiton diversifolius	Grevillea pteridfolia (d), Hibiscus sp. (d), Livistona humilis (d), Jacksonia sp. (d), Buchanania obovata (d), Ampelocissus sp. (d), Hakea arborescens	Sarga plumosum (d), Alloteropsis semialata (d), Brachystelma glabriflorum (d)	D4
193	-12.6537	136.2799	OF	Eucalyptus miniata, E. tetrodonta and Erythrophleum chlorostachys tall open forest with sparse grass understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Erythrophleum chlorostachys (d)	Livistona humilis (d), Erythrophleum chlorostachys (d), Ampelocissus acetosa (d), Buchanania obovata (d), Pandanus spiralis (d), Hibbertia dealbata (d), Syzygium suborbiculare (d),Banksia denata (d), Breynia cernua (d), Brachychiton megaphyllus, Acacia leptocarpa, Brachychiton diversifolius, Petalostigma pubescens	poor grass cover, Persoonia falcata	D14
194	-12.6530	136.2807	CF	Closed forest dominated by Lophostemon lactifluus, Nauclea orientalis and Acacia auriculiformis	Lophostemon lactifluus (d), Nauclea orientalis (d), Acacia auriculiformis (d)	Hydriastele wendlandiana (d), Alphitonia excelsa, Syzygium suborbiculare		C3
195	-12.6597	136.2828	OF	Eucalyptus tetrodonta and E. miniata open forest with Imperata cylindrica and Sarga plumosum understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Erythrophleum chlorostachys (d), Brachychiton diversifolius (d)	Lophostemon lactifluus (d), Pandanus spiralis (d), Cycas arnhemica (d), Livistona humilis (d), Canarium australianum (d), Syzygium suborbiculare (d)	Imperata cylindrica (d), Sarga plumosum on edges (d), Setaria sp. (d)	D4
196	-12.6505	136.2877	CF	Closed forest dominated by Melaleuca viridiflora, Lophostemon lactifluus, Pandanus aquaticus, Barringtonia acutangula and Syzygium suborbiculare	Melaleuca viridiflora (d), Lophostemon lactifluus (d), Pandanus aquaticus (d), Barringtonia acutangula (d), Syzygium suborbiculare (d)			C3
197	-12.6557	136.2863	OW	Eucalyptus tetrodonta low open woodland with grassy understorey	Eucalyptus tetrodonta (d), Acacia sp., Erythrophleum chlorostachys, Livistona humilis, Petalostigma pubescens, Hibiscus sp., Calytrix exstipulata	Brachychiton diversifolius	unidentified grass (d)	D13
198	-12.3593	136.7072	OF	Melaleuca leucadendra and Lophostemon lactifluus tall forest with a dense mid-storey of Pandanus aquaticus and Grevillea pteridifolia, and Lomandra tropica and Smilax australis understorey	Melaleuca leucadendra (d), Lophostemon lactifluus (d)	Pandanus aquaticus (d), Grevillea pteridifolia (d), Acacia leptocarpa, Ficus oppisita, Buchanania obovata, Planchonia careya, Canarium astralianum	Lomandra tropica (d), Smilax australis	C3
199	-12.3304	136.7350	OF	Eucalyptus tetrodonta tall forest with Sarga plumosum understorey	Eucalyptus tetrodonta (d)	Livistona humilis (d), Acacia yirrkallensis (d), Acacia leptocarpa (d), Acacia multisiliqua (d), Hibbertia dealbata (d), Grevillea sp. (d), Acacia dimidata (d), Hibiscus sp., Buchanania obovata, Brachychiton megaphyllus	Sarga plumosum (d), Buchanania obovata (juv)	D13
200	-12.3011	136.7647	OF	Eucalyptus tetrodonta tall forest with Sarga plumosum understorey	Eucalyptus tetrodonta (d)	Livistona humilis (d), Buchanania obovata (d), Calytrix exstipulata (d), Grevillea pteridifolia, Exocarpos latifolius, Acacia leptocarpa, Persoonia falcata, Hibbertia dealbata, Acacia yirrkalensis, Brachychiton megaphyllus	Sarga plumosum (d)	D13
201	-12.3008	136.7654	CF	Melaleuca viridiflora and Pandanus aquaticus closed forest with sedge sp. and Themeda triandra understorey	Melaleuca viridiflora (d), Pandanus aquaticus (d), Nauclea orientalis (d), Canarium australianum (d), Lophostemon lactifluus (d), Eucalyptus miniata	Hydriastele wendlandiana (d), Lomandra tropica (d), Barringtonia acutangula, Schefflera actinophylla (d), Zygodium flexosum (d), Melastoma sp. (d), Syzgium forte ssp. potamophilum (d), Grevillea pteridifolia (d), Flagellaria indica (d), Banksia dentata (d), Brachychiton diversifolius, Pandanus spiralis	sedges (d), Themeda triandra (d), Hibiscus sp., Hibbertia dealbata	C3
203	-13.4620	134.5851	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga intrans understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Corymbia bleeseri	Buchanania obovata (d), Corymbia ferruginea, Erythrophleum chlorostachys, Brachychiton diversifolius	Sarga intrans (d), Grevillea goodii ssp. pluricaulis, Petalostigma quadriloculare, Alphintonia excelsa, Planchonia careya, Eriachne sp., Lomandra tropica, Polygala sp., Gomphrena sp., Schizachyrium fragile Pachynema complanatum	D4
204	-13.4705	134.6385	W	Eucalyptus miniata and E. tetrodonta woodland with Eriachne sp. understorey.	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Corymbia bleeseri	Xanthostemon paradoxus (d), Pouteria arnhemica (d), Xanthostemon paradoxus, Petalostigma pubescens	Eriachne sp. (d), Grevillea goodii ssp. pluricaulis, Xanthostemon paradoxus, Planchonia careya, Petalostigma pubescens, Sarga intrans, Lomandra tropica, Buchnania obovata, Acacia seedlings, Eucalyptus seedlings, Arthrostylis aphylla, Pachynema complanatum, Triodia sp., Saurops sp., Hibbertia sp., Tephrosia porrecta, Tricoryne elatior, Gonocarpus sp.	D13
205	-13.4462	134.6678	OW	Melaleuca nervosa open woodland with Heteropogon contortus understorey	Melaleuca nervosa (d), Asteromyrtus symphyocarpa, Eucalyptus tectifica	Petalostigma pubescens (d), Grevillea pteridifolia, Acacia pellita, Acacia difficilis, Pandanus spiralis, Vitex glabrata, Calytrix exstipulata, Alphitonia excelsa, Ventilago viminalis	Melaleuca seedlings (d), Aristida holathera, Eriachne triseta, Hakea arborescens seedlings, Eragrostis cumingii, Petalostigma pubescens seedlings, Schizachyrium fragile, Wrightia saligna, Heteropogon contortus, Commeline ciliata, Rhynchospora sp., Ectrosia schultzii, Cartonema sp., Euphorbia sp., Fuirena ciliaris, Blumea sp., Eriocaulon sp., Panicum mindanense	C13

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
206	-13.4279	134.6886	W	Melaleuca nervosa open woodland with Sarga intrans understorey	Melaleuca nervosa (d), Eucalyptus tetrodonta, Corymbia bleeseri, Eucalyptu polycarpa	no dominant mid layer, Corymbia ferruginea, Erythrophleum chlorostachys, Gardenia megasperma, Cochlospermum fraseri, Xanthostemon paradoxus	Sarga intrans (d), Melaleuca nervosa seedlings, Planchonia careya sp., Lomandra tropica, Grevillea goodii ssp. pluricaulis, Eucalytus seedlings, Alphitonia excelsa seedlings, Pachynema complanatum, Alloteropsis semialata, Spermacoce sp., Waltheria indica, Cartonema sp.	C13
207	-13.4192	134.6984	OF	Eucalyptus miniata and E. tetrodonta open forest with Heteropogon triticeus	Eucalyptus tetrodonta (d), Eucalyptus miniata (d)	Buchanania obovata (d), Xanthostemon paradoxus (d), Pandanus spiralis (d), Livistona humilis, Terminalia carpentariae, Erythrophleum chlorostachys, Petalostigma pubescens	Pandanus spiralis (d), Heteropogon triticeus (d), Grevillea goodii ssp. pluricaulis, Planchonia careya, Sarga plumosum, Lomandra tropica, Eucalyptus seedlings, Pachynema complanatum, Wrightia saligna, Eriachne avenacea, Owenia vernicosa, Melaleuca nervosa seedlings, Erythrophleum chlorostachys, Thaumastochloa major, Tephrosia porrecta, Cartonema sp., Eriachne sp.	D4
208	-13.3878	134.7361	W	Eucalyptus tetrodonta woodland with Eriachne avenacea understorey	Eucalyptus tetrodonta (d)	Corymbia latifolia (d), Erythrophleum chlorostachys (d), Grevillea decurrens, Grevillea parallela, Gardenia megasperma, Terminalia carpentariae	Eriachne avenacea (d), Grevillea goodii ssp. pluricaulis, Planchonia careya, Sarga plumosum, Lomandra tropica, Petalostigma pubescens, Pseudopogonatherum contortum, Schizachyrium fragile, Eriachne obtusa, Eriachne avenacea, Spermacoce sp., Grevillea decurrens seedlings, Drosera indica, Helicteres cana, Rhynchospora sp., Sida sp.	D13
210	-13.4974	134.6075	OF	Eucalyptus tetrodonta and E. miniata open forest with Heteropogon triticeus understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Erythrophleum chlorostachys, Xanthostemon paradoxus	Buchanania obovata (d), Eucalyptus miniata saplings (d), Pouteria arnhemica, Terminalia carpentariae	Petalostigma pubescens (d), Heteropogon triticeus (d), Grevillea goodii ssp. pluricaulis, Planchonia careya, Sarga intrans, Lomandra tropica, Pachynema complanatum, Eriachne avenacea, Owenia vernicosa seedlings, Erythrophleum chlorostachys seedlings, Pandanus spiralis, Alphitonia excelsa, Buchanania obovata seedlings, Setaria apiculata, Thaumastochloa major, Helicteres cana, Rhynchospora sp., Sida sp., Aristida sp., Arthrostylis aphylla, Tephrosia porrecta, Cartonema sp.	D4
211	-13.5238	134.5772	CF	Melaleuca nervosa closed forest with grassy understorey	Melaleuca nervosa (d), Asteromyrtus symphyocarpa		Melaleuca nervosa seedlings, Asteromyrtus symphyocarpa seedlings, Cyperus haspan, Limnophila australis/brownii, Pseudoraphis spinescens, Commelina sp.	C13
212	-13.5521	134.5446	W	Melaleuca nervosa and Corymbia latifolia woodland with Eriachne sp understorey	Melaleuca sp. (d), Corymbia latifolia (d), Erythrophleum chlorostachys, Eucalyptus tectifica	Pandanus spiralis (d), Lophostemon lactifluus, Terminalia pterocarya, Gardenia megasperma, Hakea arborescens, Petalostigma pubescens, Acacia plectocarpa, Acacia difficilis	Eriachne sp. (d), Sarga intrans, Heteropogon triticeus, Heteropogon contortus, Setaria apiculata, Grewia retusifolia, Thaumastochloa major, Waltheria indica, Spermacoce calliantha, Ectrosia leporina, Aristida sp., Tephrosia porrecta, Blumea sp., Euphorbia sp., Cartonema sp., Sacciolepis myosuroides	C13
213	-13.5566	134.5388	W	Melaleuca nervosa low woodland with Shizachyrium fragile understorey	Melaleuca nervosa (d), Corymbia latifolia, Eucalyptus pruinosa, Erythrophleum chlorostachys	Petalostigma pubescens (d), Hakea arborescens, Calytrix exstipulata, Calytrix achaeta, Terminalia pterocarya, Melaleuca citrolen	Schizachyrium fragile (d), Sarga plumosum, Rhynchospora sp.	C13
214	-13.5769	134.5151	W	Eucalytpus tetrodonta and Erythrophleum chlorostachys woodland with Sarga intrans understorey	Eucalyptus tetrodonta (d)	Erythrophleum chlorostachys (d), Petalostigma pubescens, Pouteria arhemica	Sarga intrans (d), Gomphrena sp., Eriachne avenacea, Eriachne obtusa, Schizachyrium fragile, Planchonia careya, Eucalytus tetrodonta seedlings, Erythrophleum chlorostachys, Ptilotus corymbosus, Triodia sp.	D13
215	-13.5936	134.4948	W	Eucalyptus miniata woodland with Triodia sp understorey	Eucalyptus miniata (d)	Corymbia ferrugenia (d), Eucalyptus tetrodonta, Buchanania obovata, Owenia vernicosa, Petalostigma pubescens, Erythrophleum chlorostachys, Terminalia pterocarya	Triodia sp. (d), Sarga intrans, Planchonia careya, Heteropogon triticeus Owenia vernicosa seedlings, Persoonia falcata seedlings, Spermacoce sp., Gomphrena sp., Buchnera linearis, Triodia sp., Thaumastochloa major	D14
218	-13.6162	134.4701	W	Eucalyptus tetrodonta woodland with Petalostigma quadroculare understorey	Eucalyptus tetrodonta (d), Eucalyptus tectifica, Corymbia setosa, Corymbia latifolia, Amyema sanguineum	Erythrophleum chlorostachys (d), Gardenia megasperma, Terminalia ferdinandiana, Distichostemon hispidulus	Petalostigma quadriloculare (d), Mixed Eucalytus seedlings, Sarga intrans, Schizachyrium fragile, Heteropogon triticeus, Eriachne sp., Erythrophleum chlorostachys seedlings, Sarga plumosum, Polygala sp.	D13
219	-13.6471	134.4335	OF	Eucalyptus tetrodonta open forest with Eriachne sp understorey	Eucalyptus tetrodonta (d)	Petalostigma pubescens (d), Erythrophleum chlorostachys, Terminalia pterocarya, Carissa lanceolata	Eriachne sp. (d), Strychnos lucida, Planchonia careya, Grewia retusifolia, Buchanania obovata, Bridelia tomentosa, Hakea arborescens, Spermacoce sp., Alphitonia excelsa seedlings, Erythrophleum chlorostachys seedlings, Persoonia falcata, Setaria apiculata, Sarga intrans, Brachychiton paradoxus, Grewia retusifolia, Triodia sp., Thaumastochloa major, Yakirra muelleri, Aristida sp., Aristida pruinosa	D13
221	-13.6740	134.4028	OF	Eucalytptus miniata and E. tetrodonta open forest with Petalostigma quadriloculare understorey.	Eucalyptus miniata (d), Eucalyptus tetrodonta (d)	Corymbia ferrugenia (d), Corymbia latifolia, Eucalytus alba	Petalostigma quadriloculare (d), Mnesithea rottboellioides, Heteropogon contortus, Ficus opposita, Terminalia pterocarya, Gardenia megasperma, Brachychiton paradoxus, Mixed Eucalytus seedlings, Heteropogon triticeus, Grewia retusifolia, Eriachne sp., Erythrophleum chlorostachys seedlings, Planchonia careya, Eragrostis cumingii, Buchanania obovata, Themeda triandra, Sida spinosa, Helicteres cana, Evolvulus alsinoides	D4
222	-13.6795	134.3935	W	Eucalyptus jensenii woodland with Petalostigma quadriloculare understorey.	Eucalyptus jensenii (d)	Corymbia ferrugenia (d), Corymbia latifolia, Erythrophleum chlorostachys, Gardenia megasperma, Terminalia pterocarya	Petalostigma quadriloculare (d), Sarga intrans, Sarga plumosum, Heteropogon triticeus, Panicum sp., Erythrophleum chlorostachys seedlings	D10
223	-13.6931	134.3808	CF	Casuarina cunninghamiana and Lophostemon lactifluus closed forest with Mnesithea rottboellioides understorey	Casuarina cunninghamiana (d), Lophostemon grandiflorus (d), Eucalytus camaldulensis	Timonius timon (d), Melaleuca leucadendra, Terminalia platyphylla, Antidesma ghaesembilla, Pandanus aquaticus, Phyllanthus reticulatus	Mnesithea rottboellioides, Sida acuta*, Oldenlandia mitrasacmoides, Dicanthium sp.	C7
225	-13.7208	134.3538	W	Eucalyptus tetifica woodland with Heteropogon contortus understorey.	Eucalyptus tectifica (d), Corymbia latifolia, Corymbia grandifolia	Hakea arborescens (d), Erythrophleum chlorostachys, Terminalia ferdinandiana, Planchonia careya, Petalostigma pubescens	Heteropogon contortus (d), Heteropogon triticeus, Mixed Eucalytus seedlings, Sarga plumosum, Spermacoce sp.	D10
226	-13.7416	134.3333	OF	Eucalyptus miniata open forest with Eriachne sp. understorey.	Eucalyptus miniata (d), Corymbia grandifolia	Corymbia ferrugenia (d), Erythrophleum chlorostachys, Eucalyptus tetrodonta, Mixed Eucalytus/ Corymbia saplings	Eriachne sp., Sarga intrans, Spermacoce sp., Pachynema complanatum, Brachychiton paradoxus, Carissa lanceolata	D14

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
228	-13.7699	134.3039	W	Eucalyptus tetrodonta woodland with Triodia sp. understorey.	Eucalyptus tetrodonta (d), Eucalyptus miniata, Eucalyptus sp.	Corymbia ferrugenia (d), Erythrophleum chlorostachys (d) , Buchanania obovata, Croton arhemicus, Gardenia megasperma, Alphitonia excelsa, mixed Eucalytus saplings, Planchonia careya, Owenia vernicosa, Petalostigma pubescens	Triodia sp. (d), Sarga intrans, Spermacoce sp., Wrightia saligna, Bridelia tomentosa seedlings, Acacia sp. seedlings, Thaumastochloa major, Ptilotus corymbosus, Waltheria indica, Spermacoce fabiformis, Sebastiania chamaelea, Polygala sp., Cartonema sp.	D13
229	-13.7892	134.2810	OW	Corymbia ferruginea and Petalostigma pubescens low open woodland with Triodia sp. understorey.	Eucalyptus sp. (d), Corymbia ferruginea (d)	Petalostigma pubescens (d), Calytrix exstipulata, Acacia dimidiata, Erythrophleum chlorostachys, Acacia sp.	Eriachne sp. (d), Schizachyrium fragile, Spermacoce sp., Buchnera sp, Triodia sp., Mixed Eucalytus seedlings, Eragrostis sp., Fimbristylis sp., Evolvulus alsinoides, Carissa lanceolata, Hibbertia sp. Aristida sp.	D10
230	-13.8186	134.2456	W	Eucalyptus tectifica woodland with Sarga plumosum understorey.	Eucalyptus tectifica (d), Eucalyptus tetrodonta	Hakea arborescens (d), Erythrophleum chlorostachys, Petalostigma pubescens, Brachychiton diversifolius, Terminalia pterocarya, Corymbia confertiflora	Sarga plumosum (d), Melaleuca nervosa seedlings (d), Erythrophleum chlorostachys seedlings, Heteropogon contortus, Persoonia falcata, Heteropogon triticeus, Buchnera linearis, Schizachyrium fragile, Mixed Eucalytus seedlings, Fimbristylis sp., Helicteres cana, Spermacoce sp., Evolvulus alsinoides	D10
231	-13.8247	134.2386	CF	Riparian closed forest dominated by Lophostemon grandiflorus and Terminalia platyphylla with Pandanus spiralis mid-storey and Heteropogon contortus understorey	Lophostemon grandiflorus (d), Terminalia platyphylla (d), Eucalyptus sp. AA, Ficus racemosa	Pandanus spiralis (d), Acacia pellita, Buchanania obovata, mixed Eucalytus saplings	Heteropogon contortus (d), Arundinella nepalensis	C7
232	-13.8407	134.2187	W	Eucalyptus miniata woodland with Triodia sp. understorey.	Eucalyptus miniata (d)	Acacia platycarpa (d), Acacia plectocarpa (d), Terminalia grandiflora, Owenia vernicosa, Petalostigma pubescens, Ficus platypoda, Corymbia ferrugenia, Erythrophleum chlorostachys, Buchanania obovata	Triodia sp. (d), Aristida holathera (d), Spermacoce sp., Alphitonia excelsa, seedlings, Sarga intrans, Eucalyptus miniata seedlings, Owenia vernicosa seedlings, Jacquemontia browniana, Rhynchosia minima, Solanum sp., Polygala sp., Xenostegia tridentata	D14
233	-13.8708	134.1844	W	Corymbia latifolia and Eucalyptus tectifica woodland with Themeda triandra understorey	Corymbia latifolia (d), Eucalyptus tectifica (d), Corymbia confertiflora	Planchonia careya (d), Gardenia megasperma, Hakea arborescens	Themeda triandra (d), Mixed Eucalytus/ Corymbia seedlings, Heteropogon triticeus, Heteropogon contortus, Grewia retusifolia, Hakea arborescens seedlings, Buchanania obovata, Glycine sp., Bulbostylis barbata	D10
234	-13.8769	134.1773	OW	Lophostemon grandiflorus and Terminalia platyphylla open woodland with Heteropogon contortus understorey	Lophostemon grandiflorus (d), Terminalia platyphylla (d), Eucalyptus tectifica	Terminalia platyphylla (d), Planchonia careya, Lophostemon grandiflorus, Melaleuca leucadendra, Corymbia latifolia	Heteropogon contortus (d), Mixed Eucalytus/ Corymbia seedlings, Terminalia platyphylla seedlings, Mnesithea rottboellioides, Melaleuca leucadendra, Grewia retusifolia, Themeda triandra, Hakea arborescens seedlings, Pseudopogonatherum contortum, Fimbristylis sp., Cyperus sp., Indigofera linifolia, Ammannia baccifera, Oldenlandia argillacea	C7
235	-13.9030	134.1598	OW	Eucalyptus tectifica open woodland with Heteropogon contortus understorey	Eucalyptus tectifica (d), Brachychiton diversifolius	Eucalyptus tectifica (d), Erythrina variegata, Premna acuminata,Terminalia grandiflora, Flueggea virosa	Heteropogon contortus (d), Themeda triandra, Heteropogon triticeus, Grewia retusifolia, Sarga plumosum, Eucalyptus tectifica seedlings, Alphitonia excelsa seedlings, Goodenia sp., Galactia tenuiflora	D10
236	-13.9328	134.1415	ST	Open Heteropogon contortus grassland with scattered Grevillea dimidiata	Grevillea dimidiata (d), Eucalyptus tectifica, Erythrina variegata, Brachychiton diversifolius	Grevillea mimosoides (d), Cochlospermum fraseri (d)	Heteropogon contortus (d), Themeda triandra, Heteropogon triticeus, Grevillea mimosoides seedlings, Spermacoce sp., Eucalyptus tectifica seedlings, Brachychiton paradoxus, Sarga plumosum, Gossypium australe, Goodenia sp., Polymeria ambigua, Spermacoce dolichosperma, Panicum mindanaense	C18
239	-13.9559	134.1289	OW	Eucalyptus tectifica open woodland with Heteropogon contortus and Themeda triandra understorey	Eucalyptus tectifica (d), Corymbia confertiflora (d), Corymbia latifolia	Mixed Corymbia/ Eucalytus saplings (d), Erythrina variegata, Acacia ditricha, Flueggea virosa	Heteropogon contortus (d), Themeda triandra (d), Ficus opposita, Mixed Corymbia/ Eucalytus seedlings, Grewia retusifolia, Erythrina variegata seedlings, Brachychiton paradoxus, Uraria lagopodioides, Crotolaria sp.,	D10
240	-14.1047	133.9476	W	Melaleuca citrolens woodland with Schizachyrium fragile understorey	Melaleuca citrolens (d), Hakea arborescens, Eucalyptus pruinosa, Eucalyptus tectifica, Eucalyptus alba	Petalostigma pubescens (d), Melaleuca nervosa (d), Calytrix exstipulata, Cochlospermum fraseri, Grevillea parallela, Calytrix achaeta, Acacia hammondii, Gardenia megasperma, Ventilago viminalis	Schizachyrium fragile (d), Buchnera linearis, Eriachne obtusa, Triodia sp., Sarga plumosum, Blumea tenella, Rhynchospora sp., Waltheria indica, Acacia galioides, Evolvulus alsinoides, Heliotropium sp.	C13
241	-14.1068	133.9368	OW	Melaleuca citrolens open woodland with Schizachyrium understorey	Melaleuca citrolens (d), Melaleuca nervosa, Eucalyptus tectifica	Petalostigma pubescens (d), Calytrix exstipulata, Grevillea parallela, Hakea arborescens, Ventilago viminalis	Schizachyrium fragile (d), Sarga intrans, Sarga plumosum, Buchnera linearis, Eriachne obtusa, Brachychiton paradoxus, Acacia sp. seedlings, Blumea tenella, Rhynchospora sp., Waltheria indica, Triodia sp., Schizachyrium fragile, Eriachne obtusa, Acacia galioides, Evolvulus alsinoides, Heliotropium sp	D10
242	-14.1140	133.9482	W	Melaleuca citrolens woodland with Sarga plumosum understorey	Melaleuca citrolens (d), Eucalyptus pruinosa	Petalostigma pubescens (d), Melaleuca nervosa, Cochlospermum fraseri, Ventilago viminalis	Sarga plumosum (d), Acacia sp. seedlings, Heteropogon contortus, Themeda triandra, Blumea tenella, Waltheria indica, Schizachyrium fragile, Triodia sp., Carissa lanceolata	D29
244	-14.13591	133.92537	OW	Melaleuca citrolens open woodland with Eriachne sp. understorey	Melaleuca citrolens (d), Eucalyptus tectifica	Acacia ditricha (d), Corymbia latifolia, Carissa lanceolata, Melaleuca nervosa	Eriachne sp. (d), Hyptis suaveolens*, Themeda triandra, Heteropogon contortus, Sarga intrans, Grewia retusifolia, Themeda quadrivalvis*, Gomphrena sp., Sporobolus sp., Eragrostis sp., Triodia sp., Pseudopogonatherum sp., Aristida sp., Brachyachne convergens	D10
245	-14.15517	133.906	OW	Corymbia confertiflora open woodland with Themeda triandra understorey.	Corymbia confertiflora (d), Eucalyptus pruinosa, Eucalyptus tectifica, Brachychiton diversifolius, Amyema sanguineum	Melaleuca nervosa (d), Petalostigma pubescens, Carissa lanceolata, Hakea arborescens, Acacia platycarpa, Ventilago viminalis, Erythroxylum ellipticum	Themeda triandra (d), Melaleuca nervosa seedlings, Acacia ditricha seedlings, Carissa lanceolata seedlings, Bauhinia cunninghamii, Acacia platycarpa seedlings, Heteropogon contortus, Sarga plumosum, Hibiscus sp., Aristida sp., Schizachyrium fragile, Triodia sp.	C10
247	-14.17356	133.88459	OW	Eucalyptus tectifica and Erythrophleum chlorostachys open woodland with Schizachyrium fragile understorey	Eucalyptus tectifica (d), Erythrophleum chlorostachys (d), Eucalyptus alba	Calytrix exstipulata (d), Terminalia pterocarya, Gardenia megasperma, Calytrix achaeta, Acacia hammondii, Erythroxylum ellipticum	Schizachyrium fragile (d), Spermacoce sp., Petalostigma quadriloculare, Triodia sp., Alphitonia excelsa seedlings, Acacia sp. seedlings, Waltheria indica, Evolvulus alsinoides	D10

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
248	-14.17617	133.88148	OF	Eucalyptus tetrodonta and E. miniata open forest with Heteropogon triticeus understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Corymbia bleeseri	Terminalia carpentariae (d), Petalostigma pubescens, Croton arhemicus, Owenia vernicosa, Exocarpos latifolius, Acacia sp. , Melaleuca citrolens	Heteropogon triticeus (d), Mixed Eucalytus seedlings, Acacia sp. seedlings, Eriachne sp., Erythrophleum chlorostachys seedlings, Schizachyrium fragile, Sarga intrans, Alphitonia excelsa seedlings, Triodia sp., Pachynema sphenandrum, Panicum sp., Tephrosia sp., Uraria lagopodioides	D4
249	-14.2241	133.8323	W	Melaleuca nervosa woodland with Eriachne sp understorey.	Melaleuca nervosa (d)	Grevillea parallela (d), Cochlospermum fraseri, Petalostigma pubescens, Acacia platycarpa	Eriachne sp. (d), Melaleuca nervosa seedlings, Buchnera sp., Fimbristylis sp., Schizachyrium fragile, Pseudopogonatherum sp., Waltheria indica, Helicteres cana, Rhynchospora sp., Schizachyrium fragile	C13
251	-14.2412	133.8153	CF	Eucalyptus pruinosa closed forest with Themeda triandra understorey	Eucalyptus pruinosa (d)	Acacia umbellata (d), Petalostigma pubescens, Hakea arborescens, Grevillea parallela, Acacia hammondii, Calytrix exstipulata, Ventilago viminalis, Terminalia platyptera, Capparis lasiantha, Acacia lysiophloia	Themeda triandra (d), Grewia retusifolia, Sarga plumosum, Cochlospermum fraseri, Strychnos lucida, Mixed Eucalytus seedlings, Erythrophleum chlorostachys seedlings, Buchnera sp., Aristida sp., Bonamia sp., Dodnonaea lanceolata	D10
253	-14.2642	133.7935	CF	Eucalyptus camaldulensis and Melaleuca leucadendra closed forest with dense mid-storey dominated by Antidesma ghaesembilla, and Arundinella nepalensis understorey	Eucalyptus camaldulensis (d), Melaleuca leucadendra (d)	Antidesma ghaesembilla (d), Terminalia platyphylla, Nauclea orientalis, Acacia pellita, Vitex glabrata, Hakea arborescens, Barringtonia acutangula, Ventilago viminalis, Cathormion umbellatum, Dolichandrone heterophylla	Arundinella nepalensis (d), unidentified grass	C7
254	-14.2846	133.7746	OW	Eucalyptus tectifica open woodland with Heteropogon contortus understorey	Eucalyptus tectifica, Terminalia platyphylla	Planchonia careya, Hakea arborescens, Antidesma ghesaembilla	Heteropogon contortus (d), Themeda triandra, Grewia retusifolia, Themeda quadrivalvis*, Eragrostis amabillis/tenellula, Atalaya hemiglauca	D10
255	-14.2868	133.7733	CF	Melaleuca leucadendra closed forest with a dense mid-storey dominated by Acacia pellita, and Hetropogon contortus understorey	Melaleuca leucadendra (d), Eucalyptus tectifica, Eucalyptus camaldulensis, Corymbia latifolia, Nauclea orientalis	Acacia pellita (d), Lophostemon grandiflorus, Terminalia pterocarya, Hakea arborescens, Petalostigma pubescens, Vitex glabrata, Terminalia platyphylla, Ventilago viminalis, Antidesma ghaesembilla, Cathormion umbellatum	Heteropogon contortus (d), Themeda triandra, Themeda quadrivalvis*, Grewia breviflora, Eragrostis amabillis/tenellula, Eragrostis brownii, Nelsonia campestris, Ammannia baccifera, Chionachne cyathopoda	C3
256	-14.3239	133.7273	CF	Eucalyptus camaldulensis and Melaleuca leucadendra closed forest with a dense mid-storey dominated by Diospyros humilis and Arundinella nepalensis understorey	Eucalyptus camaldulensis (d), Melaleuca leucadendra (d), Terminalia platyphylla, Casuarina cunninghamiana, Nauclea orientalis, Lophostemon grandiflorus, Eucalyptus tectifica, Xanthostemon eucalyptoides	Diospyros humilis (d), Ficus coronulata, Acacia pellita, Pandanus spiralis, Ficus opposita, Barringtonia acutangula, Flueggea virosa, Antidesma ghesaembilla, Cathormion umbellatum, Dolichandrone heterophylla	Arundinella nepalensis (d), Sida sp. (d), Heteropogon contortus, Mnesithea rottboellioides, Imperata cylindrica, Grewia breviflora, Eragrostis amabillis/tenellula, Eragrostis brownii, Paspalum scrobiculatum, Passiflora foetida*, Triumfetta pentandra, Cayratia trifolia, Sida spinosa/ rohlenae, Chionachne cyathopod;	C7
258	-14.3433	133.6864	OW	Eucalyptus pruinosa open woodland with Sarga intrans understorey	Eucalyptus pruinosa (d)	Terminalia pterocarya (d), Cochlospermum fraseri, Petalostigma pubescen	Sarga intrans (d), Themeda triandra, Eragrostis sp., Carissa lanceolata, Dicliptera ciliata, Pterocaulon serrulatum, Sorghum interjectum, Panicum decompistium	D29
259	-14.3619	133.6602	OW	Eucalyptus pruinosa open woodland with Eriachne sp understorey	Eucalyptus pruinosa (d), Corymbia latifolia, Acacia ditricha	Terminalia pterocarya (d), Cochlospermum fraseri, Melaleuca citrolens, Melaleuca nervosa, Petalostigma pubescens, Ventilago viminalis, Terminalia platyptera	Eriachne sp.(d), Pseudopogonatherum contortum, Sarga intrans, Themeda triandra, Aristida sp., Schizachyrium fragile, Eragrostis sp, Rhynchospora sp., Atalaya hemiglauca, Brachyachne convergens	D29
260	-14.3848	133.6279	OW	Eucalyptus pruinosa open woodland with Eriachne sp understorey	Eucalyptus pruinosa (d)	Cochlospermum fraseri (d), Acacia ditricha, Terminalia pterocarya	Eriachne sp. (d), Themeda triandra, Acacia ditricha seedlings, Terminalia pterocarya seedlings, Rhynchospora sp., Neptunia sp., Aristida sp., Brachyachne convergens, Sorghum interjectun	D29
261	-14.3919	133.6211	OW	Eucalyptus tectifica open woodland with Themeda triandra understorey	Eucalyptus tectifica (d), Eucalyptus pruinosa, Eucalyptus umbrawarrensis	Hakea arborescens (d), Erythrophleum chlorostachys, Terminalia pterocarya, Petalostigma pubescens, Cochlospermum fraseri, Acacia ditricha	Themeda triandra (d), Grevillea dimidiata, Heteropogon contortus, Mixed Eucalytus seedlings, Erythrophleum chlorostachys seedlings, Sarga plumosum	D10
263	-14.4197	133.5780	OW	Eucalyptus umbrawarrensis open woodland with Aristida sp understorey	Eucalyptus umbrawarrensis (d), Eucalyptus pruinosa	Acacia umbellata (d), Cochlospermum fraseri, Acacia hammondii, Acacia ditricha, Terminalia pterocarya, Premna acuminata	Aristida sp. (d), Themeda triandra, Heteropogon contortus, Schizachyrium fragile, Rhynchospora sp., Helicteres cana, Eriachne obtusa, Pterocaulon serrulatum, Neptunia sp., Sida sp., Acacia sp., Brachyachne convergen;	D10
264	-14.4332	133.5585	OF	Eucalyptus tectifica open forest with Arundinella nepalensis understorey	Eucalyptus tectifica (d)	Carissa lanceolata (d), Grevillea mimosoides, Terminalia platyphylla, Acacia ditricha, Strychnos lucida, Bridelia tomentosa, Acacia pellita, Acacia umbellata, Terminalia platyptera, Diospyros humili;	Arundinella nepalensis (d), Heteropogon contortus, Eriachne sp., Hypoestes floribunda, Pterocaulon serrulatum, Helicteres isora	D10
265	-14.4460	133.5403	OF	Eucalyptus tectifica open forest with Mnesithea rottboellioides understorey.	Eucalyptus tectifica (d), Terminalia platyphylla, Eucalyptus camaldulensis, Corymbia latifolia	Eriachne sp. (d), Vitex glabrata saplings, Planchonia careya, Mixed Eucalytus/ Corymbia seedlings, Terminalia platyptera, Cathormion umbellatum	Mnesithea rottboellioides (d), Heteropogon contortus, Arundinella nepalensis, Mixed Eucalytus seedlings, Blumea tenella, Grewia breviflora, Antidesma ghaesembilla, Helicteres isora, Sida spinosa, Vigna lanceolata	D10
266	-14.4707	133.5049	OW	Corymbia latifolia and Eucalyptus tectifica open woodland with Heteropogon contortus understorey	Corymbia latifolia (d), Eucalyptus tectifica (d), Terminalia platyphylla	Acacia ditricha (d), Terminalia pterocarya, Melaleuca nervosa, Hibiscus sp. C, Terminalia platyphylla seedlings, Melaleuca citrolens, Terminalia platyptera, Cathormion umbellatum	Heteropogon contortus (d), Themeda triandra, Acacia ditricha seedlings, Aristida sp., Rhynchospora sp., Atalaya hemiglauca, Blumea tenella, Antidesma ghaesembilla, Pterocaulon serrulatum, Gossypium australe, Helicteres isora, Sida spinosa, Vigna lanceolata, Nelsonia campestris, Ammannia baccifera, Brachyachne convergens, Sarga interjectum	D10
267	-14.4746	133.4649	W	Corymbia latifolia and Eucalyptus pruinosa woodland with Sarga intrans understorey	Corymbia latifolia (d), Eucalyptus pruinosa (d), Eucalyptus tectifica, Erythrophleum chlorostachys	Acacia ditricha (d), Corymbia latifolia saplings, Brachychiton diversifolius, Cochlospermum fraseri, Terminalia platyptera	Sarga intrans (d), Mixed Eucalytus seedlings, Themeda triandra, Heteropogon contortus, Erythrophleum chlorostachys seedlings, Grevillea mimosoides seedlings, Pterocaulon serrulatum, Aristida sp., Brachyachne convergens, Sida sp.	D29
269	-14.5861	132.1687	W	Corymbia foelsheana woodland with Aristida sp understorey	Corymbia foelscheana (d), Eucalyptus tectifica, Amyema sanguineum,	Mixed Eucalytus/ Corymbia saplings (d), Hakea arborescens, Acacia pellita, Planchonia careya, Cochlospermum fraseri, Acacia pachyphloia	Aristida sp. (d), Schizachyrium fragile, Spermacoce sp., Mixed Eucalytus seedlings, Eragrostis sp., Themeda triandra, Acacia sp. seedlings, Gomphrena sp., Aristida holathera, Gossypium australe, Sporobolus australasicus, Pterocaulon sp., Crotolaria brevis, Alysicarpus ovalifolius	D10
270	-14.5864	132.1732	CF	Eucalyptus tectifica and Lophostemon grandiflorus closed forest with a dense mid-storey dominated by Acacia pellita, and Heteropogon contortus understorey	Eucalyptus tectifica (d), Lophostemon grandiflorus (d), Corymbia foelscheana	Acacia pellita (d), Terminalia platyphylla, Cochlospermum fraseri, Hakea arborescens, Acacia ditricha	Heteropogon contortus (d), Grewia retusifolia, Haemodorum sp., Fimbristylis sp., Fuirena ciliaris, Ammannia baccifera	D10

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
271	-14.5830	132.1729	OW	Corymbia foelsheana open woodland with Sarga intrans understorey	Corymbia foelscheana (d), Eucalyptus tectifica	Hakea arborescens (d), Cochlospermum fraseri, Acacia ditricha, Brachychiton diversifolius, Brachychiton paradoxus, Acacia pellita, Gardenia megasperma, Bauhinia cunninghamii, Acacia pachyphloia	Sarga intrans (d), Heteropogon contortus, Themeda triandra, Grewia retusifolia, Mixed Eucalytus seedlings, Spermacoce sp., Gossypium australe	D10
272	-14.5830	132.1684	OW	Corymbia umbonata open woodland with Aristida sp understorey	Corymbia umbonata (d), Eucalyptus tectifica, Corymbia foelscheana, Amyema sanguineum	Planchonia careya (d), Acacia pellita, Mixed Eucalytus/ Corymbia saplings, Erythrophleum chlorostachys	Aristida sp.(d), Themeda triandra, Buchanania obovata, Mixed Eucalytus/ Corymbia seedlings, Erythrophleum chlorostachys seedlings, Aristida holathera, Waltheria indica, Gossypium australe, Sporobolus australasicus, Pterocaulon sp., Crotolaria brevis, Alysicarpus ovalifolius	D10
273	-14.6138	132.5553	OF	Eucalyptus tetrodonta and Corymbia dichromophloia open forest with Heteropogon triticeus understorey.	Eucalyptus tetrodonta (d), Corymbia umbonata, Amyema sanguineum	Acacia platycarpa (d), Croton sp C, Grevillea parallela, Mixed Eucalytus/ Corymbia saplings, Dolichandrone filiformis, Helicteres D4247 Elongata	Heteropogon triticeus (d), Brachychiton paradoxus, Eucalyptus tetrodonta seedlings, Acacia platycarpa seedlings, Eriachne sp., Themeda triandra, Evolvulus alsinoides, Spermacoce sp., Galactia sp.	H9
274	-14.6144	132.5506	OF	Eucalyptus tetrodonta and Corymbia umbonata open forest with Heteropogon triticeus understorey	Eucalyptus tetrodonta (d), Corymbia umbonata, Brachychiton diversifolius, Amyema sanguineum	Acacia platycarpa (d), Croton sp C, Grevillea parallela, Mixed Eucalytus/ Corymbia saplings, Hakea arborescens, Dolichandrone filiformis, Helicteres D4247 elongata	Heteropogon triticeus (d), Brachychiton paradoxus, Eucalyptus tetrodonta seedlings, Acacia platycarpa seedlings, Eriachne sp., Evolvulus alsinoides, Haemodorum sp	D14
275	-14.6100	132.5500	OW	Eucalyptus tectifica and Eucalyptus tetrodonta open woodland with Sehima nervosum understorey	Eucalyptus tetrodonta (d), Eucalyptus tectifica (d), Corymbia umbonata	Acacia platycarpa (d), Mixed Eucalytus/ Corymbia saplings, Hakea arborescens, Gardenia megasperma, Croton arhemicus, Corymbia polysciada, Dolichandrone filiformis, Erythroxylum ellipticum, Helicteres D4247 elongata	Sehima nervosum (d), Mixed Eucalytus/ Corymbia seedlings, Brachychiton paradoxus, Heteropogon contortus, Grewia retusifolia, Themeda triandra, Eriachne sp., Lomandra tropica, Evolvulus alsinoides, Haemodorum sp.	D10
276	-14.6095	132.5543	OF	Eucalyptus miniata and E. tetrodonta open forest with Heteropogon triticeus understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Erythrophleum chlorostachys, Corymbia umbonata, Amyema sanguineum	Acacia platycarpa (d), Mixed Eucalytus/ Corymbia saplings, Hakea arborescens, Gardenia megasperma, Croton arhemicus, Planchonia careya, Grevillea mimosoides, Terminalia volucris, Buchanania obovata, Dolichandrone filiformis, Erythroxylum ellipticum, Helicteres D4247 elongata	Heteropogon triticeus (d), Mixed Eucalytus/ Corymbia seedlings, Brachychiton paradoxus, Heteropogon contortus, Grewia retusifolia, Themeda triandra, Eriachne sp., Lomandra tropica, Erythrophleum chlorostachys seedlings, Evolvulus alsinoides, Triodia sp., Haemodorum sp., Galactia sp.	D4
277	-14.4920	131.2224	OF	Eucalyptus miniata and Corymbia bleeseri open forest with Sarga intrans understorey	Eucalyptus miniata (d), Corymbia bleeseri (d), Eucalyptus tetrodonta	Terminalia canescens (d), Buchanania obovata, Owenia vernicosa, Erythrophleum chlorostachys, Terminalia ferdinandiana, Persoonia falcata Planchonia careya, Gardenia megasperma, Livistona humilis	Sarga intrans (d), Mixed Eucalytus/ Corymbia seedlings, Terminalia canescens seedlings, Pterocaulon sp., Persoonia falcata seedlings, Spermacoce sp., Petalostigma quadriloculare, Heteropogon triticeus, Erythrophleum chlorostachys seedlings, Buchnera sp.	H6
278	-14.5343	130.9288	OF	Eucalyptus miniata and E. tetrodonta open forest with grassy understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia bleeseri, Callitris intratropica	Acacia mimula (d), Livistona humilis, Pouteria arnhemica, Grevillea ducurrens, Erythrophleum chlorostachys, Petalostigma pubescens, Brachychiton paradoxus, Planchonia careya, Gardenia megasperma, Buchanania obovata, Cycas canalis	unidentified grass (burnt) (d), Heteropogon triticeus, Hibbertia sp., Blumea sp., Acacia sp. seedlings, Alphitonia excelsa seedlings, Pachynema sphenandrum, Sebastiania chamaelea, Hibbertia sp., Plagiocarpus axillaris, Bonamia brevifoli	D4
279	-14.5250	130.8867	OF	Eucalyptus tetrodonta and E. miniata open forest with grassy understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Callitris intratropica, Corymbia greeniana	Acacia mimula (d), Grevillea ducurrens, Petalostigma pubescens, Brachychiton paradoxus, Planchonia careya, Gardenia megasperma, Grevillea decurrens	unidentified grass (burnt) (d), Heteropogon triticeus, Acacia sp seedlings, Mixed Eucalytus/ Corymbia seedlings, Cycas canalis, Livistona humilis, Plagiocarpus axillaris, Bonamia brevifoli	D4
280	-14.5169	130.8400	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga intrans and Hetropogon triticeus understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia greeniana	Livistona humilis (d), Erythrophleum chlorostachys, Denhamia obscura, Acacia mimula, Acacia difficilis, Grevillea pteridifolia, Grevillea ducurrens, Cycas canalis, Pandanus spiralis, Buchanania obovata, Petalostigma pubescens	Sarga intrans (d), Heteropogon triticeus (d), Thaumastochloa major, Alphitonia excelsa seedlings, Aristida sp., Erythrophleum chlorostachys seedlings, Acacia sp. seedlings, Eriachne sp., Pachynema sphenandrum, Hibbertia D29594 Woolaning, Plagiocarpus axillaris, Bonamia brevifolia	D4
281	-14.5087	130.7987	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga intrans understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Erythrophleum chlorostachys, Corymbia greeniana	Acacia mimula (d), Pouteria arnhemica, Pandanus spiralis, Cycas canalis, Livistona humilis, Grevillea ducurrens, Petalostigma pubescens, Gardenia megasperma, Terminalia ferdinandiana, Alphitonia excelsa, Atalaya hemiglauca, Buchanania obovata, Brachychiton diversifolius	Sarga intrans (d), Acacia sp seedlings, Buchanania obovata seedlings, Heteropogon triticeus, Setaria apiculata, Brachychiton paradoxus, Lomandra tropica, Mixed Eucalytus/ Corymbia seedlings, Planchonia careya, Erythrophleum chlorostachys seedlings, Sarga plumosum, Indigofera sp., Persoonia falcata, Hibbertia D29594 Woolaning, Stylidium leptorrhizum, Plagiocarpus axillaris, Bonamia brevifolia, Marsdenia trinervis	D4
282	-14.4979	130.7883	CF	Grevillea pteridifolia closed forest with emergent Eucalyptus latifolia and E. tetrodonta and Ectrosia leporina understorey	Eucalyptus tetrodonta (d), Corymbia latifolia (d), Eucalyptus miniata, Amyema sanguineum, Erythrophleum chlorostachys	Grevillea pteridifolia (d), Lophostemon lactifluus, Livistona humilis, Melaleuca leucadendra	Ectrosia leporina (d), Rhynchospora sp., Drosera sp., Melaleuca leucadendra seedlings, Mnesithea rottboellioides, Fimbristylis sp., Mixed Eucalytus/ Corymbia seedlings, Lophostemon lactifluus seedlings, Themeda triandra, Erythrophleum chlorostachys seedlings, Pseudopogonatherum sp., Fuirena ciliaris, Eragrostis sp., Eriachne sulcata, Cyperus haspan, Ludwigia octovalvis, Limnophila fragrans, Stylidium sp.	none
283	-14.4855	130.7834	W	Eucalyptus tetrodonta and E. miniata woodland with Triodia sp understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Callitris intratropica, Corymbia greeniana, Erythrophleum chlorostachys	Petalostigma pubescens (d), Brachychiton paradoxus, Terminalia ferdinandiana, Pouteria arnhemica, Persoonia falcata, Gardenia megasperma, Livistona humilis, Grevillea pteridifolia, Grevillea ducurrens Erythrophleum chlorostachys, Croton arnhemicus, Owenia vernicosa, Alphitonia excelsa, Planchonia careya	Triodia sp. (d), Spermacoce sp., Thaumastochloa major, Sarga intrans, Petalostigma quadriloculare, Mixed Eucalytus/ Corymbia seedlings, Eragrostis sp., Eriachne sp., Lomandra tropica, Erythrophleum chlorostachys seedlings, Setaria apiculata, Schizachyrium fragile, Cymbopogon sp., Hibbertia D29594 Woolaning, Plagiocarpus axillaris Jasminum molle	D4
284	-14.4635	130.7733	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga intrans understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia greeniana	Acacia mimula (d), Erythrophleum chlorostachys, Terminalia carpentariae Livistona humilis, Petalostigma pubescens	Sarga intrans (d), Eriachne sp., Cycas sp. C, Aristida sp., Heteropogon triticeus, Livistona humilis seedlings, Mixed Eucalytus/ Corymbia seedlings, Acacia mimula seedlings	D4
285	-14.4653	130.7688	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga intrans understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Eucalyptus tetrodonta, Corymbia greeniana	Acacia mimula (d), Erythrophleum chlorostachys, Terminalia carpentariae Livistona humilis, Petalostigma pubescens, Buchanania obovata	Sarga intrans (d), Eriachne sp., Eriachne obtusa, Aristida sp., Heteropogon triticeus, Livistona humilis seedlings, Mixed Eucalytus/ Corymbia seedlings, Acacia mimula seedlings, Thaumastochloa major, Cymbopogon sp., Pterocaulon sp	D4
286	-14.4610	130.7673	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga intrans understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Eucalyptus tetrodonta, Corymbia greeniana	Acacia mimula (d), Terminalia carpentariae, Terminalia canescens, Livistona humilis, Petalostigma pubescens, Buchanania obovata, Planchonia careya	Sarga intrans (d), Eriachne sp., Eriachne obtusa, Aristida sp., Heteropogon triticeus, Livistona humilis seedlings, Mixed Eucalytus/ Corymbia seedlings, Acacia mimula seedlings, Thaumastochloa major, Pterocaulon sp., Brachychiton paradoxus	D4

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
287	-14.4596	130.7716	W	Eucalyptus miniata and E. tetrodonta woodland with Hetropogon triticeus understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Erythrophleum chlorostachys	Acacia mimula (d), Terminalia carpentariae, Terminalia canescens, Livistona humilis, Petalostigma pubescens, Buchanania obovata, Planchonia careya, Persoonia falcata	Heteropogon triticeus (d), Eriachne sp., Eriachne obtusa, Aristida sp., Heteropogon triticeus, Livistona humilis seedlings, Mixed Eucalytus/ Corymbia seedlings, Acacia mimula seedlings, Thaumastochloa major, Pterocaulon sp., Brachychiton paradoxus, Cymbopogon sp	D4
288	-14.4227	130.7546	W	Eucalyptus miniata and Corymbia greeniana woodland with grassy understorey	Eucalyptus miniata (d), Corymbia greeniana (d), Eucalyptus tetrodonta	Livistona humilis (d), Grevillea decurrens, Planchonia careya, Buchanania obovata, Persoonia falcata	unidentified grass (burnt) (d), Eriachne schultziana, Aristida sp., Sarga intrans, Sarga plumosum, Spermacoce sp., Lomandra tropica, Petalostigma pubescens, Acacia platycarpa seedlings, Planchonia careya, Mixed Eucalytus/ Corymbia seedlings, Indigofera sp., Eriachne sulcata, Hibbertia sp., Plagiocarpus axillaris, Hibbertia dealbata	D14
289	-14.4127	130.7135	W	Eucalyptus tetrodonta woodland with Sarga plumosum understorey	Eucalyptus tetrodonta (d), Callitris intratropica, Eucalyptus miniata, Corymbia greeniana,	Erythrophleum chlorostachys (d), Grevillea ducurrens, Cycas canalis, Persoonia falcata, Eucalyptus tetrodonta saplings, Petalostigma pubescens	Sarga plumosum (d), Brachychiton paradoxus, Erythrophleum chlorostachys seedlings, Mixed Eucalytus/ Corymbia seedlings, Spermacoce sp., Acacia sp. seedlings, Setaria apiculata, Grevillea decurrens seedlings, Persoonia falcata seedlings, Alphitonia excelsa seedlings, Planchonia careya, Chrysopogon sp., Hibbertia dealbata, Hibbertia sp., Polygala triflora, Plagiocarpus axillaris, Cajanus sp., Kailarsenia suffructicosa	D4
290	-14.4072	130.6693	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta, Eucalyptus jensenii, Corymbia bleeseri, Corymbia greeniana	Erythrophleum chlorostachys (d), Alphitonia excelsa, Persoonia falcata, Cycas canalis, Acacia mimula, Stenocarpus cunninghamii, Erythroxylum ellipticum	Sarga plumosum (d), Alphitonia excelsa seedlings, Persoonia falcata seedlings, Acacia mimula seedlings, Erythrophleum chlorostachys seedlings, Mixed Eucalytus/ Corymbia seedlings, Spermacoce sp., Stenocarpus cunninghamii seedlings, Grevillea parallela, Gardenia megasperma, Buchanania obovata, Cycas canalis, Panicum sp., Lomandra tropica, Hibbertia sp., Polygala triflora, Tephrosia porrecta, Oldenlandia sp., Hibbertia dealbata, Kailarsenia suffructicosa	D4
291	-14.4049	130.6234	OW	Eucalyptus miniata and E. tetrodonta open woodland with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Erythrophleum chlorostachys, Corymbia greeniana, Corymbia confertiflora	Planchonia careya (d), Alphitonia excelsa, Grevillea decurrens, Persoonia falcata, Buchanania obovata, Denhamia obscura, Petalostigma pubescens, Cycas canalis, Pouteria arnhemica, Acacia dimidiata, Livistona humilis, Gardenia megasperma, Terminalia carpentariae, Erythroxylum ellipticum	Sarga plumosum (d), Mixed Eucalytus/ Corymbia seedlings, Aristida sp., Sarga intrans, Pseudopogonatherum contortum, Thaumastochloa major, Schizachyrium fragile, Fimbristylis sp., Acacia platycarpa, Planchonia careya, Grevillea decurrens, Petalostigma quadriloculare, Erythrophleum chlorostachys seedlings, Buchanania obovata, Terminalia carpentariae seedlings, Livistona humilis, Hibbertia sp., Tephrosia porrecta, Oldenlandia sp., Hibbertia dealbata, Kailarsenia suffructicosa	D4
292	-14.4057	130.5873	ST	Open grassland with scattered Melaleuca leucadendra trees	Melaleuca leucadendra (d)	Lophostemon lactifluus (d), Banksia dentata	unidentified grass (d) , Drosera sp., Banksia dentata seedlings, Xyris complanata, Xyris cheumatophila, Eriocaulon odontospermum, Limnophila aromatica, Mitrasacme nummularia, Panicum trachyrhachis, Centrolepis exserta, Utricularia sp., Nymphoides sp., Mimulus uvedaliae., Oldenlandia sp., Sacciolepis myosuroides., Philydrum lanuginosum	C18
293	-14.4438	130.5671	OW	Eucalyptus miniata and E. tetrodonta open woodland with Sarga intrans understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia bleeseri, Corymbia greeniana	Livistona humilis (d), Planchonia careya, Cycas canalis, Terminalia carpentariae, Pouteria arnhemica, Stenocarpus cunninghamii, Brachychiton paradoxus, Persoonia falcata, Grevillea decurrens, Acacia mimula	Sarga intrans (d), Mixed Eucalytus/ Corymbia seedlings, Erythrophleum chlorostachys seedlings, Stenocarpus cunninghamii seedlings, Alphitonia excelsa seedlings, Acacia sp. seedlings, Schizachyrium fragile, Sarga plumosum, Thaumastochloa major, Aristida holathera, Heteropogon triticeus, Setaria apiculata, Lomandra tropica, Cycas canalis, Spermacoce sp., Cymbopogon sp., Planchonia careya, Acacia platycarpa, Livistona humilis, Brachychiton paradoxus, Gomphrena sp., Polygala triflora, Plagiocarpus axillaris, Hibbertia dealbata, Hibbertia muelleri	D4
294	-14.4065	130.5215	OF	Eucalyptus miniata, Corymbia greeniana open forest with grassy understorey	Eucalyptus miniata (d), Corymbia greeniana (d), Erythrophleum chlorostachys, Eucalyptus tetrodonta	Grevillea decurrens (d), Buchanania obovata, Livistona humilis, Gardenia megasperma, Planchonia careya, Cycas canalis, Persoonia falcata	unidentified grass (d), Grevillea goodii, Buchanania obovata, Grevillea decurrens, Buchnera linearis, Petalostigma quadriloculare, Pachynema complanatum, Erythrophleum chlorostachys seedlings, Mixed Eucalytus/ Corymbia seedlings, Alphitonia excelsa seedlings, Planchonia careya, Brachychiton paradoxus, Grevillea mimosoides, Patersonia macrantha, Arthrostylis aphylla, Sarga intrans, Schizachyrium fragile, Pseudopogonatherum contortum, Hibbertia sp., Stylidium leptorrhizum, Polygala triflora, Plagiocarpus axillaris, Tephrosia porrecta, Oldenlandia sp., Hibbertia dealbata	D14
295	-14.3801	130.4931	OW	Eucalyptus miniata and E. tetrodonta open woodland with Schizachyrium fragile understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia bleeseri	Petalostigma pubescens (d), Terminalia ferdinandiana, Stenocarpus cunninghamii, Acacia mimula, Grevillea decurrens, Planchonia careya, Cycas canalis, Livistona humilis, Calytrix exstipulata, Verticordia cunninghamii	Schizachyrium fragile (d), Rhynchospora sp., Eriachne obtusa, Spermacoce sp., Buchnera linearis, Acacia mimula seedlings, Aristida holathera, Stenocarpus cunninghamii seedlings, Eriachne ciliata, Eriachne schultziana	D4
296	-14.3629	130.4550	W	Eucalyptus miniata, E. tetrodonta and E. greeniana woodland with Sarga plumosum understorey	Eucalyptus miniata (d), Corymbia greeniana (d), Eucalyptus tetrodonta	Mixed Eucalytus/ Corymbia saplings (d), Cycas canalis, Livistona humilis, Persoonia falcata, Alphitonia excelsa, Buchanania obovata, Erythrophleum chlorostachys, Acacia mimula	Sarga plumosum (d), Pachynema complanatum, Grevillea goodii, Buchanania obovata seedlings, Mixed Eucalytus/ Corymbia seedlings, Planchonia careya, Stenocarpus cunninghamii seedlings, Heteropogon triticeus, Schizachyrium fragile, Hibbertia dealbata, Hibbertia muelleri, Kailarsenia suffructicosa	D14

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
297	-14.3473	130.4115	W	Eucayptus miniata and E. tetrodonta woodland with Hetropogon triticeus understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d)	Livistona humilis (d), Cycas sp. (d), Planchonia careya, Terminalia carpentariae, Grevillea decurrens, Erythrophleum chlorostachys	Heteropogon triticeus (d), Lomandra tropica, Pseudopogonatherum contortum, Cenchrus sp., Mixed Eucalytus/ Corymbia seedlings, Alphitonia excelsa seedlings, Melaleuca sp seedlings, Planchonia careya, Pachynema complanatum, Persoonia falcata, Grevillea goodii, Hibbertia sp., Polygala triflora, Plagiocarpus axillaris, Tephrosia porrecta, Oldenlandia sp., Hibbertia dealbata, Hibbertia muelleri, Kailarsenia suffructicosa	D4
298	-14.3344	130.3754	OW	Corymbia ptycocarpa and Lophostemon lactifluus open woodland with dense mid storey of Banksia dentata and Grevillea pteridifolia and Pseudopogon contortum understorey	Corymbia ptychocarpa (d), Lophostemon lactifluus (d), Melaleuca leaucadendra, Corymbia polycarpa	Banksia dentata (d), Grevillea pteridifolia (d), Cycas canalis, Lophostemon lactifluus, Pandanus spiralis, Petalostigma banksii	Pseudopogonatherum contortum (d), Mnesithea rottboellioides, Arundinella nepalensis, Eriachne schultziana, Eriachne triseta, Melaleuca sp seedlings C, Drosera sp C, Heteropogon triticeus, Lophostemon lactifluus seedlings, Banksia dentata seedlings, Schizachyrium fragile, Eriocaulon odontospermum, Limnophila aromatica, Mitrasacme nummularia, Eragrostis cumingii, Cartonema trigonospermum, Chamaecrista sp., Xyris complanata, Dapsilanthus spathaceus, Buchnera ciliata, Cyperus sp., Arthrostylis aphylla, Cartonema spicatum, Xyris indica, Nymphoides sp., Mimulus uvedaliae., Oldenlandia sp., Sacciolepis myosuroides, Xyris complanata, Xyris cheumatophila	C10
299	-14.3234	130.3468	OW	Corymbia ptychocarpa and Melaleuca viridiflora open woodland swamp with dense mid storey of Banksia dentata and Grevillea pteridifolia and sedge understorey	Corymbia ptychocarpa (d), Melaleuca viridiflora (d), Lophostemon lactifluus	Banksia dentata (d), Grevillea pteridifolia, Pandanus spiralis, Acacia difficilis	Eulalia mackinlayi, Mnesithea rottboellioides, Arundinella nepalensis, Drosera sp., Eriachne triseta, Heteropogon triticeus, Fimbristylis sp., Pseudopogonatherum contortum, Eragrostis sp, Melaleuca sp seedlings, Banksia dentata seedlings, Lophostemon lactifluus seedlings, Corymbia ptychocarpa seedlings, Utricularia chrysantha, Utricularia fulva, Osbeckia australiana, Verticordia cunninghamii, Schoenus sp, Ectrosia leporina, Eriocaulon odontospermum, Limnophila aromatica, Mitrasacme nummularia, Chamaecrista sp., Dapsilanthus spathaceus, Cyperus sp., Arthrostylis aphylla, Cartonema spicatum, Xyris indica, Mitrasacme entianea, Mitrasacme connata, Utricularia odorata, Sacciolepis myosuroides., Hibbertia dealbata, Xyris complanata, Xyris cheumatophila	C13
300	-14.3111	130.3125	OW	Eucalyptus miniata and E. tetrodonta open woodland with Eulalia mackinlayi understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia greeniana, Amyema sanguineum	Planchonia careya (d), Stenocarpus cunninghamii, Gardenia megasperma, Acacia mimula, Pouteria arnhemica, Persoonia falcata, Grevillea ducurrens, Buchanania obovata, Livistona humilis, Cycas canalis, Terminalia carpentariae, Acacia dimidiata, Calytrix exstipulata, Petalostigma banksii, Pogonolobus reticulatus	Eulalia mackinlayi (d), Lomandra tropica, Spermacoce sp., Pachynema complanatum, Mixed Eucalytus/ Corymbia seedlings, Pseudopogonatherum contortum, Petalostigma quadriloculare, Heteropogon triticeus, Sarga intrans, Eriachne obtusa, Acacia sp. seedlings, Stenocarpus cunninghamii seedlings, Comesperma secundum, Acacia nuperrima, Hibbertia sp., Buchnera ciliata, Polygala triflora, Tephrosia porrecta, Oldenlandia sp., Cajanus sp., Hibbertia dealbata, Hibbertia muelleri	D4
301	-14.2954	130.2689	W	Eucalyptus miniata woodland with Pseudopogonatherum contortum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta	Acacia mimula (d), Livistona humilis, Pouteria arnhemica, Planchonia careya, Buchanania obovata, Stenocarpus cunninghamii	Pseudopogonatherum contortum (d) , Thaumastochloa major, Sarga intrans, Lomandra tropica, Petalostigma quadriloculare, Grevillea goodii, Grevillea ducurrens, Persoonia falcata, Mixed Eucalytus/ Corymbia seedlings, Acacia sp. seedlings, Buchanania obovata, Pachynema complanatum, Spermacoce sp., Haemodorum sp., Boronia lanuginosa, Hibbertia D29594 Woolaning, Plagiocarpus axillaris, Hibbertia dealbata, Hibbertia muelleri	D14
302	-14.2864	130.2316	OF	Eucalyptus miniata and E. tetrodonta open forest with Eulalia mackinlayi understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia greeniana	Livistona humilis (d), Stenocarpus cunninghamii, Acacia platycarpa, Buchanania obovata	Eulalia mackinlayi (d), Lomandra tropica, Petalostigma quadriloculare, Grevillea goodii, Persoonia falcata, Mixed Eucalytus/ Corymbia seedlings, Acacia sp. seedlings, Buchanania obovata, Pachynema complanatum, Spermacoce sp., Planchonia careya, Cycas canalis, Patersonia macrantha, Erythrophleum chlorostachys seedlings, Pouteria arnhemica seedlings, Acacia mimula seedlings, Grevillea myosodes, Acacia dimidiata, Pseudopogonatherum sp., Comesperma secundum, Acacia nuperrima, Boronia lanuginosa, Hibbertia D29594 Woolaning, Polygala triflora, Plagiocarpus axillaris, Tephrosia porrecta, Oldenlandia sp., Hibbertia dealbata	D4
303	-14.2828	130.2148	OW	Melaleuca leucadendra and Lophostemon lactifluus open woodland with dense mid-storey dominated by Grevillea pteridifolia and Banksia dentata, and Sarga plumosum understorey	Melaleuca leucadendra (d), Lophostemon lactifluus (d), Corymbia ptychocarpa	Grevillea pteridifolia (d), Banksia dentata, Corymbia ptychocarpa saplings Lophostemon lactifluus saplings, Livistona humilis, Pandanus aquaticus	Sarga plumosum (d), Banksia dentata seedlings, Corymbia ptychocarpa seedlings, Lophostemon lactifluus seedlings, Osbeckia australiana, Melaleuca sp. seedlings, Eriachne triseta, Verticordia cunninghamii, Grevillea pteridifolia seedlings, Pachynema complanatum, Acacia pellita, Acacia difficilis, Arundinella nepalensis, Nymphoides sp., Pseudopogonatherum contortum, Schoenus sp, Utricularia chrysantha, Utricularia fulva, Eulalia mackinlayi, Xyris complanata, Dapsilanthus spathaceus, Cyperus sp., Arthrostylis aphylla, Cartonema spicatum, Xyris indica, Mitrasacme gentianea, Mitrasacme connata, Utricularia odorata, Eriocaulon lividum	C3

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
304	-14.2736	130.1719	OW	Eucalyptus miniata open woodland with Sarga intrans understorey	Eucalyptus miniata (d), Corymbia confertiflora	Acacia sp. (d), Stenocarpus cunninghamii, Gardenia megasperma, Acacia mimula, Pouteria arnhemica, Persoonia falcata, Grevillea ducurrens, Buchanania obovata, Livistona humilis, Cycas canalis, Terminalia sp C, Acacia dimidiata, Calytrix exstipulata, Planchonia careya, Grevillea pteridifolia, Grevillea parallela, Jacksonia dilatata, Corymbia latifolia, Croton arnhemicus	Sarga intrans (d), Lomandra tropica, Petalostigma quadriloculare, Persoonia falcata, Mixed Eucalytus/ Corymbia seedlings, Acacia sp. seedlings, Pachynema complanatum, Spermacoce sp., Verticordia cunninghamii, Alphitonia excelsa seedlings, Gardenia megasperma seedlings, Aristida sp., Sporobolus sp., Eriachne sp., Eriachne obtusa, Sebastiania chamaelea, Schizachyrium fragile, Thaumastochloa major, Buchnera linearis, Hibbertia sp., Polygala triflora, Tephrosia porrecta, Oldenlandia sp., Hibbertia dealbata, Distichostemon hispidulus	D14
305	-14.2641	130.1309	OW	Corymbia polysciada and Eucalyptus tetrodonta open woodland with Sarga intrans understorey	Eucalyptus tetrodonta (d), Corymbia polysciada (d)	Verticordia cunninghamii (d), Grevillea decurrens, Terminalia canescens, Terminalia carpentariae, Calytrix exstipulata, Planchonia careya, Jacksonia dilatata, Croton arnhemicus, Cochlospermum fraseri, Owenia vernicosa, Acacia sp., Grevillea dryandri	Sarga intrans (d), Lomandra tropica, Petalostigma quadriloculare, Spermacoce sp., Eriachne obtusa, Eriachne ciliata, Thaumastochloa major, Gomphrena sp., Patersonia macrantha, Heteropogon triticeus, Triodia sp., Terminalia canescens seedlings, Polygala triflora, Kailarsenia suffructicosa, Stylidium sp.	D14
306	-14.2613	130.0967	W	Eucalyptus tetrodonta woodland with Sarga intrans understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata	Grevillea decurrens (d), Terminalia carpentariae (d), Calytrix exstipulata (d), Eucalyptus tetrodonta saplings, Erythrophleum chlorostachys, Corymbia ferruginea, Stenocarpus cunninghamii, Gardenia megasperma, Acacia mimula, Acacia praelongata, Acacia platycarpa, Persoonia falcata, Terminalia ferdinandiana, Buchanania obovata, Acacia difficilis, Grevillea goodii, Croton arnhemicus, Owenia vernicosa, Petalostigma quadriloculare, Alphitonia excelsa, Pogonolobus reticulatus	Sarga intrans (d), Mixed Eucalytus/ Corymbia seedlings, Mixed Acacia seedlings, Spermacoce sp., Sporobolus sp., Eriachne sp., Schizachyrium fragile, Thaumastochloa major, Buchnera linearis, Buchanania obovata seedlings, Ptilotus sp., Erythrophleum chlorostachys seedlings, Owenia vernicosa seedlings, Bossiaea bossiaeoides, Arthrostylis aphylla, Exocarpos latifolius, Sauropus glaucus, Hibbertia sp., Polygala triflora, Tephrosia porrecta, Oldenlandia sp., Caianus sp., Hibbertia dealbata	D4
307			OW	Eucalyptus tetrodonta and Corymbia sp open woodland with Sarga intrans understorey	Corymbia sp. (d), Eucalyptus tetrodonta (d), Corymbia confertiflora, Eucalyptus tectifica	Terminalia carpentariae (d), Gardenia megasperma, Cochlospermum fraseri, Erythrophleum chlorostachys, Livistona humilis, Terminalia pterocarya, Opilia amentacea, Croton arnhemicus	Sarga intrans (d), Buchnera linearis, Persoonia falcata, Eriachne obtusa, Petalostigma pubescens, Heteropogon triticeus, Mixed Eucalytus/ Corymbia seedlings, Erythrophleum chlorostachys seedlings, Alphitonia excelsa seedlings, Eriachne sulcata, Eragrostis sp., Calytrix achaeta, Galactica tenuiflora	H6
308	-14.2758	130.0662	OF	Eucalyptus miniata open forest with Sarga intrans inderstorey	Eucalyptus miniata (d), Corymbia confertiflora	Erythrophleum chlorostachys (d), Pandanus spiralis, Buchanania obovata, Ficus scobina, Owenia vernicosa, Petalostigma pubescens, Denhamia obscura, Terminalia carpentariae, Acacia difficilis, Syzygium eucalyptoides subsp. bleeseri, Croton arnhemicus	Sarga intrans (d), Lomandra tropica, Eucalytus miniata seedlings, Spermacoce sp., Alphitonia excelsa seedlings, Gardenia megasperma seedlings, Aristida sp., Panicum sp., Eragrostis sp., Schizachyrium fragile, Buchnera linearis, Buchanania obovata, Erythrophleum chlorostachys seedlings, Brachychiton paradoxus, Pandanus spiralis, Planchonia careya, Grevillea goodii, Waltheria indica, Gomphrena canescens., Mnesithea rottboellioides, Trachymene sp.	D4
309	-14.2770	130.0645	OW	Melaleuca leucadendra open woodland with a dense mid storey of Barringtonia acutangula, and Arundinella nepalensis understorey	Melaleuca leucadendra (d), Syzygium armstrongii	Barringtonia acutangula (d), Pandanus aquaticus, Grevillea pteridifolia, Alphitonia excelsa, Syzygium armstrongii, Acacia pellita, Acacia difficilis, Melaleuca viridiflora, Notelaea microcarpa, Breynia cernua	Arundinella nepalensis (d), Mnesithea rottboellioides, Fimbristylis sp., Ectrosia leporina, Panicum mindanaense, Whiteochloa capillipes, Cyperus sp, Nelsonia campestris	C3
310	-14.2859	130.0528	CF	Melaleuca leucadendra and Syzygium armstrongii closed forest with Arundinella nepalensis understorey	Melaleuca leucadendra (d), Syzygium armstrongii (d), Xanthostemon eucalyptoides	Pandanus aquaticus (d), Grevillea pteridifolia, Alphitonia excelsa, Syzygium armstrongii, Acacia pellita, Amyema sanguineum, Buchanania obovata, Lophostemon lactifluus, Xanthostemon eucalyptoides seedlings, Barringtonia acutangula, Timonius timon, Brachychiton diversifolius, Carallia brachiata	Arundinella nepalensis (d), Mnesithea rottboellioides, Ectrosia leporina, Pandanus aquaticus seedlings, Lophostemon lactifluus seedlings, Nymphoides sp.	C3
311	-14.2857	130.0523	OW	Corymbia latifolia and Eucalyptus tectifica open woodland with Hetropogon triticeus understorey	Corymbia latifolia (d), Eucalyptus tectifica (d), Erythrophleum chlorostachys, Corymbia polysciada	Terminalia carpentariae (d), Livistona humilis, Gardenia megasperma, Brachychiton diversifolius, Petalostigma pubescens, Cochlospermum fraseri, Persoonia falcata	Heteropogon triticeus (d), Grewia retusifolia	D10
312	-12.3637	136.6995	W	Eucalyptus tetrodonta tall woodland with Sarga plumosum understorey	Eucalyptus tetrodonta (d), Erythrophleum chlorostachys	Buchanania obovata (d), Livistona humilis (d), Planchonia careya (d), Erythrophleum chlorostachys, Petalostigma quadriloculare, Acacia aulacocarpa, Acacia leptocarpa, Corymbia polycarpa, Eucalyptus ferruginea, Eucalyptus tetrodonta, Melaleuca viridiflora, Grevillea heliosperma, Hakea arborescens, Brachychiton megaphyllus, Pogonolobus reticulatus	Sarga plumosum (d), Hibbertia dealbata (d), Dapsilanthus spathaceus, Fimbristylis sp., Cassytha filiformis, Pandanus spiralis, Spermacoce leptoloba	D4
313	-12.3884	136.6639	W	Eucalyptus tetrodonta woodland with Sarga intrans understorey	Eucalyptus tetrodonta (d)	Buchanania obovata (d), Acacia yirrkalensis (d), Eucalyptus tetrodonta (d) Grevillea heliosperma (d), Hibbertia dealbata, Pachynema complanatum, Petalostigma quadriloculare, Acacia auriculiformis, Acacia multisiliqua, Acacia sublanata, Calytrix exstipulata, Corymbia ferruginea, Grevillea pungens, Grevillea pteridifolia, Persoonia falcata, Exocarpos latifolius	Sorghum intrans (d), Bossiaea bossiaeoides, Cassytha filiformis, Grevillea dryandri, Sebastiania chamaelea, Heteropogon triticeus	D4
314	-12.3860	136.6266	OF	Eucalyptus tetrodonta tall open forest with Heteropogon triticeus and Hibbertia dealbata understorey	Eucalyptus tetrodonta (d)	Livistona humilis (d), Buchanania obovata, Erythrophleum chlorostachys, Acacia auriculiformis, Acacia gonocarpa, Acacia sublanata, Pandanus spiralis, Banksia dentata, Grevillea pteridifolia	Heteropogon triticeus (d), Hibbertia dealbata (d), Petalostigma quadriloculare, Sauropus brunonis, Jacksonia dilatata, Vigna vexillata, Planchonia careya, Eucalyptus tetrodonta, Sarga intrans, Grevillea goodii, Persoonia falcata, Spermacoce leptoloba, Distichostemon hispidulus, Ampelocissus acetosa	D4
315	-12.4626	136.5440	OF	Eucalyptus tetrodonta and E. miniata tall open forest with Sarga intrans and Saraga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d)	Livistona humilis (d), Erythrophleum chlorostachys (d), Acacia lamprocarpa (d), Eucalyptus tetrodonta (d) Buchanania obovata, Hibbertia oblongata, Petalostigma quadriloculare, Acacia auriculiformis, Hakea arborescens, Persoonia falcata, Pogonolobus reticulatus, Sebastiania chamaelea	Erythrophleum chlorostachys, Hibbertia dealbata, Pachynema complanatum, Sebastiania chamaelea, Eucalyptus miniata, Sarga plumosum, Sarga intrans, Heteropogon triticeus, Grevillea goodii, Smilax australis	D4

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
316	-12.4572	136.5379	W	Eucalyptus tetrodonta woodland with Pachynema complanatum and Fimbristylis sp. understorey	Eucalyptus tetrodonta (d)	Livistona humilis (d), Buchanania obovata, Hibbertia dealbata, Petalostigma quadriloculare, Planchonia careya, Acacia leptocarpa, Acacia multisiliqua, Acacia yirrkalensis, Calytrix exstipulata, Eucalyptus ferruginea, Grevillea angulata, Grevillea heliosperma, Persoonia falcata, Pogonolobus reticulatus	Pachynema complanatum (d), Fimbristylis sp., Sebastiania chamaelea, Jacksonia dilatata, Eriachne pallescens, Sarga plumosum, Grevillea dryandri	D4
317	-12.4890	136.5115	W	Corymbia ptycocarpa and Melaleuca viridiflora woodland with Imperata cylindrica, Eriachne sp. Cymbopogon refractus understorey	Corymbia ptychocarpa (d), Melaleuca viridiflora (d)	Planchonia careya, Acacia leptocarpa, Pandanus spiralis, Banksia dentata, Grevillea pteridifolia, Hakea arborescens	Cymbopogon refractus (d), Imperata cylindrica (d), Eriachne sp. (d), Themeda sp., Philydrum lanuginosum, Spermacoce leptoloba	C13
318	-12.5103	136.4935	CF	Closed forest dominated by Eucalyptus tetrodonta , Carpentaria acuminata, Calophyllum inophyllum, Terminalia grandiflora, Melaleuca cajuputi, Melaleuca viridiflora, Xanthostemon paradoxus, Grevillea pteridifolia, Alphitonia excelsa and Nauclea orientalis with a dense mid storey of Hydriastele wendlandiana, Buchanania obovata, Lophostemon lactifluus, Pandanus aquaticus and Pogonolobus reticulatus	Eucalyptus tetrodonta , Carpentaria acuminata, Calophyllum inophyllum, Terminalia grandiflora, Melaleuca cajuputi, Melaleuca viridiflora, Xanthostemon paradoxus, Grevillea pteridifolia, Alphitonia excelsa, Nauclea orientalis	Hydriastele wendlandiana, Buchanania obovata, Lophostemon lactifluus, Pandanus aquaticus, Pogonolobus reticulatus	Alyxia spicata, Fimbristylis sp., Dianella odorata	C3
319	-12.6077	136.4057	W	Eucalyptus tetrodonta and Erthrophleumm chlorostachys tall woodland with Sarga plumosum understorey	Erythrophleum chlorostachys (d), Eucalyptus tetrodonta (d), Eucalyptus miniata	Livistona humilis (d), Wrightia saligna, Cycad sp., Hibbertia dealbata, Hibbertia sp., Planchonia careya, Pandanus spiralis, Hakea arborescensAE Brachychiton diversifolius, Pogonolobus reticulatus	Sarga plumosum (d), Buchanania obovata, Erythrophleum chlorostachys, Pachynema complanatum, Petalostigma quadriloculare, Sauropus stenocladus ssp stenocladus, Sebastiania chamaelea, Eucalyptus tetrodonta, Pandanus spiralis, Heteropogon triticeus, Eriachne pallescens, Kailarsenia suffruticosa, Brachychiton megaphyllus, Helicteres cana, Grewia retusifolia, Ampelocissus acetosa	D4
320	-12.6215	136.3844	W	Eucalyptus tetrodonta tall woodland with Sarga plumosum understorey	Eucalyptus tetrodonta (d), Erythrophleum chlorostachys, Eucalyptus miniata	Livistona humilis (d), Acacia oncinocarpa (d), Buchanania obovata, Erythrophleum chlorostachys, Cycad sp., Planchonia careya, Acacia dimidiata, Eucalyptus miniata, Eucalyptus tetrodonta, Grevillea striata, Gardenia sp., Brachychiton diversifolius, Brachychiton megaphyllus	Sarga plumosum (d), Erythrophleum chlorostachys, Hibbertia dealbata Pachynema complanatum, Petalostigma quadriloculare, Eucalyptus ferruginea, Eriachne sp., Grevillea dryandri, Hakea arborescens, Grewia retusifolia	D4
321	-12.6356	136.3442	OW	Eucalyptus tetrodonta and E. miniata open woodland with Sarga plumosum understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d), Brachychiton diversifolius	Livistona humilis (d), Dolichandrone filiformis, Planchonia careya, Acacia oncinocarpa, Eucalyptus miniata	Sarga plumosum (d), Buchanania obovata, Hibbertia dealbata, Pachynema complanatum, Petalostigma quadriloculare, Sauropus stenocladus ssp stenocladus, Hakea arborescens, Distichostemon hispidulus, Helicteres cana	D4
322	-12.6430	136.3236	OW	Cormbia polycarpa, Melaleuca viridiflora and Lophostemon lactifluus open woodland with dense mid storey of Pandanus spiralis and Banksia dentata and Grevillea pteridifolia with Imperata cylindrica, Eriachne sp and Cymbopogon refractus understorey	Lophostemon lactifluus (d), Corymbia polycarpa (d), Melaleuca viridiflora (d), Acacia auriculiformis	Pandanus spiralis (d), Banksia dentata (d), Grevillea pteridifolia (d), Livistona humilis, Acacia leptocarpa, Planchonia careya	Cymbopogon refractus (d), Eriachne sp. (d), Imperata cylindrica (d), Mitrasacme sp., Lophostemon lactifluus, Pandanus spiralis, Philydrum lanuginosum, Themeda triandra, Heteropogon contortus	C3
323	-12.6522	136.2976	W	Eucalyptus tetrodonta and E. miniata woodland with Sarga plumosum and Heteropogon triticeus understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d)	Livistona humilis (d), Terminalia carpentariae, Cycad sp., Planchonia careya, Corymbia ferruginea, Grevillea heliosperma, Grevillea striata, Persoonia falcata	Sarga plumosum (d), Heteropogon triticeus (d), Buchanania obovata, Cartonema spicatum, Hibbertia dealbata, Pachynema complanatum, Petalostigma quadriloculare, Sauropus stenocladus ssp stenocladus, Eriachne pallescens, Grevillea dryandri, Helicteres cana	D4
324	-12.5753	136.4378	W	Eucalyptus tetrodonta and Erythrophleum chlorostachys woodland with Sarga plumosum understorey	Erythrophleum chlorostachys (d), Eucalyptus tetrodonta (d), Eucalyptus miniata, Brachychiton diversifolius	Livistona humilis (d), Erythrophleum chlorostachys, Cycad sp., Acacia lamprocarpa, Acacia auriculiformis, Eucalyptus miniata, Eucalyptus tetrodonta, Hakea arborescens	Sarga plumosum (d), Buchanania obovata, Hibbertia dealbata, Pachynema complanatum, Petalostigma quadriloculare, Sauropus stenocladus ssp stenocladus, Sebastiania chamaelea, Planchonia careya, Pandanus spiralis, Spermacoce leptoloba, Brachychiton diversifolius, Brachychiton megaphyllus, Helicteres can	D4
325	-12.5639	136.4487	OW	Corymbia polycarpa and Corymbia porrecta woodland with dense midstorey of Acacia auriculiformis, Lophostemon lactifluus and Grevillea pteridifolia, and Themeda triandra understorey	Corymbia polycarpa (d), Corymbia porrecta (d), Erythrophleum chlorostachys, Eucalyptus tetrodonta (away from creek banks), Lophostemon lactifluus, Melaleuca cajuputi, Carallia brachiata	Acacia auriculiformis (d), Lophostemon lactifluus (d), Grevillea pteridifolia (d), Hydriastele wendlandiana, Buchanania obovata, Canarium australianum, Terminalia carpentariae, Breynia cernua, Barringtonia acutangula, Litsea glutinosa, Melastoma polyanthum, Acacia multisiliqua, Pandanus aquaticus, Nauclea orientalis, Timonius timon, Pogonolobus reticulatus	Themeda triandra (d), Fimbristylis sp., Philydrum lanuginosum, Dicranopteris linearis, Flagellaria indica, Limnophila fragrans	C10
326	-12.2981	136.7673	OW	Euclayptus tetrodonta open woodland with Ischaemum sp. understorey	Eucalyptus tetrodonta (d)	Livistona humilis (d), Acacia auriculiformis (d), Grevillea pteridifolia (d), Petalostigma pubescens, Acacia lamprocarpa, Acacia leptocarpa, Planchonia careya, Corymbia polycarpa, Melaleuca viridiflora, Pandanus spiralis, Hakea arborescens	Ischaemum sp.(d), Sarga plumosum, Sebastiania chamaelea, Buchanania obovata, Hibbertia dealbata, Pachynema complanatum, Vigna vexillata, Cassytha filiformis, Melaleuca viridiflora, Banksia dentata, Helicteres cana	D4
327	-12.2799	136.7848	OF	Eucalyptus tetrodonta open forest with Exocarpus latifolius and Sarga plumosum understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata	Livistona humilis (d), Acacia auriculiformis (d), Buchanania obovata, Denhamia obscura, Acacia lamprocarpa, Acacia dimidiata, Grevillea heliosperma, Persoonia falcata	Sarga plumosum (d), Exocarpos latifolius (d), Terminalia canescens, Pachynema complanatum, Petalostigma quadriloculare, Sauropus stenocladus ssp stenocladus, Sebastiania chamaelea, Templetonia hookeri, Grevillea dryandri, Persoonia falcata	D4
328	-12.2409	136.7882	OW	Eucalyptus tetrodonta open woodland with Hibbertia dealbata, Templetonia hookeri and Fimbristylis sp. Understorey	Eucalyptus tetrodonta (d)	Livistona humilis (d), Calytrix exstipulata (d), Corymbia ferruginea (d), Buchanania obovata, Acacia lamprocarpa, Acacia multisiliqua, Acacia sublanata, Acacia yirrkalensis, Calytrix exstipulata, Eucalyptus tetrodonta, Grevillea heliosperma, Grevillea pungens, Grevillea pteridifolia, Persoonia falcata, Exocarpos latifolius, Distichostemon hispidulus	Hibbertia dealbata (d), Templetonia hookeri (d), Fimbristylis sp., Pachynema complanatum, Petalostigma quadriloculare, Sauropus stenocladus ssp stenocladus, Bossiaea bossiaeoides, Eriachne pallescens, Eriachne sp., Sarga plumosum, Triodia sp., Grevillea dryandri, Boronia lanuginosa, Buchera linearis	D4
329	-12.2408	136.7882	OF	Open forest dominated by Corymbia alba, Lophostemon lactifluus, Melaleuca cajuputi and Corymbia polycarpa with dense midstorey of Acacia leptocarpa and Lophostemon lactifluus, and mixed grass\sedge understorey	Corymbia alba (d), Corymbia polycarpa (d), Lophostemon lactifluus (d), Melaleuca cajuputi (d), Melaleuca viridiflora	Acacia leptocarpa (d), Pandanus spiralis (d), Lophostemon lactifluus, Timonius timon, Pogonolobus reticulatus	Wahlenbergia caryophylloids, Dapsilanthus spathaceus, Fuirera ciliaris, Cullen badocanum, Cymbopogon refractus, Imperata cylindrica, Hyptis suaveolens*, Themeda triandra, Philydrum lanuginosum, Smilax australis	C3

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
330	-12.3996	136.5991	OF	Eucalyptus tetrodonta open forest with dense mid storey of Erythrophleum chlorostachys, Planchonia careya and Livistona humilis with Sarga plumosum understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata	Livistona humilis (d), Erythrophleum chlorostachys (d), Planchonia careya (d), Acacia auriculiformis, Pandanus spiralis, Grevillea heliosperma, Persoonia falcata, Brachychiton megaphyllus, Brachychiton diversifolius, Vitex glabrata	Erythrophleum chlorostachys (d), Hibbertia dealbata (d), Sarga plumosum (d), Buchanania obovata, Cassytha filiformis, Pachynema complanatum, Petalostigma quadriloculare, Sauropus stenocladus ssp stenocladus, Vigna vexillata, Gonocarpus leptothecus, Pandanus spiralis, Chrysopogon fallax, Grevillea goodii, Kailarsenia suffruticosa	D4
331	-12.4026	136.5721	W	Eucalyptus tetrodonta and E. miniata woodland with dense mid storey of Livistona humilis and E. miniata seedlings and Sarga plumosum and Sebastiania chamaelea understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d) Brachychiton diversifolius	Livistona humilis (d), Eucalyptus miniata (d) Cycad sp., Planchonia careya, Acacia lamprocarpa, Acacia holosericea, Acacia leptocarpa, Acacia oncinocarpa, Corymbia ferruginea, Eucalyptus ptychocarpa, Eucalyptus tetrodonta, Pandanus spiralis, Banksia dentata, Persoonia falcata, Timonius timon	Erythrophleum chlorostachys (d), Sarga plumosum (d), Sebastiania chamaelea (d) Buchanania obovata, Hibbertia dealbata, Hibbertia sp., Petalostigma quadriloculare, Sauropus stenocladus ssp stenocladus, Bossiaea bossiaeoides, Jacksonia dilatata, Vigna vexillata, Themeda triandra, Spermacoce leptoloba, Buchera linearis, Helicteres cana, Melhania oblongifolia	D4
332	-12.4073	136.5623	W	Eucalyptus tetrodonta woodland with mixed species shrub understorey dominated by Eucalyptus tetrodonta seedlings and Petalostigma quadriloculare	Eucalyptus tetrodonta (d), Eucalyptus miniata	Livistona humilis (d), Corymbia ferruginea (d), Buchanania obovata, Erythrophleum chlorostachys, Acacia oncinocarpa, Corymbia ferruginea, Grevillea heliosperma	Petalostigma quadriloculare (d), Eucalyptus tetrodonta (d), Buchanania obovata, Hibbertia dealbata, Pachynema complanatum, Sauropus stenocladus ssp stenocladus, Sebastiania chamaelea, Bossiaea bossiaeoides, Stylosanthes humilis, Gonocarpus leptothecus, Grevillea dryandri, Sarga plumosum, Aristida sp., Helicteres cana, Melhania oblongifolia	D4
333	-12.4073	136.5624	ST	Open Eriachne sp. grassland with emergent Eucalyptus tetrodonta	Eucalyptus tetrodonta	Persoonia falcata, Acacia multisiliqua, Grevillea pteridifolia	Eriachne sp. (d), Hyptis suaveolens*, Stachytarpheta sp. *, Boronia languinosa, Buchanania obovata, Grevillea dryandri, Bossiaea bossiaeoides, Distochostemon hispidulum, Petalostigma quadriloculare, Pachynema complanatum, Grevillea pungens	C18
334	-12.2045	136.7697	CF	Melaleuca viridiflora and Acacia leptocarpa closed forest swamp with Eriachne stipacea and Mnesithea rottboellioides understorey	Melaleuca viridiflora (d), Acacia leptocarpa (d), Grevillea pteridifolia, Melaleuca nervosa, Cassytha filiformis		Eriachne stipacea (d), Mnesithea rottboellioides (d), Pseudopogontherum contortum, Ectrosia leporina, Haemodorum parviflorum, Drosera indica, Goodenia sp., Mitrasacme sp	C13
335	-12.6840	135.6882	OW	Melaleuca viridiflora, Eucalyptus bigalerita and Lophostemon lactifluus open woodland with Cymbopogon refractus understorey	Eucalyptus bigalerita (d), Lophostemon lactifluus (d), Melaleuca viridiflora (d), Petalostigma pubescens, Corymbia polycarpa, Corymbia latifolia	Pandanus spiralis (d), Hakea arborescens (d), Acacia leptocarpa, Planchonia careya, Grevillea decurrens, Grevillea pteridifolia, Brachychiton megaphyllus	Cymbopogon refractus (d), Dapsilanthus spathaceus, Fimbristylis pterygosperma, Templetonia hookeri, Haemodorum parviflorum, Thysanotus banksii, Osbeckia chinensis, Melaleuca viridiflora, Eriachne sp., Germainia grandilofa, Heteropogon contortus, Buchera linearis	C13
336	-12.6906	135.6527	OW	Eucalytpus miniata and E. tetrodonta open woodland with Sarga plumosum understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia latifolia, Eucalyptus tectifica	Eucalyptus tetrodonta (d), Hakea arborescens (d), Buchanania obovata, Livistona humilis, Acacia auriculiformis, Corymbia ferruginea, Grevillea angulata, Grevillea decurrens, Grevillea striata, Persoonia falcata	Erythrophleum chlorostachys (d), Sarga plumosum (d), Gymnatheria sp., Pachynema complanatum, Petalostigma quadriloculare, Sauropus tenocladus ssp stenocladus, Sebastiania chamaelea, Hyptis suaveolens*, Heteropogon triticeus, Grevillea goodii, Buchera linearis, Helicteres cana	D4
337	-12.7142	135.6088	W	Corymbia polycarpa and Eucalyptus tetrodonta woodland with Sarga plumosum understorey	Corymbia polycarpa (d), Eucalyptus tetrodonta (d), Callitris intratropica	Livistona humilis, Breynia cernua, Croton arnhemicus, Petalostigma pubescens, Jacksonia dilatata, Templetonia hookeri, Planchonia careya, Acacia dimidiata, Acacia leptocarpa, Calytrix brownii, Melaleuca nervosa Melaleuca viridiflora, Pandanus spiralis, Grevillea striata, Persoonia falcata, Alphitonia excelsa, Pogonolobus reticulatus	Sarga plumosum (d), Ischaemum sp., Schizachyrium sp.	D14
338	-12.6990	135.7042	OF	Eucalyptus miniata and E. tetrodonta open forest with Sarga plumosum and Sauropus stenocladus ssp stenocladus understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Callitris intratropica	Livistona humilis (d), Acacia lamprocarpa (d), Persoonia falcata (d), Buchanania obovata, Dolichandrone filiformis, Petalostigma pubescens, Litsea glutinosa, Planchonia careya, Owenia vernicosa, Acacia auriculiformis, Calytrix exstipulata, Pandanus spiralis, Grevillea agrifolia, Hakea arborescens, Exocarpos latifolius	Sauropus stenocladus ssp stenocladus (d), Sarga plumosum (d), Pachynema complanatum, Petalostigma quadriloculare, Sebastiania chamaelea, Grevillea goodii, Distichostemon hispidulus, Brachychiton megaphyllus, Smilax australis	D4
339	-12.8905	135.3947	OF	Eucalyptus miniata and E. tetrodonta open forest with mixed species herb\shrub understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Grevillea pteridifolia	Buchanania obovata, Livistona humilis, Denhamia obscura, Petalostigma pubescens, Planchonia careya, Lophostemon grandiflorus, Persoonia falcata, Exocarpos latifolius, Brachychiton megaphyllus, Brachychiton diversifolius, Pogonolobus reticulatus	Pachynema complanatum, Sauropus stenocladus ssp stenocladus, Acacia gonocarpa, Acacia sublanta, Pandanus spiralis, Arastrida sp., Schizachyrium sp., Sarga plumosum, Grevillea goodii, Gonocarpus leptothecus	D4
340	-12.9294	135.3575	CF	Eucalyptus miniata and E. tetrodonta open forest with Hibbertia dealbata understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Eucalyptus porrecta	Buchanania obovata, Cycad sp., Templetonia hookeri, Acacia oncinocarpa Acacia gonocarpa, Persoonia falcata, Calytrix exstipulata, Eucalyptus miniata, Eucalyptus porrecta, Eucalyptus tetrodonta, Syzygium suborbiculare	Hibbertia dealbata (d), Pachynema complanatum, Petalostigma quadriloculare, Bossiaea bossiaeoides, Acacia gonocarpa, Acacia nuperrima, Acacia sublanata, Aristida sp., Sarga plumosum, Triodia sp., Grevillea goodii, Brachychiton megaphyllus	D4
341	-12.9617	135.3481	ST	Platyzoma microphyllum and Aristida sp. open swamp with emergent Eucalyptus tetrodonta, Pandanus spiralis and Lophostemon lactifluus	Eucalyptus tetrodonta (d), Owenia vernicosa, Corymbia confertiflora, Lophostemon lactifluus	Lophostemon lactifluus (d), Pandanus spiralis (d), Hibbertia angustifolia, Petalostigma quadriloculare, Templetonia hookeri, Acacia dunnii, Calytrix exstipulata, Melaleuca nervosa, Banksia dentata, Persoonia falcata, Distichostemon hispidulus, Livistona humilis	Platyzoma microphyllum (d), Melaleuca nervosa (d), Aristida sp. (d), Fimbristylis sp., Pachynema complanatum, Hibbertia angustifolia, Sauropus stenocladus ssp stenocladus, Bossiaea bossiaeoides, Acacia sublanata, Verticordia cunninghamii, Schizachyrium sp., Grevillea pungens, Spermacoce leptoloba	none
342	-12.9964	135.3225	W	Eucalyptus tetrodonta and E. miniata woodland with dense mixed shrub species mid storey and Pachynema complanatum and Finbristylis sp. understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d)	Templetonia hookeri (d), Acacia latescens (d), Buchanania obovata, Livistona humilis, Acacia difficilis, Acacia dunnii, Acacia oncinocarpa, Acacia producta, Acacia sublanta, Eucalyptus tetrodonta, Persoonia falcata, Grevillea pungens, Alphitonia excelsa	Pachynema complanatum (d), Fimbristylis sp.(d), Sauropus stenocladus ssp stenocladus, Bossiaea bossiaeoides, Gonocarpus leptothecus, Sida sp., Calytrix exstipulata, Eucalyptus miniata, Grevillea pungens	D4
343	-13.0218	135.2886	OW	Eucalyptus tetrodonta and E. miniata open woodland with mixed species grass\shrub understorey dominated by Pachynema complanatum understorey	Eucalyptus tetrodonta (d), Eucalyptus miniata (d)	Livistona humilis, Planchonia careya, Corymbia ferruginea, Xanthostemon paradoxus, Hibbertia dealbata	Pachynema complanatum (d), Buchanania obovata, Fimbristylis sp., Petalostigma pubescens, Sauropus stenocladus ssp stenocladus, Bossiaea bossiaeoides, Gonocarpus leptothecus, Sida sp., Acacia latescens, Acacia producta, Eucalyptus tetrodonta, Eucalyptus miniata, Schizachyrium sp., Setaria apiculata, Triodia sp., Persoonia falcata	D4

Appendix 2 Field surey data - Flora Species

EcOz Site Number	Lat	Long	Structural Formation	Community description	Upper	Mid	Lower	Veg Assoc
344	-13.0489	135.2523	W	Eucalyptus tetrodonta and Eucalyptus miniata woodland with mixed species shrub mid storey and Pachynema complanatum and Sauropus stenocladus ssp stenocladus understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d)	Eucalyptus miniata (d), Buchanania obovata, Livistona humilis, Terminalia carpentariae, Hibbertia dealbata, Bossiaea bossiaeoides, Acacia latescens, Acacia producta, Acacia sublanta, Eucalyptus tetrodonta, Persoonia falcata, Grevillea pteridifoli;	Pachynema complanatum (d), Sauropus stenocladus ssp stenocladus (d), Gonocarpus leptothecus, Calytrix exstipulata, Pandanus spiralis	D4
345	-13.0827	135.2047	OF	Eucalyptus tetrodonta and E. miniata open forest with dense mid storey of Hibbertia dealbata and Acacia latescens and Schizachyrium sp. and Triodia sp. understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Corymbia blesseri	Hibbertia dealbata (d), Acacia latescens (d), Buchanania obovata, Livistona humilis, Terminalia platyphylla, Templetonia hookeri, Acacia oncinocarpa, Verticordia cunninghamii, Persoonia falcata, Grevillea pungens	Schizachyrium sp. (d), Triodia sp. (d), Hibbertia angustifolia, Pachynema complanatum, Petalostigma quadriloculare, Acacia producta, Eriachne sp., Grevillea goodii, Gardenia sp.	D4
346	-13.1015	135.1637	W	Corymbia polycarpa and Corymbia latifolia woodland with Sarga plumosum	Corymbia latifolia (d), Corymbia polycarpa (d), Callitris intratropica, Eucalyptus jensenii, Xanthostemon paradoxus	Corymbia latifolia, Erythrophleum chlorostachys, Corymbia ferruginea	Petalostigma quadriloculare (d), Sarga plumosum (d), Fimbristylis sp., Hibbertia dealbata, Pachynema complanatum, Gonocarpus leptothecus, Calytrix exstipulata, Lophostemon lactifluus, Triodia sp., Grevillea goodii	C10
347	-13.1166	135.1230	W	Eucalyptus miniata and E. tetrodonta woodland with Sarga intrans understorey	Eucalyptus miniata (d), Eucalyptus tetrodonta (d), Terminalia carpentariae, Terminalia platyphylla, Owenia vernicosa, Xanthostemon paradoxus	Petalostigma pubescens (d), Acacia oncinocarpa (d), Buchanania obovata, Dolichandrone filiformis, Hibbertia dealbata, Templetonia hookeri, Acacia megalantha, Melaleuca minutifolia, Pandanus spiralis, Grevillea angulata, Brachychiton megaphyllus, Pogonolobus reticulatus	Sarga intrans (d), Pachynema complanatum, Hibbertia angustifolia, Sauropus stenocladus ssp stenocladus, Acacia sublanta, Triodia sp., Grevillea goodii, Gardenia sp.	D4
348	-13.1238	135.1036	CF	Melaleuca leucadendra closed forest with dense midstorey of Pandanus aquaticus, and Cymbopogon refractus and Imperata cylindrica understorey	Melaleuca leucadendra (d)	Pandanus aquaticus (d), Barringtonia acutangula, Acacia auriculiformis	Cymbopogon refractus (d), Imperata cylindrica (d), Blumea sp., Fimbristylis sp., Fuirera sp., Haemodorum parviflorum, Crinum augustifolium, Philydrum lanuginosum, Heteropogon contortu	C3
349	-14.092	133.987	OW	Acacia umbellata and Acacia holosericea open woodland with Excoecaria understorey	Acacia umbellata (d), Acacia holosericea	Excoecaria parvifolia (d)		E1
350	-14.019	134.060	CF	Melaleuca cajuputi closed forest with a dense midstorey of Pandanus spiralis, and mixed grass\sedge species understorey	Melaleuca cajuputi (d), Lophostemon grandiflorus ssp. riparius, Timonius timon, Nauclea orientalis	Pandanus spiralis (d), Melaleuca cajuputi, Barringtonia acutangula, Nauclea orientalis, Lophostemon grandiflorus ssp. riparius, Ludwigia octovalvis, Glochidion xerocarpum, Dodonaea platypter	Heteropogon contortus, Chrysopogon fallax, Imperata cylindrica, Ludwigia octovalvis	C3
351	-14.015	134.063	CF	Melalueca cajuputi closed forest with dense mid storey of Barringtonia acutangula, and mixed spcies grass\sedge understorey	Melaleuca cajuputi (d), Timonius timon, Terminalia platyphylla, Nauclea orientalis, Lophostemon grandiflorus ssp. Riparius	Melaleuca cajuputi (d), Barringtonia acutangula (d), Pandanus aquaticus, Pandanus spiralis, Glochidion xerocarpum, Dodonaea platyptera, Cordia subcordata	Cyperus sp., Imperata cylindrica, Themeda quadrivalvis*, Hyptis suaveolens*, Pennisetum polystachion*	C3

Appendix 3
Photos of Representative Vegetation Communities

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 0-10

KP 10-20

KP 20-30

KP 30-40

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 40-50

KP 50-60

KP55 Anopheles Creek

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 60-70

KP 63 Chalanyi Creek

KP 70-80

KP 75 Moyle River

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 80-90

KP90-100

KP 92 Moyle River upstream

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 100-110

KP 110-120

KP 120-130

KP 130-140

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP140-150

KP 150-160

KP160-170

KP 170-180

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 180-190

KP 190-200

None recorded

KP 200-210

KP 210-220

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 217 Homestead Creek

KP 220-230

KP 231 Bradshaw Creek

KP 240-250

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 250-260

KP 260-270

KP 266 Daly River

KP 270-280

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 280-290

KP 290-300

KP 300-310

KP 317 Chainman Creek

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 320-330

KP 330-340

KP340-350

KP 350-360

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 360-370

KP 370-380

KP380-390

KP 390-400

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 400-410

KP 401 Beswick Creek

KP 410-420

KP 420-430

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 424 Waterhouse River

KP 430-440

KP 444 Chambers River

KP 450-460

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 460-470

KP 470-480

KP 475 Bukalorkmi Creek

KP 480-490

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 490-500

KP 499 Maiwok Creek

KP 506 Flying Fox Creek

KP 509 Derim Derim Creek

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 510-520

KP 520-530

None recorded

KP 530-540

KP 540-550

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 550 Mainoru River

KP 550-560

KP 560-570

KP 570 Horse Creek

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 570-580

KP 580-590

KP 590-600

KP 600 Wilton River

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 600-610

KP 610-620

KP 620-630 semi-permanent swamp

KP620-630

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 630-640

KP 642 Annie Creek

KP 640-650

KP 650-660

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 660-670

KP 670-680

KP 680-690

KP 685 Unnamed creek upstream of route

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 690-700

Unsurveyed

KP 701 Goyder River

KP 700-710

KP 710-720

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 720-730

KP 734 Semi-permanent swamp

KP 730-740

KP 740-750

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 750-770 Mitchell Ranges

Unsurveyed

KP 770-780

KP 780-790

KP 785 Buckingham River

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 786 Semi-permanent swamp south of route

KP 788 Semi-permanent swamp south of route

KP 790-800

KP 800-810

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 810-820

KP 820-830

KP 830-840

KP 837-839 Goromuru River

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 840-850

KP 852 Boggy Creek

KP 850-860

Kp 860-870

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 870-880

KP 873 Perennial creek

KP 881 Cato River

KP 880-890

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP 890-900

KP 900-910

KP 910-920

KP 913 Giddy River

Appendix 3 Photos of representative vegetation communities along pipeline corridor

KP920-930

KP 922 Latram River

KP 930-940 Seasonal swamp

Appendix 3 Photos of vegetation at sites proposed for compressor stations and construction camps

Compressor Station at KP 163-164

Compressor Station at KP 322

Compressor Station at KP 364

Compressor Station at KP533

Appendix 3 Photos of vegetation at sites proposed for compressor stations and construction camps

Construction Camp near KP 69

Construction Camp at KP 533

Construction Camp at KP 631

Construction Camp at KP 787

Appendix 3 Photos of vegetation at sites proposed for compressor stations and construction camps

Construction Camp near KP 888