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Vegetation Assessment & Mapping Specialists

Vegetation Communities and Regional Ecosystems of The Torres Strait Islands, Queensland, Australia.

An Accompaniment to Land Zone, Vegetation Community and Regional Ecosystem Maps.

Final Report to

Torres Strait Regional Authority

Land & Sea Management Unit.

by 3d Environmental

Stanton, D.J., Fell, D.G. and Gooding, D.O.

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Executive Summary

The Torres Strait region, lying between the tip of Cape York Peninsula and the south-western coast of Papua New Guinea, has long been recognised for its cultural and ecological uniqueness and diversity. The need to preserve and appropriately manage the cultural, social and environmental values identified throughout the region is now more than ever apparent and vital given the pressures imposed by a range of current and potentially threatening processes.

Under funding from the Natural Heritage Trust administered through the Torres Strait Regional Authority Land and Sea Management Unit, a regional vegetation classification and mapping survey of the Torres Strait Islands has been undertaken. The report and accompanying maps present the first comprehensive assessment of the regions vegetation with previous studies either much broader in scale or focused on particular areas or islands. The information is intended to directly address priority issues identified in the Torres Strait Regional Land and Sea Management Strategy being; lack of information on terrestrial biodiversity ecology or biological process; and the lack of a spatial representation of vegetation communities (and regional ecosystems) at an appropriate scale for local land use planning initiatives. Furthermore, the information provided in this study serves to provide baseline data layers to support the development of Pilot Sustainable Land Use Plans on six islands (Saibai, Boigu, Dauan, Iama, Masig, and Erub).

The study focused on detailed stereoscopic interpretation of the available aerial photography, both recent and historical, supported by satellite imagery as a basis for vegetation community delineation. A field survey undertaken to provide floristic characterisation of representative vegetation communities was completed by two field ecologists between 16 October and 2 December, 2007. The survey collected data at 1 372 survey locations over a total land area of 892 km^2, supplementing 37 sites surveyed during previous data collection exercises (Neldner and Clarkson 2005), providing a spatial scale of sampling at scale of roughly 1:25 000. A secondary phase of field sampling was completed in July 2008 for Badu Island.

In total, the study identified 158 remnant vegetation communities within 27 Broad Vegetation Groups. These vegetation communities are classified into the regional ecosystem framework based on landform association, structural type and floristic assemblage. Seventy-six regional ecosystems are identified in the study area, of which 10 are recognised as new ecosystem types for the Cape York Peninsula Bioregion, within which 218 regional ecosystems are currently recognised. This accounts for approximately one third of the total ecosystem diversity present in the bioregion within a recognised sub-region contributing less than 0.01% to the bioregions total land area (12,050,307.0576 ha – IBRA Version 5). The vascular flora is similarly diverse with 1 330 vascular flora species known and including 196 naturalised species, seven species declared on *the Land Protection Act 2002*, and 31 species listed as endangered, vulnerable or rare under Queensland's *Nature Conservation Act (Wildlife) Regulation 2006*. The Torres Strait flora approximates 40% of the species known for the Cape York Peninsula bioregion and some 13% of the Queensland vascular flora.

The Islands that make up the Torres Strait sub-region are truly unique and biologically diverse terrestrial ecosystems which support outstanding terrestrial biodiversity values much of which has been previously unrecognised. The findings identify a number of highly significant vegetation types, which include those with very restricted distribution within the study area, bioregionally endemic types, extensive wetlands, and vegetation that provides important habitat for flora of national, state and regional significance. Furthermore, the vegetation and flora exhibit evidence of the evolving and ongoing fragmentation of the biomes of northern Australia and New Guinea.

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Cover Photographs

1. Mangroves and salt pan on Land Zone 1, Horn Island.
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1. Introduction

Three (3)d Environmental have been commissioned by the Torres Strait Regional Authority (TSRA) Land and Sea Management Unit to undertake a vegetation community and regional ecosystem assessment of the Torres Strait and Kaurareg Islands. The study is one of the major regional scale initiatives of the '*Land and Sea Management Strategy for Torres Strait'* developed in late 2005 to co-ordinate the delivery of funding and programs through the National Heritage Trust (NHT) program. The major objectives of the Strategy are biodiversity conservation, sustainable use of natural resources, and community capacity building and institutional change (Torres Strait NRM Reference Group 2005). The study is third in a series of regional ecosystem assessments funded through this initiative. The first of these assessments, undertaken by Greening Australia (Freebody 2002) identified areas within the Torres Strait with outstanding biodiversity values. Natural Resource Assessments (2003) completed vegetation survey on two islands (Mer and Moa) and identified their outstanding conservation values.

As a regional survey, this study presents by far the most comprehensive assessment of vegetation undertaken in the Torres Strait Islands to date and presents data in a regionally consistent framework. The information will directly inform priority issues identified in the Strategy, that is; lack of information on terrestrial biodiversity; ecological and biological processes; and incomplete vegetation mapping at appropriate scale for use in land use planning. Furthermore, the information within this study serves to provide baseline data layers to support the development of Sustainable Land Use Plans on six islands (Saibai, Boigu Dauan, Iama, Masig, and Erub). The land use plans are a NHT initiative being concurrently delivered by the TSRA Land and Sea Management Unit.

1.1 Study Area Description

1.1.1 Study Location and Context

The study area encompasses islands extending from the tip of Cape York Peninsula to within five kilometres (km) of the Papua New Guinea (PNG) coastline and encompasses some 35 000 km^2 of shallow open seas. Within this area are about one hundred and fifty islands of which 17 are inhabited and supporting approximately 8 000 indigenous people (about 20% of Australia's total Torres Strait Islander population) (Arthur and Morphy 2005). Historically the islands within the region have been occupied for between 8 000 and 6 000 years with permanent island occupation occurring after 3 500-3 000 years BP (Rowe 2006). The recognition of the Kaurareg Islands acknowledges the traditional owners of the southern continental group of islands (the Kaurareg People). In future reference within this report, the Kaurareg Islands are recognised within the broader group referred to as the 'The Torres Strait Islands'. The Islands, with regional context and island distribution shown in **Figure 1**, are located within Sub-region 3 (Cape York-Torres Strait) and the Barrier Reef Island sub-region of the Cape York Peninsula Bioregion. These can be characterised geographically into five major island groups being:

- **Eastern Group** – Comprising Mer (Murray), Erub (Darnley), Ugar (Stephen), Dauar and Waier (Mer Group) and Bramble Cay. These islands are of mostly volcanic in origin comprising mainly basic volcanic and igneous basement rocks. The latter island is a coral cay;
- **Central Group** – Comprising Warraber (Sue), Poruma (Coconut), Masig (Yorke), Sassie are low sandy islands (often with some basement rock exposure) developed on coral platforms while Naghir (Mt Ernest) and Iama (Yam) Islands are generally volcanic in origin;

- **Top Western Group -** Saibai, Boigu, and Dauan Islands. Saibai and Boigu are comprised dominantly of alluvial muds overlying old coral platforms. These islands are low, swampy, and dominated by mangroves and saltpans with difficult access to interior areas. Dauan is on granite basement forming low hills with steep rocky interior areas which are topographically accessible;
- **Near Western** –Moa, Badu and Mabuiag Islands comprised predominantly of old volcanic and granite rocks. Also includes a number of small uninhabited islands and islets; and
- **Inner** – Waibene (Thursday), Kirriri (Hammond), Ngurapai (Horn), Paliliug (Goods), Zuna (Entrance), Tuesday, Maiwai (Wednesday), Giralug (Friday), Muralug (Prince of Wales), Morilug (Mt Adolphus-Little Adolphus), Possession and Albany Islands. These are topographically elevated cluster of continental islands comprising basement igneous and volcanic rock.

Whilst geographical classification places these islands in a spatial context, geological typing of the islands has been undertaken in **Section 1.1.3** for descriptive purposes.

1.1.2 Climate

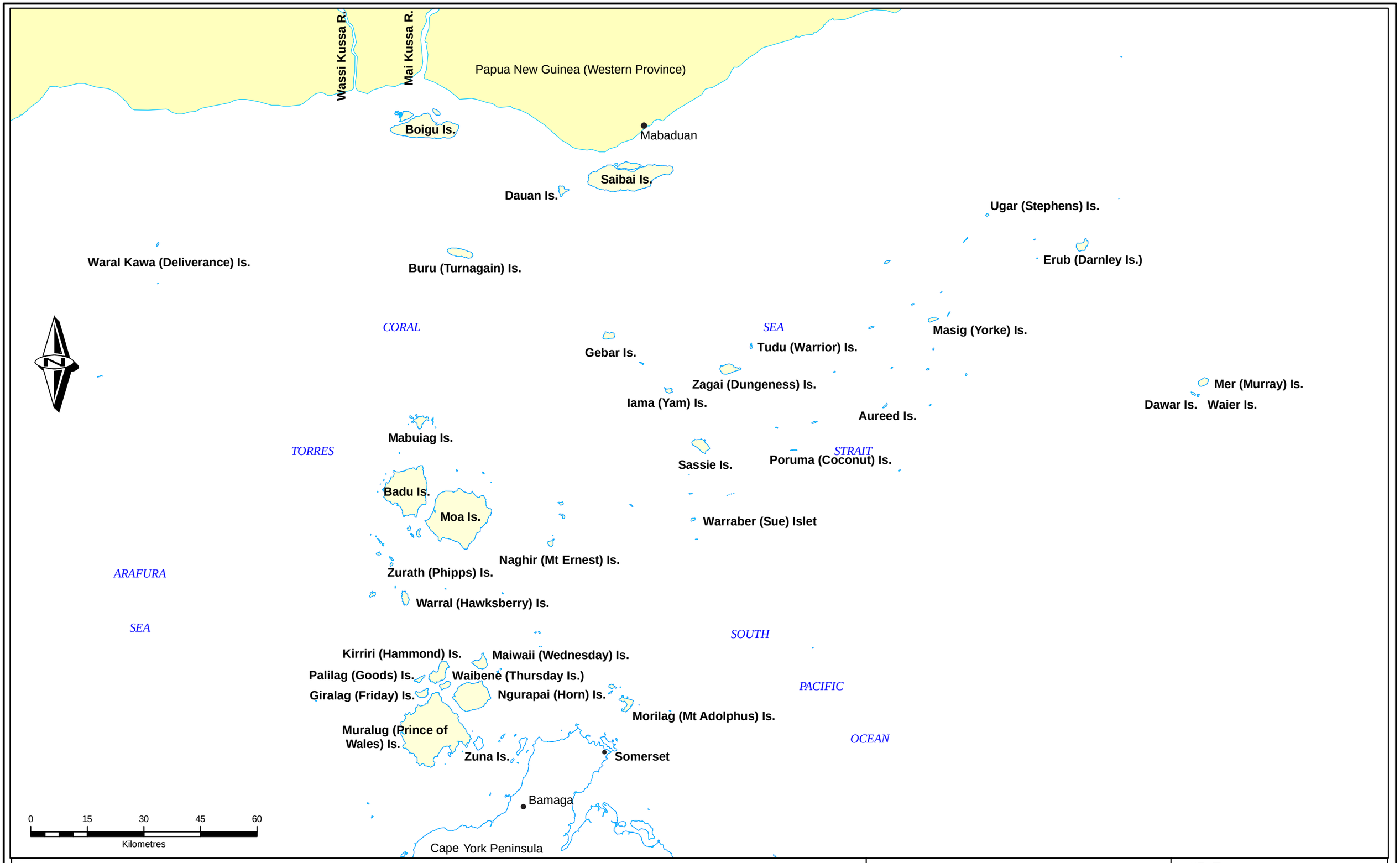
The climate of the island group on a whole is tropical monsoonal with 90% of annual rainfall (1 750-2 000 mm) occurring in the summer (December – April) period where winds are predominantly from the north-west and coinciding with highest astronomical spring tides. Strong south-easterly trade winds blow during the winter months (May – September) with moisture generated from ocean fetch falling in sporadic showers which tend to clear rapidly. The islands in general receive more than 1 600 mm of rainfall annually (Sattler and Williams 1999).

Mean temperatures recorded over a 12-year period from the Horn Island meteorological station (1995-2007) record mean maximum temperatures of 28.6º for July, and 31.8º for November. For the same weather station and same period, the driest month on average is September with 2.8 mm of rainfall, and wettest is February with 499.5mm on average, and an average annual rainfall of 1804.6 mm (BOM 2008). Records for historical weather stations are not readily available.

1.1.3 Geology and Geomorphology

The geology of the islands is presented in a number of regional reports on the island group, of which the major findings are summarised here in a broad regional overview. A more detailed analysis of the geology, geomorphology and landform evolution of the island group is presented in **Section 5.1** where land zones (according to legislative definition) are described. The islands can be placed in five broad geological groupings described below.

Islands Formed on Acidic Volcanic and Plutonic Basement: This is the most extensive geological grouping extending from the inner island group in the south; through the near western islands of Moa and Badu and Mabuiag; the central group with Iama and Gebar; and the top western group where Dauan forms the sole representative. This grouping represents the continuation of the Australian continental basement northwards to New Guinea, having its most northerly expression at Mabaduan Hill on the southern PNG coast (Loffler 1977).



NOTES:

(i) This figure has been produced for exclusive use of the client TSRA Land & Sea Management Unit and **3D Environmental**

Figure 1. Study Area Location

Client Torres Strait Regional Authority

3D Environmental
Vegetation Assessment & Mapping Specialists
P. O. Box 959
Kenmore, Qld 4069
Phone: (07) 3411 9072; (07) 3878 4344
Mobile: 0404 577 285; 0409 426 916
www.3denvironmental.com.au

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Literature often refers to the string of continental islands extending northwards to PNG as the northern extension of Australia's Great Dividing Range (Torres Strait NRM Reference Group 2005). As the Great Dividing Range is a geographical rather than geological feature, dividing the watershed on Australia's east coast into west flowing and east flowing streams (in a broad sense), the term is considered irrelevant to the islands.

A range of lithologies are represented in this group with acid welded tuff, agglomerate, rhyolite and andesite of the Torres Strait Volcanics most extensive in the southern group of islands although extending through Moa, Mabuiag, and Gebar Islands (Willmott and Powell 1977). The volcanics have been variably intruded by the Badu Granite, a coarse biotite granite which forms the highest peaks on many of the islands including Banks Peak on Moa Island, the highest Peak in the island group at 399m, and Mount Cornwallis on Dauan at 242m. These later intrusive events have resulted in extensive horfeldsing of the rhyolite basement manifest in a number of extremely resistant knolls and ridgelines, most prominent on Moa Island.

The larger islands in this geological group generally have well-developed coastal flats, often in broad embayments separated by coastal headlands. The most extensive of these is located on Moa Island where an extensive area of residual sand forms a thin cover over the granite and volcanic basement rock. Relict alluvial fans, generally deeply dissected, often fringe these residual areas and were once probably considerably more extensive. Similar features are noted on Muralug, and to a lesser extent on Horn Island.

Coastal dunes are a common feature on the coastline of the acid volcanic islands, with younger prograding beach ridge systems pronounced in a number of locations. The best development of these features is on the south-west facing coastline of Muralug Island, as well as Friday Island (see Swan 1981) where the dunes have developed aeolian (wind blown) features including blowouts and some broad deflation hollows. An extensive relict dune system is mapped on Badu Island, the extent of which has not been recognised in the previous studies of Willmott and Powell (1977). The system is developed behind exposed embayments on the islands south-eastern side, and is represented by a gently sloping broad sand ridge which tapers to a near uniform sand sheet on the dunes landward margins where it terminates against a series of low granite escarpments. Field evidence indicates that dune sand has pushed over the top of low granite saddles and headlands in some locations, being strong evidence that the broad system is a relict feature from a period of transgressive dune building. The majority of the system is stabilised with vegetation ranging from sedgeland to eucalypt woodland, which has resulted in a suppressed and evenly graded morphology. In the area to the south-west of the Badu township (in the vicinity of the current borefield), a large portion of the dunefield is in unstable form with the dominant surface area of the dune formed by exposed coarse silica sand demonstrating undulating morphologies which include shallow deflation basins, blowouts and low depositional mounds (see **Photograph 1**).

The initiation of transgressive dune development is often linked to sea level rise (Hesp and Thom, 1990) and it is feasible to conclude that the transgressive event on Badu can be linked to a sea level highstand inferred by Burne *et al*. (1995) as being 6 000 yrs B.P. It is also feasible to conclude that the dune has degraded to the suppressed and stable morphology manifest in todays landscape in the period lapsed since this sea level high stand. The timing of the event responsible for dune destabilisation is unknown, although it is clear that it is relatively recent as the unstable area forms a broad deflational basin which truncates well-wooded and stable dunes to the immediate south. Orme (1990) suggests that periods of dune instability may be initiated by anthropogenic disturbance such as burning. It is considered possible that dune instability is co-incident with the advent of permanent human occupation, prompted by indigenous land management practices.

Photograph 1. A deflation scar in the early stages of stabilisation. Transgressive dune sequence - Near Western Island group.

Extensive deposits of estuarine sediment are found on many of the island embayments, particularly on Muralug in the Port Lihou area, although broad estuarine sequences supporting mangroves are found on all of the larger islands. Many of the smaller islands including Iama, Gebar and Dauan have similar features developed to a lesser extent.

Islands of Recent Basic Volcanics: This geologic grouping is exclusive to the Eastern Group of Islands including Mer (and associated islets), Erub and Ugar. These islands have resulted from recent Pleistocene Age (<1.8Ma) volcanic activity and are formed on basaltic lava. The most spectacular expression of this recent activity is on the Murray Group where the main island and the two satellite islands of Waier and Dauar are formed on separate volcanic vents (Wilmott 1972). The main volcanic vent on Mer, with the steep outer wall of the cone rising directly behind the main area of settlement, is formed on poorly consolidated tuff and ash. The tuff crater forms a broad semi-circular rim which has breached, spilling lava to the east, with vesicular flow lava forming the more subdued eastern portion of the island. Volcanic activity has been recent enough on Dauar Islet for sheet flow morphology to remain evident on the outer slopes on the cone. Erub is perhaps less spectacular, with much of the volcanic cone eroded. Vesicular, massively bedded basalt, which forms a pile of up to 150m high (Willmott 1972), comprises much of the islands geology, overlying bedded tuff which is exposed on coastal headlands on the northern side of the island. Ugar Island presents the eroded remnants of a previously more extensive volcanic plateau.

Photograph 2. The inner crater of Mer Island with bedded tuffs and scoria visible below the inner lip of the cone. Dauar Island is visible in the background with basaltic spatter and sheet flow visible on the outer slopes of the cone.

Island Remnants of the Southern Papuan Lowlands: The Fly platform is the largest tract of low lying country in Papua New Guinea (Loffler 1977), occupying nearly a third of the mainland. Flat areas are poorly drained and swampy, terminating with extensive estuarine swamplands on the southern coast. The islands of Boigu and Saibai represent remnants of this coastal plain, possibly separated from the mainland through the erosive actions of major PNG river systems, which include the Pahoturi, the Mai Kussa, and the Wassi Kussa Rivers. Saibai Island forms the most elevated expression of this remnant coastal plain with gently domed inner alluvial regions broken by tidal swamplands and marshes. Profiles in the alluvial system indicate up to a metre of grey silty clay loam at surface, often with vertic nature (cracking clays) passing into mottled heavy clay soils at depth. On Saibai, a well-developed lateritic profile is exposed on the northern coastline of the island on which the major settlement is developed. This laterite is suffering extreme erosion on the coastal fringe.

Boigu represents a lower and swampier version of Saibai, with suppressed and fragmented alluvial remnants scattered across the islands interior, as well as on the developed northern coastal fringe. The majority of Boigu comprises marine swamplands with limited land available for development or settlement.

Suppressed beach ridges occur on both Boigu and Saibai Islands. These are scattered around islands fringes forming low rises in mangrove forests. They are most extensive on the exposed southern coast of Boigu, and the south-eastern and north-western coast of Saibai.

Coral Cays: This grouping represents a large number of smaller islands coral sand islands, mostly (although not restricted to) the central group of islands. The most prominent of these are Masig, Poruma, Aureed and Warraber although a large number of smaller cays are scattered throughout the island chain. These islands are formed on coral platforms and are extremely low lying, generally not more than 6m high (Willmott 1972). Heights for Warraber are reported as 2-8m above mean sea level (Hart *et al.* nd). In contrast to the continental and volcanic islands, the sand cays are relatively dynamic, shaped by prevailing tidal currents and subject to shifting shorelines in response to extreme weather events.

Mangrove Islands: This is an interesting island grouping which is poorly referenced in available literature. The mangrove Islands of Buru and Zagai are built on coral platforms, although unlike coral cays, the islands are subject to complete tidal inundation. These Islands in the central island group have no land elevated above the higher tidal ranges and their entire above tidal expression is as a mangrove forest. Sassie Island has areas of elevated coral rubble and calcareous sand, although the interior is swampy and frequently inundated within the normal tidal range.

2. Aims and Scope

The study aims to document the nature of vegetation communities in the Torres Strait Island Group through the provision of detailed description and mapping and placement of these communities into Queensland's regional ecosystem framework. The developed dataset provides baseline information suitable for sustainable land use planning and for broader natural resource management planning, as well as providing a means to assess the regional conservation status of Torres Strait vegetation communities under relevant state and federal legislative process.

The project scope extends to assessment of all islands with terrestrial biodiversity values. This includes documentation of the floristic composition, structure, and extent of all vegetation communities which have coverage under suitable remotely sensed imagery.

3. Methods

3.1 Desktop Literature Review

A search of relevant literature and databases provided background information on the intensity and results of previous survey, the presence and distribution of vegetation communities and flora species in the broader region. Site data sourced from the Queensland Herbarium's CORVEG database provided information on the location of previous survey sites and data extracts sourced from HERBRECS and the CORVEG database provided information on flora species distribution.

The method also included a review of previous studies completed by private organisations and government agencies over relevant sections of the study area. Relevant publications included project specific reports, state government biodiversity planning studies, regional management strategies, as well as any useful academic studies.

A regional perspective of the vegetation communities across the Torres Strait Islands is limited to the mapping carried out as part of the Cape York Peninsula Land Use Study (CYPLUS) in 1995 (Neldner and Clarkson 1995). This work produced pre-clearing mapping at 1: 250 000 scale using Aerial Photograph Interpretation (API) only for islands north of Badu Island and a combination of API and limited ground-truthing. Using the analysis of that work by Neldner (1998), the regional analysis of vegetation prior to the current survey is as follows.

Table 1. Extent of amalgamated broad vegetation groups in the Torres Strait islands (Neldner 1998).

Amalgamated Broad Vegetation Groups	Area (km^2)	% of total area
Corymbia/Eucalyptus spp. dominated woodlands, open-woodlands and open-forests	231.7	25.9
Melaleuca spp. low open-woodlands, low woodlands and tall shrublands	105.0	11.7
Grasslands and grassy open-woodlands	59.7	6.7
Closed-forests (excluding mangroves)	156.1	17.5
Mangrove closed-forests	220.9	24.7
Heathlands	11.7	1.3
Other communities (littoral vegetation, sedgelands, saltpans and wetlands)	108.1	12.1
TOTAL	**893.2**	**100.0**

Table 2. Percentage and area of each structural formation in Torres Strait Islands (Neldner 1998)

Structural Formation	Torres Strait Islands		
	No. of map units	Area km^2	% of total area
Woodland	7	233.2	26.1
Low open-woodland	3	43.5	4.9
Tall woodland	-	-	-
Open woodland	-	-	-
Closed-forest	7	212.0	23.7
Open-heath	2	1.6	0.2
Open-forest	5	11.0	1.2
Closed-tussock grassland	4	56.5	6.3
Tussock grassland	1	3.3	0.4
Sparse-herbland	4	58.4	6.5
Low closed-forest	9	183.1	20.5
Low woodland	2	55.5	6.2
Low open-forest	1	18.0	2.0
Open-sedgeland	-	-	-
Tall shrubland	1	0.6	0.1
Lakes and lagoons	-	-	-

Structural Formation	Torres Strait Islands		
	No. of map units	Area km^2	% of total area
Dwarf open-heath	2	9.5	1.1
Closed-sedgeland	2	3.2	0.4
Tall open-shrubland	-	-	-
Closed-scrub	1	2.3	0.3
Closed herbland	1	2.1	0.2

Freebody (2002) utilized the mapping data to assess the spatial distribution of each different vegetation community and to provide analysis of 'rarity' across the region. In a detailed review of island vegetation across the region incorporating 123 islands, Freebody (2002) reports 58 vegetation units that have been mapped by the Queensland Herbarium, with 34 units described as significant and representing 16% of the total terrestrial area of the Torres Strait. Significant vegetation units occur on at least 46 of the islands. Wannan and Bousi (2003) describe the vegetation and ecological values of Mer (Murray) and Moa Islands as part of a Natural Heritage Trust funded project *Torres Strait Terrestrial Biodiversity Assessment for Sustainable Development.*

The extent of the known total flora of 1065 species as deduced from the Queensland Herbarium Herbrecs database includes 154 (14%) introduced species (Neldner 1998, Freebody 2002), and recognises the lack of systematic survey and collecting work. Despite these inadequacies, the table below from Neldner (1998) indicates a high floristic diversity within the Torres Strait Islands evidenced by the presence of 32% of the diversity of the vascular flora in 0.7% of the area of Cape York Peninsula (Neldner 1998).

Table 3. Summary of the native vascular flora of the Torres Strait islands in comparison with Cape York Peninsula (from Neldner and Clarkson 1995 in Neldner 1998).

	Pteridophytes	Gymnosperms	Angiosperms	Total
Families	11	1	139	155
Taxa	26	1	977	1,067
Cape York Peninsula	**Pteridophytes**	**Gymnosperms**	**Angiosperms**	**Total**
Families	30	5	183	218
Taxa	157	6	3,173	3,338

Analysis of data extracted from Herbrecs 2007 lists 26 species listed as Endangered, Vulnerable and Rare (EVR) (see **Appendix C**). An online search of the *Environment Protection Biodiversity and Conservation Act 1999* (EPBC Act) for the Torres Shire identifies 18 threatened flora species and the potential occurrence of one Threatened Ecological Community.

Previously, much of the published information relevant to the regions natural and cultural history is available in 'Bridge and Barrier' (Walker 1972), which, in addition to a wealth of information on environmental, faunal and cultural topics, offers detailed analyses on aspects of plant biogeography. These include papers on; ecological comparisons of vegetation on either side of Torres Strait (Webb and Tracey 1972); species distribution patterns (Hoogland 1972); biogeography of tropical eucalypts (Carr 1972) and distribution of Loranthaceae (Barlow 1972). Wace (1972) in his discussion on the plant geography around Torres Strait reflects how the aforementioned are: "*based upon more or less insecure taxonomic foundations, and acknowledged gaps in distributional data*", and further that "*a common theme underlying all the papers is our almost total ignorance of past environments in the Torres Strait itself*" (in Walker 1972 pp. 198). The conclusions of Walker (1972), Mulrennan (1992), Mackey *et al.* (2006) and Freebody (2002) all refer to a lack of taxonomic and distributional data required to determine the limits of most plants at a species level within the region the need for detailed biological surveys to inform planning and management of unique and fragile island natural and cultural values.

Plant taxonomy and distributional data have been considerably advanced through initiatives such as CYPLUS and various taxonomic treatments.

Studies of past environments have also developed an increasing body of literature. Palynological studies (Rowe 2006, Parr 2003, Barham 1999) and archaeological and anthropological investigations (David *et al.* 2004, David and Badugal 2006, Barham and Harris 1987, Barham *et al*. 2004, Shnukal 2004, McNiven 2008) offer an important cultural context for biodiversity assessment and elucidate anthropogenic influences on island biodiversity over a period of human occupation in the region of between 8 000 and 6 000 years (Rowe 2006) with permanent island occupation occurring between around 3 800–2 500 years (BP) (David and Badugal 2006).

3.2 Image Base Compilation and Aerial Photograph Analysis

The initial stage of desktop assessment involved a compilation of remotely sensed imagery suitable for vegetation mapping purposes. Aerial photography was the preferred information base, allowing stereoscopic assessment of vegetation and landform patterns and giving greater confidence to assignment of land zone and vegetation structure classification. Historical aerial photography also provided a means to assess the pre-clearing distribution of vegetation communities in a large number of cases. Satellite imagery was used as a secondary means of vegetation community assessment where suitable aerial photography was not available, and was used as a base for photo-registration during digital processing, as well as a means of standardising vegetation mapping scales. A summary of aerial photography used in this assessment is provided in **Table 4** below. Assessment of photograph quality relates to a subjective appraisal of image clarity, site coverage, shadow and cloud cover.

Table 4. Aerial photography used for vegetation assessment purposes.

Island/Island Group	Year	Scale	Negative	Quality
Schenckler Aerial Survey				
Buru	1999	1:12 000	Colour	Excellent
Mabuiag	1999	1:8 000	Colour	Excellent
Erub	1999	1:8 000	Colour	Excellent
Stephen	1999	1:4 000	Colour	Excellent
Iama	1999	1:4 000	Colour	Excellent
Yorke	1999	1:4 000	Colour	Excellent
Zagai	1999	1:16 000	Colour	Excellent
Ului	1999	1:8 000	Colour	Excellent
Zurat	1999	1:8 000	Colour	Excellent
Aureed	1999	1:9 000	Colour	Excellent
Warral	1999	1:16 000	Colour	Excellent
Deliverance	1999	1:4 000	Colour	Excellent
Commonwealth Flying				
Murray	1988	1:30 000	B&W	Moderate
Dauan	1988	1:18 000	B&W	Moderate
Gabba	1988	1:25 000	Colour	Excellent
Deliverance	1971	1:42 000	B&W	Moderate
Adolphus	1973	1:34 000	B&W	Poor
Tudu	1973	1:12 000	B&W	Excellent
Moa Badu	1974	1:34 000	B&W	Poor
Moa-Badu	1971	1:85 000	B&W	Excellent
Sassie, Burpa, Warraber	1973	1:50 000	B&W	Moderate
State Flying				

Island/Island Group	Year	Scale	Negative	Quality
Cooktown-Crab Island (Prince of Wales, Thursday Group)	1992	1:50 000	Colour	Excellent
Torres Strait Island – Coconut Island	1975	1:37 800	B&W	Excellent
Boigu Island 74 Project Aerial Photography	1974	1:10 000	B&W	Excellent
Saibai Island Photography[1]	1974	1:10 000	B&W	Excellent

Two sources of satellite imagery were provided to the project by TSRA. Of these, satellite imagery sourced from Ikononos was by far the most usable, supplied in a single false colour image for a number of the individual islands including Saibai and Boigu. Quickbird imagery for the majority of the larger continental islands, including the Inner and Near Western Island Groups, was provided in a number of separate tiles. The full satellite image coverage of Muralug for example consisted of 40 individual unreferenced tiles of different sizes and shapes. The spectral signatures of these tiles lacked consistency, requiring a high degree of image manipulation to ensure spectral signatures could be matched between tiles, and matching could not always be achieved. Due to the enormous processing power required, it was not possible to load more than a limited number of tiles at any time, and this did not allow for an overview of the broader landscape as is required in a regional mapping exercise. For this reason Quickbird imagery proved unsuitable for the supplied purpose other than to provide a basis for aerial photograph rectification. The data format provided for the Quickbird imagery resulted in considerable time being used to reference tiles, and added greatly to the time taken for the digital processing (8-10 days). The usefulness of both Ikononos and Quickbird imagery was hindered by considerable cloud cover and resulting shadow in some areas, particularly on Muralug, Dauan, Mabuiag and Saibai Islands.

3.3 Site Locations

Aerial photography was analysed stereoscopically in an initial phase of pre-survey interpretation designed specifically to:

a) target a representative range of habitats within the study area;
b) sample those communities that are useful for provision of reference condition, or 'best type examples' of specific vegetation types, and;
c) direct detailed sampling towards those communities that could not be adequately categorised through API, or were considered critical to a range of significant flora species.

Further sites were added opportunistically during the field survey to provide a more complete data coverage and allow a verification of the mapping units to standard herbarium procedure. The locations of field survey sites is spatially illustrated in **Figure 2a** to **2e**. A summary of islands and sites provided in **Table 5** indicates 1 372 sites completed during the field survey**.** This comprised 74 secondary level sites, 2 tertiary level sites and 1 296 quaternary level sites.

[1] Aerial photography for the southern portion of Saibai Island only.

Table 5. Site survey effort in Stage 1 and broader study areas

Island	Quaternary Sites	Secondary Sites	Tertiary Sites	Total Sites per Island
Aureed*	3	-	-	3
Badu[2]	43	4	-	47
Boigu**	96	2	-	98
Buru*	1	-	-	1
Dauan	50	6	-	56
Erub (Darnley)	51	11	-	62
Gaboy*	1	-	-	1
Giralug (Friday)	26	-	-	26
Gebar**	34	-	-	34
Iama (Yam)	30	4	-	34
Keriri (Hammond)**	40	-	-	40
Layoak*	2	-	-	2
Masig (Yorke)	5	11	-	16
Mabuiag	51	7	-	58
Mawai (Wednesday)	21	-	-	21
Mer (Murray)	32	4	-	36
Mer/Duaur*	10	-	-	10
Moa**	178	9	2	189
Muralug (PoW)**	222	3	-	225
Morilug (Little Adolphus)*	8	-	-	8
Morilug (Mt Adolphus)*	27	-	-	27
Naghir**	11	-	-	11
Ngurupai (Horn)**	65	-	-	65
Palilug (Goode)	9	-	-	9
Possession*	4	-	-	4
Saibai**	185	12	-	197
Sassie**	9	1	-	10
Tudu**	8	-	-	8
Waibene (Thursday)	13	-	-	13
Warraber (Sue)*	6	-	-	6
Warral (Hawkesbury)**	25	-	-	25
Zagai*	10	-	-	10
Zuna (Entrance)	20	-	-	20
Total Sites	**1296**	**74**	**2**	**1372**

* indicates helicopter survey only
** indicates on ground sites supplemented by helicopter sites

[2] Badu Is. sites limited to Council managed lands in close vicinity to community.

PAPUA NEW GUINEA

Western Province

Boigu Is

Dauan Is

Saibai Is

Waral Kawa (Deliverance) Is

Buru (Turnagain) Is.

CORAL SEA

TORRES STRAIT

Gebar Is.

Legend

- Quaternary
- Quaternary (Helicopter)
- Secondary
- Tertiary

0 15 30 45 60

Kilometres

NOTES:

(i) This plan has been produced for exclusive use of the client and **3D Environmental**

Figure 2a. Survey locations – Top Western Islands

Client Torres Strait Regional Authority

3D Environmental
Vegetation Assessment & Mapping Specialists
P. O. Box 959
Kenmore, Qld 4069
Phone: (07) 3411 9072; (07) 3878 4344
Mobile: 0404 577 285; 0409 426 916
www.3denvironmental.com.au

Scale	Drawn By	Checked	File Path	Date	
1:360,000	DG	DS	C:\3D Environmental\Torres\3d_TS_Maps_A3L.mxd	25/03/08	A3

NOTES:

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Figure 2b. Survey locations – Eastern Islands

Client Torres Strait Regional Authority

3D Environmental
Vegetation Assessment
& Mapping Specialists
P. O. Box 959
Kenmore, Qld 4069
Phone: (07) 3411 9072; (07) 3878 4344
Mobile: 0404 577 285; 0409 426 916
www.3denvironmental.com.au

Scale	Drawn By	Checked	File Path	Date	
1:200,000	DG	DS	C:\3D Environmental\Torres\3d_TS_Maps_fig2.mxd	25/03/08	A3

Gebar Island

Tudu Island

Masig (Yorke) Islands

Zagai Island

Iama (Yam) Island

Aureed Island

Sassie Island

Poruma (Coconut) Is

STRAIT

Bet - Bara Island

Warraber (Sue) Islet

0 5 10 15 20

Kilometres

Legend

- Quaternary
- Quaternary (Helicopter)
- Secondary
- Tertiary

NOTES:

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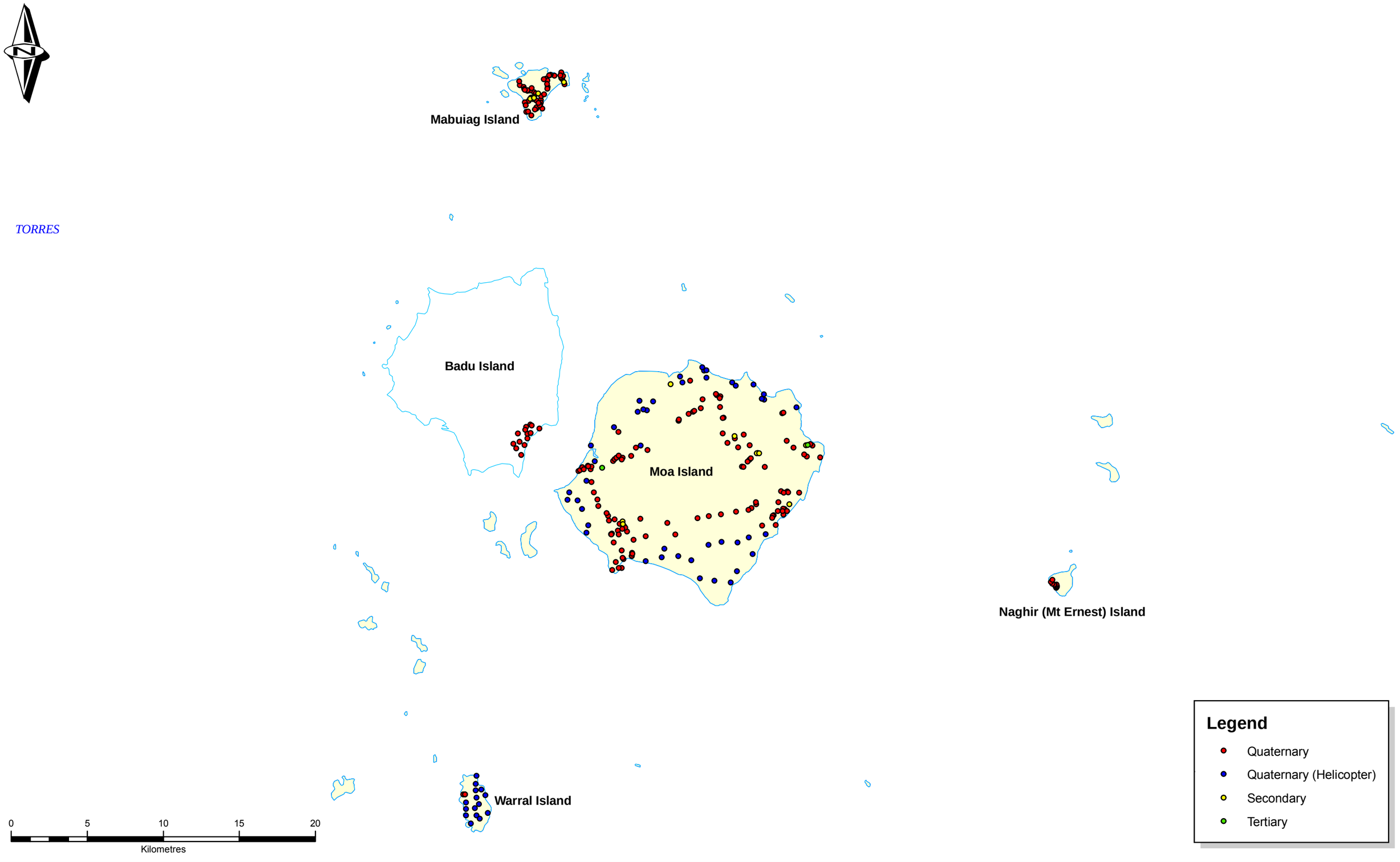
Figure 2c. Survey locations – Central Islands

Client Torres Strait Regional Authority

3D Environmental
Vegetation Assessment
& Mapping Specialists
P. O. Box 959
Kenmore, Qld 4069
Phone: (07) 3411 9072; (07) 3878 4344
Mobile: 0404 577 285; 0409 426 916
www.3denvironmental.com.au

Scale	Drawn By	Checked	File Path	Date	
1:250,000	DG	DS	C:\3D Environmental\Torres\3d_TS_Maps_fig2.mxd	25/03/08	A3



NOTES:

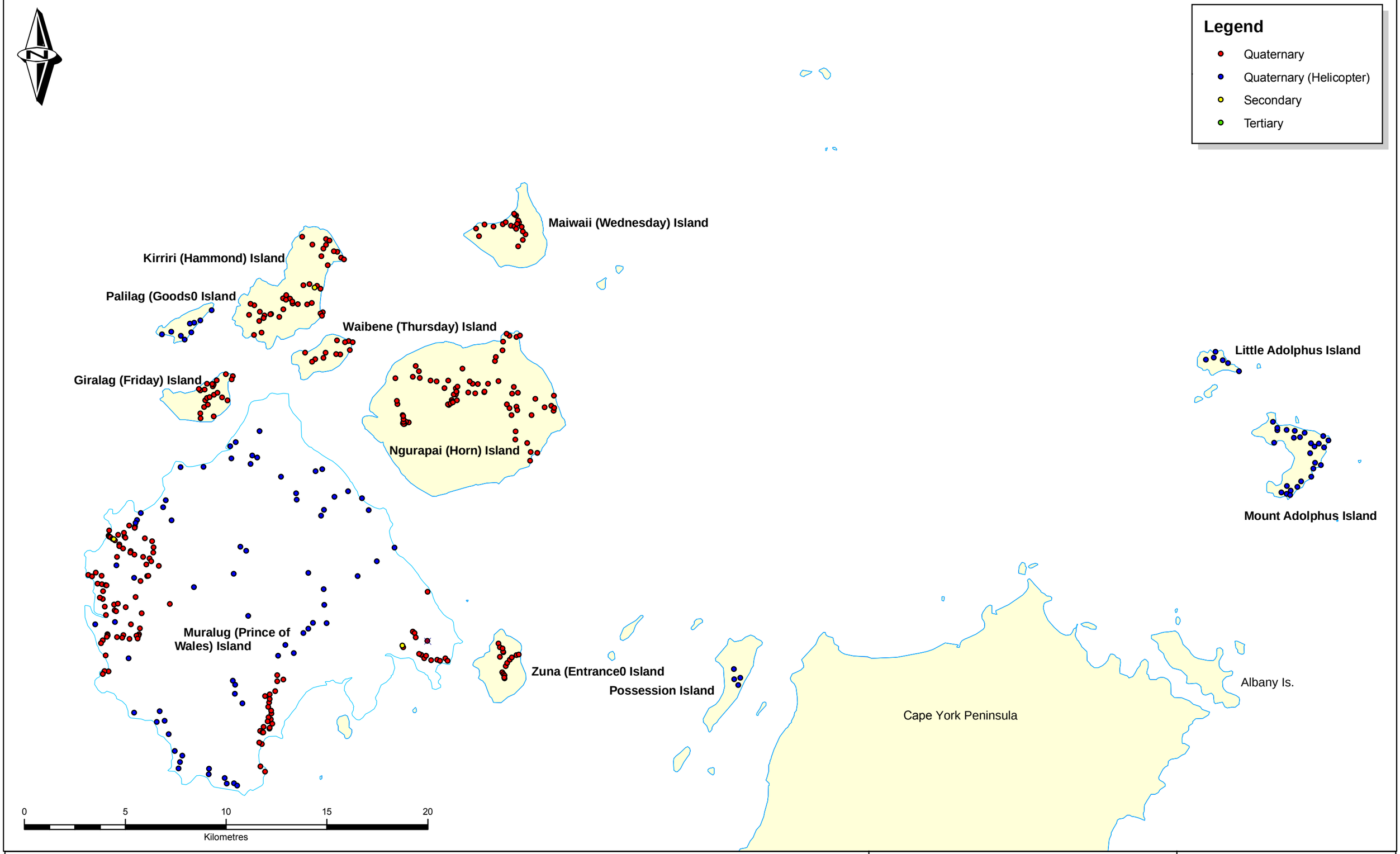
(i) This plan has been produced for exclusive use of the client and **3D Environmental**

Figure 2d. Survey locations – Near Western Islands

Client Torres Strait Regional Authority

3D Environmental
Vegetation Assessment & Mapping Specialists
P. O. Box 959
Kenmore, Qld 4069
Phone: (07) 3411 9072; (07) 3878 4344
Mobile: 0404 577 285; 0409 426 916
www.3denvironmental.com.au

Scale	Drawn By	Checked	File Path	Date	
1:230,000	DG	DS	C:\3D Environmental\Torres\3d_TS_Maps_fig2.mxd	25/03/08	A3



NOTES:

(i) This plan has been produced for exclusive use of the client and **3D Environmental**

Figure 2e. Survey locations – Inner Islands

Client Torres Strait Regional Authority

3D Environmental
Vegetation Assessment & Mapping Specialists
P. O. Box 959
Kenmore, Qld 4069
Phone: (07) 3411 9072; (07) 3878 4344
Mobile: 0404 577 285; 0409 426 916
www.3denvironmental.com.au

Scale	Drawn By	Checked	File Path	Date	
1:170,000	DG	DS	C:\3D Environmental\Torres\3d_TS_Maps_fig2.mxd	25/03/08	A3

3.4 Field Survey Procedure

The execution of the field survey within the time and budgetary constraints of the project presented a number of logistical challenges. As a priority, protocols necessary to achieve access to island communities and native title lands were developed in consultation and support of TSRA's Land and Sea Management Unit and Native Title office. These consisted of an initial round of introductory letters to all island councils and Prescribed Body Corporate (PBC) bodies followed by phone or fax communication prior to the actual field visit where possible to organize time of arrival, accommodation etc. Meetings with appropriate community representatives and AQIS officers were held on each island and served to advise and guide the survey team in regards to adherence to cultural protocols whilst on country. Where necessary and possible, cultural monitors accompanied the survey team.

The requirement to achieve a regional overview within a short time frame and with consideration to budget necessitated a single and continuous field trip over a seven week period between 16 October and 2 December 2007 wherein two ecologists aimed to access and describe as many representative vegetation communities as possible. Access to islands was achieved mainly by commercial air service (Aero Tropics) and also by charter plane and helicopter. The use of a survey vehicle on Moa, Erub, Thursday, Horn and Masig assisted site coverage although survey by walking traverses guided by stereoscopic use of aerial photography was the predominant mode of survey. A charter boat was used to access islands in the Inner Group particularly Muralug, Zuna, Friday, Hammond, and Wednesday. This provided a preliminary, although thorough assessment of vegetation in the study area that was supplemented by 11 hours of helicopter flying. The latter was an invaluable means of gaining a regional perspective of the islands, increasing site coverage and allowing the establishment of vegetation sites in otherwise inaccessible locations.

Field survey method followed Queensland Herbarium standards as identified in Neldner *et al.* (2005) using a combination of formalised secondary, tertiary and quaternary level sampling procedures, as well as informal site observation. Data relevant to requirements of Neldner *et al*. (2005) were modified to suit sampling requirements specific to the study and were entered into field notebooks. The core field information recorded included location, tenure, air photo and site photo references, landform and geological features, and community structure. Complete species lists were compiled wherever these were considered appropriate and were not limited to secondary sites. Canopy height was meticulously measured at all sample locations using a clinometer and linear regression table, and canopy cover was recorded in the majority of sites using measured crown intercept transects. A Garmin GPS 60 (Geographic Positioning System) was used to accurately record map coordinates for the site locations (GDA94). Digital photographs of all sites as well as geological and landform features and significant flora species were captured using a digital camera.

Secondary sites of non-rainforest vegetation consisted of a 50m x 10m plot located along the contour with attempts made to avoid the sampling across vegetation community boundaries, which became difficult in some of the lineal vegetation communities. Bitterlich measurements, as described in Grosenbaugh (1952), were used to record community basal area at all sites except in highly linear communities where the method proved inappropriate. Full species lists for all strata were established during the secondary sampling procedure wherein the $500m^2$ plot was intensively sampled followed by a detailed search of the vicinity. While the vicinity search was broadly defined by the extent of the basal area sweep, it was in all cases confined to the target community. The abundance of all species within the plot was recorded by stem counts and by a visually assessed abundance ranking.

Data at rainforest sites were collected using a variable area 32 nearest neighbour method as consistent with data collected for the Cape York Bioregion (Stanton and Fell 2005). Tertiary sites were completed in a similar fashion to secondary procedure, except non-woody species were not recorded. Sites recorded at tertiary level consisted of full species lists in a search area established via a radial sweep of the Bitterlich device.

Quaternary sites comprised a description of floristic structure, composition, and associated landform. Vegetation communities were also recorded on walking traverses. Botanical voucher specimens were collected throughout the field survey to verify site floristics and enable identification of those species that were problematic. All material was pressed in the field before being packaged in ethanol as required under AQIS Quarantine Permit. A total of 740 vouchers were collected.

Photograph 3. Helicopter landing site Saibai Island.

3.5 Classification of Land and Vegetation

A vegetation type is defined as a unit of structurally and floristically similar vegetation, whilst a land type is defined as a unit of structurally and floristically similar vegetation on a similar geology (Stanton and Morgan 1977, Sattler and Williams 1998). Vegetation types are referred to as 'vegetation communities' (VC) and are consistently referred to as such throughout this document, whilst land types are incorporated into the broader RE classification. Vegetation communities have been amalgamated to form 'Broad Vegetation Groups' (BVG's) and are used to describe structurally similar vegetation groups, or in specific cases, vegetation groups controlled by similar ecological conditions. Broad Vegetation Groups are useful both as a means to spatially represent detailed floristic information, and to define associated ecological parameters including faunal habitat. The BVG is used as a primary subdivision to define a floristic/structural type. This is followed by an alpha suffix to define a specific VC. A VC code may be complemented by an appended code indicating particular structural attributes (e.g. a vine forest sub-canopy), or as an indicator of vegetation condition. Explanatory notes for vegetation coding are described in **Section 4.1**.

Vegetation communities are assigned to RE's on the basis of a three-part code of which the primary subdivision is bio-regional zone, followed by geology or land zone, with specific floristic attributes providing the tertiary subdivision. Vegetation communities are often amalgamated to form RE's, and these communities may retain autonomy through classification as a RE sub-unit. RE's are assessed on a state wide basis for conservation significance, as regulated by

Queensland's *Vegetation Management Act* (1999), (VMA). The RE classification system requires detailed knowledge and understanding of both landform and geology and these features have been described and classified in this report.

3.5.1 Non-Rainforest Vegetation

Vegetation structure is classified according to the system of Neldner *et al.* (2005) modified from Specht (1970) and this classification has been applied consistently to vegetation throughout the field survey and broader flora study. Structural formation classes as qualified by Neldner *et al.* (2005) are detailed in **Table 6.**

3.5.2 Classification of Rainforest Vegetation

The classification of rainforest vegetation is based on the classification of Walker and Hopkins (1990) which is adapted from Webb (1959). This classification describes rainforest in terms of several attributes including:

1. Complexity of life forms including species diversity in a number of structural layers. The presence / absence of structural features including plank buttresses, banyans etc. Complexity is recorded as either simple, simple-complex, and complex;
2. The leaf sizes of the dominant plants/strata. Leaf size options are macrophyll, mesophyll, notophyll, microphyll and nanophyll;
3. The floristic composition of the dominant stratum including the tendency for one or more species to dominate or otherwise;
4. Indicator growth forms including the presence of palms, moss etc.; and
5. Height and crown cover classes including the presence of emergents;
6. Thicket is used to described stunted rainforest vegetation in which the canopy closes at 3-9 m (Webb, 1959);
7. 'Deciduous' in reference to a rainforest stand means that the species in question, or at least certain individuals in the species population, completely lose their leaves for a time and that this behaviour is obligatory and fixed for the species (Webb, 1959).
8. 'Semi- deciduous' indicates that most leafless species are truly deciduous, but that some are facultative, i.e. leaf-fall is controlled by the severity of the dry season, rather than by being obligate (Webb, 1959); and
9. 'Semi-evergreen' means that few or none the species are truly deciduous, and that most of those that shed their leaves do so incompletely depending on the severity of the dry season (Webb, 1959).

It should be noted that in accordance with the classification of Walker and Hopkins (1990), emergents are classified as trees clearly above the dominant stratum whose crown cover is less than 5% of the total canopy cover. This classification of an emergent stratum is not extended to severely disturbed communities whose structural integrity has been compromised through human intervention.

Table 6. Structural formation classes qualified by height for Non-Rainforest Vegetation: Neldner *et al.* 2005) modified from Specht (1970).

Projective Foliage Cover	**70-100%**	**30-70%**	**10-30%**	**<10%**
Approximate Crown Cover %	**80 - 100%**	**50 - 80%**	**20 - 50%**	**< 20%**
Crown separation	**closed or dense**	**mid-dense**	**sparse**	**very sparse**
Growth Form[3]	**Structural Formation Classes (qualified by height)**			
Trees > 30m	tall closed-forest	tall open-forest	tall woodland	tall open-

[3] Growth form of the predominant layer (the ecologically dominant layer).

Projective Foliage Cover	70-100%	30-70%	10-30%	<10%
Approximate Crown Cover %	80 - 100%	50 - 80%	20 - 50%	< 20%
Crown separation	closed or dense	mid-dense	sparse	very sparse
Growth Form[3]	Structural Formation Classes (qualified by height)			
	(TCF)	(TCF)	(TW)	woodland (TOW)
Trees 10 – 30m	closed-forest (CF)	open-forest (OF)	woodland (W)	open-woodland (OW)
Trees < 10m	low closed-forest (LCF)	low open-forest (LOF)	low woodland (LW)	low open-woodland (LOW)
Shrubs 2 - 8m	closed-scrub (CSC)	open-scrub (OSC)	tall shrubland (TS)	tall open-shrubland (TOS)
Shrubs 1 - 2m	closed-heath (CHT)	open-heath (OHT)	shrubland (S)	open-shrubland (OS)
Shrubs <1m	-	dwarf open-heath (DOHT)	dwarf shrubland (DS)	dwarf open-shrubland (DOS)
Succulent shrub	-	-	succulent shrubland (SS)	dwarf succulent shrubland (DSS)
Hummock grasses	-	-	hummock grassland (HG)	open hummock grassland (OHG)
Tussock grasses	closed-tussock grassland (CTG)	tussock grassland (TG)	open tussock grassland (OTG)	sparse-tussock grassland (STG)
Herbs	closed-herbland (CH)	Herbland (H)	open-herbland (OH)	sparse-herbland (SH)
Forbs	closed-forbland (CFB)	Forbland (FB)	open-forbland (OFB)	sparse-forbland (SFB)
Sedges	closed-sedgeland (CV)	Sedgeland (V)	open-sedgeland (OV I)	-

3.5.3 Classification of Remnant/Non-Remnant Vegetation

The definition of remnant vegetation adopted follows that defined by the EPA (2006) being:

"Woody vegetation is mapped as remnant where the dominant canopy has greater than 70% of the height and greater than 50% of the cover relative to the undisturbed height and cover of that stratum and dominated by species characteristic of the vegetation's undisturbed canopy. An undisturbed stratum (or layer) is defined as one that shows no evidence of extensive mechanical or chemical disturbance (logging, clearing, poisoning, etc.) evident in field inspections or on the available historical aerial photographic record" (EPA, 2006).

Classification of remnant vegetation in this exercise relies on the establishment of reference condition in communities or locations where disturbance has been minimal and environmental conditions are typical of the community across the broader study area. These sites allowed relative canopy height and canopy cover, or ground cover composition in the case of grasslands and wetlands, to be compared between community reference condition, varying degrees of disturbance, and varying seral stages of regrowth. From this comparison a tightly defined and consistent definition of non-remnant vegetation communities could be ascertained through thorough field measurement.

Grassland communities are assessed on composition of ground cover, compared to reference condition sites established in undisturbed communities. As a general rule applied, a vegetation polygon is classified as non-remnant if its total width is less than 15m, and the vegetation polygon is less than one hectare in size and isolated from remnant vegetation communities.

3.6 Scale of Survey

In vegetation survey, sampling scale is determined by sampling intensity, influenced by vegetation complexity and the areal extent of remnant vegetation. The Agricultural Organisation of the United Nations (FAO 1979) recommends 25 sites per km^2 for 1:10 000 scale soil survey, although Neldner *et al.* (2005) recommend a minimum of half of this sampling density for vegetation survey, dependant on the vegetation complexity and areal extent of remnant vegetation. Reference to **Table 5** indicates 1 372 survey locations recorded during the initial phase of field survey, with an additional 34 sites recorded during previous mapping exercises (EPA Corveg sites). Resultant sampling equates to roughly 1:25 000 scale, based on a total land area of 892 km^2 and minimum site requirements as per Neldner *et al*. (2005). This data is suitable for incorporation into detailed state wide regional ecosystem assessments at present sampling intensity, although additional sites will be gathered during any subsequent survey phases.

The spatial scale and accuracy of a mapping product is determined in part by the scale of the image base used for vegetation community delineation. Reference to **Table 4** indicates considerable disparity between aerial photographic scales used in the assessment, ranging from 1:4 000 scale on Iama Island to 1:85 000 on Moa. This disparity in spatial scales was addressed to a degree during the photo rectification process, whereby photographic line work was registered against satellite imagery at a standardised 1:25 000 scale, as required in the project brief. Whilst this process will have rectified disparities in spatial scale between islands to a large degree, variations in the scale of vegetation community delineation between islands as well as spatial accuracy of vegetation linework can be expected.

3.7 Image Interpretation and Attribution Method

Aerial photography was purchased as contact prints and subject to detailed stereoscopic assessment. The aim of stereoscopic analysis is to delineate consistently mappable units (polygons) of homogenous vegetation characterised through similarity of aerial photographic pattern or signature. During this process, geological and vegetation community boundaries were marked directly onto the aerial photography with removable white china ink, and a 0.25mm Rotring pen. The width of vegetation line work produced was between 0.25mm and 0.5mm with finer line work resulting in a more accurate delineation of vegetation community boundaries.

Polygon attribution is based on a hierarchical system identifying landform/geological affiliation, vegetation structure, and floristic composition. This stratification was consistent with basic rules of vegetation classification detailed in **Section 3.5.**

Where suitable aerial photographic material was not available, satellite imagery was used as a base for vegetation community delineation with vegetation line work established directly on the digital image and incorporated into the broader spatial database. In the case of Saibai Island, where suitable aerial photographic coverage was available for only half of the island, the line work established during aerial photographic interpretation was extrapolated across the broader study area, over the top of available satellite imagery.

3.8 Pre-clearing Vegetation Method

The oldest available photographic imagery was utilised to establish pre-clearing vegetation communities within the study area. Vegetation line work was established on these photographs, attributed accordingly, and overlain with the recent satellite imagery to determine the extent of clearing. Vegetation polygons were clipped to cleared boundaries on recent imagery to produce a 'Remnant Vegetation Layer'.

Historically cleared vegetation was attributed with a code indicative of its pre-clearing status, and an appended designator of its current status, whether it be cleared or in varying stages of regrowth. Where no suitable historical photography was available, ecological and geological knowledge gathered throughout the course of the survey was used to reconstruct the original vegetation mosaic. Existing vegetation communities and community boundaries are extrapolated across areas of similar geology and landform to re-construct the pre-clearing landscape. Reconstructed polygons were attributed with a code to indicate pre-clearing status and appended with a symbol to designate current status and/or condition. A separate pre-clearing layer was generated from re-constructed vegetation community mapping, allowing an assessment of the relative impacts of past land use practice on specific vegetation communities.

3.9 Digital Processing and Accuracy

The marked aerial photographs were scanned at a resolution of 300dpi. Each photo was then registered within ArcMap using the geo-registration extension against the supplied Satellite imagery at 1:25 000 scale or greater. Upon completion of photo registration, the identified boundaries were captured as line-work. Final editing was performed when all of the boundaries had been captured, prior to generation of polygons in ARC/INFO format.

As described in **Section 3.6**, spatial accuracy is determined largely by the scale of the image base used for the mapping exercise, the thickness of the vegetation linework, and photographic distortion (RMS error). Although photo registration and rectification was undertaken on a spatially consistent satellite image base, variations in spatial accuracy will occur due to the wide range of aerial photographic scales used during the assessment. All vegetation line-work was approximately 0.5 mm wide on the aerial photography and as a general rule, 0.5 mm on aerial photography at 1:10 000 scale (as used on Saibai and Boigu) is equivalent to 500 mm on the ground, which is equivalent to an accuracy of +/- 5 m. On 1:85 000 scale photography as was used on Moa Island, an accuracy of +/- 85 m can be expected. Standardisation of the spatial accuracy between individual islands was achieved to some degree during the registration process which utilised standardized satellite imagery at 1:25 000 scale. On islands where smaller scale photography was used during the vegetation mapping process, particular attention was paid to ensure the coastline and areas around urban settlement were mapped with a spatial accuracy of 1:25 000 scale or greater.

The RMS error obtained during the registration process varied from photo to photo and between islands, although was particularly high on mountainous islands such as Mabuiag which were captured with low level photography. RMS error was introduced by the considerable radial distortion of the landscape on the peripheries of the photography. Once again, this distortion was significantly reduced during the linework rectification process by utilizing standardized scale satellite imagery. It should be noted that in areas of significant cloud cover on satellite imagery, the spatial accuracy of the linework cannot be guaranteed.

3.10 Limitations and Constraints

The survey objectives were largely achieved, however a number of limitations and constraints are worthy of mention.

- As previously discussed, Quickbird imagery proved unsuitable for the supplied purpose other than to provide a basis for aerial photograph rectification. The spectral signatures of Quickbird tiles lacked consistency, requiring a high degree of image manipulation to ensure spectral signatures could be matched between tiles which in many cases could not be achieved. This process consumed considerable time and effort (approximately 80 hours of GIS time) that was not accounted for in the project budget. Furthermore, cloud

cover on both satellite formats created significant information gaps, particularly on Muralug, Mabuiag, Dauan and Saibai Islands.

- Due to unforeseen circumstances, introductory letters sent to Badu Island Council and the PBC were not received by the appropriate representatives. Therefore the acting PBC Chair, executive and members had no prior knowledge of the projects purpose, and subsequently, access to Native Title lands was denied. Access to the small extent of DOGIT land was granted through Badu Council, however the lack of representative vegetation communities within the DOGIT land deemed it necessary for a secondary field trip to be scheduled to cover the entirety of the island. Following liaison with representatives of Mura Badulgal (Torres Strait Islander) Corporation PBC Body, Badu Council and the TSRA Land and Sea Management Unit, a second field trip to Badu Island was carried out between 22 July and 29 July 2008. Access to all areas outside of Council duristiction was however once again denied on the basis that the PBC body was, at that time, not a functioning entity and could not therefore facilitate a process to secure the consent of traditional owners for the survey team to access Native Title lands. The survey was therefore limited to a small portion of the DOGIT land around Badu village.

- Minimal field data was collected on a number of small islands including atolls throughout the study area. Whilst such islands are indeed small, a number supported terrestrial vegetation and would be worthy of inspection. These include the more remote islands such as Deliverance where review of documentation from previous studies has proved valuable to achieve a preliminary classification of vegetation communities. The use of helicopter survey enabled a rapid overview of vegetation structure. In a number of instances however, assessment of the floristic composition could not be achieved. These areas include (but are not limited to) rainforest on the steep terrain of Gebar, Mt. Adolphus, and Naghir Islands which are recommended for on ground assessment during future field work programs.

- Throughout the survey, every attempt was made to collect detailed site based floristic data, and provide collections of voucher specimens for species not readily identified in the field, or for records of poorly collected taxa. A thorough analysis of this floristic data however remains outside of the project scope. Vouchers of a number of species necessary for full floristic descriptions of vegetation communities and regional ecosystems await identification and are referred to with collection numbers throughout. A detailed floristic analysis utilizing the taxonomic and distributional data collected during the survey in combination with pre-existing data would be a valuable future supplement to the study, and would result in a significant contribution to the current knowledge of plant biogeography of the region.

4.0 Results – Field Analysis

4.1 Classification of Land and Vegetation

4.1.1 Land Zones

Aerial photographic analysis completed in conjunction with detailed field survey effort indicates 11 broad geological/landform associations in the study area relevant to land zone classification as per Neldner *et al*. (2005) and Harris (undated). These are given a specific geological attribute in the mapping process to allow associations between land zone and vegetation to be recognised, and RE's classified. The landform/geological associations relevant to land zone classification that are recognised in the study area are identified in **Table 7** below and spatially illustrated in accompanying maps **3a** to **3e.** The derivation of these classifications is discussed briefly in **Section 5.1.**

Table 7. Geological types and land zones identified in the Torres Strait Islands.

Geological Attribute	Geological Description	EPA Land Zone
E	Estuarine muds, alluvium (saline and brackish alluvium), coastal sands and rock shelves subject to saltwater incursion.	1
D	Coastal dunes, cheniers, calcareous beach sands (including atolls), beach ridges and associated swales.	2
A	Alluvial plains, alluvial fans (active), terraces and fluvial sediments. Excludes alluvial sediments affected by tidal/saltwater incursion.	3
T	Remnant colluvial surfaces.	5
As	Residual sandy plains and sandy terraces.	5
L	Exposed duricrust	7
B	Basalt escarpments and terraces.	8
V	Volcanic cones formed on ash and scoria.	8
G	Granite hillslopes and footslopes including boulder talus and colluvium.	12
Gd	Diorite and Dacite.	12
Mg	Metamorphosed granitoid rocks including hornfels.	12
R	Rhyolites and associated fine grained volcanic rocks including tuff, ignimbrite and a range of other acid volcanic extrusive and intrusive rocks.	12

4.1.2 Vegetation Communities

The VC's identified within the study area, in relation to specific Broad Vegetation Groups (BVG's) and land zone affiliations are listed in **Table 8** below with distribution maps presented in the accompanying maps **4a** to **4e**. One hundred and fifty eight VC's are identified within 27 BVG's. It should be noted that this classification relates to remnant vegetation only and classification of non-remnant vegetation communities is discussed in **Section 6.1.3.** It should be noted in respect to the vine forest and thicket communities, that relatively fine scale floristic and

structural variations have been differentiated between islands and island groups. This was possible due to the geographic isolation that islands impose on their inherent vegetation, giving confidence that fine scale floristic variations are consistently represented and delineated. These communities however represent a snapshot of the floristic and structural variation present within the island group and a large number of intermediate variations may be present.

Table 8. Vegetation Communities in the Project Area.

Vegetation Community	Description	Geologies
	Evergreen/Semi-evergreen vine forest and vine thicket	
1a	Evergreen notophyll vine forest + *Acmenospermum claviflorum* + *Syzygium puberulum* + *Ganophyllum falcatum* + *Arytera divaricata* + *Ficus microcarpa* + **Mangifera indica.*	G
1b	Evergreen notophyll vine thicket (windsheared) + *Manilkara kauki* + *Intsia bijuga* + *Pouteria sericea* + *Aglaia elaeagnoidea* + *Garcinia warrenii* + *Pandanus* sp.	G
1c	Evergreen notophyll vine thicket (windsheared) + *Manilkara kauki* + *Celtis philippensis* + *Terminalia muelleri* + *Diospyros maritima* + *Thespesia populneiodes* + *Drypetes deplanchei.*	D
1d	Mesophyll/notophyll vine forest + *Endiandra glauca* + *Acacia polystachya* + *Syzygium bungadinnia* + *Canarium australianum* + *Dysoxylum oppositifolium.*	GD, R
1e	Mesophyll/notophyll vine forest + *Myristica insipida* + *Maranthes corymbosa* + *Cryptocarya cunninghamii* + *Dysoxylum latifolium* + *Calophyllum sil* +/- *Arenga australasica.*	G
1f	Complex notophyll vine forest + *Pouteria* sp. + *Calophyllum sil* + *Argyrodendron polyandrum* + *Palaquium galactoxylon* + *Acmenospermum claviflorum* + *Licuala ramsayi.*	G
1g	Evergreen notophyll vine thicket + *Calophyllum sil* + *Syzygium branderhorstii* + *Diospyros hebecarpa* + *Schefflera actinophylla* + *Podocarpus grayae* +*Licuala ramsayi.*	G
1h	Evergreen notophyll vine thicket with *Buchanania arborescens* + *Drypetes deplanchei* + *Eleaodendron melanocarpum* + *Endiandra glauca* + *Elaeocarpus arnhemicus* + *Chionanthus ramiflora.*	R
1i**	Evergreen mesophyll vine forest + *Horsfieldia australiana, Syzygium bamagense* + *Acmena hemilampra* subsp. *hemilampra* + *Buchanania arborescens.*	A
1j	Tall evergreen notophyll vine forest + *Syzygium angophoroides* + *Acmena hemilampra* subsp. *hemilampra* + *Acacia auriculiformis* + *Syzygium forte* subsp. *forte* + *Podocarpus grayae*	A
	Deciduous/Semi deciduous vine forest and vine thicket	
2a	Deciduous/Semi-deciduous vine forest + *Erythrina variegata* + *Manilkara kauki* + *Terminalia subacroptera* + *Mimusops elengi* + *Cordia subcordata.*	D
2b	Semi deciduous vine forest/thicket + *Canarium australianum* + *Terminalia subacroptera* + *Bombax ceiba* var. *leiocarpum* + *Cochlospermum gillivraei* + *Cleistanthus peninsularis* + *Ficus virens* var. *sublanceolata.*	G,R
2c	Semi-deciduous vine thicket + *Mimusops elengi* + *Acacia auriculiformis* + *Terminalia subacroptera* + *Diospyros* spp. +/- *Manilkara kauki* +/- *Melaleuca cajuputi* subsp. *platyphylla.*	A
2d	Semi deciduous vine forest + *Tetrameles nudiflora* + *Canarium australianum* + *Ficus* spp. + *Bombax ceiba* var. *leiocarpum* +/- *Alstonia spectabilis.*	G
2e	Semi deciduous vine thicket + *Terminalia subacroptera* + *Intsia bijuga* + *Hibiscus tiliaceus* + *Excoecaria agallocha* + *Thespesia populneoides* + *Cathormion umbellatum* subsp. *moniliforme.*	L

Vegetation Community	Description	Geologies
2f	Semi-deciduous vine thicket + *Canarium australianum* + *Manilkara kauki* + *Dalbergia densa* var. *australis* + *Buchanania arborescens* + *Sterculia* sp. (Annan River L.J. Brass 20319) + *Cochlospermum gillivraei.*	R
2g	Semi deciduous notophyll vine forest + *Canarium australianum* + *Terminalia subacroptera* + *Semecarpus australiensis* + *Buchanania arborescens* + *Acacia auriculiformis* +/- *Erythrina variegata* +/- *Welchiodendron longivalve* +/- *Parinari nonda* +/- *Chionanthus ramiflora.*	A
2h	Deciduous notophyll vine forest + *Erythrina insularis* +/- *Antiaris toxicaria* var. *macrophylla*+/- *Terminalia subacroptera* +/- *Bombax ceiba* var. *leiocarpum* +/- *Canarium australianum* + *Acacia auriculiformis.*	G,R
2i	Semi deciduous notophyll vine thicket + *Berrya javanica* + *Cupaniopsis anacardioides* + *Bombax ceiba* var. *leiocarpum* + *Diospyros hebecarpa* + *Mimusops elengi* + *Melicope peninsularis.*	B
2j	Semi-deciduous notophyll vine forest + *Bombax ceiba* var. *leiocarpum* + *Diospyros hebecarpa* +/- *Alectryon repandodentatus* + *Cupaniopsis anacardiodes* + *Alstonia spectabilis* +/- *Melicope peninsularis.*	B
2k	Deciduous vine forest + *Gyrocarpus americanus* + *Bombax ceiba* var. *leiocarpum* + *Antiaris toxicaria* var. *macrophylla* + *Canarium australianum* + *Cathormion umbellatum* subsp. *monoliforme* + *Garuga floribunda* var. *floribunda* +/- *Adenanthera pavonina* +/- *Maranthes corymbosa.*	B, GD, R
2l	Semi-deciduous notophyll vine forest + *Bombax ceiba* var. *leiocarpum* + *Gyrocarpus americanus* + *Garuga floribunda* var. *floribunda* + *Manilkara kauki* + *Diospyros maritima* + *Celtis philippensis.*	D
2m	Semi-deciduous notophyll vine forest + *Milletia pinnata* + *Terminalia* spp. + *Diospyros maritima* + *Manilkara kauki* + *Aglaia elaeagnoidea* + *Pouteria obovata* + *Drypetes deplanchei* +/- *Erythrina* spp.	D
2n	Semi deciduous notophyll vine thicket + *Canarium australianum* + *Antiaris toxicaria* var. *macrophylla* + *Acacia auriculiformis* + *Terminalia subacroptera* + *Manilkara kauki* + *Bombax ceiba* var. *leiocarpum.*	G
2o	Semi deciduous notophyll vine forest + *Acacia auriculiformis* + *Barringtonia calyptrata* + *Maranthes corymbosa* + *Syzygium forte* subsp. *forte* + *Bombax ceiba* var. *leiocarpum* + *Canarium australianum.*	MG
2p	Semi deciduous vine thicket (windsheared) + *Bombax ceiba* var. *leiocarpum* + *Premna serratifolia* + *Acacia crassicarpa* + *Manilkara kauki* + *Drypetes deplanchei* + *Terminalia subacroptera* +/- *Arenga australasica.*	D
2q	Tall semi deciduous vine forest + *Bombax ceiba* var. *leiocarpum* + *Berrya javanica* + *Antiaris toxicaria* var. *macrophylla* + *Garuga floribunda* var. *floribunda* + *Canarium australianum* +/- *Albizia lebbeck* +/- *Syzygium bamagense* +/- *Maranthes corymbosa.*	Gd
2r	Semi deciduous vine forest + *Sterculia quadrifida* + *Canarium australianum* + *Cleistanthus peninsularis* + *Terminalia subacroptera* + *Antiaris toxicaria* var. *macrophylla* +/- *Paraserianthes toona* + *Alstonia actinophylla* +/- *Xanthoxylum rhetsa* +/- *Maniltoa lenticellata* var. *lenticellata.*	Gd, G
2s	Semi-deciduous notophyll vine thicket (windsheared) + *Pouteria*	G

Vegetation Community	Description	Geologies
	sericea + *Ficus virens* var. *sublanceolata* + *Schefflera actinophylla* + *Garcinia warrenii* + *Syzygium puberulum.*	
2t	Semi-deciduous notophyll vine forest and occasional thicket with *Bombax ceiba* var. *leiocarpum* + *Canarium australianum* + *Terminalia* spp. + *Acacia polystachya.*	G, Gd, R
2u	Semi-deciduous vine forest + *Manilkara kauki* + *Terminalia* spp. + *Sterculia quadrifida* + *Premna serratifolia* + *Acacia crassicarpa* + *Drypetes deplanchei* + *Millettia pinnata.*	D
2v	Semi-deciduous vine thicket + *Acacia polystachya* and *Terminalia subacroptera.*	R
2w	Deciduous vine thicket + *Garuga floribunda* var. *floribunda*+ *Gyrocarpus americanus* + *Bombax ceiba* var. *leiocarpum* +/- *Antiaris toxicaria* var. *macrophylla.*	B
2x	Deciduous vine thicket + *Cochlospermum gillivraei* + *Bombax ceiba* var. *leiocarpum* + *Terminalia subacroptera* +*Sterculia quadrifida* + *Psydrax reticulata* + *Drypetes deplanchei.*	R
2y	Semi-deciduous vine thicket + *Manilkara kauki* + *Terminalia subacroptera* + *Cordia subcordata* + *Premna serratifolia* + Indeterminate species.	D
2z	Low groved notophyll vine thicket + *Sterculia quadrifida* + *Manilkara kauki* + *Eugenia reinwardtiana* + *Pandanus* sp.	D
2xx	Semi-deciduous vine forest + *Terminalia catappa* + *Acacia auriculiformis* + *Myristica insipida*	A
	Swamp and riparian forest and forest complexes	
3a	*Lophostemon suaveolens* + *Melaleuca quinquenervia* + *Syzygium angophoroides* + *Asteromyrtus brassii* + *Dillenia alata* swamp forest complex	A, As, D
3b	Medium to tall *Melaleuca leucadendra* +/- *Melaleuca argentea* + *Syzygium forte* subsp. *forte* + *Dillenia alata* open forest.	A
3c	Tall *Melaleuca dealbata* / *Melaleuca leucadendra* open forest/*Acacia* sp. open forest / Mesophyll vine forest complex.	A
3d	Evergreen mesophyll vine forest / Sclerophyll vine forest complex + *Syzygium forte* subsp. *forte* + *Syzygium bamagense* + *Horsfieldia Australiana* +/- *Melaleuca leucadendra* +/- *Lophostemon suaveolens.* (1i/3b- 50/50)	A
3e	*Melaleuca quinquenervia* + *Pandanus sp.* +/- *Deplanchea tetraphylla* swamp forest/ *Lophostemon suaveolens* +/- *Asteromyrtus brassii* +/- *Acacia crassicarpa* +/- *Deplanchea tetraphylla* open swamp forest complex (7d/8b -50/50).	D
3f	*Lophostemon suaveolens* + *Melaleuca leucadendra* + *Corymbia clarksoniana* open forest.	A
3g	Tall *Melaleuca dealbata* + *Acacia crassicarpa* + *Acmena hemilampra* + *Deplanchea tetraphylla* + *Syzygium forte* subsp. *forte* swamp forest complex.	A
	Welchiodendron dominant closed to open forests and woodlands	
4a	*Welchiodendron longivalve* + *Acacia polystachya* +/- *Terminalia subacroptera* +/- *Canarium australianum* +/- *Bombax ceiba* var. *leiocarpum* open to closed forest.	A, G, MG, Gd, R
4b	*Welchiodendron longivalve* low woodland, low open woodland and tall open shrubland	G, R
4c	Low *Welchiodendron longivalve* + *Melaleuca dealbata* open forest.	G, A
	Eucalypt dominant open forests and woodlands	
5a	*Corymbia novoguinensis* +/- *Corymbia stockeri* subsp. *peninsularis* woodland and open forest.	As

Vegetation Community	Description	Geologies
5b	*Corymbia clarksoniana* + *Corymbia nesophila* +/- *Corymbia tessellaris* +/- *Corymbia stockeri* subsp. *peninsularis* +/- *Welchiodendron longivalve* woodland and open forest.	A, G, Mg
5c	*Corymbia clarksoniana* + *Melaleuca stenostachya* + *Melaleuca viridiflora* +/- *Asteromyrtus symphyocarpa* +/- *Parinari nonda* +/- *Asteromyrtus brassii* woodland.	A
5d	Low *Corymbia clarksoniana* + *Melaleuca viridiflora* + *Welchiodendron longivalve* + *Asteromyrtus brassii* + *Acacia leptocarpa* woodland and shrubland complex.	R
5e	Low to medium *Corymbia clarksoniana* +/- *Welchiodendron longivalve* +/- *Eucalyptus leptophleba* open forest and woodland.	R, G
5f	*Eucalyptus leptophleba* +/- *Acacia polystachya* woodland and open forest.	G
5g	*Corymbia tessellaris* + *Acacia polystachya* +/- *Welchiodendron longivalve* woodland and open forest.	A, G
5h	*Corymbia* spp. + *Melaleuca saligna* + *Acacia crassicarpa* +/- *Eucalyptus platyphylla* +/- *Eucalyptus brassiana* open forest.	A
5i	*Corymbia clarksoniana* +/- *Corymbia novoguinensis* +/- *Livistona muelleri* woodland and open forest.	A, D
5j	*Eucalyptus tetrodonta* + *Corymbia nesophila* +/- *Corymbia clarksoniana* +/- *Corymbia novoguinensis* +/- *Corymbia stockeri* subsp. *peninsularis* open forest.	AS, D
5k	*Corymbia nesophila* +/- *Corymbia stockeri* subsp. *peninsularis* +/- *Eucalyptus tetrodonta* woodland and open forest.	A, AS, D
5l	*Corymbia stockeri* subsp. *peninsularis* +/- *Corymbia nesophila* +/- *Eucalyptus tetrodonta* +/- *Eucalyptus cullenii* woodland.	G, GD, R
5m	Low *Corymbia* spp. *(C. stockeri, C. nesophila, C. clarksoniana)* + *Melaleuca stenostachya* +/- *Melaleuca viridiflora* +/- *Asteromyrtus symphyocarpa* woodland.	A, D
5n	*Eucalyptus platyphylla* + *Erythrophloeum chlorostachys* +/- *Corymbia nesophila* +/- *Corymbia novoguinensis* +/- *Eucalyptus tetrodonta* +/- *Corymbia stockeri* subsp. *peninsularis* woodland and open forest.	A, D
5o	*Corymbia tessellaris* +/- *Corymbia clarksoniana* woodland and open woodland.	A, D, GD
5p	Low *Corymbia polycarpa/Corymbia novoguinensis* + *Acacia crassicarpa* + *Terminalia subacroptera* +/- *Sterculia quadrifida* +/- *Syzygium suborbiculare* woodland and open woodland.	D
5q	Low *Corymbia stockeri* subsp. *peninsularis* open forest.	A, AS,D
5r	*Corymbia nesophila* woodland and open forest.	R
5s	*Corymbia clarksoniana* +/- *Corymbia tessellaris* woodland.	A, GD
5t	*Eucalyptus platyphylla* +/- *Corymbia stockeri* subsp. *peninsularis* +/- *Corymbia nesophila* +/- *Corymbia clarksoniana* woodland.	R
5u	*Eucalyptus platyphylla* +/- *Corymbia tessellaris* woodland and open woodland.	A, G, R
5v	*Corymbia stockeri* subsp *peninsularis* + *Welchiodendron longivalve* + *Acacia polystachya* +/- *Corymbia tessellaris* woodland / open forest complex.	G
	Acacia dominant open forests and woodlands	
6a	Low to medium *Acacia auriculiformis* +/- *Terminalia subacroptera* +/- *Antiaris toxicaria* var. *macrophylla* +/- *Bombax ceiba* var. *leiocarpum* open forest / woodland & occasional shrubland.	G, R

Vegetation Community	Description	Geologies
6b	Low to medium *Acacia auriculiformis +/- Parinari nonda +/- Pandanus* sp. *+/- Semecarpus australiensis* open forest/woodland (and occasional shrubland).	A
6c	Low *Acacia crassicarpa + Terminalia subacroptera + Sterculia quadrifida + Manilkara kauki + Syzygium suborbiculare* open forest and woodland.	D
6d	Low *Acacia crassicarpa + Melaleuca* spp. open forest.	D
6e	Low *Acacia polystachya + Alstonia actinophylla + Buchanania arborescens + Manilkara kauki + Pouteria sericea + Sterculia quadrifida* open to closed forest.	GD
6f	Acacia sp. closed shrubland	R
6g	*Acacia crassicarpa +Asteromyrtus brassii* open forest and low open forest.	D
	Melaleuca dominant open forests	
7a	Low *Melaleuca cajuputi* subsp. *platyphylla* open forest.	A
7b/7bs	*Melaleuca saligna* open forest.	A, D
7c	Tall *Melaleuca dealbata + Corymbia clarksoniana* open forest.	A
7d	Melaleuca *quinquenervia +/- Melaleuca saligna +/- Melaleuca cajuputi* subsp. *platyphylla +/- Lophostemon suaveolens* open forest.	A, D
7e	Low *Melaleuca dealbata +/- Melaleuca saligna +/- Lophostemon suaveolens* open forest.	A, D
7f/7fs	*Melaleuca leucadendra* open forest.	A, D
7g	*Melaleuca dealbata* woodland and open forest.	D
	Lophostemon dominant woodland and open forest	
8a	*Lophostemon suaveolens +/- Melaleuca cajuputi* subsp. *platyphylla +/- Pandanus* sp. *+/- Livistona muelleri* woodland and open forest.	A
8b	Low *Lophostemon suaveolens +/- Asteromyrtus brassii +/- Acacia crassicarpa +/- Melaleuca saligna +/- Deplanchea tetraphylla* open forest and swamp forest.	A, D
8c	Low *Lophostemon suaveolens + Corymbia clarksoniana + Asteromyrtus symphyocarpa + Melaleuca saligna + Melaleuca viridiflora +/- Corymbia latifolia* open woodland.	D
	Asteromyrtus/Neofabricia dominant open forests	
9a	*Asteromyrtus brassii + Syzygium angophoroides + Acmena hemilampra* subsp. *hemilampra +/- Acacia crassicarpa +/- Melaleuca quinquenervia* open forest.	As
9b	*Neofabricia myrtifolia + Parinari nonda + Sterculia quadrifida + Terminalia muelleri +Milletia pinnata* closed to open forest.	D
	Casuarina dominant woodland and open forest	
10a	*Casuarina equisetifolia* open forest *+ Diospyros maritima + Premna serratifolia + Milletia pinnata*.	D
10b	*Casuarina equisetifolia* woodland and open forest +/- *Terminalia catappa* woodland and open forest.	D
	Pandanus dominant woodland and shrubland	
11a	*Pandanus* sp. *+/- Melaleuca cajuputi* subsp. *platyphylla +/- Acacia leptocarpa +/- Melaleuca acacioides* shrubland and low woodland.	A

Vegetation Community	Description	Geologies
11b	*Pandanus* sp. +/- *Melaleuca viridiflora* open forest, woodland and shrubland.	B, D, A, G
	Palm dominant forest and woodlands	
12a	*Livistona meulleri* woodland.	G
12b	Low *Nypa fruticans* closed forest.	E
	Melaleuca dominant shrublands and woodlands	
13a	*Melaleuca viridiflora* +/- *Pandanus* sp. shrubland and low woodland.	A, D, R
13b	*Melaleuca cajuputi* subsp. *platyphylla* +/- *Pandanus* sp. shrubland.	A
13c	*Melaleuca viridiflora* + *Asteromyrtus symphyocarpa* +/- *Asteromyrtus brassii* + /- *Banksia dentata* +/- *Melaleuca saligna* +/- *Leucopogon ruscifolius* shrubland.	As. A
13d	*Melaleuca saligna* + *Melaleuca viridiflora* + *Asteromyrtus symphyocarpa* +/- *Asteromyrtus brassii* +/- *Corymbia* spp. +/- *Banksia dentata* low woodland.	A, AS
13e	*Melaleuca acacioides* shrubland.	A
13f	Low *Melaleuca viridiflora* + *Corymbia clarksoniana* woodland.	A
13g	Low *Melaleuca saligna* shrubland.	A
13h	Low *Melaleuca arcana* closed shrubland.	D
13i	*Melaleuca stenostachya* shrubland +/- *Melaleuca viridiflora* low woodland.	A, AS, Gd,R
13j	*Melaleuca acacioides* +/- *Melaleuca viridiflora* open shrubland.	A
	Shrublands and shrubland complexes	
14a	Dwarf *Welchiodendron longivalve* + *Alyxia spicata* +/- *Melaleuca viridiflora* +/- *Acacia* spp. +/- *Asteromyrtus brassii* shrubland.	R
14b	*Melaleuca cajuputi* subsp. *platyphylla* + *Acacia auriculiformis* +/- *Terminalia subacroptera* open scrub and low open forest.	A
14c	*Welchiodendron longivalve* shrubland.	R, Gd
14d	*Cochlospermum gillivraei* +/- *Canarium australianum* +/- *Welchiodendron longivalve* deciduous shrubland.	G, R
14e	Low open shrubland with *Baeckea frutescens*, *Melaleuca viridiflora* and *Asteromyrtus brassii*.	D
14f	*Melaleuca viridiflora* + *Melaleuca stenostachya* + *Welchiodendron longivalve* + *Acacia leptocarpa* +/- *Cochlospermum gillivraei* shrubland.	G, R
14g	*Low Alyxia spicata* + *Manilkara kauki* +/- *Buchanania arborescens* +/- *Canarium australianum* +/- *Diospyros* spp. +/- *Pandanus* sp. low closed shrubland/ rock pavement complex.	G, R
14h	*Acacia polystachya* +/- *Welchiodendron longivalve* closed shrubland.	G
14i	*Asteromyrtus brassii* + *Melaleuca saligna* + *Baeckea frutescens* + *Leucopogon yorkensis* + *Leucopogon ruscifolius* +/- *Lophostemon suaveolens* shrubland and low shrubland.	AS
14j	*Acacia brassii* +/- *Welchiodendron longivalve* closed shrubland.	R
14k	Low *Melaleuca stenostachya* + *Asteromyrtus symphyocarpa* + *Jacksonia thesioides* + *Melaleuca viridiflora* shrubland.	R

Vegetation Community	Description	Geologies
14l	Low *Melaleuca* sp. (Zuna DGF9257+) + *Welchiodendron longivalve* + *Corymbia* spp. + *Acacia brassii* + *Melaleuca stenostachya* + *Jacksonia thesioides* shrubland.	R
14m	*Grevillea striata* + *Acacia crassicarpa* + *Melaleuca viridiflora* + *Parinari nonda* + *Pandanus* sp. + *Corymbia tessellaris* shrubland.	A
14n	*Acacia crassicarpa* + *Leucopogon ruscifolius* +/- *Neofabricia myrtifolia* +/- *Pouteria sericea* +/- *Psydrax banksii* +/- *Halfordia kendack shrubland* and open shrubland.	D
14o	*Melaleuca saligna* dominant riparian shrubland complex.	A
14p	*Asteromyrtus brassii* + *Petalostigma pubescens* + *Melaleuca viridiflora* + *Asteromyrtus brassii* + *Acacia crassicarpa* + *Corymbia clarksoniana* shrubland.	R
14q	Low *Cycas* sp. open shrubland.	D
14r	*Acacia crassicarpa* + *Pandanus* sp. + *Melaleuca viridiflora* +/- *Parinari nonda* +/- *Banksia dentata* +/- *Lophostemon suaveolens* shrubland.	A
14s	Low sparse *Leucopogon ruscifolius* + *Acacia crassicarpa* + *Syzygium suborbiculare* shrubland with *Corymbia novoguinensis* emergents.	D
14t	Low sparse *Cochlospermum gillivraei* + *Canarium australianum* + *Eugenia reinwardtiana* + *Terminalia* sp. + *Pandanus* sp. shrubland.	D
14u	Low *Corymbia stockeri* subsp. *peninsualris* + *Welchiodendron longivalve* open forest / *Welchiodendron longivalve* closed scrub/ Deciduous shrubland/rock pavement complex (5v/4a/18a/18d – 30/40/20/10).	G
14u	Low *Corymbia stockeri* subsp. *peninsularis* + *Welchiodendron longivalve* open forest / *Welchiodendron longivalve* closed scrub / Deciduous shrubland / rock pavement complex (5v/14c/18a/18d – 30/40/20/10).	G
14v	*Eucalyptus leptophleba* + *Grevillea parallela* + *Exocarpos latifolius* + *Terminalia* sp. + *Acacia crassicarpa* shrubland.	D
14w	*Eucalyptus cullenii* + *Corymbia stockeri* subsp. *peninsularis* woodland +/- *Eucalyptus tetrodonta* + *Welchiodendron longivalve* + *Melaleuca stenostachya* shrubland / Low *Acacia brassii* shrubland / Deciduous shrubland complex (5l/14x/14j/18a – 20/40/30/10).	R
14x	*Eucalyptus tetrodonta* + *Welchiodendron longivalve* + *Melaleuca stenostachya* open to sparse shrubland.	R
14y	Low *Premna serratifolia* + *Cordia subcordata* +/- *Pemphis acidula* +/- *Drypetes deplanchei* shrubland.	D
	Coastal headland forest complexes	
15a	Semi deciduous vine thicket / *Pandanus* sp. open forest complex (2w/11a – 60-40).	B
	Coastal dune complexes	
16a	Coastal foredune grassland, herbland and shrubland complex. (17j/14y – 70/30)	D
16b	Coastal foredune grassland / *Casuarina equisetifolia* +/- *Pandanus* sp. +/- *Acacia crassicarpa* shrubland complex (17j/ 10b/6c – 30/20/50).	D
16c	Coastal dune swale shrubland / Low open forest complex + *Cochlospermum gillivraei* + *Canarium australianum* + *Terminalia subacroptera* + *Acacia crassicarpa* + *Melaleuca*	D

Vegetation Community	Description	Geologies
	saligna + *Melaleuca acacioides* (14t/7b – 70/30).	
16d	Coastal dune shrubland and vine forest complex (14t/2aa – 70/30).	D
16e	*Corymbia tessellaris* woodland and open forest / shrubland / vine thicket complex (5o/14t/2aa – 40/40/20).	D
16f	*Casuarina equisetifolia* woodland and open forest/vine thicket complex (10b/2aa – 60/40).	D
16g	Low *Acacia crassicarpa/Melaleuca dealbata* open forest dune swale complex (6c/7g - 80/20).	D
16h	Low groved notophyll vine thicket + *Terminalia muelleri* + *Diospyros maritima* + *Premna serratifolia* + *Thespesia populneoides* + *Manilkara kauki* (2y/17j – 80/20).	D
16i	Low open shrubland with *Terminalia* sp., *Premna serratifolia, Diospyros maritima.*	D
16j	Low groved notophyll vine thicket/ grassland and herbland complex (2z/17j - 80/20).	D
16k	Coastal foredune grassland, herbland, woodland and vine thicket complex (17j/17d/10b/2aa – 50/20/20/10).	D
	Grasslands and grassland complexes	
17a	Tall *Ischaemum australe +/- Imperata cylindrica +/- Themeda triandra +/- Mnesithea rottboellioides +/- Heteropogon triticeus* grassland.	A
17b	*Themeda triandra +/- Imperata cylindrica +/- Mnesithea rottboellioides* grassland.	B, V
17c	Open to closed tussock grassland with emergent shrubs.	GD, R
17d	Medium to tall *Mnesithea rottboellioides* + *Heteropogon triticeus* + *Cymbopogon* spp. *+/- Imperata cylindrica +/- Themeda triandra* grassland.	A. AS. D, G, L
17e	Relic cultivated alluvial plains with anastomosing channel morphology.	A
17f	*Imperata cylindrica* dominant grassland.	D
17g	*Imperata/Themeda* grassland complex with emergent shrubs.	A
17h	*Imperata cylindrica* + *Themeda triandra* grassland / *Welchiodendron longivalve* open forest and woodland complex (17f/4a – 90/10).	G
17i	Low sedgeland with emergent shrubs and trees.	AS, D
17j	Low *Spinifex sericeus* + *Vigna marina* + *Ipomoea pes-caprae* subsp. *brasiliensis* + *Sesuvium portulacastrum* grassland and forbland complex.	D
	Rock pavement and pavement complexes	
18a	Deciduous shrubland / Rock pavement complex.	R
18b	Low *Acacia brassii +/- Welchiodendron longivalve +/- Cochlospermum gillivraei* shrubland/ rock pavement complex (18a/14j -50/50).	Gd, R
18c	*Welchiodendron longivalve +/- Acacia polystachya* closed shrubland / Low deciduous shrubland/rock pavement complex (18a/14c – 50/50).	G, R
18d	*Corymbia stockeri* subsp. *peninsularis* + *Welchiodendron longivalve* + *Psydrax banksii* + *Dodonoea* sp. + *Ficus sp.* rock pavement complex.	G

Vegetation Community	Description	Geologies
	Boulder slope vineland/shrubland complexes	
19a	Open vineland/deciduous shrubland/boulder slope complex.	G, Gd
	Wetland complexes and mosaics	
20a	*Eleocharis dulcis* closed sedgeland.	A
20b	Open wetland complex.	D
	Successional vine forest communities	
21a	Low vine forest and vine thicket with *Barringtonia calyptrata* + *Macaranga involucrata* var. *mallotoides* + *Hibiscus tiliaceus* + *Semecarpus australiensis* successional vine forest and thicket.	V
	Anthropogenically altered (secondary) vine forest and thicket	
22a	Tall palm *(Cocos nucifera*) woodland and open forest with mesophyll/notophyll vine forest sub-canopy of *Myristica insipida* and *Lepidopetalum fructoglabrum.*	B
22b	Semi deciduous vine thicket (secondary) + *Buchanania arborescens* + *Manilkara kauki* + *Scolopia braunii* + *Drypetes deplanchei* + *Terminalia muelleri.*	D
	Saline transitional communities	
23a	Low *Excoecaria agallocha* + *Hibiscus tiliaceus* + *Thespesia populneoides* + *Melaleuca cajuputi* subsp. *platyphylla* open forest.	E
23b	*Pemphis acidula +/- Terminalia subacroptera +/- Premna serratifolia* closed shrubland.	D
23c	Semi deciduous transitional vine forest + *Xylocarpus granatum* + *Manilkara kauki.*	D
	Mangrove forest, woodland and shrubland complexes	
24a	Mangrove closed and open forest, woodland and shrubland complexes (24d/24c – 80/20).	E
24b	*Pemphis acidula* + *Osbornia octodonta* closed shrubland.	E
24c	*Avicennia marina* subsp. *eucalyptifolia* open to closed forest.	E
24d	Open to closed forest of *Bruguiera gymnorhiza +/- Rhizophora stylosa.*	E
	Samphire herblands and shrublands and salt pans	
25a	Dwarf halophytic shrubland and saltpan.	E
25b	Salt pan.	E
	Samphire grasslands	
26a	Closed *Sporobolus* sp. grassland.	E
26b	*Sporobolus* sp. Grassland / Chenopod forbland and herbland complex (26a/25a - 50/50).	E
	Estuarine wetland complexes and mosaics	
27a	*Schoenoplectus* sp. sedgeland.	E
27b	Tall *Schoenoplectus* sp. Sedgeland / Estuarine wetland complex.	E

**indicates pre-clearing community only*

Additional Descriptors: An appended indicator of condition may be applied. As an example a community code of 1ax, where 'x' is the appended condition indicator, represents a highly disturbed VC which has retained sufficient structural integrity to be classified as 'remnant' according to the VMA (1999). The use of an appended 'r', or appended 'd' against VC7ba vegetation attribute is used to distinguish riparian occurrences and drainage depression occurrences respectively, which proved necessary for RE differentiation in this community.

Pre-clearing Descriptors (including non-remnant vegetation types): Where vegetation has been cleared or disturbed to a degree that it can no longer be classified as remnant, the pre-clearing vegetation code is provided as the primary attribute, followed by an appended indicator of current status or condition. As an example, the code B2j(c) indicates a presently cleared area with a pre-clearing vegetation type of B2j. A list of current status indicators is provided in **Table 9**.

Table 9. Descriptors used to indicate pre-clearing vegetation and current vegetation status.

Current Status Indicator (Appended)	Variation
(c)	Native vegetation has been cleared and remains cleared. Generally, these areas are under housing or infrastructure development, or agricultural use.
(b)	Native vegetation has been cleared or disturbed and is currently occupied by Bamboo thicket.
(e)	Native vegetation has been cleared or disturbed and is currently occupied by exotic species (other than Bamboo).
(r)	Native vegetation has been previously cleared and is currently occupied by native regrowth (secondary vegetation) with non-remnant status.

4.1.3 Regional Ecosystems

Vegetation communities have been classified into RE's based on landform association, structural type and floristic assemblage. Seventy six RE's are identified in the study area detailed in **Table 10.** This includes recognition of 10 new RE's of which two are identified on the basis of pre-clearing extent. The spatial distribution of these RE's is provided in accompanying maps **5a** to **5e.** A spatial analysis on the extent of RE's in the Torres Strait Island Sub-region presented in **Section 6.** Further description of RE's including classification and derivation is provided in **Section 5.2.**

Table 10. Regional Ecosystems in the Project Area.

Regional Ecosystem	Component Vegetation Communities	Regional Ecosystem Description[4] .	Vegetation Management Status
Land Zone 1- Estuarine muds and alluvium subject to saltwater incursion			
3.1.1	24a (co) 24b 24d 12b	Closed forest of *Rhizophora stylosa* ± *Bruguiera gymnorhiza.* Occurs as outer mangroves.	Not of Concern
3.1.2 **3.1.2b**	24c 23c 24a (co)	*Avicennia marina* ± *Ceriops tagal* low open forest landward side of mangroves.	Of Concern
3.1.4	23a	*Excoecaria agallocha* ± *Aegiceras corniculata* closed scrub. Upper tidal reaches of rivers.	Of Concern
3.1.5	26a	*Sporobolus virginicus* closed tussock	Not of Concern

[4] Short description as per REDD Version 5.2, 2007

Regional Ecosystem	Component Vegetation Communities	Regional Ecosystem Description[4] .	Vegetation Management Status
	26b (co)	grassland. Occurs on coastal plains.	
3.1.6	25a 25b 26b (co)	Sparse herbland or bare saltpans. Associated with salt plains and saline flats.	Not of Concern
3.1.7**	27a 27b	*Schoenoplectus* sp. estuarine wetland mosaic.	Not of Concern
Land Zone 2 - Coastal Dunes, Cheniers and Sand Sheets and associated Dune Swales.			
3.2.2a	1c 2p 2y 2z 16d(co) 16e(co) 16f(co) 16h(co) 16j(co) 16k(co)	Semi-deciduous vine thicket on coastal dunes and beach ridges.	Of Concern
3.2.2b**	2a 2l 2u 9b	Semi-deciduous notophyll vine forest and thicket of prograding beach ridges of the Torres Strait Islands*.	Of Concern
3.2.3	7g 7e 6d 16g (co)	*Melaleuca dealbata* ± *Acacia crassicarpa* open forest. Occurs in dune swales on the west coast.	Of Concern
3.2.4a **3.2.4b** **3.2.4c** **3.2.4d**	7f 7d 8b 3e (7d/8b) 7b 16c (co)	*Melaleuca leucadendra* ± *M. dealbata* open forest. In dune swales, and swampy areas.	Of Concern
3.2.5a **3.2.5b** **3.2.5c**	6c 5p 6g 14t 14v 14q 16c(co) 16b(co) 16d (co) 16g (co)	*Acacia crassicarpa* ± *Syzygium suborbiculare* ± *Parinari nonda* woodland. On beach ridges.	Not of Concern
3.2.6a **3.2.6b**	10b 16f(co) 16b(co) 16k(co) 10b	*Casuarina equisetifolia* woodland. Occurs on foredunes.	Of Concern
3.2.7	5i 5o 16e (co)	*Corymbia intermedia* or *C. clarksoniana* woodland in wet coastal areas.	Not of Concern
3.2.8	5k 5n 5m 5q	*Corymbia nesophila* ± *C. novoguinensis* ± *Eucalyptus* spp. woodland on old stabilised dunes.	Of Concern
3.2.10c	5j	*Eucalyptus tetrodonta, Corymbia clarksoniana* ± *E. brassiana* or *Erythrophleum chlorostachys* woodland on	Of Concern

Regional Ecosystem	Component Vegetation Communities	Regional Ecosystem Description[4] .	Vegetation Management Status
		stabilised dunes.	
3.2.14	13h	*Melaleuca arcana* low open forest. Associated with dune swamps.	Of Concern
3.2.15	13a 8c 17i	*Melaleuca viridiflora, Neofabricia myrtifolia* woodland on beach ridges.	Not of Concern
3.2.19a **3.2.19b**	14n 14e	*Leucopogon yorkensis* ± *Asteromyrtus brassii* open heath on old beach ridges.	Of Concern
3.2.24	17j 17d 17f 16a(co) 16b(co) 16h(co) 16k(co)	Closed herbland of mixed graminoids and forbs. Occurs on exposed foredunes.	Of Concern
3.2.25	16i 14y 16a(co) 16j(co)	Sparse herbland of mixed herbaceous species on foredunes and beach ridges.	Of Concern
3.2.26	14s	Sparse herbland/shrubland and bare sand areas. Predominantly on sand blows.	Not of Concern
3.2.27	20b	Ephemeral and perennial lakes in coastal dunefields	Of Concern
3.2.28	2m	Evergreen notophyll vine forest on beach ridges on coral atolls, shingle cays and sand cays.	Of Concern
3.2.30	23b	*Pemphis acidula* ± low closed forest. Restricted to coral atolls, shingle cays and sand cays.	Of Concern
Land Zone3 - Alluvial plains, alluvial fans, terraces and fluvial sediments			
3.3.1c* **	2xx	Closed semi-deciduous mesophyll vine forest. Mainly occurs on loamy alluvia (Pre-clearing classification only).	Extinct (??)
3.3.5c	1i 1j 3d (co)	Evergreen notophyll vine forest. Occurs on alluvia on major watercourses.	Not of Concern
3.3.6	3c(co) 3d(co)	Evergreen notophyll vine forest with *Melaleuca leucadendra* on swamps.	Of Concern
3.3.7	2g 4a 6b	Tall semi-deciduous notophyll/microphyll vine thicket (sic-forest). Occurs on colluvial plains.	Not of Concern
3.3.9	3a 3f 8b	*Lophostemon suaveolens* open forest. Occurs on streamlines, swamps and alluvial terraces.	Not of Concern
3.3.10a **3.3.10b** **3.3.10c** **3.3.10d**	3b 14o/7br 5h 3g	*Melaleuca argentea* and / or *M. fluviatilis* ± *M. leucadendra* open forest. Fringes streams and creeks.	Not of Concern
3.3.12	7d	*Melaleuca quinquenervia* open forest. Associated with scattered coastal swamps.	Of Concern
3.3.13	7bs	*Melaleuca saligna* ± *Hakea pedunculata* open forest. Occurs on edges of salt pans plains.	Of Concern
3.3.14	7b 7e 13g	*Melaleuca saligna* ± *M. viridiflora, Lophostemon suaveolens* woodland on drainage swamps.	Not of Concern

Regional Ecosystem	Component Vegetation Communities	Regional Ecosystem Description[4] .	Vegetation Management Status
3.3.14b	7fs		
3.3.17b	5o 5g 5s	*Corymbia clarksoniana, Erythrophleum chlorostachys* woodland on alluvial plains.	Not of Concern
3.3.20c	5b	*Corymbia clarksoniana* ± *Erythrophleum chlorostachys* ± *Melaleuca viridiflora* woodland on alluvial plains.	Not of Concern
3.3.22	5i 5c	*Corymbia clarksoniana* or *C. novoguinensis* woodland on alluvial plains.	Not of Concern
3.3.27	5k 5q 5m	*Corymbia nesophila* ± *Eucalyptus tetrodonta* ± *Eucalyptus brassiana* woodland on alluvial sediments.	Not of Concern
3.3.28	5u 5n	*Eucalyptus platyphylla* ± *Corymbia clarksoniana* woodland on alluvial and colluvial plains.	Not of Concern
3.3.42a **3.3.42c**	13a 13c 14m 14r 13f 11b 13b	*Melaleuca viridiflora* low woodland in drainage areas.	Not of Concern
3.3.48b	13d	*Melaleuca saligna* ± *M. viridiflora* low open woodland in drainage depressions.	Not of Concern
3.3.51	13e 13j	*Melaleuca acacioides* ± *Hakea pedunculata* tall shrubland on marine plains.	Of Concern
3.3.57	17d 17g	*Imperata cylindrica* ± *Mnesithea rottboellioides* closed tussock grassland on coastal plains.	Of Concern
3.3.62	17a 17e 11a	Grassland/sedgeland with *Pandanus* spp. Confined to Torres Strait Islands.	Of Concern
3.3.63	20a	Closed sedgeland dominated by *Eleocharis dulcis.* On seasonally flooded marine plains.	Not of Concern
3.3.65	20b	Ephemeral lakes and lagoons on alluvial plains and depressions.	Not of Concern
3.3.68**	2c 14b	Semi-deciduous notophyll vine forest and thicket on alluvial plains. Northern islands of the Torres Strait*.	Of Concern
3.3.69**	7c 4d 4c	*Melaleuca dealbata* +/- *Corymbia clarksoniana* open forest on alluvial plains.	Of Concern
3.3.70**	8a 7a	*Lophostemon suaveolens* +/- *Melaleuca cajuputi* subsp. *platyphylla* +/- *Pandanus* sp. +/- *Livistona muelleri* woodland and open forest. Alluvial plains of northern Torres Strait Islands.	Of Concern
Land Zone 5 – Sandy plains and rises/ lateritic profiles and remnant alluvial/colluvial surfaces.			
3.5.5	5a	*Corymbia novoguinensis* or *C. nesophila* ± *C. tessellaris* woodland on northern Cape York Peninsula.	Of Concern
3.5.8c	5q	*Eucalyptus tetrodonta* ± *Corymbia hylandii* subsp. *peninsularis* ± *C. stockeri* woodland on erosional plains and sandtone plateaus.	Not of Concern
3.5.15a	13a	*Melaleuca viridiflora* ± *Acacia* spp. ±	Not of Concern

Regional Ecosystem	Component Vegetation Communities	Regional Ecosystem Description[4] .	Vegetation Management Status
3.5.15b	13d 13f 13c 17i	*Asteromyrtus symphyocarpa* low woodland on scattered coastal sand plains.	
3.5.17a	13i	*Melaleuca stenostachya* +/- *Melaleuca viridiflora* low open woodland on flat plains.	Of Concern
3.5.19a	14i	*Asteromyrtus lysicephala, Choriceras tricorne* open heath on sand sheets.	Not of Concern
3.5.23x1	5j 5k	*Eucalyptus tetrodonta* ± *Corymbia nesophila* ± *C. clarksoniana* woodland on undulating rises.	Of Concern
3.5.29	17d	*Sorghum plumosum* var. *plumosum* ± *Themeda arguens* closed tussock grassland on erosional plains.	Not of Concern
3.5.32**	9a	*Asteromyrtus brassii* + *Syzygium angophoroides* + *Acmena hemilampra* subsp. *hemilampra* open to closed forest on sandy rises*.	Not of Concern
Land Zone 7 – Exposed or shallowly covered duricrust			
3.7.1x1b	2e	Semi-deciduous notophyll vine thicket on lateritic remnants. Northern Torres Strait Islands.	Of Concern
Land Zone 8 - Basalt escarpments and terraces/Volcanic cones formed on ash and scoria			
3.8.4b	17b	*Imperata cylindrica* ± *Mnesithea rottboellioides* closed tussock grassland on basalt vents & cones.	Of Concern
3.8.5a** **3.8.5b**** **3.8.5c**** **3.8.5d**** **3.8.5e****	2i 2j 2k 2w 21a 15a	Semi-deciduous notophyll/microphyll vine forest of the Torres Strait Island Sub-region*.	Of Concern
Land Zone 12 – Acid volcanic and plutonic rocks including hornfelsed granite parent rocks			
3.12.4a **3.12.4b**	4a 4b 14u (co) 17h (co) 1d	Notophyll vine forest of *Welchiodendron longivalve* on Torres Strait Islands.	Not of Concern
3.12.8	5b 5s 5e	*Corymbia clarksoniana* ± *C. tessellaris* open forest on coastal ranges and lowlands.	Not of Concern
3.12.9	5g 5o	*Corymbia tessellaris, C. clarksoniana* open forest. Occurs on coastal ranges.	Not of Concern
3.12.11	5l 5v 14u (co) 14w(co)	*Corymbia stockeri* subsp. *peninsularis* ± *Welchiodendron longivalve* woodland on Torres Strait Islands.	Not of Concern
3.12.13	5r	*Corymbia nesophila* ± *C. hylandii* subsp. *peninsularis* woodland on acid volcanic hills.	Not of Concern
3.12.16c **3.12.16d**	13i 14k 14x 14w(co)	*Melaleuca viridiflora, Asteromyrtus brassii* woodland. Associated with granitic hills.	Not of Concern
3.12.18	5f	*Eucalyptus leptophleba, Corymbia clarksoniana* woodland to open woodland on	Not of Concern

Regional Ecosystem	Component Vegetation Communities	Regional Ecosystem Description[4] .	Vegetation Management Status
		coastal hills.	
3.12.20	14c 14d 14h 18c(co)	Evergreen notophyll vine forest dominated by *Welchiodendron longivalve* on headlands.	Of Concern
3.12.21a	2b 2f 2n 2s 2v 2x	Deciduous vine thicket. Occurs on granite slopes mainly on the Great Dividing Range and offshore islands.	Not of Concern
3.12.23	14j 14w(co) 18b(co) 6f	*Acacia brassii* low open forest on acid volcanics on northern ranges and islands.	Of Concern
3.12.29	17c 12a	*Heteropogon triticeus* ± *Sarga plumosum* closed tussock grassland on continental islands.	Of Concern
3.12.30	17f 17h(co)	*Imperata cylindrica* ± *Mnesithea rottboellioides* closed tussock grassland on steep slopes.	Of Concern
13.12.31x1a	14a 14f 14l 14g	Shrubland on exposed coastal headlands of the Torres Strait Islands.*	Of Concern
3.12.33b	19a 11b	Granite boulders covered with blue-green algae. Occurs on Black Mountain and Cape Melville.	Of Concern
3.12.34c	18a 18b (co) 18c (co) 18d 14w (co) RR GG	Rock pavements associated with hillslopes and footslopes of the Torres Strait Islands.*	Of Concern
3.12.35a**	2t 2h	Semi-deciduous mesophyll/notophyll vine forest on granite slopes of the Torres Strait Sub-region.*	Of Concern
3.12.35b**	2d		
3.12.35c**	2o		
3.12.35d**	2q		
3.12.35e**	2r		
3.12.35f**	6a/6e		
3.12.36a**	1a 1e 1f	Evergreen to complex evergreen mesophyll to notophyll vine forest and thicket on mountain ranges of Torres Strait Islands.	Of Concern
3.12.36b**	1b 1g 1h		
3.12.37**	5t 5u	*Eucalyptus platyphylla +/- Corymbia stockerii +/- Corymbia clarksoniana* woodland to open woodland on coastal hills.	Not of Concern
3.12.38**	5d 14p 13a	*Melaleuca viridiflora* ± *Neofabricia myrtifolia* low woodland on granitic ranges.	Not of Concern

*Preliminary description / **New regional ecosystem / *** Pre-clearing representation only / co = Component of Vegetation Complex where specific components of this VC are included in the RE.

5.0 Results Analysis and Discussion

5.1 Clarifications on the Classification of Land Zones in the Study Area

The following provides a brief analysis of the land zone classifications used to derive RE's in the area, including description of their component landforms, rationale for classification, and their distribution.

5.1.1 Land Zone 1

As per the definition of Harris (nd.), this land zone includes all alluvial deposits subject to periodic tidal inundation, including muds, sands and rock bars inundated by brackish or marine waters. Whilst this is conceptually simple, Land Zone 1 does present some problem for interpretation due its relationship with Land Zone 3. There is often a continuum of landform between these land zones and differentiation is possible only through assessment of ground cover or shrub species. Land Zone 1 is recognisable through its association with sod grasses, sedges and chenopod forbs and in many cases, the upper tidal influence is marked by a low bench or rise, particularly on Boigu and Saibai Islands where low alluvial rises define the boundaries between tall tussock grasslands and sod grassland/salt flat vegetation. Saibai Island also demonstrates a continuum between freshwater and estuarine wetland systems which proved problematic. The attenuated arms of tidal swamps that intrude into the islands central alluvial areas are dominated by mangroves forests on the seaward portions, merging seamlessly into mixed melaleuca and mangrove communities fringing tall brackish sedge swamps, with inland attenuations frequently represented by marginally brackish sedgelands with scattered mangrove shrubs, vine thickets and melaleuca dominant communities on the fringes. In these areas, the distinction between Land Zone 1 and Land Zone 3 was subjective, based on field assessment of the degree of saltwater influence in particular portions of the wetland system as observed in the late dry season. In all cases, attempts were made to apply a consistent approach to land zone classifications, ensuring any future attempts to clarify these land zone boundaries can be addressed on a regionally consistent basis. In summary, with reference to the definition provided by Harris (nd.), the classification of Land Zone 1 is best indicated by the nature of its constituent species. This land zone is recognised by a prominence of halophytic species including mangroves, salt tolerant grasses and sedges, and chenopod forbs.

5.1.2 Land Zone 2

This land zone includes all landforms composed of marine sands and may include beach ridges, cheniers, degraded sand dunes, aeolian dune systems, and the calcareous sand deposits of coral cays. It also encompasses dune swales and associated freshwater wetlands. The best developed occurrences are on the inner islands with extensive prograding dune systems found on the south-western facing embayments of Muralug and Friday Islands. Land Zone 2 is developed on all of the larger islands to some degree, often manifest as a minor sliver of sand (beach ridge) immediately above the upper tidal limits. Extensive wind blown (aeolian) sand deposits well developed on Badu and Naghir (to a lesser degree) are also classified in this system. Marine sands subject to tidal inundation, often occupied by mangrove species, are classified as Land Zone 1.

5.1.3 Land Zone 3

Difficulties with the distinction between Land Zone 1 and Land Zone 3 have been indicated previously in **Section 5.1.1**. Land Zone 3 in this study includes all transported alluvial material except those affected by tidal inundation; older sediment and colluvial profiles affected by deep weathering, laterisation and clay alteration, and; residual sediments. The major landforms associated with Land Zone 3 include piedmont fans and outwash plains; fluvial sediments and terraces associated with drainage channels, and; alluvial sediments associated with freshwater swamps. Problematic areas which concern the distinction between Land Zone 3 and Land Zone 5 on Moa and Muralug Islands are described in **Section 5.1.4.**

The most extensive occurrences of Land Zone 3 are associated with gently overlapping alluvial fans and outwash plains on Muralug and Moa Islands. This is not surprising considering that due to their considerable size, these islands have a well-developed drainage network which is lacking on many of the smaller islands in the study area. The composition of the alluvial plains depends largely on provenance, with alluvium derived from finer grained acid volcanic rocks generally being silty and poorly drained. Coarser granitoid rocks produce sandier alluvial types which are relatively well-drained, often supporting luxuriant riparian vine-forest vegetation. On the south-eastern side of Muralug Island where the dominant geology is diorite, relatively fertile clay rich alluvial plains have developed. The soil associated with these plains is mildly vertic (shrink and swell) with a well-drained upper soil profile and gentle gilgai micro-topography. The geological code TQH characterises the majority of the fringing coastal plains on the larger islands, indicating an undifferentiated unit comprising Tertiary, Quaternary and Holocene age sediments. In the majority of cases (particularly on Horn and Muralug Island), coastal plains are formed by low angle, evenly graded alluvial fans which slope to tidal margins without any abrupt variation in topography. Local sea level provides a control on the base level of erosion, influencing the angle of the fringing alluvial fan, the rate of sedimentation, and the depth of fan incision. It is evident that the dominant control on the distribution of surficial sediments on these fans is sheetwash and alluvial process rather than being residual sediment weathered insitu. On this account, the majority of the more extensive coastal plains are classified as LZ3 features rather than LZ5 as might be otherwise inferred. A relative sea level fall would reactivate alluvial process, initiating a new episode of fan incision and erosion, forming a transient sequence of relict alluvial surfaces. As discussed in Section 5.1.4, relict alluvial surfaces are present in some locations on the larger islands, possible testament to a recent sea level fall as inferred by Burne et al (1995). The possibility that the alluvial covering on these broad coastal plains is surficial, overlying deeply weathered sediments from previous depositional cycles, or bedrock weathered insitu should be considered. Until in-depth soil profiling and geomorphic studies are undertaken on these coastal plains, it is not possible to confirm their true nature and land zone classification can only be based on visible geomorphic character.

As previously mentioned in Section 1.1.3, remnants of the Fly Platform, manifest as sandy clay rises on Saibai and Boigu Islands are described as Quaternary age by Wilmott *et al.* (1972), although broad physiographic groupings of Paijmans *et al.* (1971) classify the islands as part of the Tertiary age Oriomo Plateau. Evidence produced from sediment coring undertaken by Barham (1999) support early Pleistocene age for these features, based both on observation of ferruginous pisoliths within the soil profile and experimental results. It is therefore not inappropriate to classify these broad clay plains as Land Zone 5 features, although this reclassification has not been implemented in this study, due largely to the poorly constrained definition of what constitutes a LZ5 feature. For the purpose of this study, the majority of the alluvial landform on Saibai (and all of Boigu) has been classified as Land Zone 3, corresponding to the coastal plain of Bleaker (1983) on the adjacent PNG coast, which shares similarities in both landform and vegetation, and is classified as a Holocene feature (Blake and Ollier, 1970). The lateritised sediments on the coastal margins of Saibai are classified as Land Zone 7 features and are described in the following section.

5.1.4 Land Zone 5

The classification of Land Zone 5 presents one of the most problematic aspects of land classification in the exercise, due largely to its relationship with more recent alluvial features and its often subtle characteristics which are not always immediately obvious. The Land Zone is most extensive on Moa and Muralug Islands, and discussion on the provenance of these features is provided below. Minor areas have been classified on Wednesday and Friday Islands, and a number of lateritised colluvial terraces on the south western side of Dauan have also been recognised in this category, and are described briefly towards the end of the section.

Photograph 4. Extensive alluvial plains (Land Zone 3) on Saibai Island supporting Pandanus. The sinuous red-brown feature is a desiccated sedge swamp. Dauan Island is visible in the far right background of the photograph.

Rationale for the classification of Land Zone 5 on Moa Island, considers the broad physiography and landform development of the island, and is described based largely on field observation. The present day morphology has been heavily influenced by the intrusion of the Badu Granite (Cub) into the Torres Strait Volcanics (Ct) in the Late Carboniferous period. This intrusion altered the mineral structure of the earlier volcanic rocks through extreme heating (hornfelsing) which hardened them, and resulted in a rock type that is resistant to weathering. The Badu granite in contrast, being coarse grained and fresh, was relatively susceptible to both physical and chemical breakdown. This differing susceptibility to erosion created an erosion gradient, particularly along granite contacts and the Badu Granite was eroded at a much faster rate than the more resilient Torres Strait Volcanics. Preferential erosion of the granite resulted in the deposition of significant quantities of coarse granite sand, which are well-preserved as thick, gently undulating sand plains in the present Moa landscape (incorporated in part into the landform type AS). Active deposition on these sand plains has largely ceased and they have been classified as Land Zone 5 features in this exercise in recognition of their relict status. It is however clear that these sand plains are likely to be of Quaternary age, and are significantly younger than the erosional plain which occupies more central parts of the island. Preferential erosion of the younger granite pluton has resulted in the broadly semi-circular rim of hardened volcanic rock evident on the southern and eastern margins of the island, which has channelled the bulk of the sedimentation towards the northwest into a broad topographic depression, where the best preserved and developed examples of these relicts sand plains are located.

There is strong evidence in the present landscape to suggest that the extremely rapid erosion and deposition that resulted in formation of the sand plains slowed, or, that sediment deposition was re-directed. A considerable proportion of broad plain indicated as **AS** is clearly an erosional feature, with shallow residual sands overlying granite basement which protrudes as numerous

corestones above the surface of what is an otherwise flat leached sandy plain. Residual terraces composed of coarse granite sand, being remnants of the former depositional landform, are limited to marginal areas of the erosional plain and have clearly retreated in their extent. This landscape almost certainly results from a much earlier period of weathering and is clearly a more typical Land Zone 5 feature.

Photograph 5. Deeply weathered granite basement on erosional plain (Landform AS) on Moa Island.

Changes in rates of sedimentation can be attributed to either shifts in climatic regime, or as a gradual cessation as landforms lower through denudation over time, and both of these mechanisms may have been partly responsible for a change in regime from deposition to erosion. A change in base level may also have contributed to the shifting regime. Pleistocene (122ka) sea level is reported to have been 5 m higher than present in the Cape York Peninsula region (Burne *et al.* 1995) and a drop in sea levels may have contributed to a shift in the regime from coastal plain deposition to erosion. An area of extremely weathered sand dune on the broad erosional plain provides a clear indication of higher sea levels in the past. It should be noted that this contrasts dramatically with the findings of Rowe (2007), who postulates on the basis of the pollen record, that sediment deposition rates in the last 2 500 years have increased dramatically due to anthropogenic disturbance (landscape burning) facilitating extensive freshwater swamp formation (expansion) on Moa Island. At least in the geomorphic sense, there is no evidence for this.

Through whatever mechanism, this shift in sedimentary regime has resulted in a number of features on the north-west coastal plain which are considered unique to the island. Several low sandy rises on the north-western side of the island support open forest vegetation comprising *Melaleuca quinquenervia, Syzygium angophoroides* and *Acmena hemilampra* subsp. *hemilampra.* If landscape position is ignored, these forests would normally be classified as swamp forests, typically occupying the lower permanently wet portions of the landscape. That these communities occupy low sandy rises presents some problems for landscape interpretation. The residual rises may represent relict sand dunes, although are too degraded for this to be demonstrated clearly. Vegetation on these rises is also significantly different from communities on weathered dunes in other locations, with sparse shrublands being more typical. With this considered, it is possible that the forest communities (mapped as VC9a) represent remnants of former swamplands that have been subject to a topographic reversal and now occupy the raised portions of the erosional plain. In any case, from a landscape sense, there is little alternative to classify these low rises as Land Zone 5 features.Furthermore, landform systems similar to the one described on Moa are identified on Muralug behind Big Buttertin Beach. In this area, coarse sandy terraces are scattered across a coastal plain where thin recent alluvial deposits overly a

deeply leached kaolin profile. The classification of this coastal plain remains problematic, dependant largely on the depth of the recent alluvial cover. In the absence of any detailed soil auger sampling on these plains, visible surficial morphology provides the only sound basis for classification. As such, the classification places them within Land Zone 3. Future soil sampling efforts would be required to increase confidence in Land Zone classification in these areas, in particular, determination of the depth of recent alluvial cover. The sandy terraces rising above these gently sloping plains are often characterised by basal exposures of laterite and as such, are classified within Land Zone 5. It should however be considered likely that the sandy overburden is a superficial Quaternary deposit which, similar to Moa Island, has been stripped in adjacent areas.

Photograph 6. Exposed laterite profile at the base of a remnant sand plain on Muralug Island.

On Wednesday and Friday Islands, Land Zone 5 is recognised in midslope positions, typically on eroded and deeply weathered terraces. Iron stained kaolin cements the detrital sediment on Wednesday Island, and erosion gullies have incised the landform, generated through excessive surface run-off over a relatively impermeable substrate. The landform on Wednesday Island corresponds roughly to an area of deeply weathered sandstone reported in the vicinity by Wilmott (1977), however this sandstone outcrop was not observed during the traverse. Although in a similar topographic location on Friday Island, the facilitation of deep sediment weathering by the high permeability of the constituent coarse granitic sediment has favoured a period of relative landform stability. This stability has allowed preservation of relict alluvial features, although these features may be considerably younger than Tertiary age.

The classification of Land Zone 5 extends northward to Dauan Island where series of truncated colluvial terraces fringe the base of the piedmont slope on the islands western side, mapped as landform type 'T'. Examination of cuttings on these features exposed on drainage incisions demonstrates a strong lateritic horizon at approximately 60cm depth in the soil profile in some areas. These features have been classified with Land Zone 5 on account of their long term stability and weathering history.

In summary, the classification of Land Zone 5 within the Torres Strait Islands applies to extensive erosional plains and remnant sand plains identified on Moa and Muralug Islands, weathered alluvial remnants associated with gully heads on Friday and Wednesday Islands, and minor areas associated with lateritised colluvial terraces on Dauan. Extensive coastal plains on the north-west side of Horn Island and to a lesser extent Wednesday and Friday Islands lack some of the geomorphic and landform features described for Moa and Muralug, which makes Land

Zone classification more robust. Thin surficial layers of alluvial sediment and fine silica sand are present on some coastal plains on the inner islands although these are generally extremely shallow with the majority of the fringing coastal plain being influenced by alluvial process which is continuing in the present geomorphic regime.

5.1.5 Land Zone 7

A minor area of mapped as Land Zone 7 (geol. prefix T) underlies the settlement on Saibai Island, forming the most topographically elevated portion of the island. This landform is currently undergoing significant landward erosion through undercutting and collapse of the iron cemented hard-pan layer, most actively during the summer periods where northerly trade winds prevail. The inclusion of this feature under the classification of Land Zone 7 is based on the lateritic exposure evident on the coastline, directed under advice from the Queensland Herbarium, and has not been validated through formalised soil profiles or geomorphic analysis. Due to the long history of settlement, this landform is largely devoid of remnant vegetation.

Photograph 7. Slabby exposure of lateritic duricrust on the coastal fringe of Saibai township.

5.1.6 Land Zone 8

Land Zone 8 poses few problems for classification, being restricted to the eastern group of islands including Mer, Erub and Ugar. Landforms associated with Land Zone 8, which include Pleistocene flow basalts and associated volcanic ejecta, have been adequately characterised in the introductory sections of this report (**Section 1.1.3**) and require little expansion in this section. Basaltic terraces and pavements subject to tidal inundation, supporting mangrove communities in some locations have been classified as Land Zone 1.

5.1.7 Land Zone 12

Land zone 12 occupies a considerable proportion of the combined island mass, and as previously described in **Section 1.1.3** (i.e. Islands Formed on Acidic Volcanic and Plutonic Basement), extends through all island groupings with the exception of the eastern group. This is a relatively simple group to define, including all igneous and volcanic rocks greater than Cainozoic in age, and as such extends to all basement outcrop in the Torres Strait Islands other than Pleistocene basalt. There is however significant chemical and structural variation within the grouping and in

an attempt to better describe the landscape and provide a more comprehensive ecological analysis, a number of land zone sub-groupings have been recognised.

Sub-groupings, as listed in **Table 7**, are characterised in respect to a rock types specific ecological properties. Rhyolite (R), which is extensive on the inner group of islands (including Muralug), is generally the least fertile grouping, being fine grained, and resilient to weathering. Granites weather to form sandy soils which are relatively well-drained, and can be relatively fertile depending on the percentage of iron and magnesium rich mineral in the parent rock. The Badu Granite, which comprises a significant proportion of the Badu, Moa, Dauan and Iama land masses, is relatively rich in biotite and derived soils are of moderate fertility (as a generalisation). By definition, diorite is richer in iron and magnesium rich minerals than both granite and rhyolite, and derived soils are of moderate fertility. This feature is a useful indicator to assist differentiation of forest types, for example, some of the best-developed examples of vine forest on foothills occupy diorite knolls and talus slopes on the south eastern-side of Muralug Island.

A final classification recognises altered acid plutonic rocks classified as MG, and is indicative of rocks that have been hardened through superheating during subsequent intrusive events. These rocks, generally termed hornfels, are extremely resistant to weathering and often manifest in the landscape as rock piles and knolls comprised of boulder talus as on Moa Island. Although a metamorphic rock on a generic level, hornfels is grouped within Land Zone 12 in recognition of the limited chemical change parent material undergoes during the heating process.

5.2 Regional Ecosystem Descriptions and Rationale for Classification

This section provides descriptive notes on the occurrence and characteristics of RE's in the study area. Features of each RE are discussed in relation to component vegetation communities with recognition of some marked structural and floristic variations which may occur within individual RE's. It should also be noted that individual vegetation communities may be recorded in a range of regional ecosystems dependant on geological association.

5.2.1 Regional Ecosystem 3.1.1

Description: Closed forest of *Rhizophora stylosa* ± *Bruguiera gymnorhiza.* Occurs as outer mangroves.
Status: Not of Concern
Vegetation Communities: 24a (co), 24b, 24d, 12b
Reference Sites: 41 Quaternary

This is a highly complex and variable RE occupying intertidal areas, generally on the seaward fringe of mangroves where tidal exchange is greatest, although may be attenuated well inland along estuarine drainage systems. All islands sampled with the exception of the Coral Cays have some development of this regional ecosystem on their shorelines, although the most extensive occurs on the northern islands of Saibai and Boigu, as well as mangrove islands of Zagai, Buru and Sassie. The major component is open to closed forest although a range of structural variations including closed shrubland, mangrove woodland and low open forest have been included in the classification. As such, VC24a the major component of this RE is described as a mangrove forest, woodland and shrubland complex. Vegetation Community 24d is a purer expression of RE3.1.1 mapped on the mangrove tidal islands of Sassie and Buru.

The mapping of VC24a as a complex reflects limitations in vegetation sampling which concentrated on terrestrial biodiversity values as required within the project scope. Vegetation sampling was insufficient to describe all floristic and structural components of this complex with confidence. Wherever possible, VC24c is separated from the mangrove complex to allow differentiation of RE3.1.2, which is discussed in following sections. There is however considerable complexing of this RE which is evident in the spatial data, particularly on the northern islands. This RE also includes small areas of Nypa forest on North-West Creek mapped as VC12b, and limited occurrences of *Pemphis acidula* and *Osbornia octodonta* dominated low closed forest on intertidal areas of Iama Island and Sassie Island (VC24b).

This RE represents the best development of mangrove habitat in the Torres Strait. It provides important habitat for estuarine crocodiles, and may provide habitat for the vulnerable listed butterfly *Hypochrysops apollo*, and two other jewel butterflies *H. narcissus* and *H. apelles* (EPA 2007). The occurrence of Nypa forest on Muralug is significant and representing an extension of geographical range north from the Jardine River mouth and is the only known occurrence between Cape York and PNG. The ecosystem also provides an important cultural resource supporting traditional hunting and fishing practises and is fundamental to marine biodiversity and fisheries.

Photograph 8. Tall open forest with dominant *Bruguiera sp.* on Boigu Island (RE3.1.1). Canopy height of this community exceeded 35m.

Photograph 9. A grove of Nypa Palm (*Nypa fruticans)* on North-West Creek, Muralug Island represents the most northern occurrence of the palm in Australian territory.

5.2.2 Regional Ecosystem 3.1.2

Description: *Avicennia marina* ± *Ceriops tagal* low open forest landward side of mangroves
Status: Of Concern
Vegetation Communities: 24c, 23c, 24a
Reference Sites: 14 Quaternary

Vegetation Community 24c: This regional ecosystem is extensive on the landward fringe of mangrove forest complexes, typically on the forest boundary between halophytic forbland (RE3.1.6) and Sporobolus grasslands (RE3.1.5). The major occurrences are on the northern islands of Saibai and Boigu where they are mapped as a component of mangrove complex type VC24a, although smaller areas are present on the majority of islands sampled and have been individually differentiated. The dominant canopy tree is *Avicennia marina* subsp. *eucalyptifolia* with the canopy varying markedly in both height and structure. The majority of communities sampled were woodlands, although tall open forests with canopy heights exceeding 30m were common on Boigu Island. This RE has been mapped separately wherever convenient, although it has been included in a broader complex with RE3.1.1 in the majority of areas.

Photograph 10. A specimen of *Avicennia marina* subsp. *eucalyptifolia* exceeding 35m. Tall open forest (RE3.1.2) on Boigu Island.

Photograph 11. Mangrove woodland dominated by *Avicennia marina* subsp. *eucalyptifolia* on Boigu Island (RE3.1.2).

Vegetation Community 23c: The interior of Sassie Island hosts a unique ecosystem, mapped here as VC23c. The community is recognised in the sub-grouping of RE3.2.1b due to its limited aerial extent and lack of a more appropriate RE classification. This community provides a significant floristic departure from other VC's allocated to this group and its floristic association presents features transitional between a mangrove and vine forest community. The canopy, which attains heights of 25m or greater, is dominated by the deciduous mangrove species *Xylocarpus granatum* with *Manilkara kauki* a co-dominant species. Due to difficult access, the community was observed from helicopter only and its shrub and ground cover composition in unknown. Investigation of similar Xylocarpus dominated forests, which form a fringe to vine forests on the islands southern coast, suggest that it occupies raised ridges of coral rubble above the height of average maximum tidal inundation.

Photograph 12. The deciduous crowns of *Xylocarpus granatum* clearly visible in contrast to the evergreen nature of surrounding mangrove communities. Interior areas of Sassie Island.

5.2.3 Regional Ecosystem 3.1.4

Description: *Excoecaria agallocha* ± *Aegiceras corniculata* closed scrub. Upper tidal reaches of rivers.
Status: Of Concern
Vegetation Communities: 23a
Reference Sites: 10 Quaternary

This RE is extensive on Saibai Island, particularly on the brackish landward attenuations of tidal inlets where it forms a fringing community.

Vegetation Community 23a: The dominant component VC23a is classified as a saline transitional community on account of its requirement for brackish conditions. Dominant canopy species are *Excoecaria agallocha*, *Avicennia marina* subsp. *eucalyptoides*, *Bruguiera* sp., *Hibiscus tiliaceus* and *Thespesia populneoides*. The type merges with VC2c in some locations where scattered vine forest species including *Terminalia subacroptera* may occur in the canopy together with *Acacia leptocarpa*. *Melaleuca cajuputi* subsp. *platyphylla* may also be a prominent canopy species in some locations. Typical understorey species include *Clerodendron inerme*, *Acanthus ilicifolius*, and *Cynanchum carnosum* with *Acrostichum aureum* dominating the groundcover.

Photograph 13. VC23a fringing brackish sedge swamps on Saibai Island. *Excoecaria agallocha*, *Hibiscus tiliaceus* and *Thespesia populneoides* form the dominant canopy species in this narrow fringe.

5.2.4 Regional Ecosystem 3.1.5

Description: *Sporobolus virginicus* closed tussock grassland. Occurs on coastal plains.
Status: Not of Concern
Vegetation Communities: 26a, 26b(co)
Reference Sites: 16 Quaternary

Sporobolus virginicus dominant grasslands (VC26a) are extensive on the northern islands of Boigu and Saibai where they occupy the landward fringe on mangrove forest communities, often complexing with salt flats and halophytic forblands where they are mapped as VC26b. Associated species include *Tecticornia australasica*, *Cynanchum carnosum*, and *Sesuvium portulacastrum*. On margins *Acrostichum aureum* and *Eleocharis dulcis* may occur. Emergent shrubs to 1m may occur and include *Avicennia marina, Bruguiera parviflora, Clerodendron inerme, Excoecaria agollocha, Thespesia populneoides* and *Wollastonia biflora*. The community

also forms a component of VC26b, mapped as a complex of sporobulus grassland and chenopod forbland. On Boigu Island, Sporobolus grasslands are seasonally burnt as traditional practice. It is postulated that burning prevents mangrove invasion, and by doing so, assists in the long-term maintenance of habitat diversity, also maintaining access for traditional prawning practices and hunting of introduced deer.

Photograph 14. Recently burnt (Oct. 2007) Sporobolus grassland with open forest of *Avicennia marina* subsp. *eucalyptifolia* in background. Boigu Island.

5.2.5 Regional Ecosystem 3.1.6

Description: Sparse herbland or bare saltpans. Associated with salt plains and saline flats.
Status: Not of Concern
Vegetation Communities: 25a, 25b, 26b (co)
Reference Sites: 16 Quaternary

RE3.1.6 is the dominant ecosystem in the northern island group with relatively extensive areas also occurring on the mid western islands of Moa and inner islands of Muralug and Horn. The RE manifests in response to hyper-saline conditions, a result of repetitive tidal wetting and subsequent evaporation.

Vegetation Community 25a & 25b: The dominant floristic components of VC25a & VC25b are halophytic forbs including *Tecticornia australasica*, *Halosarcia* sp., *Sarcocornia quinqueflora* subsp. *quinqueflora* and *Suaeda australis*. Where these species form a prominent ground cover, they are mapped as VC25a. Areas of this RE, mapped as VC25b, lack any significant ground cover due to persistent salt scalding. Evaporite crusts may form in the lower depressions of these areas during dryer periods. The RE provides estuarine wetland habitat values. Small areas of VC25a form a componet of the estuarine complex VC26b.

Photograph 15. An evaporite crust on a saltpan on Saibai Island where the formation is mapped as VC25b.

Photograph 16. Saltpan vegetation on Horn Island with clumps of the halophytic forbs *Tecticornia australasica* and *Halorsarcia* sp. in the foreground. These areas are mapped as VC25a.

5.2.6 Regional Ecosystem 3.1.7 (New RE)

Preliminary Description: Preliminary Description – *Schoenoplectus* spp. Sedgelands
Status: Not of Concern
Vegetation Communities: 27a, 27b
Reference Sites: 9 Quaternary

This grouping is described as a new RE for the bioregion, restricted to island remnants of the Fly Platform. The community has two variants being a low open sedgeland of *Schoenoplectus littoralis* mapped as VC27a, and a taller sedgeland mosaic mapped as VC27b.

Vegetation Community 27a: The variant 27a is prominent on both Saibai and Boigu Island and occupies drainage depressions on tidal flats in which variations in salinity depend on seasonal rainfall. During the wet season, these depressions accumulate freshwater, which progressively evaporates during drier periods to increase salinity. During the driest periods of the year, the wetlands are characterised by desiccated sedges including *Schoenoplectus littoralis* and

Eleocharis dulcis often with an evaporate accumulation in drainage low points. These systems are dynamic and seasonal variations in species composition may lead to confusion with VC25b. The system does however appear unique to these northern islands and as such warrants recognition as a separate ecosystem. The habitat exhibits high integrity although there may be minor impacts associated with grazing of feral deer, although seasonal hunting controls this population. The extent of similar ecosystems on the Fly Platform of mainland PNG is unknown yet likely to be associated with the Wunji Land System (CSIRO 1971). The RE provides important estuarine wetland habitat values with likely habitat for estuarine crocodile, migratory waders, Jabiru and Sauras Crane and a cultural resource for traditional fishing and hunting.

Vegetation Community 27b: The taller variant (VC27b) is restricted to Saibai Island where it occurs as a brackish wetland comprising extensive areas of tall sedgeland mosaiced with open areas of brackish water. The community forms where freshwater swamplands mix with estuarine waters, generally on the landward margins of mangrove forest complexes. Classification within Land Zone 1 is based on the regular tidal mixing, and the prominence of mangrove vegetation on the community margins. The community was originally mapped within the Map Unit 190 of Neldner and Clarkson (1995) and has been incorporated into RE3.3.63. The original description recognises that 48% of the community occurs on saline tidal flats.

Photograph 17. Tall sedgeland/open wetland mosaic on the landward margins of mangrove forest complex (VC27b). Saibai Island.

Photograph 18. Low sedgeland/ wetland communities on seasonal drainage depression. VC27a on Boigu Island.

5.2.7 Regional Ecosystem 3.2.2a

Description: Semi-deciduous vine thicket on coastal dunes and beach ridges
Status: Of Concern
Vegetation Communities: 1c, 2p, 2y, 2z, 16d(co), 16e(co), 16f(co), 16h(co), 16j(co), 16k(co)
Reference Sites: 2 secondary, 9 Quaternary

This classification is restricted to true thickets, which according to definition adopted in this study have canopy heights less than 9m. These communities are often floristically similar to RE3.2.1x1 although the much lower stature warrants differentiation. They are also relatively widespread, mapped on most of the larger continental islands in the Torres Strait Area. The RE comprises VC1c, VC2p, VC2y, a dominant component of VC16j and components of a number of coastal foredune complexes.

Vegetation Community 1c: VC1c is an evergreen thicket of windswept foredunes. *Manilkara kauki* forms the dominant (and often sole) canopy species. Associated species include *Celtis philippensis, Terminalia muelleri, Diospyros maritima, Thespesia populneiodes, Drypetes deplanchei, Mimusops elengi, Smilax australis, Capparis sepiaria* and *Flagellaria indica.* The stature is influenced by coastal exposure which limits canopy height. It is prominent on Erub with a minor occurrence mapped on Masig Island.

Photograph 19. Low windswept evergreen vine thicket (VC1c) on the exposed south-eastern coast of Erub. The thicket is dominated by *Manilkara kauki.*

Vegetation Community 2p: The major occurrence of VC2p is on Moa Island, where it occupies foredune locations on broad coastal dune systems to the south of Saveka Point. In this location the community can be best described as a groved thicket with clumped trees reaching average canopy heights of 8m interspersed with bare areas of windblown sand. *Bombax ceiba* var. *leiocarpum, Premna serratifolia, Acacia crassicarpa* and *Manilkara kauki* are the dominant canopy species with emergents of Bombax to 15m height. Subdominant taxa are *Drypetes deplanchei, Pouteria sericea* and *Celtis philippensis* with the associated species *Acacia polystachya, Diospyros compacta, Exocarpos latifolius, Aglaia elaeagnoidea, Canarium australianum, Carallia brachiata, Ficus virens, Cupaniopsis anacardioides, Semecarpus australiensis, Terminalia meulleri, Sterculia quadrifida, Arenga australasica* and *Cochlospermum gillivraei*. *Arenga australasica* (Vulnerable EPBC, NCA) is a prominent species in the sub-canopy layer on Moa Island. It is not likely that this unique feature can be extended to any mapped example of this community on other islands.

Photograph 20. The broken canopy typical of VC2p, Moa Island. *Arenga australasica* is a prominent sub-canopy component of this thicket community.

Vegetation Community 2y: The major occurrences of vine thicket type 2y (VC2y) were not sampled during the survey other than an overview of the community provided by a helicopter flight over Sassie Island, and some notes of the community provided in the ICC report (Freebody, 2002) on the central portions of Deliverance Island. From this overview, the community has described as a semi-deciduous notophyll vine thicket with canopy heights of 3-6m dominated by *Premna serratifolia, Manilkara kauki,* and *Terminalia* sp. (Freebody, 2002). Extensive occurrences of the type appear restricted to Deliverance and Sassie Islands although minor, possibly unrepresentative areas are present on Tudu Island.

Photograph 21. An example of VC2y on the eastern end of Sassie Island. The community forms a fringe between mangroves and coastline.

Vegetation Community 2z/16j: Vegetation community 2z forms the dominant component of the foredune complex type 16j, which is mapped as a complex of notophyll vine thicket and foredune grassland/shrubland complex. Vegetation community 2z conforms reasonably with the RE type description, being typified by an uneven canopy composed of deciduous notophyll and occasional microphyll species. Constituent species are *Sterculia quadrifida, Eugenia reinwardtiana, Manilkara kauki, Guettardia speciosa, Terminalia subacroptera., Cochlospermum gillivraei, Acacia crassicarpa, Premna serratifolia, Aglaia elaeagnoidea,*

Drypetes deplanchei, Diospyros maritima, Psydrax banksii, Elaeodendron melanocarpum, Capparis sepiaria, Turraea pubescens, Gyrocarpus americanus , Morinda citrifolia, Opilia armentacea, Capparis quiniflora, Cyclophyllum maritimum, Micromelum minutum, Pleurostylia opposita, Exocarpos latifolius, Tabernaemontana orientalis, Salacia chinensis, Alectryon reticulatus, Breynia cernua, Cayratia cardiophylla, Miliusa brahei and *Pandanus tectorius.* The communities uneven appearance is accentuated by the groved nature of the community which has scattered clumps of trees and shrubs relatively well-spaced and separated by bare sand or sparse tussock grasses and herbs. The community is represented in **Photograph 22.**

Photograph 22. The typical structure of VC2z as a component of complex type 16j. Near Western Island Group.

5.2.8 Regional Ecosystem 3.2.2b

Preliminary Description: Semi-deciduous vine thicket on coastal dunes and beach ridges
Preliminary Status: Of Concern
Vegetation Communities: 2a, 2l, 2u, 9b
Reference Sites: 2 Secondary (Saibai SA1, SA94); 21 Quaternary

This vegetation group sits uncomfortably in any current RE classifications groupings for Cape York Peninsula and has thus been proposed as a new RE type specific to the Torres Strait Islands. The proposed RE comprises four vegetation communities broadly described as semi-deciduous notophyll vine forests. The constituent communities are described briefly in the following section.

Vegetation Community 2a: VC2a is restricted to the northern island group, with the best developed expression of the type on the south-eastern coastal margins of Saibai Island, although scattered occurrences are also found on the southern coast of Boigu Island and Gebar Island. The community occupies calcareous sand ridges, is deciduous in nature, and has maximum canopy heights of 35m in the better-developed examples. *Erythrina variegata* often dominates the uneven canopy with a mix of other deciduous species such as *Terminalia subacroptera, Cordia subcordata*, and *Milletia pinnata* and with evergreen species such as *Manilkara kauki, Mimusops elengi* and *Aglaia elaeagnoidea.* Associated canopy species are *Acacia auriculiformis, Pandanus* sp., *Excoecaria agollocha, Guettardia speciosa, Premna serratifolia, Drypetes deplanchei, Exocarpos latifolius, Diospyros maritima, Diospyros compacta, Ficus virens, Garcinia warrenii, Carallia brachiata, Buchanania arborescens, Pouteria obovata, Sterculia quadrifida, Garuga floribunda* var. *floribunda*, *Hibiscus tiliaceus,* and *Terminalia catappa.* The occasional presence

of *Heritiera littoralis, Xylocarpus granatum* and *Excoecaria agollocha* is associated with an often sharp transition to mangrove forest.

On the southern coasts of Saibai and Boigu this RE occupies the most elevated parts of the landscape and therefore has been a focus for traditional settlement. Parts of the coast continue to provide seasonal living and camping sites for traditional owners being accessed only by boat. The vegetation is likely to also provide important ethno-botanical resources. The occurrence of **Cocus nucifera* and **Bambusa vulgaris* may be associated with past and present areas of settlement.

Photograph 23. Deciduous crowns of *Erythrina variegata* in a well-developed example of VC2a. South-eastern margins on Saibai Island.

Vegetation Community 2l: A single example of VC2l was located on a broad degraded sand dune on the north-eastern side of Erub. Although restricted in area, this community was well-preserved with minimum canopy disturbance and an intact ground and shrub layer. The canopy, which ranges from 12-25m, is dominated by *Bombax ceiba* var. *leiocarpum* and *Garuga floribunda* var. *floribunda* with *Gyrocarpus americanus* and *Diospyros maritima*. Associated species are *Diospyros hebecarpa*, *Drypetes deplanchei*, *Celtis philippensis* and *Manilkara kauki*. Pre-clearing mapping indicates that this community has always had a highly restricted occurrence and is unique to Erub. VC2l supports the *Alectryon repandodentatus* (E) and the rare listed *Neololeba atra.*

Photograph 24. The deciduous crowns of *Garuga floribunda* var. *floribunda*, *Bombax ceiba* var. *leiocarpum* and *Gyrocarpus americanus* clearly visible in the canopy of VC2l. Erub Island.

Vegetation community 2u: VC2u is the dominant variant in this proposed RE, being mapped on prograding dune sands in a number of locations including Muralug, Moa and Warral Islands, as well as having a preserved example in the eastern group of islands on Dauar Islet. The canopy ranges from 12 to 30m, with characteristic species *Mimusops elengi*, *Sterculia quadrifida* and *Terminalia sp.* although *Manilkara kauki* is always present. VC2u supports the vulnerable species *Dendrobium biggibum* (Cooktown Orchid) and *Psydrax reticulata*.

Photograph 25. Well preserved and developed example of VC2u on Wongai Beach, Muralug Island. The dark green canopy is dominated by *Manilkara kauki*.

Vegetation Community 9b: VC9b was sampled to quaternary level on Muralug Island where it formed restricted groves on a broad dune amongst a broader area eucalypt dominant woodlands. The canopy is composed of species similar to VC2u, although *Neofabricia myrtifolia* is a dominant to co-dominant species. Mapping indicates that this vine forest variation has a limited distribution in the Torres Strait Islands.

5.2.9 Regional Ecosystem 3.2.3

Description: *Melaleuca dealbata* ± *Acacia crassicarpa* open forest. Occurs in dune swales on the west coast**.**
Status: Of Concern
Vegetation Communities: 7g, 7e, 6d, 16g (co)
Reference Sites: 8 Quaternary Sites

Melaleuca dealbata has relatively restricted distribution in the mapping area, confined mostly to the Inner Islands and Near Western islands of Muralug and Moa. Where it occurs on coastal dunes, it is generally restricted to narrow linear swales which are relatively difficult to represent in a spatial sense due to scale, although where possible, these communities have been differentiated. Three vegetation communities and one vegetation complex comprise the representation of this RE in the island group and these are described below.

Vegetation Community 7g: The best development of the RE is represented by VC7g, which is a common dune swale community on the south-west side of Muralug **(**see **Photograph 26)**. To the immediate north of North-West Beach (Site PWS42) an extensive occurrence of this community occupies a dune swale complex with *Melaleuca dealbata* open forest occupying the dune swales, and lower *Melaleuca dealbata* woodland inhabiting the dune crests. The dune crests support a dense grassy groundcover, whilst swales, being seasonal swamps, are largely devoid of vegetation. To the south, this community separates into a dune complex with crests composed of

Acacia crassicarpa woodland (RE3.2.5) with associated *Syzygium suborbiculare*, *Sterculia quadrifida*, *Grevillea parallela*, and *Parinari nonda*. *Melaleuca dealbata* forest is attenuated along the dune swales. This complex of vegetation types has been mapped as VC16g.

Vegetation Community 7e: Vegetation community 7e (see **Photograph 27**) is a lower variant of the RE, mapped on Moa Island in a back dune swale to the south of Saveka Point. The variant is characterised by a mixed canopy of dominant *Melaleuca dealbata* with *Lophostemon suaveolens* and *Melaleuca saligna*. Mapped distributions indicate that this type, potentially a new RE sub-type, has an extremely limited occurrence.

Vegetation Community 6d: Vegetation community 6e, located on Possession Island, was sampled by helicopter reconnaissance only. Observations indicate that the dominant canopy comprises *Acacia crassicarpa* with a mix of Melaleuca species which may include *Melaleuca dealbata* and *Melaleuca cajuputi*. The community occupies a dune swale and through brief observation appears to occupy a swampier landform than the previously described communities.

Photograph 26. Vegetation community 7g, occupying a dune swale at site PWS42.

Photograph 27. Vegetation Community 7e on Moa Island. *Melaleuca dealbata* forms the dominant canopy with *Lophostemon suaveolens* and *Melaleuca saligna* forming sub-dominant canopy components.

5.2.10 Regional Ecosystem 3.2.4

Description: *Melaleuca leucadendra* ± *M. dealbata* open forest. In dune swales and swamps..
Status: Of Concern
Vegetation Communities: 7b, 7d**,** 7f, 3e, 16c (co)
Reference Sites: 4 Secondary Sites (PWQ4, MO66, MO20, BAS39), 17 Quaternary Sites

Melaleuca leucadendra dominant communities are a relatively frequent community on dune swale systems of the Inner and Near Western Island groups. The extent of this RE is somewhat broadened by a range of *Melaleuca* dominant communities. These communities provide valuable wetland (palustrine) habitat and may be inundated for a number of months over the wet season.

Vegetation Community 7b: *Melaleuca saligna* forms the dominant canopy in VC7b, which is a relatively widespread community in dune swale systems on Moa Island where it is mapped as RE sub-type 3.2.4d. Remnants of it are also recognised on Mabuiag Island where it has been extensively cleared for residential development. It is ecologically and structurally similar to VC7f although canopy heights are often significantly lower, in the range of 15 to 20m. There is currently no RE or RE subtype classification that comfortably accommodates this vegetation community and it is suggested that an additional RE sub-type be erected to provide a suitable classification. Dependant on studies of the broader CYP bio-region, a sufficient extent of this community may be recognised to warrant an individual RE classification. A complex of VC7b and 14t (RE3.2.5) recognised near Kubin on Moa Island as complex type 16c (sites MOQ118 to MOQ120) appears to be similarly unique.

Vegetation Community 7d: *Melaleuca quinquenervia* forms the dominant canopy component of VC7d (sampled at Site MOQ66), which is restricted to a broad swale south of Saveka Point on Moa Island. The community is mapped as RE sub-type 3.2.4b in this exercise, based on recommendations from the Queensland Herbarium. Sub-dominant canopy species in this community include *Lophostemon suaveolens, Melaleuca saligna* and *Melaleuca cajuputi* and canopy heights attain 20m. The sub canopy is dominated by *Livistona muelleri* and includes *Lophostemon suaveolens, Melaleuca quinquenervia, Acacia crassicarpa* and a host of epiphytes such as *Myrmecodia platytyrea* subsp. *antoinii, Dendrobium triamellatum, Dischidia major* and *Hydnophytum moseleyanum* var. *moseleyanum*. A sparse understorey comprises *Acacia leptocarpa, Melaleuca quinquenervia, Acacia crassicarpa, Livistona muelleri* and *Glochidion disparipes.* Similar communities are classified as RE sub-type 3.2.4b in current mapping databases (REDD, Version 5.2, 2007) and this occurrence has been similarly classified. The extent of such communities in the Torres Strait Islands appears however to be extremely restricted.

Photograph 28. Low open forest with dominant *Melaleuca saligna* (VC7b) in a dune swale on Moa Island (MOQ122).

Photograph 29. Open forest with dominant *Melaleuca quinquenervia* (VC7d) in a dune swale on Moa Island (MOS66).

Photograph 30. Extensive swamp forest of *Melaleuca quinquenervia* (VC7d) nestled in deflationary hollow (LZ2). Near Western Island Group.

Vegetation Community 7f: VC7f forms what would probably be considered the type example of RE3.2.4 (classified in this exercise as RE3.2.4a) comprising a tall open forest of *Melaleuca leucadendra* (canopy 30-35m). In its best development sampled behind Long Beach on Muralug (Site PWQ4) the sub-canopy is extremely sparse comprising *Livistona muelleri, Melaleuca saligna, Melaleuca cajuputi* and *Ficus virens.* Well-developed examples also occur on Friday Island (Site FQ3) where the understorey of the features *Livistona muelleri, Glochidion apodogynum, Cyclophyllum maritimum, Alstonia spectabilis, Mimusops elengi, Breynia cernua, Acacia polystachya, Pandanus tectorius, Gymnosporia inermis,* and *Vitex acuminata.*

Photograph 31. Tall open forest of *Melaleuca leucadendra* (VC7f) at its maximum development behind Long Beach on Muralug Island (Site PWQ4)

Vegetation Community 3e: *Lophostemon suaveolens* dominant forests on coastal dunes are not common in the study area although representative communities are present on Badu Island where they form swamp forests on broad deflation plains. In these communities, *Deplanchea tetraphylla*, *Asteromyrtus brassii*, *Acmena hemilampra* subsp. *hemilampra* and *Acacia crassicarpa* are prominent canopy associates. These communities are recognised as RE sub-type 3.2.4c (REDD Version 5.2, 2007) and have been similarly classified here. The community often forms broad, poorly defined mosaics and complexes with *Melaleuca quinquenervia* dominant swamp forest (VC7d/RE3.2.4b). The shrub layer supports *Macaranga involucrata* subsp. *mallotoides* with a groundcover dominated by *Blechnum indicum*, *Scleria* sp. and *Canavalia papuana*.

Photograph 32. Tall open forest of *Lophostemon suaveolens* and *Deplanchea tetraphylla* in complex with *Melaleuca quinquenervia* dominant open forest on Badu Island (VC3e).

5.2.11 Regional Ecosystem 3.2.5

Description: *Acacia crassicarpa* ± *Syzygium suborbiculare* ± *Parinari nonda* woodland. On beach ridges.
Status: Not of Concern
Vegetation Communities: 6c, 5p, 6g, 14v, 14t, 14q, 16c(co),16d(co), 16b(co), 16g(co)
Reference Sites: 10 Quaternary Sites. (Includes MO118, NAQ9, NAQ6, FRQ2).

Acacia crassicarpa dominant communities are common on prograding coastal dune and beach ridge systems, particularly on Muralug within the Inner Island Group. Vegetation communities comprising RE3.2.5 are structurally and floristically variable, ranging from tall shrublands to low open woodlands, often with a mix of associated shrubland and woodland species. *Acacia crassicarpa* may form a sub-dominant component of some of the communities grouped under this classification.

Vegetation Community 6c: The type example of this RE is VC6c, represented as RE3.2.5a in the RE mapping, is common on prograding beach ridge complexes typically found on the west coast of Muralug. The dominant canopy comprises *Acacia crassicarpa* which is generally associated with a number of vine forest and woodland species such as *Sterculia quadrifida, Terminalia subacroptera, Syzygium suborbiculare, Parinari nonda, Cochlospermum gillivraei, Neofabricia myrtifolia, Grevillea parallela,* and *Melaleuca viridiflora*. The community typically forms a low open woodland community with bare sand clearly visible between canopy trees on account of the sparse ground cover. Due to the frequent, although repetitive change in edaphic conditions across these dune sequences, these communities are commonly mapped as components of coastal dune complexes, as has been applied with VC16b, VC16d and VC16g.

Vegetation Community 5p: Vegetation community 5p has been mapped wherever *Corymbia* species, (generally *Corymbia novoguinensis, Corymbia clarksoniana* or less commonly *C. tessellaris*), form prominent emergents or canopy components, represented as RE subtype 3.2.5b. Typically, Corymbia components are sparse, scattered as sub-dominant or co-dominant components of the canopy layer with species such as *Parinari nonda, Sterculia quadrifida, Acacia crassicarpa, Canarium australianum* and *Alphitonia excelsa* otherwise typical of VC6c. A Long-Fruited Bloodwood thought to be *Corymbia polycarpa* was collected on Muralug and Horn Islands[5]. The community is represented in **Photograph 34.**

Vegetation Community 6g: The broad system of stabilised transgressive dunes to the south-west of the Badu Island township host this relatively well-developed acacia dominant open forest type. Canopy heights are may reach 28m in some locations although communities of much lower stature (12-15m) are a more typical representation. *Acacia crassicarpa* dominates the canopy with *Asteromyrtus brassii* forming a prominent co-dominant to sub-dominant canopy species. A range of associated species including *Melaleuca dealbata* and *Corymbia novoguinensis* may be scattered sparsely throughout the canopy structure. In some locations, *Asteromyrtus brassii* may dominate the canopy although such areas are generally restricted. The predominant sub-canopy comprises *Asteromyrtus brassii, Acmena hemilampra* subsp. *hemilampra,* and *Lophostemon suaveolens* with characteristic species of the shrub layer including *Astermomyrtus brassii, Dodonaea polyandra, Endiandra glauca, Halfordia kendack, Exocarpos latifolius, Psydrax banksii, Litsea glutinosa, Deplanchea tetraphylla,* and *Breynia oblongifolia.* A dense low shrub/ groundcover layer of *Lomandra banksii* is a general feature of this community in association with *Alyxia spicata, Lithomyrtus obtusa, Shizaea dichotoma* and *Panicum* sp. As with the majority of acacia dominant communities, VC6g is indicative of past disturbance and may be a seral stage in a successional sequence from shrubland to eucalypt woodland. Alternatively, the forest type may be indicative of a severe fire scarring within a former eucalypt dominant community that is in a

[5] (DGF9219+DJS, DGF9221+DJS)

relatively advanced stage of recovery. Community 6g is recognised as sub-type variant RE3.2.5c on account of atypical structural features and geomorphic association. Representation is provided in **Photograph 35.**

Photograph 33. *Acacia crassicarpa* dominant woodland (VC6c) as a component of VC16d. Muralug (Site PWQ48).

Photograph 34. Low open woodland of *Acacia crassicarpa*, *Grevillea parallela* and *Corymbia* spp. typical of VC5p. This photograph is taken at Site PWQ71 to the North of Bampfield Head on Muralug.

Photograph 35. Well-developed *Acacia crassicarpa* dominant open forest with associated *Asteromyrtus brassii* (VC6g). Stabilised transgressive dunes system. Near Western Island Group.

Vegetation Community 14t/16c: This VC is represented on Moa Island as a component of dune complex type 16c (Site MO118), as well as a number of examples mapped individually on Muralug Island (PWO47). The community represents a sparse shrubland with dominant species including *Cochlospermum gillivraei, Canarium australianum, Eugenia reinwardtiana, Terminalia subacroptera* with *Pandanus* sp. dominating in some areas. In the complex type 16c, the shrubland component occupies dune crests, separated by *Melaleuca saligna/Melaleuca acacioides* open forest in narrow dune swales. The community is represented in **Photograph 36**.

Photograph 36. Shrubland VC14t occupying beach ridges on Moa Island at site MOQ118.

Vegetation Community 14v: Shrubland community 14v is confined to Naghir Island where it manifests on exposed crests of aeolian dunes. Shrubs are generally low and sparse, dominated by *Grevillea parallela, Acacia crassicarpa, Acacia polystachya, Terminalia subacroptera, Exocarpos latifolius* and occasionally *Eucalyptus leptophleba* over a ground cover of *Heteropogon triticeus* and the exotic *Hyptis suaveolens.* A similar shrubland forms a component of VC16e on the aeolian dune system of Friday Island. The shrubland is represented in **Photograph 37,** taken at Site NAQ9. Due to its considerable departure from the RE3.2.25 type description, the inclusion of this community as an RE subtype should be considered. Disjunct populations of *Eucalyptus leptophleba* on Naghir represent the northern limit of the species geographical range.

Photograph 37. Shrubland type VC14v on exposed crests of aeolian dunes on Naghir Island (NAQ9). The dominant shrub in this location is *Eucalyptus leptophleba.*

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Vegetation Community 14q: A species of Cycas thought to be a disjunct population of *Cycas badensis* forms a low shrubland on low parallel dunes on the north-west coast of Moa Island where it is mapped as VC14q. The community was observed during a helicopter survey and although not sampled on the ground, is relatively extensive, continuous, and readily differentiated as a discrete vegetation unit. The community is represented in **Photograph 38.**

Photograph 38. *Cycas badensis* forming a shrubland community on low parallel dunes. North –west coast of Moa Island (VC14q).

5.2.12 Regional Ecosystem 3.2.6

Description: *Casuarina equisetifolia* woodland. Occurs on foredunes.
Status: Of Concern
Vegetation Communities: 10a, 16e(co) 16f (co), 16b (co), 10b
Reference Sites: 3 Secondary (Masig; YO5, YO6, YO16), 7 Quaternary Sites.

Casuarina equisetifolia forms a prominent woodland community on foredunes throughout many of the islands in the study area, both on continental islands and coral cays. It is apparent through examination of a considerable number of Casuarina dominant communities throughout the study area that structural variations to this community occur, and the current descriptions provide an inadequate account of these variations.

In a similar fashion to VC5p, frequent edaphic change across prograding dune systems has often resulted in a complexing of this RE with associated dune shrubland and woodland communities. These complexes are classified as VC16b and VC16f, the latter being a particularly well-developed example on the south coast of Friday Island where *Casuarina equisetifolia* woodland complexes with vine thicket (RE3.2.2). Vegetation community 10b provides what would generally be considered a typical representation of RE3.2.6, (represented in the RE attributes as RE3.2.6a) where *Casuarina equisetifolia* forms a woodland community over a ground cover of sprawling herbs and grasses typical of foredune communities. Such examples are best represented on the west coast of Muralug (on Bampfield and Long Beach) where woodlands typically reach 30m height and mix with scattered coastal vine forest species trees, most commonly *Terminalia catappa.* This would represent the maximum development of the type, and more typical examples on coastal foredunes would rarely reach an average canopy height of greater than 20m.

Photograph 39. Maximum development of VC10b on Bampfield Beach where *Casuarina equisetifolia* mixes with vine forest species.

Photograph 40. Vegetation complex 16f on Friday Island where *Casuarina* woodland complexes with notophyll vine thicket. The Acacia in foreground right is *Acacia oraria*.

Casuarina dominant communities which occur on the central group of islands and coral cays in particular, are poorly represented in the literature. Open forest of *Casuarina equisetifolia* forms the dominant vegetation type of Masig and Kodel Islands. Canopy heights ranging from 18 to 25m are typical over a dense sub-canopy of vine forest species (height range of 10 to 15m) dominated by *Diospyros maritima, Pouteria obovata, Aglaia elaeagnoidea, Diospyros compacta, Cyclophyllum maritimum* and *Terminalia subacroptera.* Previous classification efforts have recognised the vine forest component only; however repeated measurement over three detailed sites in this survey clearly indicates that PFC of Casuarina is typically 60 to 80% with basal area measurement of 8-10m^2/ha. This structural variation, represented as VC10a, is resticted to coral cays in the central island ground where they have been assigned to RE sub-type 3.2.6b.

Photograph 41. Open forest of *Casuarina equisetifolia* with a vine forest sub-canopy on Masig. The community is rapidly being fragmented to accommodate expanding sewerage infrastructure requirements.

5.2.13 Regional Ecosystem 3.2.7

Description: *Corymbia intermedia* or *C. clarksoniana* woodland in wet coastal areas.
Status: Not of Concern
Vegetation Communities: 5i, 5o, 16e (co)
Reference Sites: 8 Quaternary

Vegetation Community 5i: Vegetation Community 5i, representing a 'type community' for RE8.3.7 is restricted largely to the Inner Island Group with sampled communities on Muralug, Horn, and Wednesday Islands. *Corymbia clarksoniana* forms an open forest community at sites PW3 (Muralug) and H17 (Horn), with a canopy height range of 18 to 23m and a typical sub canopy composed of *Neofabricia myrtifolia, Acacia crassicarpa* and *Parinari nonda.* Communities on Wednesday Island mapped as VC5i (Site WEQ13 and WEQ15) are dominated by *Corymbia novoguinensis* with a sparse sub canopy of *Parinari nonda, Acacia crassicarpa* and *Livistona muelleri* (see **Photograph 42**). The shrub layer is well-defined and dominated by *Jacksonia thesioides, Alyxia spicata, Parinari nonda, Acacia crassicarpa, Psydrax reticulata* (V), *Premna dallachyana, Syzygium suborbiculare, Psychotria poliostemma, Breynia oblongifolia, Psydrax banksii, Terminalia subacroptera, Smilax australis* and *Lithomyrtus retusa.*

Vegetation Community 5o/16e: A sub-type of this RE is represented by woodland an open forest communities composed of *Corymbia tessellaris.* This sub-type was poorly sampled, although clearly visible as community on younger dune sequences on the north-west facing embayments of Muralug during helicopter and charter boat survey where it is mapped as VC5o. The community was also sampled as a component of VC16e, a woodland/shrubland complex on younger aeolian dune systems on Friday Island (**Photograph 43**) where an open shrub layer comprised *Acacia crassicarpa, Sterculia quadrifida, Alstonia spectabilis, Alstonia actinophylla, Croton arnhemicus, Stephania japonica, Premna serratifolia, Mallotus nesophila, Canarium australianum, Smilax australis* and *Atalaya sericopetala.*

Photograph 42. VC5i on Wednesday Island (WEQ15) with dominant canopy composed of *Corymbia novoguinensis*.

Photograph 43. VC16e forms a complex of woodland and shrubland communities on Friday Island. The woodland community is composed of *Corymbia tessellaris* which are visible on the skyline (Site FR2).

5.2.14 Regional Ecosystem 3.2.8

Description: *Corymbia nesophila* ± *C. novoguinensis* ± *Eucalyptus* spp. woodland on old stabilised dunes.
Status: Of Concern
Vegetation Communities: 5k, 5n, 5m, 5q
Reference Sites: 2 Quaternary

Vegetation Community 5k: *Corymbia nesophila* dominant communities on coastal dunes are restricted in the mapping area. The RE would most typically be represented by VC5k (on coastal dunes), which is limited to a number of minor areas that have not been adequately ground truthed.

Vegetation Community 5n: It is mapped as a number of disjunct occurrences on weathered (Pleistocene?) dune systems on the west coast of Muralug. In the representative Site PWQ40, *Eucalyptus platyphylla* forms the dominant canopy tree, ranging in height from 21-27m, with

Erythrophleum chlorostachys a sub-dominant component. *Corymbia clarksoniana* occasionally reaches the canopy and is co-dominant with *Erythrophleum chlorostachys* in the sub canopy.

Photograph 44. Vegetation Community 5n at Site (PWQ40) on Muralug Island. *Eucalyptus platyphylla* forms the dominant canopy species.

Vegetation Community 5m & 5q: Variant VC5m is restricted to the north-coast of Wednesday Island on weathered back-dune situations. It forms a low woodland community with dominant *Corymbia stockeri* subsp. *peninsularis* at heights of 10-12m. *Acacia crassicarpa* forms a sparse sub-canopy layer over a mid dense shrub layer of *Cochlospermum gillivraei* and *Melaleuca stenostachya* at 3-6m. The degraded dune feature which hosts this community merges landward with a sandy alluvial plain with negligible change in community floristics or structure. The open forest form of this community. Where *Corymbia stockeri* subsp. *peninsularis* forms an open forest, generally in absence of the dense shrub layer, the community is mapped as VC5q.

Photograph 45. Low woodland to open forest of *Corymbia stockeri* subsp. *peninsularis* (VC5q) on a weathered backdune situation. Wednesday Island at Site WEQ3.

5.2.15 Regional Ecosystem 3.2.10c

Description: *Eucalyptus tetrodonta, Corymbia clarksoniana* ± *E. brassiana* or *Erythrophleum chlorostachys* woodland on stabilised dunes.
Status: Of Concern
Vegetation Communities: 5j
Reference Sites: 2 Secondary Sites (PWS6, PWS69)

Vegetation Community 5j: Regional Ecosystem 3.2.10c occurs only on the western coast of Muralug Island where older dune systems are well preserved and relatively extensive. The RE is typified by VC5j which provides a mix of species relatively representative of the RE type description. *Eucalyptus tetrodonta* dominates the canopy which reaches heights of greater than 30m in most communities. *Corymbia nesophila* forms a sub-dominant to co-dominant canopy component in some communities with *Corymbia novoguinensis* and *Corymbia clarksoniana* locally prominent, although more abundant in sub-canopy layers. *Erythrophleum chlorostachys* is nearly always present in varying quantities. Sub-canopy species are relatively variable although *Erythrophleum chlorostachys*, *Corymbia clarksoniana* and *Neofabricia myrtifolia* are typical and were present in the sub-canopies of most communities sampled. The characteristic understorey is composed of *Xylomelum scottianum, Acacia leptocarpa, Acacia platycarpa, Acacia crassicarpa, Acacia polystachya, Melaleuca viridiflora, Neofabricia myrtifolia, Planchonia careya, Grevillea parallela, Jacksonia thesioides, Leucopogon ruscifolius, Alphitonia excelsa, Syzygium suborbiculare* with associated vine thicket species such as *Cupaniopsis anacardioides, Sterculia quadrifida, Mallotus nesophila* and *Drypetes deplanchei.*

Photograph 46. Tall open forest of *Eucalyptus tetrodonta* on degraded sand dunes at Site PWS6 (Muralug Island).

5.2.17 Regional Ecosystem 3.2.14

Description: *Melaleuca arcana* low open forest. Associated with dune swamps.
Status: Of Concern
Vegetation Communities: D13h
Reference Sites: HI15

Vegetation Community 13h: Regional Ecosystem 3.2.14 is restricted to a single occurrence on Horn Island, expressed as a low closed shrubland which forms a semi-circular swamp within a broader relict dune system. *Melaleuca arcana* is the dominant species forming a shrub layer rarely exceeding 1.5m. The ground cover is dominated by Restionaceae spp. The occurrence of *M. arcana* in this locality represents an extension of geographical range north from the Jardine

River. The community is therefore unique in the Torres Strait regional context with future consideration to fire management requirements important for its long-term preservation.

Photograph 47. A low swamp shrubland of *Melaleuca arcana*. Site HI15 on Horn Island.

Photograph 48. *Melaleuca arcana*. Site HI15 on Horn Island.

5.2.18 Regional Ecosystem 3.2.15

Description: *Melaleuca viridiflora, Neofabricia myrtifolia* woodland on beach ridges.
Status: Not of Concern
Vegetation Communities: D8c, D13a, D17i
Reference Sites: 1 Secondary (BAS20), 1 Quaternary (PWQ5)

Two VC's are classified under this ecosystem, of which VC13a is the most prominent. Characteristics of these vegetation communities are summarised below.

Vegetation Community 13a: *Melaleuca viridiflora* shrubland and low woodland occupies extensive areas on the broad degraded sand dunes of Badu Island. The community in this location forms a low woodland of 8 to 12m height dominated by *Melaleuca viridiflora* with scattered *Asteromyrtus brassii* and rare *Corymbia novoguinensis.* The sparse shrub layer is composed of *Banksia dentata, Pandanus sp.,* and scattered *Acacia crassicarpa.* Ground covers

are similarly sparse, dominated by *Dapsilanthus spathaceus* and a range of scattered herbs such as *Drosera spatulata*, *Eriocaulon* sp. and *Dianella* sp. In the better developed deflationary sand sheets on Badu Island, the community forms a sparse shrubland, verging on a sedgeland in areas where deflation has scoured the overlying sand sheet to its erosional base level (on the capillary fringe of the water table). Several examples of this community are also represented on Horn Island in association with a low dune-swale complex, where the structural and floristic affinities are similar to the examples on Badu Island.

In some locations on Badu Island the Melaleuca shrub layer becomes very sparse, and the structural formation grades to a *Dapsilanthus spathaceus* dominant sedgeland generally with scattered emergent shrubs. These areas are mapped as VC17i, although are retained within the broader group of RE3.2.15.

Photograph 49. Low woodland of *Melaleuca viridiflora* (VC13a) occupying degraded sand dunes on Badu Island (BAS20).

Vegetation Community 8c: A variant of the RE, represented as VC8c was mapped on the tapering slope of an old dune system on Muralug Island. The canopy of this community was dominated by *Lophostemon suaveolens* with *Corymbia clarksoniana*, *Asteromyrtus symphyocarpa*, *Melaleuca saligna* and *Melaleuca viridiflora* scattered evenly throughout. *Melaleuca viridiflora*, *Pandanus* sp., and *Banksia dentata* formed the dominant sub-canopy component. *Corymbia latifolia* (shown in **Photograph 50**) was recorded in this community and in adjoining woodlands of *E. tetrodonta* and *C. nesophila* on old beach ridges. The species is known previously from a collection housed at the NSW Herbarium (T. Bean pers. comm. Jan 08). Its occurrence on Muralug and on Zuna verifies a considerable extension of the geographical extent being otherwise known only from the Northern Territory and West Kimberley Region (Brooker *et al*. 1994) and south west Papua (Conn *et al.* 2006+). Due to the extremely limited size of this community, it has been classified under RE3.2.15, in the absence of a more suitable classification.

Photograph 50. *Corymbia latifolia* (DGF9199+DJS) forms a scattered canopy tree in VC8b on Muralug (Site PWQ5).

5.2.19 Regional Ecosystem 3.2.19

Description: *Leucopogon yorkensis* ± *Asteromyrtus brassii* open heath on old beach ridges.
Status: Of Concern
Vegetation Communities: 14n, 14e,
Reference Sites: 2 Quaternary (PO4, HI14, MO148)

Vegetation communities 14n and 14e provide representation for RE3.2.19. These communities have a scattered distribution, with small areas mapped on Horn, Possession, Muralug and Moa Islands where they occupy deeply leached sand deposits of relict beach ridges.

Vegetation Community 14n: This community is classified as RE3.2.19a based on advice provided by the Queensland Herbarium. On Horn Island, the community represents a shrubland dominated by *Acacia crassicarpa, Neofabricia myrtifolia, Leucopogon ruscifolius, L. yorkensis,* and *Cochlospermum gillivraei.* These species form a relatively uneven shrubland canopy from 4 to 8m tall and with a scattered low shrub layer of *Pouteria sericea, Psydrax banksii, Exocarpos latifolius, Myrsine* sp., *Alyxia spicata, Breynia oblongifolia, Pandanus sp., Jacksonia thesioides, Drypetes deplanchei* and *Notelaea ovata.* The groundcover is sparse of *Lomandra banksii, Aristida* sp., and *Dianella bambusifolia. Sterculia quadrifida* and *Premna serratifolia* are associated with a number of additional shrubs including *Grevillea parallela* and *Pouteria sericea* which join the mix of species on Possession Island. Representative examples of this community

are also mapped on Badu Island where the community occupies a broad dune formation. On Badu, *Leucopogon ruscifolius* and *Acacia crassicarpa* form the dominant sparse shrubby canopy, although scattered emergents of *Corymbia novoguinensis* and *Syzygium suborbiculare* are occasionally present. The representation on Badu Island occupies an unstable transgressive dune sequence (as discussed in **Section 1.1.3** and shown in **Photograph 1**) and appears to be a transitional to better developed open forest and woodland types on more stable dune formations. A representative community on Possession Island is shown in **Photograph 51**.

Vegetation Community 14e: A single representative unit of VC14e has been mapped on Moa Island where it is represented as RE sub-type 3.2.19b. This community is structurally dissimilar to the RE type description, and has been assigned to RE3.2.19 in the absence of a more suitable classification. The community is a dwarf open shrubland dominated by *Leucopogon ruscifolius* with co-dominant *Melaleuca viridiflora* and subdominant *Asteromyrtus brassii* and *Baeckea frutescens*. Associated species are *Banksia dentata, Acacia crassicarpa, Alyxia spicata* and *Exocarpos latifolius.* The epiphytes *Dischidia major* and *Myrmecodia platytyrea* subsp. *antoinii* are abundant throughout. Ground cover, dominated by *Dapsilanthus spathaceus, Schoenus sparteus, Lomandra banksii* and *Dianella bambusifolia* is sparse, with areas of bare sand between the scattered shrubs. The community occupies a deeply leached sand sheet, which forms a low rise above the Tertiary sand plain on which it sits, interpreted to be a relict sand dune based on its position in the landscape and broad crescent shape. The VC is illustrated in **Photograph 52**.

Photograph 51. A relatively extensive occurrence of VC14n (RE3.2.19) on Possession Island.

Photograph 52. Sparse low shrubland 14e (RE3.2.19) on relict dune. Moa Island (MO148).

5.2.20 Regional Ecosystem 3.2.24

Description: Closed herbland of mixed graminoids and forbs. Occurs on exposed foredunes
Status: Of Concern
Vegetation Communities: 17d, 17j, 16a (co), 16b (co), 16h (co), 16k (co)
Reference Sites: 3 Secondary (YOS02, YOS13, YOS16), 1 Quaternary (TU8)

Regional Ecosystem 3.2.24 forms an almost universal cover on the majority of coastal foredune communities sampled, although its best development is often associated with sand cay islands of the eastern group, particularly on foredune communities where sand actively accumulates. Vegetation Community 17j is the dominant component of this ecosystem forming an open to closed grassland and forbland complex composed of species including *Spinifex sericeus, Vigna marina, Ipomoea pes-capre* subsp. *brasiliensis, Cassytha filiformis* and a range of halophytic forbs such as *Sesuvium portulacastrum.* Grasses including *Mnesithea rottboellioides* and *Heteropogon triticeus* form a prominent ground cover where the community is mapped as VC17d, although such grassland areas are often an indication of prior disturbance.

The representation of this RE as a homogenous ecosystem is rare due to the fine scale ecotonal change across foredune systems evident in the majority of locations. This ecosystem typically complexes with RE3.2.25 (VC14y) where it merges on the leaward side of dunes with low shrubland. In such locations, the community is mapped as complex 16a. It also mixes with a range of other ecosystems including RE3.2.2 and RE3.2.6 represented in the mapping as complex types 16b and 16k. The RE provides an important rookery for sea turtles.

Photograph 53. Typical structure of RE3.2.24 (VC17j) on Masig Island (YOS2).

5.2.21 Regional Ecosystem 3.2.25

Description: Sparse herbland of mixed herbaceous species on foredunes and beach ridges.
Status: Of Concern
Vegetation Communities: 16i, 14y, 16a (co), 16j (co)
Reference Sites: 1 secondary (YOS4), 1 Quaternary (TU8)

Regional Ecosystem 3.2.25 is composed of VC16i and VC14y, forming low sparse shrublands and shrublands respectively. The ecosystem generally occurs on foredune locations in association with and immediately landward of RE3.2.24 (VC17j) often complexing with this

community where it is mapped as complex 16a, and with microphyll vine thicket where it is mapped as VC16j. The two dominant components, VC16i and VC14y, are discussed briefly below.

Vegetation Community 16i: Vegetation community 16i represents open tussock grassland with emergent shrubs, verging on a sparse shrubland in some locations. Ground cover is composed of *Heteropogon triticeus* and *Cymbopogon sp.* with emergent shrubs, ranging in height from 1-2m, typical of adjacent vine thicket communities and including *Premna serratifolia, Terminalia subacroptera* and *Cordia subcordata.* The community, which has been mapped exclusively on Tudu Island, is most likely the result of repetitive burning practice which has pushed back vine thicket margins. The community is represented in **Photograph 54**.

It is of note that Haddon (1888) described the vegetation of Tudu on account of a visit there in 1888 where "*The interior of the island is flat, and supports a vegetation of bushes and coarse grass. In one spot only, about one-third from the northern end, are there a few fairly large trees, ……. There are only a few young coconut palms*" (Haddon 1888). An earlier account by Dumont d'Urville in 1840 in Haddon (1888) refers to Tudu as "*a bank of sand almost at sea level, on the north point is a clump of trees, the rest of this miserable land is saline, marshy, covered with grasses and shrubs that afford scarcely any shade*".

Photograph 54. Open tussock grassland with emergent shrubs on Tudu Island (VC16i).

Vegetation Community 14y: Vegetation community 14y typically occupies a narrow fringe between foredune grassland and taller open forest communities in backdune localities, in places ecotonal to this transition. The community is largely restricted to coral cays where it forms a complex with the foredune grassland community VC17j, and is frequently mapped as a component of vegetation complex VC16a. Shrubland is the dominant structural formation with a height range of 0.5m to 2m and projected canopy cover of 25% to 60%. Typical canopy species include *Cordia dichotoma, Premna serratifolia* and *Drypetes deplanchei.* These species form cover to a sparse ground cover typical of VC17j. Vegetation community 14y is not represented as a homogenous polygon in the mapping data.

Photograph 55. Low open shrubland community 14y on Masig Island (YOS4). The community has been mapped as a component of VC 16a.

5.2.22 Regional Ecosystem 3.2.26

Description: Sparse herbland/shrubland and bare sand areas. Predominantly on sand blows
Status: Not of Concern
Vegetation Communities: 14s
Survey Locations: 1 Secondary Site (BAS35)

Vegetation Community 14s: Vegetation community 14s, providing the only representation of RE3.2.26, is restricted to Badu Island where it forms a low sparse shrubland. The dominant shrub layer forms an uneven upper stratum ranging in height from 0.5m to 1m with a total cover rarely exceeding 10%. *Leucopogon ruscifolius* forms the dominant component of the shrub layer with scattered *Acacia crassicarpa, Leucopogon yorkensis, Syzygium suborbiculare, Exocarpos latifolius, Alyxia spicata, Melaleuca viridiflora* and *Pandanus conicus.* The groundcover forms 5% combined cover dominated by *Dapsilanthus spathaceus*, with associated species such as *Xyris complanata, Lomandra banksii, Evolvulus alsinoides, Tricoryne elatior, Cassytha pubescens, Gompholobium* sp. (DGF9707+), *Tephrosia* sp. (DGF9710+), *Myrtella obtusa,* and *Drosera spatulata*. Emergents of *Corymbia novoguinensis* to 6m are scattered throughout the community. This community occupies a unique geomorphic situation, being restricted to the outer gently undulating slopes of a broad deflationary hollow within a stabilising transgressive dune system.

Photograph 56. Low sparse shrubland type 14s on Badu Island.

5.2.23 Regional Ecosystem 3.2.27

Description: Ephemeral and perennial lakes in coastal dunefields.
Status: Of Concern
Vegetation Communities: 20b
Survey Locations: No Representative Sites.

A number of small perennial swamps are mapped on Badu Island, occupying deflationary hollows with a broad dune complex. The example represented in **Photograph 57** occupies a degraded sand sheet on the landward margins of a transgressional dunefield. An association with fringing forests of *Melaleuca quinquenervia* is typical. Further survey is recommended to provide for full characterisation of these communities.

Photograph 57. Shallow ephemeral and occasional seasonal open waterbodies are scattered across the Badu Island sand dunes and sheets.

5.2.24 Regional Ecosystem 3.2.28

Description: Evergreen notophyll vine forest on beach ridges on coral atolls, shingle cays and sand cays.
Status: Of Concern
Vegetation Communities: 2m
Survey Locations: 3 Secondary Sites (YO1, YO8, YO9)

Vegetation Community 2m: Vegetation Community 2m, is mapped exclusively on coral cays of the central group of islands. Whilst floristically similar to VC2u (RE3.2.1x1), the community has been differentiated largely on a geographical basis. Vegetation Community 2u is restricted to parallel dune systems of continental islands while 2m dominates the calcareous sand of the coral cays. Differentiated from the type are *Casuarina equisetifolia* dominant open forests with vine forest sub-canopies previously mapped under this classification on Masig. The dominant canopy, which forms heights of 18 to 25m is composed of a mix of deciduous and evergreen species and it is suggested that an amendment to the RE type description from evergreen to semi-deciduous should be considered. Dominant species include *Milletia pinnata, Terminalia subacroptera, Diospyros maritima, Manilkara kauki, Aglaia elaeagnoidea, Pouteria obovata, Drypetes deplanchei* with scattered *Erythrina variegata.* The latter species forms the dominant canopy on Gaboy Island. Highly disturbed examples of the type, sampled on Tudu and Aureed Islands, are generally dominated exclusively by *Manilkara kauki,* the likely result of selective indigenous land management practice. Vegetation on these islands are reported to be heavily impacted by

firewood harvesting to service the Trepang industry (see Shnukal 2004). The vegetation community is represented in **Photograph 58** overleaf.

Photograph 58. The sub-canopy structure of VC2m on Masig Island at Site YO1.

5.2.25 Regional Ecosystem 3.2.30

Description: *Pemphis acidula* ± low closed forest. Restricted to coral atolls, shingle cays and sand cays.
Status: Of Concern
Vegetation Communities: 23b
Reference Sites: 2 Quaternary

Vegetation Community 23b: This shrubland/low closed forest community is mapped on Tudu, Sassie, and Iama Island. It is recognised as a saline transitional type, providing indication that some overlap between LZ1 and LZ2 exists. On Tudu, it is typified by a closed shrubland with canopy heights of 6m - 8m, forming an extensive landward fringe to mangroves and appearing to be confined to sand dunes (LZ2) above the average maximum tidal limit. A minor area on the north-west side of Iama mixes with the low mangrove shrub *Osbornia octodonta* on a coral platform at upper tidal limits. Land zone classification schemes adhered to in this survey consider this community as occurring within LZ1, although the floristic assemblage and landform are considered consistent with those provided in the RE type description (REDD Version 5.2, 2007). For the purposes of this study, the community has been mapped as RE3.2.30 in all occurrences, although clarification on the land zone affinities of this community are required.

Photograph 59. The light green crowns of *Pemphis acidula* (VC23b) forming an extensive fringe to mangrove communities on Tudu Island.

5.2.26 Regional Ecosystem 3.3.5c

Description: Evergreen notophyll vine forest. Occurs on alluvium on major watercourses.
Status: Not of Concern
Vegetation Communities: 1i, 1j, 3d (co)
Reference Sites: 4 Secondary (MO48, MO76, MO107, MO106)

Regional ecosystem 3.3.5 is composed of VC1i and VC1j, restricted to Moa Island where they occur on well-drained sandy alluvium of the larger watercourses and are representative communities of the RE sub-type 3.3.5c. The communities, which represent distinctive structural variations, are mapped as components of vegetation complex 3d. Maximum development of the RE occurs on Tutalia Creek where evergreen mesophyll vine forest (VC1i) and evergreen notophyll vine forest (VC1j) form a broad complex on the well-developed sandy flood plain alluvials on the lower reaches of Tutalia Creek. Vegetation community 1j is unique to Moa Island and is not known to occur on Cape York Peninsula.

Vegetation Community 1i: This tall evergreen mesophyll gallery forest occupies the well-drained and seasonally inundated sandy banks on the lower reaches of Tutalia Creek, with minor occurrences also recorded in a number of other riparian situations on Moa Island. Canopy heights of 40m were regularly observed in this community with typical species including *Horsfieldia australiana, Syzygium bamagense* and *Acmena hemilampra* subsp. *hemilampra* although *Maranthes corymbosa* and *Buchanania arborescens* are prominent in some localities. The sub-canopy assemblage includes *Licuala ramsayi,* and *Pandanus* spp. with *Arenga australasica* recorded at site MO83. The community is shown in **Photograph 60.** Vegetation Community 1i is a prominent component of the complex type 3d.

Vegetation Community 1j: Vegetation community 1j is a tall forest, reaching heights of 35m, with dominance shared between *Acmena hemilampra* subsp. *hemilampra* and *Syzygium angophoroides.* Associated canopy species include *Acacia auriculiformis*, *Syzygium forte* subsp. *forte, Calophyllum sil* and *Buchanania arborescens.* The sub-canopy is dominated by *Podocarpus grayae* with prominent *Pandanus* sp., *Buchanania arborescens* and *Calophyllum sil, Horsfieldia australiana, Endiandra glauca, Carallia brachiata,* and *Deplanchea tetraphylla*. Shrub layers are variable although a typical assemblage in better-developed locations may include *Halfordia kendack, Atractocarpus sessilis, Podocarpus grayae, Endiandra glauca, Salacia disepala, Dysoxylum oppositifolium, Cyclophyllum maritimum, Cryptocarya bamagana, Polyscias australiana, Haplosticanthus fruticosus, Psydrax* sp. (DGF8955+), *Polyalthia nitidissima* and *Cryptocarya cunninghamii.*

The community occupies the sandy flood overflow deposit on the lower reaches of Tutalia Creek, peripheral to the main flood channel on which maximum development of riparian rainforest occurs. The community is illustrated in **Photograph 61**.

5.2.27 Regional Ecosystem 3.3.6

Description: Evergreen notophyll vine forest with *Melaleuca leucadendra* on swamps.
Status: Of Concern
Vegetation Communities: 3c, 3d (co)
Reference Sites: 3 Secondary (MO76, MO107, MO48)

Regional Ecosystem 3.3.6 is represented by the vine forest/open forest mosaic of VC3c, and as a component of forest complex type 3d. These communities occupy swampy depressions and flood overflow channels on well-drained granitic alluvium. Characteristics of these communities are discussed briefly below.

Vegetation Complex 3c: Vegetation Complex 3c occupies a series of broad swampy drainage depressions on Moa Island. Tall mesophyll vine forest and Melaleuca open forest form a mosaic with roughly equal contribution to total canopy cover by both components, which have a canopy height range of 35m to 40m. The canopy of the tall open forest component is dominated by *Melaleuca dealbata* with *Melaleuca leucadendra* occurring in some locations (MO48). Sub-canopy species are typically swamp tolerant and may include *Dillenia alata, Gmelina dalrympleana, Horsfieldia australiana, Calophyllum sil, Acacia polystachya* and *Pandanus* sp. The type is restricted to Moa Island in broad drainage depressions. The community is shown in **Photograph 62.**

The vine forest component occupies elevated loamy sand rises within the drainage swamp and is best described as a tall evergreen mesophyll vine forest. A canopy height range of 30 to 45m is typical with a diverse floristic composition dominated by *Syzygium angophoroides, Acacia auriculiformis, Buchanania arborescens* and *Syzygium bamagense.* Additional species are *Syzygium forte* subsp. *forte, Gmelina dalrympleana, Terminalia sericocarpa, Maranthes corymbosa, Vitex acuminata, *Mangifera indica, Carallia brachiata, Calophyllum sil, Ficus drupacea* and *Acacia polystachya*. The sub-canopy and shrub layers support *Arenga australasica, Pandanus* spp., and *Licuala ramsayi*. The vine forest component of RE3.3.6 is illustrated in **Photograph 63.**

Regional ecosystem 3.3.6 also forms a component of complex type VC3d, where it mixes with evergreen mesophyll forest type VC1i.

Photograph 60. Tall evergreen mesophyll vine forest (VC3i) forming gallery forest on Tutalia Creek.

Vegetation Complex 3d: Complex type 3d (VC3d) is mapped on Tutalia Creek (MO107) and tributaries (Moa Island), as well as minor occurrence associated with a perennial drainage feature south of Saveka Point. Although riparian forest complexes, the lower reaches of these watercourses, which typically host these communities, form broad swampy flood overflow channels, and as such, are represented as swampland ecosystems rather than specialist riparian forests. The open forest component of this complex, which is dominated by *Melaleuca leucadendra* (and occasionally *Lophostemon suaveolens*, provides representation for RE3.3.6, with the evergreen mesophyll vine forest component represented and previously described as VC1i (RE3.3.5c). The structural formation is consistent with the representation provided in VC3c with canopy heights of the *Melaleuca leucadendra* dominant open forest attaining 45m and a range of vine forest species forming the sub-canopy and shrub layers.

Photograph 61. Tall notophyll forest VC1j on lower reaches on Tutalia Creek, Moa Island (MO106).

Photograph 62. Tall open forest (swamp forest) of *Melaleuca leucadendra* on Moa Island. Component of VC3c.

Photograph 63. Complex sub-canopy features of the vine forest component of VC3c with prominent *Arenga australasica.* The large canopy tree in the foreground is *Syzygium bamagense.*

5.2.28 Regional Ecosystem 3.3.7

Description: Tall semi-deciduous notophyll/microphyll vine thicket. Occurs on colluvial plains.
Status: Of Concern
Vegetation Communities: 2g, 4a
Reference Sites: 1 Quaternary (G14)

This RE is confined to Gebar Island as scattered pockets withint a broader grassland community. The community also occurs as a perennial fringe to a deeply incised drainage line. The canopy, ranging in height from 15 to 25m, includes *Canarium australianum, Terminalia subacroptera, Semecarpus australiensis, Buchanania arborescens* and *Acacia auriculiformis* as dominant species. *Erythrina variegata, Welchiodendron longivalve, Parinari nonda* and *Chionanthus ramiflora* form subdominant canopy components. The sub canopy was not sampled intensively due to time restrictions. Also included in this category are isolated pockets of *Welchiodendron longivalve* open forest occupying the same landform, which are thought to be fire disturbed variants of the better developed VC2g. Where these forests form discrete units, they are mapped as VC4a. Traditional burning practice has had a major structural impact on this community, most likely leading to a significant reduction in its original extent and floristic complexity.

Photograph 64. Sub canopy structure of VC2g on Gebar Island, where it occupies loamy alluvial soils.

5.2.29 Regional Ecosystem 3.3.9

Description: *Lophostemon suaveolens* open forest. Occurs on streamlines, swamps and alluvial terraces.
Status: Not of Concern
Vegetation Communities: 3a, 3f, 8b
Reference Sites: 2 Secondary (MOA16, BAS1); 5 Quaternary

The RE classification 3.3.9 incorporates VC3a, VC3f and VC8b. These VC's are considered atypical of the RE type description. These component vegetation communities are described briefly below.

Vegetation Community 3a: Vegetation Community 3a on Moa Island, occupies the swampy channels of major drainage features, typically on lower stream reaches. The community is often narrow and linear, becoming more extensive on swampy areas where coarse alluvial sand has been deposited. *Lophostemon suaveolens* forms the dominant open forest canopy, attaining heights of 25m, although it is accompanied by *Melaleuca quinquenervia, Syzygium angophoroides* and *Asteromyrtus brassii.* The sub-canopy features *Dillenia alata, Gmelina dalrympleana,* and *Acacia crassicarpa* with a diverse shrub layer which includes *Melastoma malabathricum* subsp. *malabathricum, Polyscias australianum, Chionanthus ramiflora, Flagellaria indica, Syzygium angophoroides, Diospyros hebecarpa, Rhodamnia australis, Deplanchea tetraphylla, Livistona muelleri, Carallia brachiata, Acmena hemilampra* subsp. *hemilampra, Terminalia* sp., *Litsea breviumbellata, Maranthes corymbosa, Tabernaemontana orientalis,* and *Macaranga involucrata* var. *mallotoides. Gahnia* sp., *Lomandra banksii* and *Lindsaea ensifolia* form the dominant ground cover. The community merges downstream with VC3d which occupies the thicker deposits of fluvial sand.

Photograph 65. VC3a at Site MO16 (Moa Island). *Lophostemon suaveolens* forms the dominant canopy.

Vegetation Community 3f: The only described representation of VC3f is on Badu Island where it occupyies broad swampy drainage lines and and shallow depressions formed on loamy granitic alluvium. The community typically forms on the upper reaches of drainage lines in broad gully heads where a number of low angle alluvial fans coalesce. *Lophostemon suaveolens* forms the dominant canopy, reaching heights of 30m, with co-dominant to sub-dominant *Melaleuca leucadendra. Corymbia clarksoniana* forms a minor canopy component (5-10%) where the community was sampled and *Parinari nonda* occasionally reaches canopy height. The sub-canopy is of *Acacia leptocarpa, Acacia crassicarpa, Carallia brachiata, Dillenia alata* and *Pandanus* sp., with *Banksia dentata, Gmelina dalrympleana, Pandanus* sp., *Rhodamnia australis*

and *Dillenia alata* representing the most prominent shrub species with a height range of 3m to 8m. The ground cover is typically dense with *Ischeamum australe, Ischeamum* sp., *Imperata cylindrica*, *Heteropogon triticeus*, *Melastoma malabathricum* subsp. *malabathricum*, and *Crotalaria calycina.* The community is represented in **Photograph 66.**

Vegetation Community 8b: Vegetation community 8b is located on a coastal outwash plain to the south of Saveka Point. The community forms a low open forest with *Lophostemon suaveolens* forming the dominant canopy. Sub-dominant species are typically *Melaleuca saligna, Asteromyrtus brassii* and *Acacia crassicarpa*. The sparse to mid-dense sub-canopy layer is dominated by *Livistona muelleri, Pleomele angustifolia* and *Dodonaea polyandra* over a sparse shrub layer of *Polyscias australianum, Litsea breviumbellata, Endiandra glauca, Rhodomyrtus macrocarpa, Wilkiea rigidifolia, Alyxia spicata, Buchanania arborescens, Psydrax banksii, Calophyllum sil, Halfordia kendack,* and *Smilax australis. Lomandra banksii* dominates the ground cover. The alluvial substrate comprises coarse sand derived from alluvial outwash across a narrow swampy flood plain. Both drainage capacity and fertility can be considered moderate.

Photograph 66. Open forest type 3f at Site BAS1 (Badu Island). *Lophostemon suaveolens* and *Melaleuca leucadendra* form the dominant canopy species.

Photograph 67. Low open forest of *Lophostemon suaveolens, Melaleuca saligna, Asteromyrtus brassii* and *Acacia crassicarpa* (VC8b) at Moa Site MO72.

5.2.30 Regional Ecosystem 3.3.10

Description: *Melaleuca argentea* and/or *M. fluviatilis* ± *M. leucadendra* open forest. Fringes streams and creeks.
Status: Not of Concern
Vegetation Communities: 3b, 3g, 5h, 7f, 14o
Reference Sites: 5 Quaternary

Vegetation Community 7f: The dominant component of this RE is VC7f representing an open to tall open forest of *Melaleuca leucadendra.* It occurs commonly as a riparian fringe on major drainage features, extending to broader flood overflow plains in some locations. On riparian areas and associated overflow channels, *Melaleuca leucadendra* forms the canopy ranging in height from 15m in poorly developed communities on Warral Island, to greater than 30m on well-drained flood overflow channels on Muralug. Vegetation Community 7f is also represented by a woodland variant extending away from the riparian margins across a silty flood plain (PW81). This *Melaleuca leucadendra* dominant community has a mixed sub-canopy layer of which *Melaleuca saligna* and *Corypha utan* are components. The occurrence of the latter species is a significant extension of range north from the Dulhunty River (Forster 1996) although the most northerly vouchered material at BRI is from near Aurukun (P. Forster pers. comm. March 2008). It also occurs in the Northern Territory. Similar communities on drainage swamps are represented as RE3.3.14b (VC7fs).

Photograph 68. Open forest of *Melaleuca leucadendra* (VC7f) on flood overflow of North-West Ck, Muralug Island (PW58).

Photograph 69. Disjunct population of *Corypha utan* forming a sub-canopy component of *Melaleuca leucadendra* woodland (VC7f). Muralug Island Site PW81.

Vegetation Complex 3b: Vegetation community 3b (RE3.3.10a) forms a tall open forest complex on Moa Island where it is restricted to narrow drainage lines incised into coarse sandy plains. A canopy height range of 28 to 38m is typical comprising *Melaleuca argentea* and *Melaleuca leucadendra,* although occasionally accompanied by vine forest species including *Syzygium forte* subsp. *forte* becoming more prominent in the sub-canopy. Dominant sub-canopy species include *Dillenia alata, Parinari nonda, Acacia auriculiformis, Buchanania arborescens, Euroschinus falcatus* var. *angustifolius* and *Pandanus* sp. The community is represented in **Photograph 70**. The community provides habitat for the vulnerable *Voacanga grandiflora*.

Photograph 70. Riparian open forest (RE3.3.10a) at Site MO4, Moa Island.

Vegetation Community 3g: Broad swampy drainage lines carved into degraded sand dunes on Badu Island are habitat for swamp forest type VC3g. The drainage lines that host this community originate as swampy depressions nestled within broad sand sheets and become gradually more incised as water flux increases downstream. The depth of drainage incision, which may be up to 3m, and seasonal water flow has resulted in the classification of these forests within LZ3 rather than LZ2, as might otherwise be applied if drainage away from the swamp was impeded to any degree. *Melaleuca dealbata* forms the dominant canopy of this community, reaching heights of 30m, with associated species including *Lophostemon sauveolens, Acmena hemilampra* subsp. *hemilampra, Syzygium forte* subsp. *forte, Syzygium angophoroides, Deplanchea tetraphylla, Gmelina dalrympleana* and *Acacia crassicarpa. Carallia brachiata, Dillenia alata* and *Gmelina dalrympleana* are prominent as sub-canopy species. The shrub layer is dominated by the vine forest species *Polyscias australiana, Wilkiea rigidifolia, Syzygium fibrosum, Chionanthus ramiflora, Cryptocarya brassii, Macaranga involucrata* var. *mallotoides, Rhodamnia australis, Dysoxylum oppositifolium, Tabernaemontana orientalis, Litsea breviumbellata, Endiandra*

glauca, Rhodamnia macrocarpa, Sterculia quadrifida, Haplosticanthus fruticosus and *Litsea glutinosa.* The community often forms in complex with *Melaleuca leucadendra* dominant riparian communities (VC3b) and is mapped in this exercise as sub-type variant 3.3.10d.

Photograph 71. Tall open riparian forest type 3g on Badu Island (Site BDQ25).

Vegetation Community 7b/14o: Regional Ecosystem sub-type 3.3.10b, represented by VC7b, is dominated by *Melaleuca saligna,* which forms a prominent low open forest fringe to major drainage lines on Muralug. *Melaleuca acacioides* may be associated with the sub-canopy of this VC on brackish river reaches. Vegetation Community 14o represents a riparian shrubland variant of this RE sub-type mapped on the middle reaches of North-West Creek (Muralug Island). Classification of this system is based largely on aerial photographic interpretation and brief aerial inspection. As such, the specific characteristics of this community are poorly known although *Melaleuca saligna* and *Acacia* spp. are inferred as the dominant species.

Photograph 72. Vegetation Community 5h at Site HI57, Horn Island with *Eucalyptus brassiana* in the background.

Vegetation Community 5h: Vegetation Community 5h represents a mixed riparian forest type classified under RE sub-type 3.3.10c. The dominant canopy, always in open forest formation, ranges in height from 15 to 23m and is composed of *Melaleuca saligna, Corymbia stockeri* subsp. *peninsularis, Corymbia clarksoniana, Eucalyptus brassiana* and *Eucalyptus platyphylla.*

Melaleuca leucadendra is also prominent in location. *Melaleuca saligna* forms the dominant sub-canopy component in association with *Dillenia alata* and *Deplanchea tetraphylla.* The community occupies swampy flood overflow plains, often associated with relict dune systems, and has been mapped only on Horn Island. A representative community is shown in **Photograph 72.** The occurrence of *Eucalyptus brassiana* in this VC on Horn Island is a new record for the study area.

5.2.31 Regional Ecosystem 3.3.12

Description: *Melaleuca quinquenervia* open forest. Associated with scattered coastal swamps.
Status: Of Concern
Vegetation Communities: 7d
Reference Sites: 2 Quaternary (MO148a, MO148b)

Vegetation Community 7d: Regional Ecosystem 3.3.12 is represented by VC7b which is restricted to the broad erosional plain on the north-west side of Moa Island occurring as a number of sparsely scattered swampland communities amongst a broader residual sand plain (LZ5). *Melaleuca quinquenervia* forms the dominant canopy species in a community which ranges structurally from open forest to shrubland, depending largely on fire history. The ground cover is dominated by *Dapsilanthus spathaceus*, *Schoenus* sp. and *Pandanus* sp.

Photograph 73. A *Melaleuca quinquenervia* swampland formed on the broader residual sand plain.

5.2.32 Regional Ecosystem 3.3.13

Description: *Melaleuca saligna* ± *Hakea pedunculata* open forest. Occurs on edges of salt pans.
Status: Of Concern
Vegetation Communities: 7bs
Reference Sites: 2 Quaternary

Vegetation Community 7bs: This RE, characterised by VC7bs is restricted largely to Horn Island, with occurrences also on Muralug. The community is represented by an open forest, generally low in stature with a canopy height range of 10 to 18m. The dominant canopy is formed by *Melaleuca saligna* although it mixes with *Livistona muelleri*, in some cases with Livistona dominating the canopy. The sub-canopy is often sparse, although *Livistona muelleri* and *Pandanus* sp. are locally prominent. The landform hosting this community is restricted to outwash plains on the margins of salt flats true to the type description. Where this community

occurs on drainage swamps, it has been classified as RE3.3.14 (VC7b), which is discussed in the following section.

Photograph 74. *Livistona muelleri* forming a prominent sub-canopy layer to *Melaleuca saligna* open forest (VC7bs). Horn Island Site HI5.

5.2.33 Regional Ecosystem 3.3.14

Description: *Melaleuca saligna* ± *M. viridiflora, Lophostemon suaveolens* woodland on drainage swamps.
Status: Not of Concern
Vegetation Communities: 7b, 7e, 13g, 7fs
Reference Sites: 9 Quaternary

Regional Ecosystem 3.3.14 represents *Melaleuca saligna* dominant open forests occurring in drainage swamps. There is some degree of overlap with RE3.3.13 which occupies outwash plains adjacent to salt flats, most prominently on Horn Island.

Vegetation Community 7b: Although occurring on the same Land Zone, RE3.3.14 has been classified where VC7b occurs in drainage depressions and represents a much more extensive expression of *Melaleuca saligna* dominant open forest, occurring on the majority of islands in the Inner Island Group, as well as Mabuiag and Moa Island. Whilst *Melaleuca saligna* is the dominant canopy species, it mixes with *Melaleuca leucadendra, Livistona muelleri* and *Alstonia spectabilis* on Friday Island. The sub-canopy is generally sparse, although *Livistona muelleri* and *Pandanus* sp. are generally prominent.

Vegetation Community 13g & 7e: The RE classification also includes VC13g and VC7e, occurring on Zuna and Moa Islands respectively. Vegetation Community 13g represents a low closed shrubland of *Melaleuca saligna* which forms a narrow (although mappable) fringe to an Eleocharis dominated swampland community on Zuna Island. Vegetation Community 7e represents an open forest community with a canopy composed of *Melaleuca dealbata*, *Melaleuca saligna* and *Livistona muelleri*. The community, which occupies a broad drainage depression on the south coast of Moa Island, was identified during helicopter survey and was not subject to detailed on-ground investigation.

Vegetation Community 7fs: Minor areas of *Melaleuca leucadendra* dominant swamp forest was observed during helicopter traverse fringing saline flats on Badu Island. This community,

mapped as VC7fs, has not been adequately ground truthed and requires further description. This representation has been mapped as RE3.3.14b.

Photograph 75. *Melaleuca saligna* dominant open forest on a drainage swamp on Zuna Island (ZQ9).

5.2.34 Regional Ecosystem 3.3.17b

Description: *Corymbia clarksoniana, Erythrophleum chlorostachys* woodland on alluvial plains.
Status: Not of Concern
Vegetation Communities: 5o, 5g, 5s
Reference Sites: 1 Secondary (POW82), 1 Quaternary.

Vegetation Community 5o: Vegetation Community 5o on alluvium provides the dominant representation of RE3.3.17b, restricted to the broad alluvial flats near Port Lihou on Muralug Island. The community occupies an unusual landform situation, occurring on the alluvial aprons of a number of diorite knolls which protrude above the general surface of the surrounding alluvial plain. The derived soils are relatively fertile, clay rich, and have mild vertic properties manifesting in subdued gilgai morphology. *Corymbia tessellaris* forms the dominant canopy with associated *Corymbia clarksoniana* attaining canopy heights of 27m. Ground cover is composed of dense tussock grasses of which *Themeda triandra* is most prominent, although it also includes *Ischaemum australe* and *Imperata cylindrica.* The community has been classified with sub-type RE3.3.17b, which provides representation most consistent with the REDD (Version 5.2, 2007).

Vegetation Community 5g: Vegetation community 5g on alluvium represents a *Corymbia tessellaris* dominant open forest with small areas mapped on Warral Island and Friday Island. The community occurs most commonly on sandy alluvial soils derived from granite where it mixes with a range of vine forest species, making it distinct from VC5o which typically represents grassy woodland. Limited floristic and structural information was gathered on this community.

Vegetation Community 5s: Vegetation community 5s forms restricted areas of *Corymbia clarksoniana* and *Corymbia tessellaris* dominant low open woodland on Muralug Island. Species associated with the sub-canopy of this community include *Livistona muelleri* and *Acacia leptocarpa.* This community is separated from VC5o by stature and landform. Vegetation community 5s forms a stunted community on silty poorly drained alluvial outwash, whilst 5o occupies more fertile soils derived from diorite and has developed considerably greater stature.

Photograph 76. Woodland type 5o on alluvial soils. Muralug Island at Site PW82.

Photograph 77. *Corymbia tessellaris* dominant open forest on alluvial flat (Friday Island Site FR21).

5.2.35 Regional Ecosystem 3.3.20c

Description: *Corymbia clarksoniana* ± *Erythrophleum chlorostachys* ± *Melaleuca viridiflora* woodland on alluvial plains.
Status: Not of Concern
Vegetation Communities: 5b
Reference Sites: 12 Quaternary

Vegetation Community 5b: Vegetation Community 5b is the dominant woodland an open forest community on Moa Island where it occupies silty alluvial outwash plains and piedmont fans, typically derived from granite, hornfels and metamorphic lithologies. The community is mapped as the newly described RE subtype 3.3.20c which is represented as a woodland to open forest, with canopy heights ranging from 18 to 27m. *Corymbia clarksoniana* tends to dominate the canopy, although associated canopy species may include *Corymbia nesophila*, *Corymbia tessellaris*, *Corymbia stockeri* subsp. *peninsularis* and *Welchiodendron longivalve*. Welchiodendron is often well represented in the canopy and shrub layers which may also

comprise *Planchonia careya, Melaleuca viridiflora, Acacia leptocarpa* and *Cycas* sp. The Cycas is thought to be the endemic *C. badensis.*

Photograph 78. Typical structure of VC5b which represents the dominant woodland and open forest community on Moa Island (Site MO94).

5.2.36 Regional Ecosystem 3.3.22

Description: *Corymbia clarksoniana* or *C. novoguinensis* woodland on alluvial plains.
Status: Not of Concern
Vegetation Communities: 5i, 5c
Reference Sites: 1 Quaternary (Zuna ZQ6)

Vegetation Community 5i: The major occurrences of this RE are on degraded sand dunes where they have been mapped as RE3.2.7. Small areas of VC5i occupy sandy alluvial wash on the margins of a drainage depression on Zuna Island, which represent the only mapped areas of this RE in the study area. This occurrence forms an open forest with relatively even canopy heights in the 18 to 23m range. *Corymbia clarksoniana* dominates the canopy, with *Lophostemon suaveolens, Livistona muelleri* and *Parinari nonda* associated. *Livistona muelleri* has a tendency to form dense groves in some areas which have been incorporated into the broader VC. The sub-canopy is relatively dense (up to 40% PFC) and composed of *Melaleuca viridiflora, Lophostemon suaveolens, Livistona muelleri,* and *Pandanus* sp. The shrub layer features *Livistona muelleri, Acacia leptocarpa, Acacia brassii, Acacia simsii, Acacia crassicarpa, Ficus opposita, Dodonaea polyandra* and *Pandanus* sp. Tall graminoids form the dominant ground cover comprising *Ischaemum australe, Heteropogon triticeus, Mnesithea rottboellioides* and *Imperata cylindrica.* The community merges with *Melaleuca saligna* open forest (RE3.3.17) where the ground becomes increasingly swampy.

Vegetation Community 5c: This classification also includes VC5c where *Corymbia clarksoniana* forms a low woodland community with co-dominant canopy species including *Parinari nonda, Melaleuca viridiflora, Welchiodendron longivalve* and *Pandanus* sp. The sub-canopy layers (typically an S1 layer) are typically dominated by *Melaleuca viridiflora* and *Pandanus* sp. This community is restricted to Moa Island where it occupies alluvial fans, although its occurrence is more extensive on the sandy alluvial plains of Land Zone 5.

Photograph 79. A dense grove of *Livistona muelleri* within VC5i. Zuna Island Site ZQ6.

Photograph 80. Vegetation Community 5c recorded at Site MO99, Moa Island.

5.2.37 Regional Ecosystem 3.3.27

Description: *Corymbia nesophila* ± *Eucalyptus tetrodonta* ± *Eucalyptus brassiana* woodland on alluvial sediments.
Status: Not of Concern
Vegetation Communities: 5k, 5q, 5m
Reference Sites: 2 Secondary, 18 Quaternary

Three VC's are represented under this category.

Vegetation Community 5k: Vegetation Community 5k forms the dominant variant, being relatively extensive on the Inner Island Group and particularly well-developed and extensive on Horn and Muralug Islands. The community generally forms an open forest community with canopy heights ranging from 18 to 27m. *Corymbia nesophila* forms the dominant canopy species in most locations, although it mixes with *Corymbia stockeri* subsp. *peninsularis* and *Eucalyptus tetrodonta* in the majority of communities sampled. *Erythrophleum chlorostachys* forms a co-dominant canopy component in some locations on Muralug Island (Site PW78) and *Corymbia*

latifolia occasionally reaches the canopy (PQ63). Sub-canopy is variable although a general assemblage of species includes *Melaleuca stenostachya, Neofabricia myrtifolia, Alphitonia excelsa, Xylomelum scottianum, Acacia polystachya, Livistona muelleri* and *Capparis arborea*. Shrub layers are typically composed of *Melaleuca viridiflora, Melaleuca stenostachya, Xylomelum scottianum, Acacia simsii, Persoonia falcata, Jacksonia thesioides, Acacia simsii, Acacia platycarpa, Banksia dentata, Melaleuca nervosa, Planchonia careya* and *Acacia leptocarpa.* The ground cover generally comprises a range of grasses including *Heteropogon triticeus, Panicum trichoides, Themeda triandra, Imperata cylindrica, Eriachne pallescens* and *Eragrostis spartinoides.*

Photograph 81. A typical example of open forest type 5k on alluvium represented at Site PW15. The canopy in this community is dominated by *Corymbia nesophila.*

Vegetation Community 5q: Vegetation community 5q forms a lower open forest variant of this RE. The community is restricted to the Inner Island Group with best development occurring on Muralug, Wednesday and Horn Islands. The general canopy ranges in height from 15 to 21m and is dominated by *Corymbia stockeri* subsp. *peninsularis* with *Corymbia nesophila* and *Corymbia clarksoniana* commonly associated canopy species. The shrub layer is variable although in open forest communities on sandier substrates, the shrub layer tends to be dominated by *Acacia* spp. and *Jacksonia thesioides.*

Vegetation Community 5m: On siltier soils, the open forest structure is replaced by woodland and occasionally open woodland with a sub-canopy layer dominated by a range of myrtaceous shrubs including *Melaleuca stenostachya, Melaleuca viridiflora* and *Asteromyrtus symphyocarpa.* In these locations, the community is mapped as VC5m, being prominent on Wednesday, Friday, and Horn Islands. It merges with VC 13d (RE3.3.48) in some areas where *Melaleuca saligna* forms a prominent sub-canopy component, particularly on Horn Island where VC5m and VC13d tend to mosaic. As a general rule applied, VC5m was classified where *Corymbia stockeri* subsp. *peninsularis* forms a clear canopy layer above sub-canopy strata. Where *Corymbia stockeri* is a component of the canopy that is subdominant to *Melaleuca saligna* (or associated *Melaleuca* spp.), or forms an emergent layer, the community is classified with VC13d.

Photograph 82. Low woodland variant of VC5m at Site PW7 where *Corymbia nesophila* is a co-dominant canopy species with *Corymbia stockeri* subsp. *peninsularis.*

5.2.38 Regional Ecosystem 3.3.28

Description: *Eucalyptus platyphylla* ± *Corymbia clarksoniana* woodland on alluvial and colluvial plains.
Status: Not of Concern
Vegetation Communities: 5u, 5n
Reference Sites: 3 Quaternary

Regional Ecosystem 3.3.28 is represented by two VC's, both restricted to Muralug Island.

Vegetation Community 5u: Vegetation Community 5u, surveyed by helicopter at Site PW116, represents a woodland community with dominant *Eucalyptus platyphylla* with an estimated canopy heights range of 18 to 23m. The sub-canopy is relatively sparse, and is composed of *Livistona muelleri* and scattered *Melaleuca viridiflora. Melaleuca* spp. forms the dominant shrub layer over an open grassy ground cover. The community occupies a broad alluvial outwash plain on the landward margins of a coastal dune/estuarine wetland complex.

Photograph 83. Vegetation Community 5u. Alluvial flat behind a coastal dune complex. Muralug Site 116.

Vegetation Community 5n: This community is restricted to alluvial terraces on North-West Creek where it forms an extensive flood plain type. *Eucalyptus platyphylla* dominates the canopy attaining maximum heights of 27m, with sub-dominant species including *Eucalyptus tetrodonta*, *Corymbia nesophila* and *Erythrophleum chlorostachys.* Sub-canopy is generally sparse, although *Erythrophleum chlorostachys* is prominent in association with *Eucalyptus* spp. and *Corymbia* spp. typical of the canopy. Ground cover is dominated by *Heteropogon contortus, Imperata cylindrica* and *Themeda triandra.* The community is represented in **Photograph 84**.

Photograph 84. Vegetation community 5n on an alluvial terrace of North-West Creek. The community, sampled in this location is located at PW061.

5.2.39 Regional Ecosystem 3.3.42

Description: *Melaleuca viridiflora* low woodland in drainage areas.
Status: Not of Concern
Vegetation Communities: 13a, 13b, 13c, 14b, 14m, 14r, 11b
Reference Sites: 23 Quaternary

Vegetation communities falling under the classification of RE3.3.42 form one of the most extensive and variable vegetation groups in the Torres Strait Islands. *Melaleuca viridiflora* forms the pivotal species in a group whose distribution and ecology is largely controlled by soil drainage and to a lesser extent, soil fertility.

Vegetation Community 13a: Vegetation Community 13a represents the most abundant of the variations, common on the Inner Island and Near Western Island groups, with a floristic composition and structural form that is largely consistent with the type description of RE sub-unit 3.3.42a. *Melaleuca viridiflora* dominantes the shrub layer with heights between 4m to 10m. *Pandanus* sp. is a common sub-dominant species and a range of myrtaceous species may be associated, although at no stage are these associated species dominant. The community also includes scattered shrublands of *Melaleuca acacioides* on Moa Island which mix on the margins of salt flats and mangrove wetlands. It occupies areas of limited surface drainage, generally on silty outwash plains with infertile clay loam soils.

Photograph 85. Shrubland dominated by *Melaleuca viridiflora* with scattered emergents of *Parinari nonda* and *Corymbia clarksoniana.* Site MO7 (Moa Island).

Vegetation Community 13c: Vegetation Community 13c represents a shrubland, canopy heights ranging from 3m to 6m, dominated by *Melaleuca viridiflora, Asteromyrtus symphyocarpa* and *Banksia dentata. Hakea pedunculata* and *Melaleuca saligna* may be associated although they are always sub-dominant shrub components, and *Melaleuca acacioides* may occur on community on saltpan margins. The secondary shrub layer is typically sparse, comprising species characteristic of the upper stratum and the ground cover is dominated by sedges, typically not forming more than 30% total cover. *Melaleuca viridiflora* is consistently represented by a distinctive variety represented as a low and generally poorly formed shrub with thick leathery leaves and distinctive red buds on growing points. The VC is consistent with the description provided for sub-type RE3.3.42a (REDD, Version 5.2, 2007) and it has been mapped as such. The major distribution of VC13j is on the larger islands of the Inner Island Group (Muralug and Horn) and Moa Island, where it occupies poorly drained alluvial flats, typically on the peripheral margins of outwash plains where sediments are dominantly silts and clays. A superficial coating of fine white residual silica sand is often visible on the soil surface. This VC is also recorded on LZ5.

Photograph 86. Vegetation Community 13c on Muralug Island (Site PW057).

Vegetation Community 13f: Vegetation Community 13f is recognised where *Melaleuca viridiflora* forms a canopy with sub-dominant to co-dominant *Corymbia* spp., typically in shrubland to low woodlands structural formation. A range of *Corymbia* species may be present include *Corymbia stockeri* subsp. *peninsularis, Corymbia nesophila* and *Corymbia clarksoniana. Parinari nonda* is locally abundant as a canopy and sub-canopy species and *Banksia dentata* and *Asteromyrtus symphyocarpa* often form a prominent sub-canopy layer. Ground cover is variable although as a general rule, with *Themeda triandra* dominant in areas of better soil drainage, giving way to sedges as drainage becomes increasingly impeded. The community often merges with VC5c which occupies a similar landscape position, although *Melaleuca viridiflora* represents a sub-canopy species in VC5c, only occasionally reaching canopy height. The major occurrences of this community are on Moa and Badu Islands. This community is extensively mapped in association with LZ5 on Moa Island.

Vegetation Community 14m: Mixed shrubland on Hammond Island forms VC14m. It is structurally a tall shrubland, although it forms occasional woodland, with an uneven upper stratum ranging in height from 5m to 12m. The community is consistent with RE3.3.42a and is represented within this sub-type in this exercise. *Melaleuca viridiflora* is a co-dominant canopy species mixing with *Acacia crassicarpa, Grevillea parallela, Parinari nonda* and *Pandanus* sp. *Corymbia tessellaris* forms an emergent species reaching heights of 15m. Ground cover is dominated by grasses which include *Imperata cylindrica* and *Heteropogon triticeus.* The community occupies silty alluvial soils (alluvial fan) forming a corridor between granite footslopes with vine forest, and salt pan. It is likely that the structure and floristic composition of this community is heavily influenced by fire, and the community had been recently burnt at the time of survey. The community is represented in **Photograph 87.**

Photograph 87. Vegetation Community 14m on Hammond Island (Site HA12).

Vegetation Community 14r: Vegetation Community 14r has a restricted distribution, confined to Moa Island, on coastal plains to the south of Saveka Point (St Paul's) where it is represented under the broad sub-unit of RE3.3.42a. Canopy height ranges from 6m to 9m, represented structurally as a shrubland to low woodland. The upper stratum is mixed, comprising a relatively even proportion of *Acacia crassicarpa, Melaleuca viridiflora* and *Pandanus* sp. Associated species include *Parinari nonda, Banksia dentata* and *Lophostemon suaveolens* which form sub-dominant canopy components and are always present. *Banksia dentata* is the dominant species in the secondary shrub layer. Ground cover is relatively dense with well-developed tussock grasses dominated by *Ischaemum australe.* The community, an example of which is represented in **Photograph 88**, is developed on silty alluvial outwash plains on the landward fringe of a broad coastal dune system.

Photograph 88. Low woodland/shrubland community 14r on Moa Island. The photograph is taken at Site MO65.

Vegetation Community 11b: Pandanus dominant shrublands and low woodlands are prominent on drainage swamps and seepage zones is a range of localities, although they are most prominent on Dauan and Mabuiag Island. These communities generally form tall shrublands, mixing with *Melaleuca viridiflora* in some locations on Mabuiag Island, and have been classified as VC11b. These communities present some classification difficulties, having frequently developed in response to disturbance which may include intense fire or removal of previous canopy layers by mechanical disturbance. In the broader landscape of the Torres Strait Islands, this community appears relatively stable being maintained by regular fire and remnant status is warranted. It should be noted that this community has been distinguished from the broad expanse of Pandanus dominant woodland occupying alluvial systems on Saibai Island. This VC has been classified under the broad RE sub-type 3.3.42a

Photograph 89. A Pandanus dominant low woodland occupying a freshwater seepage zone on Dauan Island.

Vegetation Community 13b: North of Mabuiag Island, *Melaleuca viridiflora* is replaced by *Melaleuca cajuputi* subsp. *platyphylla* as the dominant Melaleuca species. *Melaleuca cajuputi* forms extensive shrublands and low open forests on Saibai Island, and Boigu Island to a lesser extent. The shrubland VC13b is restricted to Saibai Island where it forms a vegetation unit that is structurally similar to VC13a, although based on floristic affinities to vegetation communities associated with the northern Torres Strait Islands (Saibai in particular), has been assigned to the

new RE sub-type 3.3.42c. Vegetation Community 13b is represented with a general canopy height range from 3m to 6m, occasionally reaching 10m where ground becomes swampy. *Melaleuca cajuputi* forms the dominant shrubland species although it mixes with *Pandanus* sp. and *Acacia leptocarpa. Acacia auriculiformis* may represent a prominent canopy component where the shrubland community fringes brackish wetlands, merging with mixed shrubland type 14b. The ground cover is frequently dominated by *Acrostichum aureum* in these locations. The community occupies soil types which range from moist brackish clays to hardened silty clay loams with mound and hummock micro-topography as at Site SAS066.

Photograph 90. Vegetation Community 13b (RE3.3.42c) at Site SAS066 (Saibai Island).

5.2.40 Regional Ecosystem 3.3.48b

Description: *Melaleuca saligna* ± *M. viridiflora* low open woodland in drainage depressions.
Status: Not of Concern
Vegetation Communities: 13d
Reference Sites: 20 Quaternary

Vegetation Community 13d: Vegetation Community 13d has an extensive distribution on coastal outwash plains of the Inner and Near Western Island groups where it frequently mosaics with woodlands (VC5m) and other shrubland communities (13a, 13c). *Melaleuca saligna* is the characteristic and generally dominant species in the upper stratum, forming a shrubland to low woodland community with a height range from 5 to 9m. Associated canopy species include *Melaleuca viridiflora* (long drooping leaf variety), *Asteromyrtus symphyocarpa, Asteromyrtus brassii* and *Banksia dentata. Corymbia stockeri* subsp. *peninsularis* and *Corymbia nesophila* are occasional canopy components, forming an emergent layer in some locations, and merging with woodland type 5m with increasing dominance of *Corymbia* spp. The shrub layer is frequently dominated by *Asteromyrtus symphyocarpa* and *Banksia dentata* with *Pandanus* sp. locally prominent. Ground cover layers are typically sparse, dominated by a range of sedges and grasses, typically forming a cover of less than 30%. VC13d occupies poorly drained alluvial outwash plains, often with a superficial film of white residual sand at surface, rather than drainage swamps. The community is classified as the new RE sub-unit of 3.3.48b, distinctive from the more typical occurrences of RE3.3.48 which are described as being associated with drainage depressions. It is represented in **Photograph 91** overleaf.

Photograph 91. A relatively well-developed example of VC13d at Site H1011 (Horn Island). The shrub layer is poorly developed in this location.

5.2.41 Regional Ecosystem 3.3.51

Description: *Melaleuca acacioides* ± *Hakea pedunculata* tall shrubland on marine plains.
Status: Of Concern
Vegetation Communities: 13e, 13j
Reference Sites: 6 Quaternary

Regional Ecosystem 3.3.51, represented as VC13e and VC13j frequently forms a narrow fringe to mangrove communities on many of the larger islands including islands of both the Inner and Near Western Groups.

Vegetation Community 13e: Vegetation Community 13e is the dominant representation of this ecosystem, forming a tall closed shrubland (scrub) with *Melaleuca acacioides* on Horn Island, Muralug Island, and Moa Island. These are relatively simple communities, generally lacking a distinctive sub-canopy layer, with a ground cover dominated by salt tolerant sedges and grasses including *Fimbristylis dichotoma* and occasionally *Sporobolus virginicus.*

Vegetation Community 13j: Vegetation Community 13j represents an open shrubland variant restricted to a single mappable occurrence on Muralug Island behind Port Lihou. Canopy heights range from 3m to 6m with PFC generally less than 20%. *Melaleuca acacioides* forms the dominant shrub layer with associated species including *Hakea pedunculata* and *Leucopogon ruscifolius.* The Vulnerable listed orchid *Dendrobium bigibbum* was recorded in this community.

5.2.42 Regional Ecosystem 3.3.57

Description: *Imperata cylindrica* ± *Mnesithea rottboellioides* closed tussock grassland on coastal plains.
Status: Of Concern
Vegetation Communities: 17d, 17g
Reference Sites: 6 Quaternary

Grasslands mapped under the classification of RE3.3.57 fall in a generic group, and were difficult to differentiate on a floristic level due to lack of fertile specimens at the time of survey (late dry season).

Photograph 92. Tall closed shrubland of *Melaleuca acacioides* (VC13e) on the margins of a salt flat (Site HI01, Horn Island).

Photograph 93. Open shrubland with dominant *Melaleuca acacioides.* Vegetation community 13j on Muralug Island (Site PW83).

Vegetation Community 17d: Vegetation Community 17d provides reference to a floristically undifferentiated grassland classification with a range of species including *Imperata cylindrica, Themeda triandra, Heteropogon triticeus* and *Mnesithea rottboellioides.* The community has scattered occurrences throughout the study area with the best developed examples being located on Moa Island and Gebar Island, generally on relatively well-drained, sandy loam soils. These grasslands have developed in response to repetitive anthropogenic burning and the fire disclimax vegetation types are often evident scattered throughout the community as discontinuous and isolated remnants. The community is represented in **Photograph 94** overleaf.

Vegetation Community 17g: Vegetation Community 17g has been mapped in a single location on Muralug where the dominant *Themeda triandra* and *Imperata cylindrica* grassland community mosaics with *Melaleuca nervosa* shrubland. The shrubland component represents shrubby thickening in the absence of regular fire.

Photograph 94. Grasslands on a broad alluvial plain on Gebar Island. The community in this location represents a fire climax community with vine forest (the original vegetation type) clearly visible in the background.

5.2.43 Regional Ecosystem 3.3.62

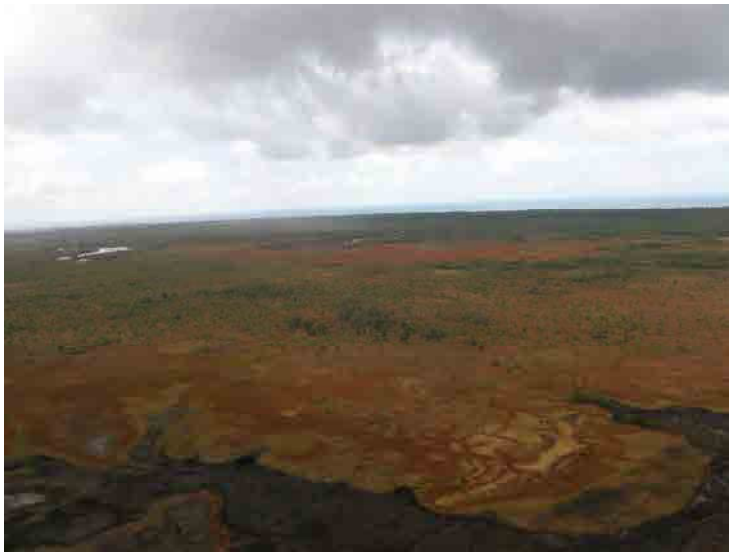
Description: Grassland/sedgeland with *Pandanus* spp. Confined to Torres Strait Islands.
Status: Of Concern
Vegetation Communities: 17a, 17e, 11a
Reference Sites: 3secondary (SA15, SA21, BO16), 33 Quaternary

This RE comprises a mosaic of grassland, shrubland and low woodland types, confined mostly to Northern Islands group with extensive areas on Saibai Island. More restricted and scattered areas occur on Boigu, and isolated examples are also represented on Hammond and Moa Islands (Inner and Near Western Island Groups respectively). The RE is endemic to the Torres Strait.

Vegetation Community 17a: The dominant component of this ecosystem is VC17a, generally developed as a closed tussock grassland dominated by *Ischaemum australe* with associated species *Imperata cylindrica, Themeda triandra, Mnesithea rottboellioides, Vandasia retusa,* and *Derris trifoliata*. Species associated with brackish margins include *Fimbristylis ferruginea, Acrostichum aureum,* and *Cynanchum carnosum.* Characteristic emergent shrubs are *Acacia leptocarpa, Melaleuca cajuputi* subsp. *platyphylla, Pandanus* sp. *Livistona muelleri, Antidesma parviflorum, Acacia auriculiformis* and less commonly *Dillenia alata* on the Northern Island Group. This VC is represented in **Photograph 95.**

Vegetation Community 17e: Vegetation Community 17e represents anthropogenically disturbed areas on Saibai Island which have re-established native grass cover. These communities are clearly identifiable on aerial photography due to their intricate and precisely constructed furrow and ridge morphology, indicative of prior cultivation. Barham (1999) identifies this feature as former prehistoric tropical field systems with characteristic physical traces of relict agricultural mounds and ditches. Barham and Harris (1985), in Barham (1999) report that the field systems on Saibai were partly in use as late as 1945 with detailed mapping carried out as part of archeological investigations indicating previous use of some 650 ha of land area. High cultural values are therefore assciated with this vegetation. This community is composed of grass species typical of VC17a, although they lack the prominent emergent shrub layer. A representative community is illustrated in **Photograph 96.**

Photograph 95. Remnants of the grassland community 17a (VC17a) are scattered amongst the broader mosaic of salt flat and mangrove communities on Boigu Island.



Photograph 96. The intricate pattern of irrigation channels carved into the alluvial landscape are diagnostic of VC17e. These are visible in the photo foreground.

Vegetation Community 11a: *Pandanus* sp. forms the dominant component of VC11a, a tall shrubland/low woodland community that is most extensive on Saibai Island, with minor occurrences also on Hammond and Moa Islands. *Pandanus* sp. forms the dominant component of the upper stratum which has a height range of 4m to 10m, and PFC generally between 10% and 40%. Associated canopy species include *Melaleuca cajuputi* subsp. *platyphylla, Dillenia alata* and *Livistona muelleri*, the latter often manifest as a canopy emergent. The secondary shrub layer is frequently dominated by *Melaleuca cajuputi* subsp. *platyphylla*, *Acacia leptocarpa* and low Pandanus shrubs. *Melaleuca acacioides* forms a component of the secondary shrub layer on Hammond Island. In the majority of communities sampled, the ground cover is dominated by *Ischaemum australe* although *Sarga* sp. is locally prominent on Hammond Island. The development of this unique ecosystem is undoubtedly linked to soil type, as well as an ongoing fire practice. Whilst the RE is largely confined to the Northern Islands of the Torres Strait associated with isolated Pleistocene alluvial remnants of the Papuan Fly Platform, scattered occurrences of the type on the Inner and Near Western Island Groups provides some indication that similar land use practice was being applied across the broader Torres Strait Island area. Detailed examination of soil profiles was not undertaken during the study, although some considerable differences in soil physical properties is expected between island groups where this

RE is supported, which provides some evidence that this community is shaped largely by land management practice. The community is widespread on the Morehead-Kiunga area of the PNG lowlands and is identified in the Bula and Mibini Land Systems (CSIRO 1971).

Photograph 97. Typical representation of *Pandanus* sp. shrubland/woodland (VC11a) on Saibai Island (Site SA021).

5.2.44 Regional Ecosystem 3.3.63

Description: Closed sedgeland dominated by *Eleocharis dulcis.* Occurs on seasonally flooded marine plains.
Status: Not of Concern
Vegetation Communities: 20a
Reference Sites: 12 Quaternary (Saibai, Zuna)

Vegetation Community 20a: VC20a is extensive only on Saibai Island, with minor areas mapped on the Inner Island Group (Zuna and Muralug Islands). The Saibai communities form an extensive system of broad shallow swamps attenuated well into the islands alluvial interior. These swamps possess a dense cover of *Eleocharis* sp. which was dry at the time of survey. A dramatic response to seasonal rainfall would be expected however, prompting vigorous new growth. These are generally brackish wetland communities, merging with mangrove swamps and salt pans on estuarine margins. In this regard, seasonal desiccation of these communities would be facilitated in part by salinity which increases dramatically as the soil dries, to be flushed during seasonal rainfall events. The community further manifests within a constructed wetland on Boigu Island and has a very restricted occurrence on Zuna. The latter is a circular swamp dominated by Eleocharis surrounded by shrubland of *Melaleuca saligna* (VC13g). Representation is provide in **Photograph 98.**

Photograph 98. An extensive sedge swamp with dominant *Eleocharis* sp. on Saibai Island. The wooded fringes are dominated by mangrove spp. and *Melaleuca cajuputi* subsp. *platyphylla.*

5.2.45 Regional Ecosystem 3.3.68 (New RE)

Description: Semi-deciduous notophyll vine forest and thicket on alluvial plains. Northern islands of the Torres Strait.*
Vegetation Communities: 2c, 14b
Reference Sites: 4 Secondary (Saibai SA40, SA43, SA80, BO8)

A new RE, under the classification of RE3.3.68, has been erected to accommodate two VC's which are restricted to the Northern Island Group. These communities, represented by vine forest classification 2c on Saibai Island and closed shrubland type 14b an Boigu Island, occupy a unique landform situation with no similar representation in either the broader island group or bio-region.

Vegetation Community 2c: Vegetation community 2c is confined to Saibai Island where it occupies hard clayey alluvium on the margins of brackish swamps, generally as discontinuous pockets in the structural range of semi-deciduous vine thicket to semi-deciduous vine forest. Representative areas are also located on sinuous slivers on alluvium in the eastern portion of the island, which form low rises above tidal salt pans. The canopy is typically broken and uneven, ranging in height from 5 to 18m. Dominant species are *Mimusops elengi, Terminalia subacroptera, Diospyros calycantha, Acacia auriculiformis, Manilkara kauki, Heritiera littoralis, Hibiscus tiliaceus, Excoecaria agollocha* and *Thespesia populneoides. Livistona benthamii* and *Ptychosperma elegans* are rare emergents and *Melaleuca cajuputi* subsp. *platyphylla* may also be locally prominent often on margins. Sub-canopy species are *Mimusops elengi, Drypetes deplanchei* and *Cupaniopsis anacardioides* with vines such as *Flagellaria indica* and *Opilia armentacea* common at Site SA80. It merges with transitional forest type VC23a, on brackish swamp margins, differentiated by the general prominence of mangrove species including *Excoecaria agallocha* and *Avicennia marina* in the transitional types. A representative photograph is provided in **Photograph 99**.

Photograph 99. Maximum development of VC2c on Saibai Island (Site SA80) with *Livistona benthamii* prominent in the sub-canopy. *Ptychosperma elegans* in background left.

Vegetation Community 14b: VC14b is restricted to Boigu Island where remnants are scattered across a large portion of the islands landscape. The community is represented as a tall open scrub to low open forest with an upper stratum dominated by *Acacia auriculiformis, Melaleuca cajuputi* subsp. *platyphylla* and *Terminalia subacroptera.* A range of vine thicket species including *Hibiscus tiliaceus, Mimusops elengi, Thespesia populneoides, Drypetes deplanchei* and *Excoecaria agallocha* generally form a sub-dominant component of the canopy. Prominent shrub species include *Capparis lucida, Gymnosporia inermis, Chionanthus ramiflora, Drypetes deplanchei, Ximenia americanus* and *Diospyros littoralis.* Thin wiry lianes such as *Flagellaria indica, Opilia armentacea, Derris trifoliata* and *Cynanchum carnosum* are abundant and may form part of the groundcover with *Acrostichum aureum.* The community occupies silty alluvial deposits that form low rises above a landscape otherwise dominated by salt pans and estuarine wetlands. These rises are rarely more that 0.5m above the maximum tidal levels, and from field observation, the community margins are rapidly retreating with succession by mangrove shrublands. A representative example is shown in **Photograph 100.** The rare species *Tristiropsis acutangula* (Sapindaceae) which occurs in the understorey as a sapling shrub is not previously known north of Cape York Peninsula (Lockerbie) (Herbrecs 2007) however occurs in Papua New Guinea (Conn *et al.* 2006).

Photograph 100. Low open forest type 14b on a low alluvial rise amongst broader estuarine wetland vegetation.

5.2.46 Regional Ecosystem 3.3.69 (New RE)

Preliminary Description: *Melaleuca dealbata* +/- *Corymbia clarksoniana* open forest on alluvial plains.
Status: Not of Concern (VMS status requires review)
Vegetation Communities: 7c, 4d
Reference Sites: 1 Secondary (MO49), 1 Quaternary

Vegetation Community 7c: Vegetation Community 7c is restricted to coastal areas north of St Paul's, Moa Island. The community is described as a tall open forest, with canopy heights ranging from 27 to 35m, composed of *Melaleuca dealbata* and *Corymbia clarksoniana* in relatively equal proportions. Sub-canopy comprises scattered trees to 18m including *Corymbia clarksoniana, Livistona muelleri* and *Acacia crassicarpa.* The community had been recently burnt at the time of survey and shrub layers and ground cover were sparse. *Imperata cylindrica* formed the dominant regenerating grass species. This community occupies a well-drained, thick sequence of alluvial outwash which has been heavily dissected by erosion gullies in some locations. The floristic composition of this community appears unique in a bio-regional context and a new RE code of RE 3.3.69 has been assigned following discussion with the Queensland Herbarium. This community has been heavily fragmented and a dominant proportion of the landform that it occupies has been cleared.

Vegetation Community 4d: Vegetation community 4d represents a minor component of the landscape adjacent to VC7c, differing structurally as a low open forest community dominated by *Welchiodendron longivalve* and *Melaleuca dealbata.* Limited floristic information was gathered in relation to this community. Although similar to VC7d, it has been highly fragmented by clearing and infrastructure development. Due to its restricted size and similar landform association, this VC has been included as a subtype of the proposed new RE3.3.69.

Photograph 101. Tall open forest of *Corymbia clarksoniana* and *Melaleuca dealbata* (VC7c) on Moa Island (Site MO48).

5.2.47 Regional Ecosystem 3.3.70 (New RE)

Description: *Lophostemon suaveolens +/- Melaleuca cajuputi* subsp. *platyphylla +/- Pandanus* sp. *+/- Livistona muelleri* woodland and open forest. Alluvial plains of northern Torres Strait Islands.
Status: Of Concern
Vegetation Communities: 8a, 7a
Reference Sites: 2 Secondary (Saibai SA20, SA61); 10 Quaternary

The RE classification 3.3.70 incorporates two distinctive vegetation communities most commonly associated with the alluvial remnants of the Fly Platform on Saibai Island, although with minor occurrences extending southwards onto Moa Island. These communities are composed of VC8a and VC7b.

Vegetation Community 8a/7b: Vegetation Community 8a is confined to Saibai Island where *Lophostemon suaveolens* forms an open forest community. It forms scattered groves throughout the more extensive *Ischaemum* spp. grasslands (see RE3.3.62) which occupy the broad gently domed alluvial plains in the islands interior. Canopy heights range from 10-18m and associated canopy species may include *Melaleuca cajuputi* subsp. *platyphylla*, *Livistona muelleri* and *Pandanus* sp. although all three of these species are more prominent in the sub-canopy and shrub layers together with *Acacia leptocarpa*. Ground cover is generally dominated by *Ischaemum australe*, *Imperata cylindrica* and *Vandasia retusa*. Upper trunks and branches support the epiphytes *Myrmecodia platytyrea* subsp. *antoinii*, *Hydnophytum mosleyanum* var. *moseleyanum*, *Dischidia nummularia* and *D. major*. *Melaleuca cajuputi* subsp. *platyphylla* occasionally separates from this community to form a discrete low open forest unit, particularly on swampier alluvial plain margins, unit classified as VC7a. In recognition of the association with the broader *Lophostemon suaveolens* open forest communities, VC7a has been classified as a component of RE3.3.70.

Photograph 102. Low open forest of *Lophostemon suaveolens.* Alluvial plains of Saibai Island.

5.2.48 Regional Ecosystem 3.5.5

Description: *Corymbia novoguinensis* or *C. nesophila* ± *C. tessellaris* woodland on northern Cape York Peninsula.
Status: Of Concern
Vegetation Communities: 5a
Reference Sites: 4 Quaternary (MO5, MO15, MO23, MO153).

Vegetation Community 5a: Regional Ecosystem 3.5.5, represented as VC5a in this mapping exercise, is restricted to Moa Island. Where surveyed, the community presents as an open forest with a canopy height range of 18m to 25m dominated by *Corymbia novoguinensis.* Associated canopy species typically include *Parinari nonda, Lophostemon suaveolens, Acacia crassicarpa* and *Melaleuca viridiflora* although these species are never dominant. The sub-canopy, which ranges from 10 to 15m is typified by *Parinari nonda, Lophostemon suaveolens, Livistona muelleri, Acacia crassicarpa, Welchiodendron longivalve, Melaleuca viridiflora* and *Syzygium suborbiculare.* Ground cover is typically grassy although species were not identified due to lack of fertile material. The open forest community occupies the sandy remnants of a former depositional surface. These remnants form low, flat or gently undulating rises above a surrounding erosional plain, although scattered examples are found in a number of locations on the island. The community is represented in **Photograph 103** overleaf.

5.2.49 Regional Ecosystem 3.5.8c

Description: *Eucalyptus tetrodonta* ± *Corymbia hylandii* subsp. *peninsularis* ± *C. stockeri* woodland on erosional plains and sandtone plateaus.
Status: Not of Concern
Vegetation Communities: 5q
Reference Sites: 2 Quaternary (FRQ9, WEQ9)

Minor areas of RE3.5.8c are represented on Wednesday and Friday Islands where the community is characteristed as a low woodland or low open woodland of *Corymbia stockerii* subsp. *peninsularis* (VC5q). *Melaleuca stenostachya* is the typical sub-canopy dominant, although occasionally forms the canopy in areas of low soil moisture and fertility where it is differentiated as VC13i (RE3.5.7). A number of intermediate structural phases between woodland and shrubland may exist, passing through open woodland community 5m, although this community is

not differentiated from the broader woodland/shrubland complex. This RE is associated with deeply weathered terraces and remnant alluvial features, typically in lower mid-slope locations. More detailed analysis of these associated landforms is provided in **Section 5.1.4.**

Photograph 103. Vegetation Community 5a at Site MO23.

Photograph 104. Typical representation of VC5q occurring on a deeply weathered alluvial feature (FRQ9).

5.2.50 Regional Ecosystem 3.5.15

Description: *Melaleuca viridiflora* ± *Acacia* spp. ± *Asteromyrtus symphyocarpa* low woodland on scattered coastal sand plains.
Status: Not of Concern
Vegetation Communities: 13d, 13c, 13a, 13f, 17i
Reference Sites: 1 Secondary (MO19), 12 Quaternary (Moa & Muralug)

Regional Ecosystem 3.5.15 exists as a mosaic of *Melaleuca viridiflora* dominant shrubland and low woodland VC's, largely restricted to Moa Island with small areas also mapped on Muralug. These VC's occupy residual sandy plains, formed on deeply weathered granite on Moa, and clays on Muralug, and their formation is largely a response to infertile soils and poor drainage.

Vegetation Community 13d: Vegetation Community 13d, represented as a newly erected sub-type RE3.5.15a, forms a somewhat better developed community with canopy heights to 8m and canopy cover typically ranging from 40% to 60%. *Melaleuca saligna* is the characterising upper stratum species, which is typically co-dominant with *Melaleuca viridiflora* and *Asteromyrtus symphyocarpa. Banksia dentata* forms an occasional shrub layer, in association with species otherwise typical of the canopy. An emergent layer dominated by *Corymbia* spp. (typically *Corymbia stockeri* subsp. *peninsularis* or *Corymbia nesophila*) is commonly formed. The type occupies sandy plain areas, with soils better drained than VC13c. Numerous granite corestones area apparent scattered across the surface where the community was sampled at MO21. Illustration of VC13d is provided in **Photograph 105.**

Vegetation Community 13c: The dominant community on Moa Island is VC13c, which forms a low sparse shrubland, with shrub cover with a general range from 10% to 20%, and heights of the upper stratum ranging from 3m to 6m. *Melaleuca viridiflora* and *Asteromyrtus symphyocarpa* form the dominant shrub species, with associated and occasionally co-dominant shrubs including *Asteromyrtus brassii* and *Banksia dentata. Melaleuca saligna* and *Leucopogon ruscifolius* are occasional shrub species. Ground cover is typically sparse and dominated by *Dapsilanthus spathaceus*. In comparison to VC13a on alluvium, where this community occurs on remnant surfaces, the *Melaleuca viridiflora* variety is typically a longer (pendulous) leaf variety. A representative photograph is provided in **Photograph 106.** The community is described under RE sub-type 3.3.15b

Vegetation Community 13f/13a: Vegetation Community 13f is recognised where *Melaleuca viridiflora* forms a canopy with sub-dominant to co-dominant *Corymbia* spp. This community forms a mosaic with *Melaleuca viridiflora* dominant woodland (VC13a) on remnant alluvial plains on Moa Island. Vegetation Community 13f is typically a tall shrubland to low woodland, with an upper stratum height ranging from 7 to 10m. Canopy cover varies although cover of > 40% is typical. The suite of *Corymbia* spp. that may be present include *Corymbia stockeri* subsp. *peninsularis, Corymbia nesophila* and *Corymbia clarksoniana. Parinari nonda* is locally abundant as a canopy and sub-canopy species and *Banksia dentata* and *Asteromyrtus symphyocarpa* often form a prominent sub-canopy layer. Ground cover is variable although as a general rule, with *Themeda triandra* dominant in areas of better soil drainage, giving way to sedges as drainage becomes increasingly impeded. The community often merges with VC5c which occupies a similar landscape position, although *Melaleuca viridiflora* represents a sub-canopy species in VC5c, only occasionally reaching canopy height (refer to **Photograph 107)**.

Photograph 105. Vegetation Community 13d on residual plain with outcropping granite corestone.

Photograph 106. Vegetation Community 13c on residual sand plain. Moa Island Site M019.

Photograph 107. Low woodland of *Melaleuca viridiflora* and *Corymbia clarksoniana* (VC13f) on remnant sand plain at site MO112.

Vegetation Community 17i: Vegetation Community 17i is a relatively extensive formation associated with residual sand plains on north-west side of Moa Island where it is represented as RE sub-type 3.3.15b, in recognition of its association with VC13c. The community was not sampled on the ground, being observed from helicopter, although some indication of its constituent species can be ascertained from Site MO149 where a swampland within the broader VC17i community was sampled and where *Dapsilanthus spathaceus* formed the dominant ground cover, typical of other open shrubland communities on the broader residual plain. Low emergent shrubs including *Melaleuca viridiflora, Pandanus* sp. and *Asteromyrtus brassii* to 1m are associated with the community. This community has been assigned to the new RE sub-unit of RE3.5.15b (based on Herbarium recommendations) in recognition of its distinctive floristic and structural characteristics, and its association with the broader mosaic of shrubland and low woodland communities comprising RE3.5.15.

Photograph 108. Mosaic of sedgeland and low open forest (VC17i, VC9a) communities on residual sand sheets in the north west of Moa Island.

5.2.51 Regional Ecosystem 3.5.17a

Description*: Melaleuca stenostachya +/_ Melaleuca viridiflora* on flat plains.
Status: Of Concern
Vegetation Communities: VC13i
Reference Sites: 2 Quaternary (MO025, MO028)

Vegetation Community 13i: Mapped areas of VC 13i on Land Zone 5 are restricted to Friday and Wednesday Islands where it is represented as a shrubland, or rarely as low woodland, with a canopy dominated by *Melaleuca stenostachya.* Associated canopy species include *Asteromyrtus symphyocarpa, Melaleuca viridiflora* with *Corymbia stockeri* subsp. *peninsularis* frequently forming an emergent tree layer, becoming dominant where it merges with VC5m. This community occupies deeply weathered alluvial deposits, generally on gully heads where older alluvial landforms are preserved as incised terraces. Derivation of these landform features is described briefly in **Section 5.1.5.**

Photograph 109. Tall shrubland of *Melaleuca stenostachya* with emergent *Corymbia* spp. on deeply weathered alluvial remnants.

5.2.52 Regional Ecosystem 3.5.19a

Description*: Asteromyrtus lysicephala, Choriceras tricorne* open heath on sand sheets.
Status: Not of Concern
Vegetation Communities: 14i
Reference Sites: 2 Quaternary (MO025, MO028)

Vegetation Community 14i: Vegetation Community 14i is the only component of RE3.5.19, represented as sub-type 3.5.19a. The community is floristically atypical and has been placed in this category for convenience in the absence of more suitable category. Residual sand rises on Moa Island host the only representation of VC14i identified in the study area. The community manifests as a shrubland and occasional low open forest with a general canopy height from 4m to 8m, and emergents to 10m. *Asteromyrtus brassii* is the dominant species in the upper stratum, accompanied by *Melaleuca saligna, Lophostemon suaveolens,* and *Acacia crassicarpa. Lophostemon suaveolens* forms the dominant emergent species. The lower shrub layer achieves up to 50% cover featuring *Leucopogon ruscifolius, Baeckea frutescens, Exocarpos latifolius, Melaleuca viridiflora, Alyxia spicata, Banksia dentata* and *Lomandra banksii* features in the groundcover. The floristic similarities to VC8b must be recognised, although VC14i represents a generally lower, shrubbier version on residual sand rather than recent fluvial deposits as in VC8b. The associated landform is severely leached humic sand which forms low rises above an erosional plain. As discussed in **Section 5.1.5,** the provenance of these low sand rises is uncertain, possibly representing old dunes or remnant fluvial deposits.

Photograph 110. Vegetation Community 14i on residual sand rise. Site MO25.

5.2.53 Regional Ecosystem 3.5.23x1

Description: *Eucalyptus tetrodonta* ± *Corymbia nesophila* ± *C. clarksoniana* woodland on undulating rises.
Status: Not of Concern
Vegetation Communities: 5k, 5j
Reference Sites: 4 Quaternary (Muralug)

Regional Ecosystem 3.5.23x1 is represented by two VC's, with occurrences restricted to Muralug Island.

Vegetation Community 5j: Vegetation Community 5j represents a tall open forest, with a canopy height range of 23 to 35m, dominated by *Eucalyptus tetrodonta* and *Corymbia nesophila.* The sub-canopy, which attains a height of 18m is dominated by *Corymbia stockeri* subsp. *peninsularis.* Typical species of the upper shrub layer include *Xylomelum scottianum, Acacia platycarpa, Persoonia falcata, Pandanus spiralis, Grevillea parallela* while the sparse lower shrub layer comprises *Alyxia spicata, Jacksonia thesioides, Parinari nonda, Acacia leptocarpa* and *Syzygium suborbiculare.* This community occupies low residual sand rises which are scattered across the coastal plain on Muralug Island with the community description coming from SitePWQ25. The community is illustrated in **Photograph 111**.

Vegetation Community 5k: Vegetation Community 5k occupies remnant alluvial terraces in scattered locations on Muralug. It is similar to VC5j, although the canopy is typically lower, and *Eucalyptus tetrodonta* is sparsely scattered or absent. The dominant canopy is composed of *Corymbia nesophila* and *Corymbia stockeri* subsp. *peninsularis* which generally form an open forest, and occasionally woodland in some locations and *Erythrophleum chlorostachys, Corymbia novoguinensis* and *Corymbia tessellaris* in some locations. *Parinari nonda* often forms a sub-canopy dominant with typical shrubs in a sparse understorey being layer *Neofabricia myrtifolia, Melaleuca viridiflora, Banksia dentata, Acacia simsii* and *Jacksonia thesioides.* Representation is provided in **Photograph 112.**

Photograph 111. Woodland VC5j on remnant alluvial terrace.

Photograph 112. Low sand rise on Muralug supporting *Eucalyptus tetrodonta* and *Corymbia nesophila* open forest, Site PWQ25.

5.2.54 Regional Ecosystem 3.5.29

Description: *Sorghum plumosum* var. *plumosum* ± *Themeda arguens* closed tussock grassland on erosional plains.
Status: Not of Concern
Vegetation Communities: 17d
Reference Sites: 1 Quaternary (MO86)

Vegetation Community 17d: Grassland community 17d represents the generic grassland type on a range of Land Zone associations. On LZ5, Moa Island provides for the only representation. The community (at MO86) is dominated by *Themeda triandra* and *Heteropogon triticeus* with a range of emergent shrubs, the most prominent being *Planchonia careya, Cycas badensis, Parinari nonda* and *Cochlospermum gillivraei.* The grassland is a fire climax community, with scattered vine forest remnants clumped on low granite mounds which protrude above the undulating sand plain, offering some protection from fire. It should be noted that this grassland community has been stable for long periods and its extent has changed little in the past 35 years, based on the 1974 photographs which were used to assist the mapping exercise.

Photograph 113. Grassland community 17d on undulating sandy plain, Site MO86, Moa Island.

5.2.55 Regional Ecosystem 3.5.32 (New RE)

Preliminary Description: *Asteromyrtus brassii* + *Syzygium angophoroides* + *Acmena hemilampra* subsp. *hemilampra* open forest. Residual sand rises and sheets.
Status: Not of Concern
Vegetation Communities: 9a
Reference Sites: 1 Secondary (MO29), 2 Quaternary.

Vegetation Community 9a: This community is expressed on Moa Island where it presents a number of discontinuous, broadly linear occurrences across a broad erosional plain. *Asteromyrtus brassii, Syzygium angophoroides, Acmena hemilampra* subsp. *hemilampra, Acacia crassicarpa* and *Melaleuca quinquenervia* form the dominant canopy constituents of an open forest community with a canopy height range of 15m to 20m. The sub-canopy and shrub layers tend to merge ranging in height from 2m to 10m comprising *Leucopogon ruscifolius, Exocarpos latifolius, Lithomyrtus obtusa, Livistona muelleri, Acacia crassicarpa, Polyscias australiana, Breynia oblongifolia, Baeckea frutescens, Alyxia spicata, Lophostemon suaveolens, Dillenia alata, Banksia dentata, Pandanus* sp., *Endiandra glauca,* and *Myrsine urceolata.* The ground cover is dominated by *Lomandra banksii.*

This community presents some difficulty for classification in a landform sense. The low sandy rises that it occupies are scattered across a broader erosional surface and their provenance is not clear. It is considered that these features may represent relict beach ridges, although their morphology has been degraded to a degree that confirmation of this is not possible. The low rises also support forest communities that are atypical of degraded dune systems examined in other locations, more typically occupied by stunted shrublands. That the vegetation community comprises species typically associated with swamplands is also puzzling when it is considered that the ridges are elevated above the surrounding erosional plain and provide reasonable drainage. Given that the surrounding landform is erosional presents the possibility that these features are the result of a topographic reversal and the forest communities represent former swamplands on a previous depositional surface. The species composition of the forest gives some support to this possibility. Without the ability to positively identify these features, they have been classified with the broader erosional plain as LZ5 features. A new RE is proposed to accommodate this community under the preliminary classification of RE3.5.4x6.

Photograph 114. Open forest dominated by *Asteromyrtus brassii* and *Syzygium angophoroides* (VC9a) at Site MO108.

5.2.56 Regional Ecosystem 3.7.1x1b

Description: Closed semi-deciduous mesophyll vine forest. Mainly occurs on loamy alluvia.
Status: Not of Concern
Vegetation Communities: 2e
Reference Sites: 2 Quaternary

Vegetation Community 2e: The lateritic profile that provides an elevated base for the Saibai Island township presents a significant puzzle in respect to pre-clearing vegetation association. With out any similar examples of lateritic profiles in the study area, let alone a fully vegetated one, the pre-clearing landscape can only be re-constructed from remnants associated with this landform. It should also be considered that with the considerable history of traditional occupation, the vegetated landscape has most likely undergone a number of transformations in an area that was central to pre-european occupation. The only remnant of native vegetation on the laterite plateau exists in the form of a scrubby vine thicket community, mapped as L2e, which has been reduced to two marginal slivers along the access road to the Saibai cemetery. These slivers comprise a low semi-deciduous vine thicket with canopy species represented by *Thespesia populneoides, Terminalia subacroptera, Cathormion umbellatum* subsp. *monoliforme, Dendrolobium umbellatum, Intsia bijuga, Hibiscus tiliaceus, Manilkara kauki, Milletia pinnata, Cordia subcordata* and *Lysiphyllum bipinnata.*

That this community is marginal to estuarine wetland communities is manifest in the prominence of a deciduous mangrove species (*Excoecaria agallocha)* in the canopy. The central areas of this landform were likely to have formed a much better developed thicket community than is represented in contemporary remnants, with a prominence of species including *Terminalia subacroptera* and *Acacia auriculiformis.* It is possible that clues to the original floristic composition of this landform may be present on the mainland PNG coastline, although no such communities are documented in available literature. Although highly degraded and extremely limited in size, the continuity with adjacent remnant estuarine landscapes affords this community remnant status. This community has been assigned to a preliminary RE classification based on Herbarium recommendations. Further review into the bio-regional occurrence of this RE is required.

Photograph 115. Remnants of vine thicket community 2e reduced to narrow slivers on roadside margins.

5.2.57 Regional Ecosystem 3.8.4b

Description: *Imperata cylindrica* ± *Mnesithea rottboellioides* closed tussock grassland on basalt vents & cones**.**
Status: Of Concern
Vegetation Communities: 17b, 17b(e)
Reference Sites: 3 Secondary (ER006, ER021, MU030), 13 Quaternary

Native grasslands form a considerable portion of the major basaltic islands, and these are represented as RE3.8.4b, in recognition of their geographic seperation from basaltic grasslands in the south of the bioregion. Some floristic variation from the type description is present in the surveyed communities.

Grasslands on Erub Island extend from the upper slopes to the coastal margins and form a broad complex with vine forest communities which are generally restricted to gully lines and sheltered locations. Two secondary sites were surveyed on Erub (ER06 and ER021), both of these located on basaltic coastal headlands and both were dominated by *Themeda triandra* achieving between 70-80% cover. Additional groundcover species are **Passiflora foetida, Anisomeles malabarica, Cissus maritima, Ipomoea pes-capre* subsp. *brasiliensis,* and *Jacquemontia paniculata.* Scattered low stunted shrubs of *Wrightia pubescens* subsp. *penicillata*, *Litsea glutinosa*, *Morinda citrifolia* and *Flueggea virosa* subsp. *melanthesoides* may occur with occasional emergents of *Barringtonia calyptrata* to 10m. Lantana is usually abundant on margins often within emerging shrublands dominated by *Macaranga tanarius.*

Away from the coastal headlands *Imperata cylindrica* was often the dominant species and the tendency for it to mosaic with *Themeda triandra* meant that differentiation based on species composition could not be completed with any degree of confidence. As such, VC17b describes a mosaic of grassland species which may include *Themeda triandra, Imperata cylindrica* and *Mnesithea rottboellioides*, restricted to basic volcanic rock types.

Photograph 116. Vegetation Community 17b with dominant *Themeda triandra* (Site ER021, Erub Island).

Secondary level survey was completed at sites considered from on ground examination to be in good condition, however data from a number of additional Quaternary sites indicate the general condition of the grassland on Erub to be extremely variable. Large areas, generally on the margins of vine forest communities are dominated by *Lantana camara* where they are mapped as VC17b(e), or have been invaded by a range of colonising native shrubs where they have been represented as VC17b(r). Typical regenerating species include *Micromelum minutum, Litsea glutinosa, Cupaniopsis anacardioides, Wrightia pubescens* subsp. *penicillata, Melicope peninsularis, Flagellaria indica, Jacquemontia paniculata,* Annonaceae (DGF8739+), *Abutilon* sp., Rubiaceae (DGF8741+), *Thespesia populneoides, Ficus opposita, Barringtonia racemosa, Atalaya sericopetala, Tabernaemontana orientalis, Morinda citrifolia, Clerodendron* sp. and *Garuga floribunda* var. *floribunda.* Exotics such as **Senna alata, *Calopogonium mucunoides, *Sida retusa, *Sida rhombifolia, *Macroptilium atropurpurea, *Clitoria ternata* and **Bambusa* spp. are frequent.

Considerable areas have also been subject to severe topsoil erosion which has thinned the ground cover and these areas are represented as VC17b(s). In all cases, these communities have been represented with remnant status. In the case of VC17b(e) and VC17b(s) remnant status has been recognised given that an applied land management practice (i.e. appropriate fire regimes) is capable of quickly re-establishing natural condition.

Native grassland communities on Mer Island were similar to those on Erub although they generally demonstrated considerably more species diversity. At Site MU030, groundcover composition was as follows; *Mnesithea rottboellioides* (40%), *Themeda triandra* (21%), *Imperata cylindrica* (19%), *Ipomoea pes-capre* subsp. *brasiliensis* (13%), *Premna dallachyana* (4%), *Anisomeles malabrica* (2%), *Desmodium* sp. (DGF8812+) (1%), *Wedelia biflora* (<1%), **Passiflora suberosa* (<1%), **Passiflora foetida* (<1%), **Calopogonium mucunoides* (<1%), and *Cyanthillium cinereum* (<1%). The emergence of low shrubs throughout the grassland such as *Premna serratifolia, Barringtonia calyptrata, Cordia dichotoma, Flueggea virosa* subsp. *melanthesoides, Clerodendron* sp., *Psychotria* sp., *Aristolochia acuminata* and *Ficus opposita* suggests that the landscape has not been fired for a number of years.

Photograph 117. Grassland community V17b on Mer Island with emergent shrubs prominent (MU030).

The literature suggests considerable conjecture about the provenance of grasslands on these islands. Draffan *et al.* (1983) in Freebody (2002), and Stocker (1978), refer to the use of fire in vine forest areas (with a closed canopy) on Erub and Mer Islands causing habitat alteration and a reduction of the total area of closed forest to fire climax grasslands. The results of this study however indicate that the grassland community on Mer occupies a cinder cone, which imposes unique edaphic conditions on vegetation communities in the form of extreme drainage. The considerable number of volcanic vents and basalt regolith on Australia's north-eastern region that naturally support grasslands in much wetter or similar climates (e.g. Seven Sisters near Yungaburra, Mount Fox and Clump Point in Queensland's wettest coastal location), offer evidence to suggest that the grasslands on these islands were not necessarily preceded by vine forest. The extremely fresh nature of many of the volcanic structures apparent on the Dauar Cone, and to lesser extent the Mer Cone, largely disproves any theory of rainforest succession to grassland. Historical annotations by Haddon (1901) provide clear evidence that the landscape dynamic has changed little in the period of European influence. An extract from Haddon quotes "*the cresentic valley, crater, or "big valley" Aupaut, being formed in a porous volcanic ash, is somewhat arid; the vegetation consists of coarse grass, low scrub and scattered coconut palms and presents a marked contrast to the remainder of the island; the steep slopes are unusually bare*" (Haddon 1901 Part 1, Chapter 3, pp30).

Similarly, the argument that Erub (and Mer) once supported a blanketing vine forest community that was cleared and burnt to produce the grassland mosaic that is apparent in today's landscape is questionable. Whilst there is no doubt that fire controls vine forest distribution to a considerable extent, ecotonal changes upslope along gully lines from tall vine forest (VC2k) to vine thicket (VC2w), to grassland (VC17b) observed during the study indicates the considerable role the natural environment plays in vine forest distribution. It is unlikely that the upper slopes of Erub ever supported luxuriant vine forest due to the relative dryness of the climate and the extreme soil drainage on these upper slope areas. It should thus be stated that whilst removal of fire as a land management tool may not have any marked effect long term effect on vine forest distribution, it will certainly result in considerable degredation of these restricted grassland communities through lantana invasion. Very hot late dry season fires burnt upslope are likely to cause a retreat of vine forest margins with subsequent invasion by lantana.

5.2.58 Regional Ecosystem 3.8.5 (New RE)

Description: Preliminary Description; Semi deciduous and Deciduous Notophyll Vine Forest. Basaltic Islands of the Torres Strait.
Status: Of Concern
Vegetation Communities: 2i, 2j, 2k, 2w, 15a, 21a, 22a
Reference Sites: 10 Secondary (ER02, MU11, MU01, ER44, ER20, ER12, ER11, ER34, MU09, ER45), 74 Quaternary.

RE 3.8.5 describes vine forests formed on basalt, typical of the Torres Strait Eastern Island Group including Mer, Erub, and Ugar Islands. A new RE classification (RE3.8.5) is provided in recognition of their unique structural and floristic characterics, distinct from basaltic vine forests typical of mainland areas. This is a variable grouping and the degree of floristic and structural variation warrants a range of RE sub-types to be described. Six sub-types are described under the classifications of VC2i, VC2j, VC2k, VC2w and VC15a. The Endangered shrub and small tree *Alectryon repandodentatus* is previously known from four Queensland Herbarium collections on Mer and also from semi deciduous mesophyll vine forest at Lockerbie, Cape York (Landsberg and Clarkson 2004). Survey records indicate that it is a very common species that is pervasive in both canopy and sub-canopy layers throughout this regional ecosystem, on both Mer and Erub. It also occurs in VC1a on Dauan Island. A highly disjunct population of *Chrysophyllum roxburgii* previously noted on the island by Freebody (2002) was vouchered during the survey. The species was not recorded elsewhere on the island. A disjunct population of *Canarium vitiense* was also recorded on Erub from this RE.

Vegetation Community 2i: The initial sub-type is represented by VC2i, classified as RE3.8.5a (based on Herbarium advice), which occurs on the steep basaltic escarpments on Erub Island. This community is a thicket, with canopy heights ranging from 6 to 10m, and emergents to 15m. The dominant canopy comprises (in order of decreasing dominance) *Berrya javanica*, *Cupaniopsis anacardioides*, *Diospyros hebecarpa*, *Aglaia elaeagnoidea*, *Melicope peninsularis*, *Bombax ceiba* var. *leiocarpum*, *Drypetes deplanchei*, *Mimusops elengi* and *Manilkara kauki*. The sole emergent species is typically *Bombax ceiba* var. *leiocarpum*. This is a restricted community limited to a number of steep sheltered gully lines and coastal escarpments where some protection from fire is afforded.

Photograph 118. Notophyll vine thicket type 2i on a steep basaltic escarpment at Site ER013.

Vegetation Community 2j: Vegetation Community 2j is the dominant vine forest type on both Mer and Erub Islands, and is also represented under the sub-unit of RE3.8.5a. The best representation is formed on gentle basalt slopes to the north east of the airport on Erub where the community mixes with VC2k. Well-preserved remnants of this community were difficult to find on Mer, although the best type example was located adjacent to the workers accommodation at Site MU01 where the canopy and internal forest structure was surprisingly well-preserved. In this location, a general canopy height range of 15m to 18m was typical with emergents reaching 28m. The canopy species comprised *Bombax ceiba* var. *leiocarpum, Diospyros hebecarpa, Alectryon repandodentatus* (E), *Adenanthera pavonina, Wrightia pubescens* subsp. *penicillata,* and *Antiaris toxicaria* var. *macrophylla. Bombax ceiba* var. *leiocarpum* always forms the emergent layer. On Erub Island, *Cupaniopsis anacardioides* forms a dominant to co-dominant canopy species with *Diospyros hebecarpa* (refer to Site ER12). It is therefore considered unusual that this species is not recorded as either a canopy or sub-canopy species on Mer. The typical canopy structure of this VC is highly broken, often with significant canopy gaps extending to near ground level. The uneven nature of this canopy can only be attributed to disturbance in some form, possible with extreme wind as a major contributing factor.

Vegetation Community 2k: Vegetation community 2k, represented by RE sub-unit 3.8.5b, was sampled to secondary level at Site ER011 and represents the maximum development of vine forest observed on the basaltic islands. This tall deciduous forest formation is restricted to Erub Island where it occupies sheltered pockets, generally within broader areas of VC2j. The canopy, which typically ranges from 25m to 38m, has an open feel due to the deciduous canopy although measured crown cover is typically > 80%. The dominant canopy species (in order of decreasing dominance) are *Gyrocarpus americanus, Cathormion umbellatum* subsp. *monoliforme, Garuga floribunda* var. *floribunda, Antiaris toxicaria* var. *macrophylla, Mimusops elengi, Wrightia laevis, Diospyros hebecarpa* and *Bombax ceiba* var. *leiocarpum.* The sub-canopy is relatively open (30 – 50%) with dominant species including *Diospyros hebecarpa, Celtis philippensis, Alectryon repandodentatus* (E) and *Manilkara kauki.*

Photograph 119. The best development of VC2j on Murray Island at Site MU01.

Photograph 120. Tall deciduous vine forest community 2k at site ER011 on Erub Island. The prominent tree is *Gyrocarpus americanus.*

Vegetation Community 2w: Deciduous vine thicket on basalt is characterised by VC2w, occurring on both Erub and Mer Islands. A separate sub-typing of RE3.8.5c is used to describe this distinctive community which is associated with exposed basaltic escarpments on Erub and Maer Islands. The community forms a canopy with a height range of 6m to 8m that is typified by species similar to VC2k described above. Besides an obvious difference in canopy height, the distinction between VC2k and VC2w is also an ecological one, with VC2w typically on drier sites such as steep exposed escarpments or as narrow attenuations upslope along gully lines within broader grassland communities. Canopy species include *Antiaris toxicaria* var. *macrophylla*, *Garuga floribunda* var. *floribunda*, *Gyrocarpus americanus*, *Terminalia subacroptera* and scattered *Bombax ceiba* var. *leiocarpum.* The sparse sub-canopy comprises *Cleistanthus peninsularis*, *Drypetes deplanchei*, *Eugenia reinwardtiana*, and *Alectryon repandodentatus* (E). Ground cover comprises abundant slender vines and low shrubs which form a sparse cover over a substrate typically composed of basalt talus.

Photograph 121. Vine thicket type 2w at site ER34 with the deciduous nature of the canopy clearly evident.

Vegetation Community 15a: Vegetation community 15a represents a complex of vine thicket and low open forest mapped on the steep south-eastern basaltic escarpment of Mer. The components, which comprise vine thicket type 2w and an undescribed low open forest of

Pandanus sp, contribute roughly equal portions to the complex which was left undifferentiated due to limitations with photographic scale and the steep slopes which made remote interpretation and accurate representation extremely difficult. The vine thicket component VC2w has been previously described although in this situation, *Pandanus* sp. may form a minor component of the canopy and the sub-canopy is typically dominated by evergreen species with *Manilkara kauki* particularly prominent. *Pandanus* sp. forms the canopy of the low open forest component, accompanied by occasional trees which include *Hibiscus tiliaceus,* and *Barringtonia calyptrata.* The relatively even canopy is occasionally interrupted by emergent trees such as *Bombax ceiba* var. *leiocarpum.* This is a community that has been shaped by extreme environmental conditions, clearly evident in the strongly windswept crowns of the vine thicket complex component, which occupies the more exposed positions on the escarpment. The vegetation complex is represented under the sub-type classification of RE 3.8.5e.

Photograph 122. Vine thicket component (VC2w) of the coastal headland complex type VC15a.

Photograph 123. Low open forest of *Pandanus sp*. which forms component of VC15a on Mer.

Vegetation Community 21a: Successional forests are recognised in sheltered positions on the western portion of Mer Island, occupying gully lines incised into the main cinder cone. This community forms a dense thicket to low closed forest, generally with canopy heights in the 6m to 12m range, with dominant upper stratum species including *Cerbera manghas, Macaranga*

tanarius, Hibiscus tiliaceus, Mangifera indica, Barringtonia calyptrata, Myristica insipida, Pouteria obovata, Alstonia spectabilis, Premna dallachyana with vines such as *Mucuna gigantea* and *Entada phaseoloides. Bombax ceiba* var. *leiocarpum* may be present as a sparse emergent in the more advanced successional stages. The development of these communities is controlled by both fire and edaphic conditions. It should also be noted that whilst the climax stage of this VC is possibly VC2j, the extreme drainage conditions imposed by the porous cinder substrate is likely to limit successional forest development and it is expected that even advanced successional stages are likely to be extremely depauperate both in stature and floristics. Cessation of regular burning will possibly facilitate the expansion of depauperate thickets at the expense of grasslands. The contemporary fire regimes of the island were not discussed in detail with the local community. Evidence from historical photographs (1988) indicates that these communities are in a state of relative stability. The timing and intensity of fires is an important land management issue requiring additional investigation in relevance to the management of invase weeds particularly Lantana. This community is represented as RE sub-type 3.8.5d.

Photograph 124. Early stage successional forest on Mer Island forming a low closed thicket with dominant *Macaranga tanarius*.

5.2.59 Regional Ecosystem 3.12.4

Description: Notophyll vine forest of *Welchiodendron longivalve* on Torres Strait Islands.
Status: Of Concern
Vegetation Communities: 4a, 4b, 4c, 1d, 17h (co)
Reference Sites: 3 Secondary (MO003, MA030, MA043)

Regional Ecosystem 3.12.4 is an endemic yet extensive community in the study area occurring on granite and rhyolite hillslopes and footslopes, reaching its northern limits on Gebar Island in the Central Island Group.

Vegetation Community 4a: Regional Ecosystem 3.12.4 is formed dominantly by VC4a, which is represented in the coverage as sub-type RE3.12.4a. This VC is an amalgam of two forest types that, due to frequency of variation and similarity in photographic signature, could not be differentiated with confidence on either aerial photography or satellite imagery. The canopy height of VC4a is highly variable, although generally ranging from 8 to 20m. The dominant floristic component is *Welchiodendron longivalve* although this species mixes to varying degrees with a range of vine forest species. On Moa and Muralug Islands, *Welchiodendron longivalve* closed forest and semi-deciduous vine forest communities form mosaics that separate into

distinctive structural components. On Mabuiag and Hammond Islands, Welchiodendron forms a canopy with evergreen species and this grouping has also been included in VC4a. A representative assemblage of canopy species in this VC includes *Welchiodendron longivalve* as a dominant to sub-dominant species with *Acacia polystachya, Endiandra glauca, Canarium australianum, Psydrax* sp. (DGF8884+), *Syzygium bungadinnia, Dysoxylum oppositifolium, Alphitonia excelsa, Sterculia quadrifida, Parinari nonda, Canarium australianum, Pouteria sericea, Gyrocarpus americanus, Drypetes deplanchei* and *Bombax ceiba* var. *leiocarpum.*

Vegetation Community 4b: Vegetation Community 4b forms a low woodland variant of this RE with typical examples on Gebar and Mabuiag with a well-developed grassy ground cover. Small areas on Moa Island where Welchiodendron mixes with *Melaleuca dealbata* on loamy granite slopes are represented as VC4c. The RE also forms a component of vegetation grassland complex 17h. Vegetation Community 17h represents a grassland complex behind St Paul's Village (Moa Island) where, through the process of repetitive burning, Welchiodendron dominant open forest has retreated into sheltered pockets along gully lines within a broader grassland community.

Photograph 125. *Welchiodendron longivalve* dominant closed forest on Mabuiag Island (MA003).

Photograph 126. Low *Welchiodendron longivalve* dominant woodland on acid volcanic footslopes (VC4b-Gebar Island).

Vegetation Community 1d: Vegetation Community 1d, represented in the mapping as sub-type RE13.12.4b, is a variation restricted to the Torres Strait Islands. The community occupies sheltered gully lines, most abundantly on Mabuiag Island, although scattered occurrences have been mapped on Gebar and Warral Islands. Only the Mabuiag Island forests have been adequately ground truthed and classification of this community on other islands is based largely on landscape position and photographic signatures. The canopy is relatively even, ranging from 18 to 25m, and canopy cover is greater than 80%.

Evergreen species dominate the canopy with a minor deciduous component present in some locations. Typical canopy species in order of decreasing dominance include *Endiandra glauca, Syzygium bungadinnia, Buchanania arborescens, Acacia polystachya, Dysoxylum oppositifolium, Canarium australianum, Pouteria sericea, Sterculia quadrifida, Schefflera actinophylla, Myristica insipida, Carallia brachiata, Clerodendron* sp., *Rhodomyrtus macrocarpa, Cryptocarya exfoliata, *Mangifera indica, Calophyllum sil, Elaeodendron melanocarpum, Terminalia subacroptera* and *Maranthes corymbosa.* The sub-canopy ranges in height from 10 to 15m and includes species otherwise typical of the canopy, plus several additional species including *Chionanthus ramiflora, Arytera bifoliolata, Cryptocarya exfoliata* and *Pouteria obovata.* Ground cover is typically sparse, with abundant rock talus and scattered epiphytes dominated by *Drynaria quercifolia.* The community merges upslope from gully walls into Welchiodendron and *Acacia polystachya* dominant open forest.

Photograph 127. The distinctive bark of *Syzygium bungadinnia* which is a prominent canopy component of VC1d.

5.2.60 Regional Ecosystem 3.12.8

Description: *Corymbia clarksoniana* ± *C. tessellaris* open forest on coastal ranges and lowlands.
Status: Not of Concern
Vegetation Communities: 5b, 5s, 5e
Reference Sites: 28 Quaternary

Regional Ecosystem 3.12.8 is represented by VC5b, VC5s and VC5e. Vegetation Community 5b forms the dominant woodland and open forest type on footslopes and colluvial slopes of Moa Island. Vegetation Community 5s on granitic landforms is relatively more restricted, occurring most abundantly on Hammond Island of the Inner Island Group.

Vegetation Community 5b: The typical structure of VC5b is woodland and occasional open forest with canopy heights ranging from 23 to 27m. *Corymbia clarksoniana* forms the dominant

canopy species in most locations, accompanied by a mixed range of *Corymbia* spp. including *Corymbia dallachyana, C. tessellaris, C. novoguinensis* and *C. nesophila.* Welchiodendron is locally abundant, although it is more commonly a sub-canopy tree, and *Melaleuca dealbata* reaches the canopy in some locations. Dense groves of *Cycas badensis* form a prominent shrub layer in some locations, particularly on colluvial slopes and ground cover is typically grassy with *Heteropogon triticeus* and *Themeda triandra* the dominant species.

Vegetation Community 5s: Vegetation Community 5s on granitic footslopes presents a more typical expression of RE3.12.8 than VC5b. The community forms woodland to open forest with canopy heights ranging from 23 to 27m. *Corymbia clarksoniana* dominates the canopy with *Corymbia tessellaris* forming a sub-dominant canopy component. Sub-canopy and shrub layers are typically sparse and ground cover is grassy with dominant *Themeda triandra.* Similar to its occurrence on alluvial soils, VC5s is associated with more fertile edaphic conditions, and occupies diorite footslopes where it occurs on Hammond Island.

Photograph 128. A typical expression of VC5b on granitic footslopes of Moa Island.

Photograph 129. Woodland community 5s on diorite footslope. Hammond Island Site HA18.

Vegetation Community 5e: Windswept south-east facing slopes of Thursday Island provide the only representation of VC5e in the study area. The community forms a low open forest, typically with a windswept even canopy structure with an average height of 15m. *Corymbia clarksoniana* forms the dominant canopy species, with *Corymbia nesophila* and *Eucalyptus leptophleba* sub-dominant. *Welchiodendron longivalve* occasionally reaches the canopy although it is more common as a sub-canopy tree. *Livistona muelleri, Acacia leptocarpa* and *Deplanchea tetraphylla* are associated canopy species although are they generally more common in the sub-canopy. The shrub layer is typically sparse comprising *Acacia simsii* and *Pogonolobus reticulatus* with ground cover dominated by sedges and tussock grasses

Photograph 130. Low open forest community 5e at Site TI08, Thursday Island.

5.2.61 Regional Ecosystem 3.12.9

Description: *Corymbia tessellaris, C. clarksoniana* open forest. Occurs on coastal ranges.
Status: Not of Concern
Vegetation Communities: 5g, 5o
Reference Sites: 13 Quaternary

Limited floristic or structural sampling was undertaken in this RE, which is represented by VC's 5g and 5o. The communities occur most commonly on the inner group with mapped examples on Hammond, Warral and Muralug Islands.

Vegetation Community 5g: Vegetation Community 5g (on granite lithologies) represents an open forest community with dominant *Corymbia tessellaris* often associated with *Welchiodendron longivalve* over a sparse sub-canopy of vine forest species. Vine forest species are generally dominated by *Acacia polystachya, Syzygium suborbiculare, Parinari nonda, Carallia brachiata* and deciduous vine forest species including *Canarium australianum.* Well-developed examples were observed on Warral Island where they dominated the footslope communities, merging upslope with *Acacia polystachya* and *Welchiodendron longivalve* dominant shrublands. Some good examples also occur on sheltered gully lines in the central portion of Muralug Island. *Eucalyptus cullenii* was associated with this community in a number of Muralug localities.

Photograph 131. Lighter coloured crowns of *Corymbia tessellaris* in VC5g forming a mosaic with vine forest community 2q on central portions of Muralug Island.

Vegetation Community 5o: Vegetation community 5o (on granitoid lithologies) represents a much simpler community, typically a grassy open woodland with a range of associated shrubland species including *Grevillea parallela*, *Pandanus* sp. and *Livistona muelleri.* This community has most likely been heavily influenced by a frequent burning regime. Vegetation community 5o was sampled to quaternary level at Hammond Island Site HA009.

Photograph 132. Grassy woodland community VC5o on Hammond Island with dominant *Corymbia tessellaris.*

5.2.62 Regional Ecosystem 3.12.11

Description: *Corymbia stockeri* subsp. *peninsularis* ± *Welchiodendron longivalve* woodland on Torres Strait Islands.
Status: Not of Concern
Vegetation Communities: 5l, 5v, 14w(co), 14u(co)
Reference Sites: 33 Quaternary

Regional Ecosystem 13.12.11 is the dominant ecosystem on acid volcanic and granitic ranges of the Inner Island Group. The RE is formed by VC5l, which also forms components of the vegetation complex 14g.

Vegetation Community 5l: Vegetation Community 5l is typically a woodland and occasionally open forest community with canopy heights generally ranging from 12m to 23m. The canopy is dominated by *Corymbia stockeri* subsp. *peninsularis* in the majority of occurrences although mixes with *Eucalyptus cullenii, Eucalyptus tetrodonta* and *Corymbia nesophila* occur on Muralug Island. *Welchiodendron longivalve* is a prominent sub-canopy and occasional canopy species. Shrub layers are typically sparse although *Acacia brassii, Acacia leptocarpa, Welchiodendron longivalve, Cochlospermum gillivraei* and *Grevillea parallela* are scattered throughout. Ground cover is formed by a mosaic of grasses and exposed acid volcanic rock with *Imperata cylindrica* and *Heteropogon triticeus* the dominant species. In complex type 14w, VC5l mosaics with shrublands of *Acacia brassii* and *Welchiodendron longivalve* although it has not been differentiated due to scale of complex variation. Minor areas of this RE are represented as VC5m on Horn Island where *Melaleuca stenostachya* forms a dense sub-canopy to *Corymbia stockeri* subsp. *peninsularis.*

Photograph 133. Woodland structure of VC5l on Muralug Island.

Vegetation Community 5v: This community is a relatively extensive VC restricted to granite hills and footslopes on Badu Island. *Corymbia stockerii subsp. peninsularis* forms the dominant canopy species with a height range of 20m to 28m. *Welchiodendron longivalve* is a co-dominant species, often separating into copses in sheltered location. Associated canopy species include *Acacia polystachya* and scattered *Corymbia tessellaris. Welchiodendron longivalve* forms the dominant sub-canopy species, mixing with *Acacia polystachya, Terminalia subacroptera* and *Psydrax banksii. Cycas badensis* is a dominant shrub species on the footslopes. The natural variability in both the structure and floristic composition of the community is imposed by the irregularity of the granite boulder slopes on which the community has developed. The community remains poorly sampled due to access restrictions imposed during the field survey. More comprehensive vegetation survey on Badu would greatly benefit the description of this VC.

Photograph 134. Vegetation community 5v on Badu Island.

5.2.63 Regional Ecosystem 3.12.13

Description: *Corymbia nesophila* ± *C. hylandii* subsp. *peninsularis* woodland on acid volcanic hills.
Status: Not of Concern
Vegetation Communities: 5r
Reference Sites: 5 Quaternary

Vegetation Community 5r: Vegetation Community 5r, which provides representation for RE3.12.13 occurs in a number of scattered occurrences on the Inner Island Group. Small areas are mapped on sheltered upper slope positions on Zuna, Thursday and Muralug Islands. Site location TI14 on Thursday Island presents a typical community with canopy heights of 21m to 27m in a woodland and occasional open forest form. The canopy is dominated by *Corymbia nesophila* and *C. stockeri* subsp. *peninsularis* with an open sub-canopy and a sparse shrub layer comprising *Grevillea parallela, Acacia leptocarpa* and *Pogonolobus reticulatus* and a grassy ground cover dominated by *Themeda triandra.* On Zuna the canopy is lower with a diverse shrub layer dominated by *Jacksonia thesioides,* associated *Acacia brassii, Livistona muelleri, Xylomelum scottianum, Melaleuca stenostachya,* and *Acacia simsii*.

Photograph 135. Woodland of *Corymbia nesophila* on upper slope on diorite. Thursday Island Site TQ14.

5.2.64 Regional Ecosystem 3.12.16

Description: *Melaleuca viridiflora, Asteromyrtus brassii* woodland. Associated with granitic hills.
Status: Not of Concern
Vegetation Communities: 14k, 13i, 14x, 14w (co)
Reference Sites: 2 Secondary (ZS14, PWS11), 2 Quaternary (PWQ10, HAQ17a)

Small areas of this RE are scattered throughout the inner island group, with minor areas also mapped on Moa Island and some extensive areas also represented on Muralug. The low shrubland (VC14k) blankets a broad topographic depression in the central portion of Zuna Island with VC13i much less extensive. The RE is typically manifest as a shrubland and rarely low woodland with *Melaleuca stenostachya* forming a prominent component of the canopy species. Structurally and floristic similarities are shared with coastal headland shrublands (refer to RE3.12.31x1a) although differentiation is based largely on ecological controls. Whilst extreme exposure is the limiting factor in development of shrublands on exposed coastal headlands, the development of RE3.12.16 is limited largely by soil infertility and moisture. Both VC14k and VC13i are assigned to RE sub-type 3.12.16c whilst VC14x, represents the RE sub-type 3.12.16d. Vegetation community 14x occupies an extensive portion the rocky central interior of Muralug Island as component of the complex VC14w.

Vegetation Community 14k: Vegetation community 14k is resticted to a broad topographic depression in the central portion of Zuna Island, occupying an area of skeletal soil formed on hard white acid volcanic rocks (rhyolite). The infertility of this substrate is the dominant control on shrubland development. *Melalueca stenostachya* forms the dominant component of the shrubland which has a general canopy height of 1.5 to 2m with sub-dominant to co-dominant species including *Melaleuca viridiflora, Asteromyrtus symphyocarpa, Asteromyrtus brassii* and *Jacksonia thesioides.* The canopy is relatively even although is frequently broken with areas of unvegetated acid volcanic rubble.

Photograph 136. Shrubland type 14k in a broad topographic depression on Zuna Island.

Vegetation Community 13i: Vegetation community 13i represents near pure stands of *Melaleuca stenostachya,* growing in shrubland or low woodland formation on acid volcanic rocks. The type is represented in only a few locations on Moa, Muralug and Hammond Islands with small areas forming on low rises in the acid volcanic basement, or on colluvial slopes where a thin thin blanket of poorly drained silty soils is retained. Typical of the occurrence of *M. stenostachya* in other communities, the species indicates extremely infertile edaphic condition.

Photograph 137. Low rise in acid volcanic basement at PWQ10 supporting *Melaleuca stenostachya* low woodland (VC13i).

Vegetation Community 14x: Vegetation community 14x (RE 3.12.16d) forms the dominant component of VC14w, the latter being an extensive shrubland, low woodland and pavement complex on Muralug Island. The community, which is not represented individually in the mapping exercise, forms a low open shrubland with shrub heights ranging from 1.5 to 3m, and scattered emergents to 8m. The shrub layer is dominated by *Melaleuca stenostachya, Corymbia stockeri* subsp. *peninsularis, Eucalyptus cullenii, Eucalyptus tetrodonta, Welchiodendron longivalve*, *Acacia* sp. (DGF9191+), and *Cochlospermum gillivraei*. *Eucalyptus cullenii* and *Corymbia stockeri* form the dominant emergent species. The ground cover is generally sparse interspersed with abundant bare rocky areas. Typical species are *Heteropogon triticeus, Carissa ovata, Melaleuca stenostachya, Heamodorum coccineum, Cheilanthes* sp., *Themeda triandra, Evolvulus alsinoides, Schoenus sparteus, Eriachne pallescens,* and *Alloteropsis semialata*.

Photograph 138. Low open shrubland VC14x (RE3.12.26a).

5.2.65 Regional Ecosystem 3.12.18

Description: *Eucalyptus leptophleba, Corymbia clarksoniana* woodland to open woodland on coastal hills.
Status: Not of Concern
Vegetation Communities: 5f
Reference Sites: 4 Quaternary.

Vegetation Community 5f: Vegetation Community 5f is restricted to Naghir Island, and provides the only representation of the RE in the study area. The community occupies well-drained granitic soils of the footslope and colluvial apron on the islands western side. *Eucalyptus leptophleba* forms the dominant canopy component of this open forest community which possesses a relatively even canopy at 20 to 25m height with *Acacia polystachya* an occasional associated species. The sub-canopy is relatively sparse featuring *Dodonaea polyandra* and *Pleomele angustifolia*, although the community hosts a well-developed shrub layer at 3m to 8m and 50% cover composed of *Dodonaea polyandra, Polyscias elegans, Micromelum minutum, Canarium australianum, Grewia oxyphylla, Psychotria poliostemma, Diospyros compacta* and *Dalbergia densa* var. *australis.* This community is highly disjunct, forming Australia's most northerly occurrence of *Eucalyptus leptophleba.* The only other recognised occurrence of the species in the Torres Strait Islands is confined to scattered populations located on Thursday Island. Macgillivray (1852, 11, p. 39) (in Haddon 1888) in his account of a visit to Torres Strait and Naghir makes reference to *E. leptophleba* as follows…. "*the small Eucalypti growing between the hill and the brushes is the most northern limit of that Australian genus known to me*".

Photograph 139. *Eucalyptus leptophleba* open forest on a granite colluvial Apron. Naghir Island Site NA05.

5.2.66 Regional Ecosystem 3.12.20

Description: Evergreen notophyll vine forest dominated by *Welchiodendron longivalve* on headlands.
Status: Of Concern
Vegetation Communities: 14c, 14d, 14h, 18c(co)
Reference Sites: 22 Quaternary

Regional Ecosystem 3.12.20 representing *Welchiodendron longivalve* dominant shrubland is formed by VC14c and VC14f. These shrubland communities occupy coastal escarpments

exposed to prevailing trade winds and this element of exposure, combined with skeletal soils, limitsd the development of these community to shrublands. Strong wind shearing of the canopy is generally apparent.

Vegetation Community 14c/14d: Vegetation Community 14c is the dominant expression of this community, with extensive occurrences on exposed hillslopes of most of the larger continental islands. The community is particularly abundant on the Inner Island Group where it extends from coastal escarpments well upslope to exposed ridge crests and peaks, mixing with *Acacia brassii* shrublands (VC14j) on Muralug Island. The general canopy height for this community is less than 8m in accordance with classification as a shrubland although communities with an upper stratum of less than 1m have also been included. *Welchiodendron longivalve* is the dominant species with associated *Acacia polystachya, Cochlospermum gillivraei, Melaleuca stenostachya, Alyxia spicata, Terminalia subacroptera, Psydrax reticulata* (V), *Diospyros reticulata, Drypetes deplanchei* and *Premna dallachyana.* Where deciduous thicket species, typically *Cochlospermum gillivraei* and *Terminalia* spp., dominate the canopy, the community is represented as VC14d. *Psydrax reticulata* is particularly prominent as a canopy or sub-canopy species.

Photograph 140. Windsheared shrublands of *Welchiodendron longivalve* forming a mosaic with rock pavement on exposed coastal escarpment of Naghir Island.

Vegetation Community 14h: This is an *Acacia polystachya* dominant variant of RE3.12.20, mapped largely on Warral Island although possibly more extensive than mapping currently indicates. The canopy comprises generally >50% cover of *Acacia polystachya* with co-dominant to sub-dominant *Welchiodendron longivalve* in a closed shrubland to low open forest formation. The sub-canopy features of this community were not sampled intensively during the survey. The community is a prominent component of the complex type VC18c.

Photograph 141. The brilliant green canopy features of *Acacia polystachya* in VC14f. Warral Island.

5.2.67 Regional Ecosystem 3.12.21a

Description: Deciduous vine thicket. Occurs on granite slopes mainly on the Great Dividing Range and offshore islands**.**
Status: Of Concern
Vegetation Communities: 2b, 2f, 2n, 2s, 2v, 2x
Reference Sites: 3 Secondary (DA01, DA32, DA47), 18 Quaternary

Regional Ecosystem 3.12.21 represents a diverse array of floristic and structural variations of semi-deciduous and deciduous vine thicket mapped individually in the Vegetation Community Classifications 2b, 2f, 2x, 2n, 2v and 2s. This RE also comprises components of the vegetacomplexes 18c and 14d. The features of the major VC's are discussed briefly below. All component VC's are described under the sub-unit RE 3.12.21a. Vegetation 2v, being an *Acacia polystachya* dominant variation, is poorly sampled and as such, is not included in the vegetation descriptions.

Vegetation Community 2b: This is a floristically uniform community on the granite boulder footslopes of Dauan Island. The community, which was nearly fully deciduous at the time of survey, forms a semi-deciduous notophyll vine thicket and occasional low closed forest. Dominant canopy species include *Canarium australianum, Cochlospermum gillivraei, Bombax ceiba* var. *leiocarpum, Cleistanthus peninsularis, Cupaniopsis anacardioides, Pouteria sericea, Ficus virens* var. *sublanceolata, Terminalia subacroptera, Elaeocarpus arnhemicus* and *Manilkara kauki.* The understorey is diverse comprising *Glycosmis trifoliata, Dimorphocalyx australiensis, Salacia disepala, Psydrax reticulata, Cyclophyllum maritimum, Cupaniopsis anacardioides, Memecylon pauciflorum, Cliestanthus peninsularis, Micromelum minutum, Ganophyllum falcatum, Cryptocarya exfoliata, Litsea glutinosa, Tabernaemontana orientalis, Eugenia reinwardtiana, Drypetes deplanchei, Diospyros reticulatus, Aidia racemosa, Capparis sepiaria, Ixora timorensis, Exocarpos latifolius, Cathormion umbellatum* subsp. *monoliforme, Celtis philippensis, Murraya ovatifoliolata, Cryptocarya exfoliata, Litsea glutinosa, Diospyros reticulatus, Chionanthus ramiflora, Pleomele angustifolia, Macaranga tanarius, Pouteria sericea,* and *Ficus obliqua* var. *obliqua.* Thin wiry vines are numerous such as *Gymnosporia inermis, Trophis scandens, Cissus* sp., *Flagellaria indica, Cansjera leptostachya, Hoya australe* subsp. *sanae* and *Jasminum elongata.*

Photograph 142. Vine Thicket Community 2b at Site DA01 (Dauan Island).

Vegetation Community 2f: Small areas of low deciduous vine thicket, typically with canopy heights ranging from 3m to 6m, are found on the steep exposed rocky headlands of Horn and Adolphus Island. The communities form a patchwork with sclerophyll shrubland communities, and are attenuated attenuated upslope along gully lines where some shelter from the elements is afforded. The dominant canopy is occupied by a range of species which include, in order of decreasing dominance; *Buchanania arborescens, Millettia pinnata, Sterculia* sp. (Annan River), *Terminalia subacroptera, Cochlospermum gilivraei* and *Pouteria sericea.* Sub-canopy and ground covers are poorly developed on account of the low stature and rocky substrate. Additional site survey would benefit the characterisation of this community.

Photograph 143. Low semi-deciduous notophyll vine thicket (VC2f) on exposed slopes of Horn Island (Site HI26).

Vegetation Community 2n: Vegetation Community 2n is the dominant structural variation on Iama Island where it occupies wind-exposed footslopes on granite. The community is typically lower than VC2b and has a much more even and wind sheared canopy structure. The community was sampled at Sites YA014, YA017, YA019, YA20, YA23 and YA25 where typical canopy species included in order of decreasing dominance *Canarium australianum, Antiaris toxicaria* var. *macrophylla, Gyrocarpus americanus, Terminalia subacroptera, Manilkara kauki, Acacia auriculiformis, Diospyros reticulata, Sterculia* sp. (Annan River) and *Premna dallachyana*.

The understorey is diverse featuring *Memecylon pauciflorum, Dimorphocalyx australiensis, Drypetes deplanchei, Eugenia reinwardtiana, Exocarpos latifolius, Micromelum minutum, Murraya ovatifoliolata, Glycosmis trifoliata, Turraea pubescens, Manilkara kauki, Litsea glutinosa, Cryptocarya exfoliata, Wrightia pubescens* subsp *penicillata, Diospyros hebecarpa, Chionanthus ramiflora, Cupaniopsis anacardioides, Ixora timorensis, Streblus brunonianus, Luvunga monophylla, Miliusa traceyi, Diospyros compacta, Alyxia spicata, Aidia racemosa, Micromelum minutum, Arytera bifoliolata,* and *Intsia bijuga.* Typical vines are *Capparis quiniflora, Derris trifoliata, Trophis scandens, Opilia armentacea, Flagellaria indica, Secamone elliptica,* and *Salacia disepala.*

Vegetation Community 2s: This vine thicket variant occupies windsheared upper slope positions on Dauan Island. Limited floristic information was gathered for this community due to its occurrence on a precipitous slope, which greatly limited the ability to sample safely. Thus the community description pertains largely to canopy features which were recorded though observation. The canopy is relatively even with strong wind shearing and typical height estimated at 8m. Dominant canopy species comprised *Ficus virens* var. *sublanceolata, Pouteria sericea, Shefflera actinophylla, Pouteria obovata, Garcinia warrenii, Syzygium puberulum, Ficus microcarpa, Acmenosperma claviflorum, Ficus destruens, Terminalia subacroptera, Myristica insipida, Canarium australianum, Arytera divaricata, Aglaia elaeagnoidea* and *Drypetes deplanchei.*

Photograph 144. Vegetation Community 2n on footslopes at Site YA019, Iama Island.

Photograph 145. Vegetation Community 2s demonstrating typically wind sheared canopy structure on steep south-east facing upper slopes of Dauan Island.

Vegetation Community 2x: A representation of a fully deciduous vine thicket community, with occurrence restricted to upper slopes on Mabuiag Island where it occupies acid volcanic talus, complexing with rock pavement shrubland (VC18c) and bare rock pavement. Where sampled on Mabuiag Island at Site MO047, the canopy comprised *Bombax ceiba* var. l*eiocarpum, Terminalia subacroptera, Cochlospermum gillivraei, Sterculia quadrifida, Cleistanthus peninsularis, Drypetes deplanchei* and *Melicope peninsularis* at a height of 8m. Sub-canopy species although sparse may include *Pouteria sericea, Garcinia warrenii, Syzygium puberulum, Acmenosperma claviflorum, Myristica insipida, Arytera divaricata, Aglaia elaeagnoidea,* and *Drypetes deplanchei.* Photographic illustration is provided in **Photograph 146.**

Photograph 146. Typical structure of VC2x at Site MO45, Mabuiag Island.

5.2.68 Regional Ecosystem 3.12.23

Description: *Acacia brassii* low open forest on acid volcanics on northern ranges and islands.
Status: Of Concern
Vegetation Communities: 14j, 14w (co), 18b (co), 6f
Reference Sites: 16 Quaternary

Acacia brassii dominant shrublands are prominent on the continental islands being particularly extensive on the rocky interior of Muralug Island and on Mabuiag Island. These communities are represented individually or as components of broader shrubland and rock pavement mosaics. The RE comprises a number of VC's which are discussed briefly below.

Vegetation Community 14j and Complex 14w: Vegetation Community 14j forms the dominant expression of this RE and is mapped on rocky acid volcanic ridgelines and hillslopes of the Inner Island Group, being particularly prominent on Muralug Island. Extensive areas are also represented on Mabuiag Island. The community represents a shrubland of typically 1.5 to 5m tall dominated by *Acacia brassii.* Associated species include a range of shrubs such as *Cochlospermum gillivraei, Melaleuca stenostachya* and *Welchiodendron longivalve* although in no circumstance do these shrubs dominate the upper stratum. *Melaleuca viridiflora* may be locally prominent on Mabuiag where the type merges with VC14a. This community forms extensive complexes with Eucalypt shrublands, Welchiodendron shrublands and deciduous shrublands on Muralug Island where it is mapped as a component of the shrubland complex type VC14w. The coomunity is also major component of the pavement complex type VC18b.

Vegetation Community 6f: The steep wind exposed peak of Mt. Adolphus hosts a windswept closed shrubland of *Acacia* sp. Due to difficulties with land access permission, this community could only be observed remotely from helicopter. As such, confirmation of the acacia to species level was not achievable. This community is placed into RE3.12.23 as a preliminary measure subject to on-ground floristic assessment. The shrubland forms a narrow fringe between rock pavement on the eastern facing escarpment of Mt. Adolphus and well-developed evergreen vine forest on the mountains leeward side.

Photograph 147. *Acacia brassii* dominant community 14j as a component of the shrubland complex 14w on Muralug Island (Site PoW 45).

Photograph 148. *Acacia brassii* dominant shrubland as type 14j on Mabuiag Island. The type separates into VC18b where the ratio of rock/shrubland is greater than 1:1

Photograph 149. *Acacia* sp. shrubland type 6f. Well-developed evergreen vine forest (VC1a) is clearly visible on the sheltered margins of this shrubland.

5.2.69 Regional Ecosystem 3.12.29

Description: *Heteropogon triticeus* ± *Sarga plumosum* closed tussock grassland on continental islands
Status: Of Concern
Vegetation Communities: 17c, 12a
Reference Sites: 18 Quaternary

Regional Ecosystem 3.12.29 is relatively extensive throughout the Torres Strait continental islands where it typically occupies exposed coastal headlands and footslopes on granite and acid volcanic rocks. The RE is represented by VC17c and VC12a, the latter being an atypical expression of the type.

Vegetation Community 17c: This classification provides a generic representation of grassland communities on acid volcanic and acid plutonic lithologies. The constituent grass species are variable dependant on soil type, exposure and derivation. Communities on Dauan are composed dominantly of *Cymbopogon refractus* and *Heteropogon triticeus* with a range of shrub species forming an emergent layer including *Pandanus* sp., *Psydrax* sp., *Cochlospermum gillivraei*, *Syzygium suborbiculare* and *Parinari nonda.* These communities are fire controlled, derived from repetitive burning of colluvial footslopes which has caused an upslope retreat of the vine forest margins. Associated soils are generally well-drained sand and gravel loams mixed with granite detritus.

In wind-exposed locations on skeletal soils, grasslands represent a climax community with species composition and structure influenced by prevailing climatic and edaphic conditions rather than human induced landscape changes. *Themeda triandra* forms the dominant species in such locations often interspersed with scattered shrubs and bare rock pavement. It should be noted that a range of RE sub-types are represented under this classification although no attempt has been made to separate these on a floristic or landscape process basis. Considerable field survey will be required to confidently differentiate and typify these variations.

Photograph 150. A typical expression of VC17c on Dauan Island where it occupies a regularly burnt granite boulder footslope.

Vegetation Community 12a: This community represents an atypical expression of RE3.12.29 forming grassy woodland of *Livistona muelleri* on the colluvial footslopes of Dauan Island. Similar to VC17c, repetitive burning of the footslopes has resulted in an upslope retreat of the vine forest margins, although in this community, the fire tolerance of *Livistona muelleri* has resulted in the retention of this species as vine forest margins have retreated. It should be noted that the palm forms a scattered emergent in a limited number of vine thicket communities examined on the island. This community has been classified under RE13.12.29 due to its extremely limited extent and similarity in community derivation to the more extensive VC17c.

Photograph 151. *Livistona muelleri* grassy woodland (VC12b) on granite colluvial footslopes of Dauan Island.

5.2.70 Regional Ecosystem 3.12.30

Description: *Imperata cylindrica* ± *Mnesithea rottboellioides* closed tussock grassland on steep slopes.
Status: Of Concern
Vegetation Communities: 17f, 17h (co)
Reference Sites: No reference sites

The extensive mosaic of grassland and low closed forest on steep granite hillslopes on Moa Island provides the only mapped representation of this RE in the exercise. More intensive field survey is likely to result in additional representation. Several areas mapped as RE13.12.29 may be more appropriately represented under this RE.

Vegetation Community 17f: The Moa Island example forms an extensive grassland complex dominated by *Imperata cylindrica.* Closed forest communities of Welchiodendron are restricted to fire protected gullies and boulder piles where they are represented as RE3.12.4, although due to scale limitations, these could not be adequately differentiated from the broader grassland system. The grassland/Welchiodendron open forest complex is represented as VC17h. The current representation of this RE is clearly influenced by repetitive firing of the slopes which has caused retreat of the once dominant closed forest communities in favour of Imperata dominant grassland. This community is in a state of relative stability with little change in areal extent indicated between 1974 aerial photography and recent satellite imagery.

Photograph 152. Grassland community 17h with a stark fire controlled boundary between grassland and open forest. The similarity to grassland communities on Dauan are notable, however Moa Island examples are dominated by *Imperata cylindrica*.

5.2.71 Regional Ecosystem 3.12.31x1a (New RE)

Preliminary Description: Shrubland on exposed coastal headlands of the Torres Strait Islands.
Status: Of Concern
Vegetation Communities: 14a, 14f, 14l, 14g
Reference Sites: 1 Secondary (MA02), 22 Quaternary Sites.

A new Regional Ecosystem is erected to represent shrubland communities formed on coastal headlands, whose development has been shaped by elements of extreme wind exposure and skeletal soil development. These communities are generally located on south-east facing headlands which are exposed to the prevailing south east trade winds. Scattered communities may also occur on exposed ridgelines away from the immediate coast.

Vegetation Community 14a: The dominant representation for this group is provided by VC14a which occurs on the majority of continental island groups including the Central group, the Near Western Group, and Muralug Island on the Inner Island Group. The community is represented as a shrubland to dwarf open shrubland with canopy heights ranging from 0.5m to 1.5m. Several examples with prostrate shrubs were also included in this classification. The dominant canopy comprises *Melaleuca viridiflora* and *Welchiodendron longivalve*, generally in equal proportion. *Asteromyrtus brassii* is present in some locations but is rarely prominent. *Lithomyrtus retusa* is

prominent as a secondary shrub layer, occasionally reaching the upper strata. Additional characteristic species are *Psydrax reticulata, Alyxia spicata, Acacia brassii, Jacksonia thesioides, Acacia leptocarpa, Acacia simsii, Cochlospermum gillivraei, Parinari nonda, Pogonolobus reticulatus, Asteromyrtus symphyocarpa, Exocarpos latifolius,* and *Melaleuca stenostachya.* Groundcover is dominated by stunted shrubs with a minor contribution to cover from *Dianella* sp., *Themeda triandra, Cassytha filiformis, Aristida* sp., *Schoenus* sp., *Thaumastochloa* sp., *Phyllanthus* sp., *Alloteropsis semialata* and the *Gompholobium pinnatum*. The community is restricted to rhyolite headlands on infertile skeletal soils.

Photograph 153. Vegetation Community 14a on Mabuiag Island Site MA2.

Photograph 154. Dwarf shrubland/grassland complexes with prostrate *Melaleuca viridiflora* shrubs have also been included in VC14a. Site MO69 on Moa Island.

Vegetation Community 14f: Vegetation Community 14f is represented only on the southern footslopes of Thursday Island. This is a slightly more developed community, forming a shrubland at 1.5 to 3m tall composed of a mixed range of species including *Melaleuca viridiflora, Welchiodendron longivalve, Cochlospermum gillivraei, Grevillea parallela* and *Melaleuca stenostachya. Corymbia* spp. may be present as emergents. The community grades upslope into woodland community 5e.

Photograph 155. Shrubland community 14f on Thursday Island.

Vegetation Community 14l: The inner islands of Zuna, Horn and Hammond host VC14l, which similar to VC14a, occupies steep coastal headlands directly exposed to prevailing south-easterly trade winds. The community is manifest as a low shrubland to shrubland, typically 1m to 1.5m tall with an upper shrub layer composed of, in order of decreasing dominance, *Melaleuca viridiflora, Acacia brassii, Lithomyrtus retusa, Welchiodendron longivalve, Jacksonia thesioides, Corymbia nesophila, Asteromyrtus symphyocarpa, Melaleuca stenostachya, Alyxia spicata, Acacia simsii, Halfordia kendack,* and *Psydrax reticulata*. This community is structurally similar to VC14a although a more diverse upper stratum warrants recognition as an individual community.

Photograph 156. Low windswept shrubland community 14l on exposed coastal escarpments of Zuna Island.

Vegetation Community 14g: The shrubland complex 14g is most prominent on exposed granite boulder footslopes on Dauan Island although a minor area has also been differentiated on Iama Island. The upper stratum of this community forms a dense shrubby thicket that is generally impenetrable, with a typical height of not greater than 1.5m. Species representative of the dominant upper stratum (S1 layer) include *Buchanania arborescens, Manilkara kauki, Alyxia spicata* and *Pouteria sericea.* On Iama, the unit includes coastal vine thicket species such as

Manilkara kauki, Terminalia subacroptera, Canarium australianum, Eugenia reinwardtiana, Sarcostemma viminale subsp. *brunonianus, Alyxia spicata,* and *Drypetes deplanchei.*

Emergents of *Pandanus* sp. to 8m are scattered throughout the complex. Similar to other communities within this grouping, the community has formed in response to extreme wind exposure and skeletal soils. This community is not florisitically typical of this proposed new RE, lacking *Melaleuca* spp. as a dominant component. It does however occupy a similar ecological niche to VC's 14a, 14f and 14l and, due to its extremely limited areal extent, has been placed within this grouping in the absence of a more suitable one.

Photograph 157. Windswept shrubland community 14g on exposed granite footslopes of Dauan Island. Site DA041.

5.2.72 Regional Ecosystem 3.12.33b

Description: Granite boulders covered with blue-green algae. Occurs on Black Mountain and Cape Melville.
Status: Of Concern
Vegetation Communities: 19a, 11a
Reference Sites: 4 Quaternary

Vegetation Community 19a: The most extensive occurrence of RE3.12.33 is mapped on Dauan Island where it occupies extensive areas of hillslope, generally in a mid-slope position. Smaller areas are mapped on Hammond and Muralug Islands. The community is best described as an open granite boulder field with scattered vine forest shrubs, low trees and occasional vine thicket. Woody cover is typically less than 5% comprising *Canarium australianum, Ficus microcarpa, Cochlospermum gillivraei* and *Tetrameles nudiflora.* Sprawling mats and low towers of the vine *Aristolochia acuminata* are locally prominent and ground cover of *Drynaria quercifolia, Asplenium* sp. and *Sarcostemma viminale* subsp. *brunonianus* are occasionally present in sheltered pockets. This community represents a significant geographical departure from mainland Cape York Peninsula examples at Black Mountain and Cape Melville. Small areas of Pandanus woodland are also recognised within this RE and are discussed below.

Vegetation Community 11a: Pandanus dominant woodland on granite headlands are scattered throughout a large number of the larger continental islands. In the majority of examples, these communities have been too small to represent individually and thus consumed within a broader vegetation complex. The communities on Dauan, represented as VC11a (on granite) are sufficiently developed to allow classification as an individual VC. The extremely limited spatial

extent of this community greatly restricts the ability to classify it appropriately within the RE framework as as such, it has been place within the broader RE3.12.33b grouping in recognition of its similarity in landform and edaphic condition.

Photograph 158. A typical granite boulder field on Dauan Island providing representation of RE13.12.33b.

Photograph 159. Pandanus woodlands (Type 11a) on granite headlands of Dauan Island.

5.2.73 Regional Ecosystem 3.12.34c

Preliminary Description: Rock pavements associated with hillslopes and footslopes of the Torres Strait Islands.*
Status: Of Concern
Vegetation Communities: 18a, 18b (co), 18c (co), 18d, 14w (co), RR, RG
Reference Sites: 13 Quaternary

This RE classification provides for representation of a range of rock pavements and rock pavement shrublands that have a considerable extent on a number of continental islands. Whilst RE3.12.34 presents a suitable classification in a structural sense, the type description is geographically confined to the Melville Range and Black Mountain cannot be applied to the

Torres Strait situation without modification of the original type description, or description as an RE sub-type. As such, this community has been described under RE sub-type 3.12.34c as advised by the Queensland Herbarium. Vegetation community 18a forms a homogenous polygon of RE3.12.4c, whilst VC18b, VC18c and 14w are mapped as complexes of a number of different RE's. Small areas of rock, devoid of vegetation and mapped under units RR and RG, are also included in this classification.

Vegetation Community 18a: Vegetation community 18a is widespread on the rockier continental islands, being particularly prominent on Mabuiag, Hawkesbury and Muralug where it occurs on areas of skeletal soil. The community comprises a complex of bare rock interspersed with shrubland, the latter typically occupying cracks and crevices where sufficient moisture and nutrient (from skeletal soil formation) is provided to allow shrubland development. The shrubland component typical comprises deciduous vine thicket species ranging in height from 1.5 to 6m, with an average cover (including bare pavement areas) typically less than 5%. Dominant species include *Cochlospermum gillivraei, Canarium australianum, Terminalia* sp., *Psydrax banksii, Psydrax reticulata, Dalbergia densa* var. *australis, Secamone elliptica, Acacia polystachya, Carissa ovata, Acacia polystachya, Ziziphus oenopolia, Capparis arborea* and occasional *Welchiodendron longivalve.* Bare pavements are scattered throughout the broader shrubland mosaic.

Vegetation community 18a is a prominent component of a number of vegetation complexes including VC18b where it mosaics with VC14j (RE3,12,23); VC18c where it mosaics with VC14h (RE3.12.20), and; VC14w where it complexes with a range of woodland and shrubland types including VC5l (RE3.12.11), VC14c (RE3.12.20) and VC14w (3.12.16d).

Photograph 160. A mosaic of deciduous shrubland and granite boulders forming a represention of VC18a on Warral Island.

Vegetation Complex 18b/18c: Shrubland /rock pavement complex type 18b is particularly prominent on the rocky acid volcanic slopes of Mabuiag Island. This complex comprises a mosaic of *Acacia brassii* low shrubland (VC14j/RE3.12.23) and deciduous shrubland/ bare rock pavement complex (VC18a/RE3.12.34c). The *Acacia brassii* shrubland component of this complex, forms a low windswept closed shrubland typically 0.5 to 1.5 m tall with prostrate examples in the most exposed locations. The type has been more thoroughly described in relation to RE3.12.23 (see **Section 5.2.68**) whilst the deciduous shrubland component is typical of VC18a described above. Vegetation community 18c is largely confined to Warral Island in the Near Western Island group where VC18a mosaics with low open forest and shrubland dominated by *Acacia polystachya* and *Welchiodendron longivalve* (VC14h/RE3.12.20).

Photograph 161. Bare pavements with scattered *Cochlospermum gillivraei* forming a mosaic with *Acacia brassii* shrubland in VC18b (Mabuiag Island) providing representation for RE13.12.34c.

Vegetation Community 18d: Shrubland /rock pavement complex type 18d is mapped on the rocky granite knolls of Badu Island, forming extensive pavements and rock piles on the islands interior. Due to access constraints, this community was sparsely sampled and as such, the description provided here may not represent the communities full range of floristic and structural variations. Further sampling of this pavement type is warranted should future access to the island for the purpose of vegetation survey be granted. The community characteristically occupies rocky knolls with scattered shrubs utilising fractures, crevices and overhangs for nutrient and shelter. *Corymbia stockerii* subsp. *peninsularis* is the dominant shrub species reaching heights of 6m. Associated shrub species include *Acacia polystachya, Psydrax banksii,* and *Welchiodendron longivalve.* A secondary shrub layer forms at a height of 0.5m to 1.5m, dominated by *Alyxia spicata, Ficus* sp. and *Dodonoea polyandra.* The total combined canopy cover of the two shrub layers is typically < 5%, with bare rock exposure forming >90% of the total ground cover.

Photograph 162. Rock pavement type 18d.

5.2.74 Regional Ecosystem 3.12.35 (New RE)

Preliminary Description: Semi-deciduous mesophyll/notophyll vine forest on granite slopes of the Torres Strait Sub-region.
Status: Of Concern
Vegetation Communities: 2d, 2h, 2o, 2q, 2r, 2t, 6a, 6e

Reference Sites: 8 Secondary (YAO4, YA05, MO003, PW085, PW093, HA05, YA18, YA21)

To provide an adequate ecological grouping for the deciduous and semi deciduous vine forest communities in the Torres Strait, it is necessary to erect an additional RE to accommodate a diverse array of vine forest types that characterise the steep granitic and acid volcanic slopes of many of the continental islands. These forests extend from the Northern Island Group, being particularly abundant on Dauan, through the central group on Iama and Gebar, the Near Western Group and the Inner Island Group. Vine forest communities often vary subtly between islands and as such, minor floristic or structural variations can be represented with relative confidence due to the ecological isolation imposed by island boundaries. The constituent vegetation communities of newly described RE3.12.35 are described below.

Vegetation Community 2d: VC 2d is mapped on the steep, boulder strewn mid to upper slopes of Dauan Island, demonstrating a marked structural contrast to the thickets of the lower slopes. Canopy heights in this community range from 18 to 25m and constituent species are both deciduous and semi-deciduous consistent with its structural classification as a semi-deciduous vine forest. Dominant canopy species include *Tetrameles nudiflora, Alstonia spectabilis, Ganophyllum falcatum, Bombax ceiba* var. *leiocarpum, Canarium australianum, Ficus virens* var. *sublanceolata, Ficus microcarpa* and **Mangifera indica.* Sub-canopy species were not sampled in detail although *Gossia floribunda* was abundant in some locations, and hemi-epiphytes including *Asplenium nidus, Drynaria quercifolia* and *Microsorum punctatum* are prominent. The community is notable for the diversity of epiphytic plants including *Dendrobium litorale*, *Bulbophyllum* spp., and *Dischidia littoralis*, listed as Vulnerable (NCA, 1992), which was particularly abundant. With reference to Herbrecs data and Stanton and Fell (2005), the occurrence of *Tetrameles nudiflora* represents a considerable extension of geographical range north from Schram Creek, although Hyland *et al*. (2003) record it from northern Torres Strait. Its presence on Dauan on steep granitic boulder slopes is considered unusual, as it is more commonly associated with seasonally flooded lowland alluvial terraces e.g. Claudie River (RE3.3.1). This species also occurs throughout lowland PNG (Conn *et al.* 2006+).

Photograph 163. In foreground, the deciduous crowns of *Tetrameles nudiflora* in flower are clearly visible in the canopy of VC2d.

Vegetation Community 2h: This community is mapped on rocky granite and rhyolite footslopes of Iama Island where it presents as a deciduous vine forest. The typical canopy is irregular, ranging in height from 12 to 25m, with a cover generally greater than 80%. The majority of crowns were fully deciduous at the time of survey resulting in a forest with an 'open' feel and a number of sub-canopy species were also deciduous. Dominant canopy species include *Erythrina insularis, Antiaris toxicaria* var. *macrophylla, Terminalia subacroptera, Canarium australianum, Bombax ceiba* var. *leiocarpum, Acacia auriculiformis,* and *Manilkara kauki.* The sub-canopy which ranges in height from 8 to 15m is relatively open comprising *Diospyros reticulatus, Manilkara kauki, Exocarpos latifolius, Capparis quiniflora, Diospyros compacta* and *Celtis philippensis.* The shrub layer is typically sparse and comprises species including *Murraya ovatifoliolata, Glycosmis trifoliata, Jasminum elongata, Trophis scandens, Eugenia reinwardtiana, Grewia oxyphylla, Diospyros reticulata, Manilkara kauki, Flagellaria indica, Drypetes deplanchei, Exocarpos latifolius, Pleomele angustifolia, Opilia armentacea, Jacquemontia paniculata, Memecylon pauciflorum, Cupaniopsis flagelliformis* var. *flagelliformis, Aglaia elaeagnoidea, Salacia disepala, Diospyros compacta, Triflorensia australis, Litsea glutinosa, Archidendron grandiflorum, Stephania japonica, Cissus maritima, Macaranga tanarius, Micromelum minutum* and **Passiflora foetida.* The community has been assigned the sub-type grouping of RE3.12.35a following Herbarium recommendations.

Photograph 164. Deciduous vine thicket type 2h at Site YA05, Iama Island.

Vegetation Community 2o: Rocky granitic knolls on Moa Island present habitat for VC2o, which in context of the Torres Strait Islands, is a well-developed semi-deciduous to semi-evergreen vine forest type. The community is represented unde the sub-type classification of RE3.12.35c, based on herbarium recommendations. This is a tall community with a canopy height range of 23 to 35m and a typically diverse floristic assemblage which includes (in order of decreasing dominance) *Maranthes corymbosa, Buchanania arborescens, Cryptocarya* sp. (DGF8917+), *Acacia auriculiformis, Syzygium forte* subsp. *forte, Barringtonia calyptrata, Gmelina dalrympleana, Polyscias elegans, Bombax ceiba* var. *leiocarpum, Sterculia quadrifida, Endiandra glauca, Carallia brachiata, Commersonia bartramia, Mimusops elengi, Canarium australianum, Myristica insipida, Beilschmiedia obtusifolia,* and **Mangifera indica* on the community margins.

The sub-canopy comprises species typical of the canopy with additional species including *Endiandra glauca, Polyscias elegans, Cleistanthus peninsularis, Garcinia warrenii, Cryptocarya hypospodia, Rhodomyrtus macrocarpa, Polyalthia australis, Ptychosperma elegans* and *Myristica insipida.* Shrub layers are evergreen and relatively well-developed with species including *Pleomele angustifolia, Drypetes deplanchei, Cliestanthus peninsularis, Flagellaria*

indica, Salacia disepala., Morinda citrifolia, Smilax calophylla, Ganophyllum falcatum, Cryptocarya hypospodia, Alstonia actinophylla, Chionanthus ramiflora, Diospyros sp. (Mt White P.I. Forster PIF 14415), *Melicope peninsularis, Micromelum minutum, Cryptocarya exfoliata, Opilia armentacea, Cupaniopsis anacardioides, Macaranga tanarius, Premna dallachyana, Dischidia ovata, Litsea breviumbellata* and *Cyclophyllum brevipes.* The Rare listed species *Archidendron hirsutum* was a prominent component of the shrub layer.

Photograph 165. Sub-canopy structure of VC2o on Moa Island (Site MO003).

Vegetation Community 2q: The best development of the RE3.12.35 is provided by VC2q, restricted to Muralug Island with notable communities found in the Port Lihou area on the southern coastal flats. In this location, the community occupies a number of rocky diorite knolls which protrude above a broad alluvial plain. The canopy is dominated by deciduous species with a height range of 25 to 40m. Typical canopy species include *Berrya javanica, Bombax ceiba* var. *leiocarpum, Albizia lebbeck, Antiaris toxicaria* var. *macrophylla, Canarium australianum, Maranthes corymbosa, Terminalia complanata, Garuga floribunda* var. *floribunda, Cordia myxa, Buchanania arborescens, Beilschmiedia obtusifolia, Ficus virens* var. *sublanceolata, Aidia racemosa, Indigator fordii, Myristica insipida, Aidia racemosa* and *Lagerstroemia archeriana.* The shrub layer is relatively open which highlights the impressive stature of this forest. The luxuriant development of this community in this location is undoubtedly assisted by the inherent fertility of the diorite, which has weathered to feed a black soil plain that forms a broad apron around the rocky landforms. The record of *Indigator fordii* represents a highly disjunct occurrence of an extremely rare species known previously from only four to six trees on the southern slopes of the McIlwraith Range (see Halford 2002). Cheek (2007) recommends a conservation status of Critically Endangered under IUCN criteria by virtue of its vulnerability to stochastic change because it occurs at a single location with a population of fewer than 50 individuals. The community is represented under the sub-type of RE3.12.35d based on Herbarium recommendations.

Vegetation community 2r: The community is restricted to Hammond Island where it occupies boulder slopes formed on diorite, and is classified under the sub-type of RE3.12.35e. The canopy is typically broken, ranging in height from 10m to 28m, with ridgeline and some disturbed lower slope communities verging on vine thickets. The floristic feature which distinguishes VC2r from other communities in this group is the prominence of *Alstonia actinophylla* as a canopy species, although the full range of species may include *Paraserianthes toona, Vitex acuminata, Canarium australianum, Buchanania arborescens, Sterculia quadrifida, Acacia polystachya, Maniltoa lenticellata* var. *lenticellata, Cleistanthus peninsularis, Cryptocarya cunninghamii, Maranthes corymbosa, Calophyllum sil, Endiandra impressicosta, Zanthoxylum rhetsa* and *Endiandra glauca.* Where the community has been subject to disturbance, such as on wind exposed

ridgelines, *Acacia polystachya* may form a low closed canopy, and these variations have mapped as **VC6e**, although incorporated into the broader RE classification. Vegetation community 6e is represented under the sub-type of RE3.12.35f with VC6a, which is discussed below. The community is illustrated in **Photograph 167.**

Photograph 166. A well-developed example of VC2q on Muralug Island. Diorite talus is clearly visible on the ground surface.

Photograph 167. The footslope margins of VC2r on Hammond Island with emergent *Alstonia actinophylla* visible in the background.

Vegetation Community 2t: Vegetation community 2t is a rather poorly constrained type due to limited floristic sampling across its mapped range which is extensive throughout the Inner Island Group including portions of the Inner Western Group and Mt. Adolphus Island. It is likely that further floristic sampling within this VC would result in a number of additional types being recognised. At present, VC2t represents the default vine forest community for the Inner Island Group, comprising vine forest communities classified largely through informal observation that cannot be classified adequately through lack of floristic data. The community has been assigned the sub-type grouping of RE3.12.35a following Herbarium recommendations. The description of this VC is based largely on descriptions from Naghir Island (NAQ02), although in the majority of mapped areas, it is expected that the dominant species which include *Bombax ceiba* var. *leiocarpum, Canarium australianum* and *Terminalia subacroptera* remain relatively constant. The community on Naghir forms a closed forest community with canopy range of 20m to 25m tall comprising in order of decreasing abundance *Bombax ceiba* var. *leiocarpum, Terminalia*

subacroptera., Acacia polystachya, Erythrina variegata., Buchanania arborescens, Canarium australianum, Sterculia quadrifida, Manilkara kauki, Gyrocarpus americanus, Antiaris toxicaria var. *macrophylla, Ficus virens* and *Ganophyllum falcatum.* The sub-canopy forms a height of 12 to 18m. composed of *Buchanania arborescens, Chionanthus ramiflora, Drypetes deplanchei, Atalaya sericopetala, Diospyros maritima, Celtis philippensis* with a typical shrub layer formed by *Chionanthus ramiflora, Drypetes deplanchei, Memecylon pauciflorum, Cupaniopsis anacardioides, Atalaya sericopetala, Capparis sepiaria, Diospyros* sp. (DGF9121+), *Diospyros maritima, Micromelum minutum, Celtis philippensis, Cryptocarya exfoliata, Diospyros compacta, Exocarpos latifolius, Salacia disepala, Elaeodendron melanocarpum, Pleomele angustifolia, Murraya ovatifoliolata, Ganophyllum falcatum, Cliestanthus peninsularis, Phyllanthus novae-hollandiae, Wrightia pubescens* subsp. *penicillata* and *Miliusa brahei.*

Photograph 168. Typical sub-canopy structure of VC2t on Naghir Island (Site NAQ02).

<u>Vegetation Community 6a:</u> Vegetation Community 6a, represented in **Photograph 169**, is restricted largely to Iama Island, with a minor occurrence also mapped on Gebar to the immediate north-west. In conjunction with the previously mentioned **VC6e**, the community is classified under the sub-type of RE3.12.35f. The canopy of this community presents a height range from 12 to 23m, typically broken and dominated by *Acacia auriculiformis* with scattered deciduous vine forest species including *Canarium australianum, Terminalia subacroptera, Bombax ceiba* var. *leiocarpum,* and *Diospyros hebecarpa.* The sub-canopy is relatively open, comprising vine forest species including *Cupaniopsis anacardioides, Terminalia subacroptera, Diospyros hebecarpa, Micromelum minutum,* and *Wrightia pubescens* subsp *penicillata.* Sub dominant and associated species include *Bombax ceiba* var. *leiocarpum, Canarium australianum, Cryptocarya exfoliata, Antiaris toxicaria* var. *macrophylla, Acacia auriculiformis, Aidia racemosa, Opilia armentacea, *Mangifera indica, Psydrax* sp. and *Manilkara kauki.*

The understorey is diverse with *Salacia chinensis, Micromelum minutum, Wrightia pubescens* subsp. *penicillata, Pleomele angustifolia, Cupaniopsis anacardioides, Diospyros compacta, Cryptocarya exfoliata, Litsea glutinosa, Memecylon pauciflorum, Exocarpos latifolius, Secamone elliptica, Terminalia subacroptera, Diospyros maritima, Tabernaemontana orientalis, Litsea glutinosa, Opilia armentacea, Psydrax* sp., *Breynia cernua, Ixora timorensis, Trophis scandens, Luvunga monophylla, Arytera bifoliolata, Jasminum* sp., *Turraea pubescens, Flagellaria indica, Streblus brunonianus, Drypetes deplanchei, Garcinia warrenii, Diospyros hebecarpa, Diospyros reticulata, Chionanthus ramiflora, Archidendron grandiflorum, Murraya ovatifoliolata, Macaranga tanarius, Drypetes deplanchei, Phaleria octandra, Capparis quiniflora, Antidesma parvifolium, Eugenia reinwardtiana,* and *Dalbergia densa* var. *australis.*

It is envisaged, as is the general case with most Acacia dominant forests, that this community has developed in response to disturbance. The nature of this disturbance is unknown, although the forest community would be expected to burn in hot conditions, with evidence from old charred stumps that it is occasionally burnt, largely in a wildfire regime. It is understood that gardens occurred on hillsides of the interior and that people would cut down the trees in a garden area, then burn them and move on the following year (Kepa/Hitchcock pers. com 2008). Further evidence is offered by Haddon (1901, pp 25) who recounts the observations by Jukes (1847 pp. 155-7**)** where**:** "*On Turtle-backed Island we found a few small groves of cocoa-nut trees near a group of huts, with a little thicket of bamboo; and near the centre of the island, following a little path through a matted wood, rendered impervious by creepers, we came [on]. . .a little circular plot of ground, not more than four or five yards in diameter; but it had evidently been dug, though in a crude manner, and in it were set several young plantain-trees, one or two other plants, and two trailing plants…which we afterwards found were a kind of yam*".

It is therefore likely that a combination of both human disturbance, wind and fire played a role in the development of this forest type. That this community is found only on Iama Island presents another puzzle. The nearby continental islands of Mabuiag and Gebar are dominated by Welchiodendron forests, although not a single individual of this plant was found on Iama. It is clear that despite a close proximity, forests on Iama has developed independently from forest types on neighbouring islands.

The high biodiversity values that this ecosystem attracts on the basis of its uniqueness in the sub-regional, regional and national contexts, is further strengthened by its provision of habitat for *Luvunga monophylla* (Rutaceae). The occurrence on Iama Island is a new record for Queensland extending geographical range eastwards from the eastern Arnhem coast of the Northern Territory. This multi-stemmed shrub of the understorey occurs in coastal vine thickets of the East Kimberley, Northern Territory and also from the Philippines with records from Timor (Hyland *et al.* 1995). Luvunga is of tribe Citreae (Rutaceae: subfam. Aurantioideae) and the the sole Australian representative of the Citrus subtribe 'Triphasiinae' (Mabberley 1998). It was first collected in the Sir Edward Pellew Group, Gulf of Carpentaria, in December 1802 by Robert Brown during Flinders Investigator circumnavigation of Australia with additional collections gathered a few months later in Timor by J.B.L.C.T. Leschenault de la Tour on Baudin's voyage (Mabberley 1998). Luvunga is relatively common in its habitat on Iama among rocky boulder slopes and hillcrests. The species is of 'least concern' according to NT legislation.

Photograph 169. The internal forest structure of VC6a (RE3.12.35f) on Iama Island (YA18).

5.2.75 Regional Ecosystem 3.12.36 (New RE)

Preliminary Description: Evergreen to complex evergreen mesophyll to notophyll vine forest and thicket on mountain ranges of Torres Strait Islands.
Status: Of Concern
Vegetation Communities: 1a, 1e, 1f, 1b, 1g, 1h
Reference Sites: 3 Secondary (DA20, MO82, MO150)

A new RE has been erected to accommodate evergreen vine forest and thicket communities of the Torres Strait Islands. Representation of vine forests is provided by VC1a, VC1e and VC1f, being thes most luxuriant development of vine forest in the island group and are assigned to the sub-type RE3.12.36a. A number of evergreen vine thicket communities are also described under this classification, recognised under the sub-type RE3.12.6b. On Cape York Peninsula, evergreen forest on granitic upper slopes is recognised on Mt Cook and south into the ranges of the northern Wet Tropics Bioregion, on upland areas of the Melville Range, and on the granitic uplands of the McIlwraith Range. The communities recognised in the study area display significant floristic differences to the previously described Cape York RE's and warrant individual recognition. These communities are mapped on a number of the more mountainous islands including Moa, Dauan, and Mt. Adolphus.

Vegetation Community 1a: Vegetation Community 1a is mapped on the steep upper boulder slopes of Mt Cornwallis on Dauan Island where it forms an evergreen notophyll vine forest. The canopy is relatively low at 15 to 25m height and is windswept in exposed locations. Dominant canopy species include *Ganophyllum falcatum, Arytera divaricata, Mangifera indica, Ficus microcarpa, Alstonia spectabilis, Celtis paniculata, Syzygium puberulum, Calophyllum sil, Buchanania arborescens, Dysoxylum oppositifolium, Acmenospermum claviflorum, Schefflera actinophylla, Endiandra impressicosta, Cryptocarya cunninghamii* and *Ficus destruens.* Amongst the sub-canopy species, *Garcinia warrenii, Endiandra impressicosta, Garcinia dulcis, Cupaniopsis anacardioides, Aglaia elaeagnoidea* and *Ficus virens* var. *sublanceolata* were frequent. The shrub layer and ground cover was relatively complex with associated species including *Pleomele angustifolia, Capparis lucida, Haplosticanthus fruticosus, Zanthoxylum rhetsa, Macaranga tanarius, Litsea glutinosa, Leea indica, Memecylon pauciflorum, Archidendron grandiflorum, Ptychosperma macarthurii, Trophis scandens, Chionanthus ramiflora, Glycosmis trifoliata, Alectryon repandodentatus* (E), and *Smilax australis.* Epiphytes, climbing epiphytes and ferns are particularly abundant in response to the permanently moist upland environment with ferns such as *Nephrolepis biserrata, Drynaria qeurcifolia, Drynaria sparsisora* and *Pyrrosia longifolia.* Epiphyic orchids are a feature together with abundant *Hoya* and *Dischidia* species.

The RE provides the only known 'Australian' habitat of *Dischidia littoralis* (Vulnerable NCA) (Forster and Liddle 1993) which was recollected on the survey (and also from Mabuiag Island). The record of *Alectryon repandodentatus* (Endangered NCA, Vulnerable IUCN) in the shrub layer is significant, being an extension of range and habitat for a species otherwise previously known in Australian territory only from the basaltic eastern islands and Lockerbie (Cape York) although it is widespread in PNG (see Conn *et al.* 2006+). The prominence of *Mangifera indica* (Mango) in the upper stratum of this forest also requires mention, as the species appears to be long established and naturalised. Information from traditional owners on Dauan Island suggests that the species was established as a potential food source for when under attack, the population retreated to the mountain tops.

Photograph 170. Evergreen notophyll vine forest near the summit of Mt Cornwallis. The boulder covered in epiphytes is typical.

Vegetation Community 1e: Vegetation Community 1e which was sampled at Site MO82 occurs on the footslopes of Banks Peak (Moa Island), occupying often steep sheltered slopes with southern aspect and formed on coarse biotite granite. Weathering of the granite has produced a well-drained and relatively fertile sandy loam soil which has favoured development of a well-developed mesophyll vine forest. The canopy has a height range of 23 to 35m with the dominant species being *Myristica insipida, Dysoxylum latifolium, Cryptocarya cunninghamii, Sterculia shillinglawii* subsp. *shillinglawii* and *Calophyllum sil.* Canopy sub dominants include *Maranthes corymbosa, Semecarpus australiensis, Aglaia tomentosa, Mimusops elengi, Buchanania arborescens, Aidia racemosa* and *Endiandra glauca*. Sub-canopy species are typified by *Endiandra glauca, Cryptocarya cunninghamii, Sterculia shillinglawii* subsp. *shillinglawii, Carallia brachiata, Cryptocarya hypospodia, Arenga australasica* (V), *Calophyllum sil, Psydrax* sp. *(*DGF8955+), *Epipremum pinnatum,* and *Entada rheedii*.

Photograph 171. *Arenga australasica* is prominent in the sub canopy and shrub layers in VC1e (Site MO083).

Shrub layers are relatively well-developed and diverse with a complex array of species which include *Arenga australasica* (V), *Ptychosperma macarthurii, Hydriastele wendlandiana, Flagellaria indica, Cryptocarya cunninghamii, Psydrax* sp. (DGF8955+), *Sterculia shillinglawii* subsp. *shillinglawii* (R), *Aglaia tomentosa, Calophyllum sil, Endiandra glauca, Cryptocarya hypospodia, Arytera divaricata, Dysoxylum latifolium, Smilax calophylla, Archidendron hirsutum*

(R), *Wilkiea rigidifolia, Archidendron grandiflorum, Mallotus philippensis, Glycosmis trifoliata, Barringtonia calyptrata, Macaranga involucrata* var. *mallotoides, Polyscias macgillivraei, Atractocarpus sessilis, Salacia disepala, Chionanthus ramiflora, Micromelum minutum, Cryptocarya hypospodia, Arytera divaricata, Arytera bifoliolata, Phaleria octandra, Mischocarpus lachnocarpus, Polyalthia australis,* and *Pleomele angustifolia.*

The prominence of *Arenga australasica,* listed as Vulnerable under both EPBC (1999) and the NCA (1992) is a noteworthy feature of this forest, along with additional rare and threatened species listed in the type description and a number of species at the limit of geographical range in Australian territory.

Vegetation Community 1f: The upper slopes of Banks Peak on Moa Island, at an elevation of 399m, host a tall well-developed notophyll vine forest which presents a complex array of structural features. This community, represented as VC1f, presents the best-developed example of vine forest in the study area and is described as a complex notophyll vine forest. Canopy heights in this community vary depending on exposure although canopies observed on sheltered leeward slopes attain heights of greater than 30m. The sub-dominant stratum form a number of poorly differentiated layers which tend to merge in places, and it is these layers that present the greatest life form complexity. Typical canopy species include *Calophyllum sil, Argyrodendron polyandrum, Cryptocarya cunninghamii, Syzygium branderhorstii, Syzygium buettnerianum, Archidendron hirsutum* (Rare), *Anthocarapa nitidula, Pouteria obovata, Acmenospermum claviflorum, Canarium vitiense, Gomphandra australiana, Pouteria* sp. (DGF9168+), *Syzygium forte* subsp. *forte, Maranthes corymbosa, Palaquium galatoxylon, Ficus microcarpa, Horsfieldia australiana, Licuala ramsayi* and *Maniltoa lenticellata* var. *lenticellata.*

The sub-canopy layer which ranges in height from 12 to 18m is dominated by *Licuala ramsayi* with associated species including *Cryptocarya cunninghamii, Psydrax* sp. *(*DGF8955+), *Ptychosperma elegans, Pandanus zea, Pouteria obovata, Canarium vitiense, Buchanania arborescens, Aglaia sapindina, Epipremnum pinnatum, Pouteria* sp. (DGF9168+), *Maranthes corymbosa, Podocarpus grayae, Meiogyne* sp. (DGF9718+), *Pimeleodendron amboinicum* (R) and *Maniltoa lenticellata* var. *lenticellata.* Shrub layers, typically 1.5 to 10m are typified by *Meiogyne* sp. (9718+), *Pimeleodendron amboinicum, Cryptocarya cunninghamii, Licuala ramsayi, Codiaeum variegatum var. moluccanum, Atractocarpus sessilis, Acmenosperma claviflorum, Pandanus zea, Piper caninum, Polyscias australiana, Psydrax* sp. (DGF9154+), *Flagellaria indica, Pouteria obovata, Diospyros sp.* (DGF9160+), *Aglaia sapindina, Gomphandra australiana, Myristica insipida, Polyscias macgillivraei, Chionanthus ramiflora, Salacia chinensis* and *Maniltoa lenticellata* var. *lenticellata.*

Photograph 172. Aerial view of VC1f on Banks Peak showing. *Licuala ramsayi* visible in canopy.

This habitat is unique in the national and regional context. The micro-climatic and edaphic conditions provide a permanently moist 'upland' habitat exhibiting important floristic evidence of biological connectivity with mesothermal uplands of the south and neighbouring PNG. Although further research and analysis is warranted utilising the survey data set, preliminary evidence reveals populations of a number of mesic taxa known previously north to the Lockerbie forests and/or Muralug. These include but are not limited to *Acmenosperma claviflorum, Aglaia sapindina, Aglaia tomentosa, Argyrodendron polyandrum, Atractocarpus sessilis, Pimeleodendron amboinicum, Cryptocarya cunninghamii, Licuala ramsayi, Canarium vitiense, Codiaeum variegatum* var. *moluccana, Endiandra impressicosta, Epipremum amplissimum, Gomphandra australiana, Maniltoa lenticellata* var. *lenticellata, Neolitsea brassii, Palaquium galactoxylon, Pandanus zea, Podocarpus grayae, Polyscias australiana, Sterculia shillinglawii* subsp. *shillinglawii, Syzygium bamagense, Syzygium puberulum,* and *Terminalia complanata.*

Colections of *Pouteria* sp. (DGF9168+DJS) one of the dominant canopy rainforest trees on Banks Peak, and *Meiogyne* sp. (Moa Is. DGF9718+DJS), are currently unplaced in the Queensland Flora and await Herbarium determination. The occurrence of Podocarpus represents the occurrence of a relictual Godwanan taxon and its northern extent of distribution.

Photograph 173. The complex sub-canopy structure of VC1f on Banks Peak (MO150) showing *Licuala ramsayi* and the stilt roots of a Pandanus species thought to be *Pandanus zea.*

Vegetation Community 1b: This community is represented as a windsheared evergreen vine thicket and occasional forest formed on exposed granite boulder footslopes of Dauan Island. The canopy height is variable depending on position in relation to rock boulders. Taller communities typically form in sheltered crevasses where the canopy may reach 12m. In exposed locations, the canopy may be significantly lower. Dominant canopy species include *Manilkara kauki, Intsia bijuga, Pouteria sericea, Garcinia warrenii, Aglaia elaeagnoidea, Chionanthus ramiflora, Diospyros reticulatus, Drypetes deplanchei, Ptychosperma macarthurii, Buchanania arborescens, Pandanus* sp., *Ficus microcarpa,* and *Pouteria obovoidea.* A shrub layer ranging in height from 0.5m to 3m is the dominant sub-canopy stratum. Typical species of this shrub layer include *Trophis scandens, Alyxia spicata, Cleistanthus peninsularis, Tabernaemontana orientalis, Glycosmis trifoliata, Cupaniopsis anacardioides, Aglaia elaeagnoidea, Flagellaria indica* and *Smilax australis.*

Photograph 174. The typical internal structure of VC1b on Dauan Island (DA04).

Vegetation Community 1g: Vegetation Community 1b represents a windsheared evergreen notophyll vine thicket that is restricted to exposed, elevated and steep escarpments on Moa Island. The type description is obtained from Site MA151 on Banks Peak where sheltered leeward slopes host the much better developed VC1f. The typical canopy is even at 6m to 8m height with representative species comprising *Podocarpus grayae, Anthocarapa nitidula, Diospyros hebecarpa, Syzygium bungadinnia, Dillenia alata, Licuala ramsayi, Ptychosperma elegans, Calophyllum sil, Pandanus zea, Cryptocarya cunninghamii, Buchanania arborescens, Rhodomyrtus macrocarpa, Psydrax* sp. (DGF9154+), *Pouteria obovata, Antiaris toxicaria* var. *macrophylla, Schefflera actinophylla, Canarium vitiense, Acacia auricauliformis* and *Polyscias elegans*. As with the majority of the windsheared thicket types, the sub-canopy is sparse although a range of species including *Atractocarpus sessilis, Codiaeum variegatum, Aglaia sapindina, Wilkiea rigidifolia, Neolitsea brassii, Sterculia quadrifida, Mischocarpus lachnocarpus, Litsea breviumbellata, Hydnophytum mosleyanum* var. *moselyanum, Helicia australasica, Syzygium buettnerianum* (R), and *Sterculia* sp. (Annan River) were recorded in the sub-canopy and shrub layers.

Vegetation Community 1h: An extremely restricted notophyll thicket community that is confined to the steep upper slopes of Mabuiag Island. The community is structurally similar to VC1g although floristic composition varies significantly. The dominant canopy, which ranges from 6m to 8m comprises *Buchanania arborescens, Drypetes deplanchei, Elaeodendron melanocarpum, Endiandra glauca, Elaeocarpus arnhemicus, Chionanthus ramiflora, Dysoxylum oppositifolium, Cliestanthus peninsularis, Rhodomyrtus macrocarpa, Canarium australianum, Ganophyllum falcatum, Calophyllum sil, *Mangifera indica* and *Arytera divaricata*. The sub-

canopy forms a poorly defined stratum ranging in height from 1.5m to 6m and is composed of *Haplosticanthus fruticosus, Rhodomyrtus macrocarpa, Pleomele angustifolia, Diospyros hebecarpa, Streblus brunonianus, Arytera bifoliolata, Cyclophyllum maritimum, Flagellaria indica, Psychotria* sp., *Diospyros* sp. (Bamaga B.P.Hyland 2517), *Ganophyllum falcatum, Phaleria octandra, Arytera divaricata, Salacia disepala, Cryptocarya exfoliata, Elaeodendron melanocarpum, Dendrobium discolor* and *Secamone elliptica. Drynaria quercifolia* forms the dominant ground cover.

Vegetation Community 1h represents a much drier thicket type that VC1g and this is reflected in the species composition. The limited height development of this community, and possibly its species composition is also influenced by the mobile acid volcanic talus slope, which it occupies.

Photograph 175. The internal structure of windsheared notophyll vine thicket type 1g. Site MA151.

Photograph 176. The steep windward slope of Banks Peak demonstrating the evergreen and windsheared structure of VC1g.

Photograph 177. Evergreen notophyll thicket VC1h on Mabuiag Island. Site MA48.

5.2.76 Regional Ecosystem 3.12.37 (New RE)

Preliminary Description: *Eucalyptus platyphylla +/- Corymbia stockerii +/- Corymbia clarksoniana* woodland to open woodland on coastal hills.
Status (Preliminary): Not of Concern
Vegetation Communities: 5t, 5u
Reference Sites: 8 Quaternary.

A new RE has been erected to incorporate *Eucalyptus platyphylla* dominant communities that are manifest on coastal headlands and footslopes of the Inner Island Group. The RE comprises VC5t and VC5u, restricted to Horn and Muralug Islands respectively.

Vegetation Community 5t: This community is mapped exclusively on Horn Island, where it represents a relatively extensive woodland and open forest community on the islands eastern side. The canopy of this community ranges from 18 to 27m and comprises (in order of decreasing abundance) *Eucalyptus platyphylla, Corymbia stockeri* subsp. *peninsularis, Corymbia nesophila* and *Welchiodendron longivalve.* The community often demonstrates a relatively well-developed shrub layer composed of *Welchiodendron longivalve* and *Acacia* spp. Limited floristic sampling was undertaken in this community and further structural survey would aid its description.

Photograph 178. Vegetation Community 5t on the eastern side of Horn Island.

Vegetation Community 5u: Similar to VC5t, community 5u was subject to limited structural sampling, with community description ascertained largely from quaternary observation. The structural characteristics were however relatively distinctive, forming localised areas of open to sparse woodland, mostly restricted to acid volcanic coastal headlands on Muralug Island. Canopy heights are estimated at 18m to 25m with canopy cover generally less than 25%. The dominant canopy species is *Eucalyptus platyphylla* with scattered *Corymbia tessellaris* and associated but uncommon *Eucalytpus cullenii.* The shrub layer is sparse, generally comprising *Cochlospermum gillivraei* and *Acacia* spp. with ground cover formed by *Themeda triandra* interspersed with rock pavement and talus. A broad area of this community was identified on the south-western portion of Badu Island (see Garnett and Jackes 1983). Due to the paucity of the field survey effort on Badu Island, coupled with the broad scale of the aerial photography used for the interpretation, the location and extent of this community could not be verified.

Photograph 179. Vegetation Community 5u on acid volcanic headland. Muralug Site PW038.

5.2.77 Regional Ecosystem 3.12.38 (New RE)

Description: *Corymbia clarksoniana* + *Corymbia stockerii* + *Corymbia nesophila* low mixed woodland of Torres Strait Islands.
Status: Not of Concern
Vegetation Communities: 5d, 14p, 13a
Reference Sites: 5 Quaternary

Regional Ecosystem 3.12.38 is new RE classification restricted entirely to Moa Island where it occupies skeletal soils formed on hard white acid volcanic rock. The constituent VC's comprise shrubland and low woodland expressions as described below in VC's 5d and 14p. Small areas of *Melaleuca viridiflora* woodland separate from this community and are also included under this classification.

Vegation Community 5d: This community represents low woodland comprising a mix of species from a range of genera. The canopy forms with a height range between 6m and 10m with cover typically 25% to 40%. Constituent species include *Corymbia clarksoniana, Corymbia nesophila, Corymbia stockeri* subsp. *peninsularis, Asteromyrtus brassii, Melaleuca viridiflora, Melaleuca stenostachya, Petalostigma pubescens, Acacia leptocarpa* and *Welchiodendron longivalve.* The relative contribution that these species make to total canopy cover varies although *Corymbia* spp. is always a canopy component. Secondary shrub layers are variable although *Melaleuca viridiflora, Melaleuca stenostachya* and *Petalostigma pubescens* are generally abundant. Grasses form a sparse cover over a typically skeletal substrate. Where

Corymbia spp. contribute less than 10% to the total canopy cover or are present as an emergent layer only, the community is represented as VC14p. The VC is represented in **Photograph 180.**

Photograph 180. Vegetation community 5d on acid volcanic soils. *Corymbia* spp. make a significant contribution to total canopy cover at this site (MO046).

Vegetation Community 14p: Vegetation Community 14p (**Photograph 181**) mosaics with VC5d, and separation of these communities is based largely on the relative contribution *Corymbia* species make to the total canopy cover. The upper shrub layer typically forms at 3m to 6m and is composed of *Melaleuca viridiflora* as a dominant with *Corymbia clarksoniana, Acacia leptocarpa, Petalostigma pubescens* and *Asteromyrtus brassii* as sub-dominant species. *Acacia crassicarpa, Parinari nonda* and *Petalostigma pubescens* are occasional canopy associates. Shrub layers are typically sparse comprising species typical of the canopy. Grasses form a sparse cover over a typically skeletal substrate. Emergents of *Corymbia clarksoniana, Corymbia nesophila* and *Corymbia stockeri* subsp. *peninsularis* may be present although by definition contribute less than 5% to the total canopy cover. In some locations, areas of pure *Melaleuca viridiflora* may separate out from the mixed shrubland, where it is mapped as VC13a. In these locations, the community is captured within RE3.12.26x1, recognising the continuum of floristic variations occurring within the VC.

Photograph 181. Vegetation Community 14p at Moa Island Site MO124.

5.3 Retrospective Classifications

Landforms suitable for human occupation have largely been cleared on the majority of inhabited islands and as such, the vegetation communities that once occupied these areas have been heavily impacted. Alluvial landforms have been used almost exclusively for inhabitation and agricultural purpose and small alluvial pockets on the majority of the larger inhabited islands have been totally cleared with limited evidence of the floristic composition or structure of pre-disturbance vegetation types. Similarly, the elevated Tertiary remnant on the northern coast of Saibai Island presents the most suitable area for human occupation on the island and has been heavily impacted by human activities. In these areas, evidence of the pre-disturbance vegetation communities can only be gathered from floristic evidence manifest in the contemporary landscape. Two VC's and associated RE's in the study area are presumed to be regionally extinct and these are described briefly below.

5.3.1 Regional Ecosystem 3.3.1c (Cleared)

Description: Closed semi-deciduous mesophyll vine forest. Mainly occurs on loamy alluvia
Status: Presumed Extinct
Vegetation Communities: 2xx(e), 2xx(c), 2xx(b)
Reference Sites: 2 Quaternary (Dauan - DA15, 43)

Vegetation Community 2xx: Vegetation community 2xx provides an example of retrospective vegetation classification with type, which is classified as mesophyll vine forest on alluvia, mapped as an RE only in pre-clearing status. All well-developed alluvial flats on islands such as Erub, Dauan, and Iama have been cleared and probably have been under human occupation for long periods prior to European settlement. Indications of the pre-clearing status of these flats can only be gained from examination of scattered non-remnant communities retained (although most likely highly modified) on gully lines and as scattered remnant trees. For this reason, the description of this community should be considered indicative. Isolated strips of VC2xx(e) on Dauan are currently occupied on swampy alluvium by *Acacia auriculiformis, Terminalia cattapa, Myristica insipida* and a range of exotic species including *Mangifera indica* and *Cocos nucifera.* The pre-clearing representation of this community is proposed to comprise a similar native species assemblage, although it is conceded that the original species assemblage is likely to be considerably more diverse. A new RE sub-type (RE3.3.1c) has been used to accommodate and describe this pre-clearing community. In in the Torres Strait Islands, any natural occurrence is apparently extinct.

Photograph 182. Semi-deciduous mesophyll vine forest dominated by *Terminalia cattapa, Mangifera indica* and *Cocos nucifera* (2xx(e)) on Dauan Island (Site DA43).

5.4 Non-Remnant Classifications

The following provides a brief explanation for, and characterisation of the non-remnant vegatation communities mapped in the Torres Strait Islands.

Bamboo: Bamboo groves and thickets are prominent on a number of islands although particulary abundant on the Eastern Island Group of Mer, Erub and Ugar. On these islands, bamboo groves mosaic with adjacent vine forest communities, either spreading from former traditional garden areas on margins or as discrete groves within the forest communities. These communities are also prominent on the continental islands of Moa and Mabuiag, although no such examples were recognised on the Kaurareg Islands (Inner Island Group). The communities are represented as the pre-disturbance vegetation type with an appended (b).

The historical record as reviewed by McNiven (2008) reveals the existence of bamboo groves throughout the Torres Strait, more specifically in the eastern islands in 1793, the western islands in 1845, and on Kirriri (Hammond) in 1867, with indications that groves continued to be established in the late nineteenth century and that the material was utilized extensively for material items (Shnukal, 2004a in McNiven 2008). Contemporary use of this important resource was observed during the field survey on Erub where large canes of the introduced *Bambusa vulgaris* cut for structural building purposes were lashed and soaked in the sea before use. This robust species is the most likely bamboo to form the communities mapped in this exercise although a number of species are recorded for the region (see McNiven 2008). The native *Neololeba atra* (listed as Rare under the *Nature Conservation Act*), occurs in the Wet Tropcs, Iron Range-McIlwraith and Lockerbie areas of north-eastern Queensland and also in Papua New Guinea and New Britain (Hyland *et al*. 2003). It is known from the Torres Strait from Mer, Naghir, Ugar and Iama (EPA 2007), and from Badu and Moa Islands (Fell pers. obs.) however is generally restricted to the understorey and rainforest margins and does not form mappable communities.

EX: Communities Dominated by Exotic Species (other than bamboo): Communities dominated by exotic species other than bamboo, are represented with an appended (e). This classification extends to a range of communities and species including extensive areas of tall closed forest of **Mangifera indica* (Mango) or **Delonix regia* (Poinciana) on a number of islands, most prominently Mer and Erub, where such communities have been designated as non-remnant vegetation. Former grassland areas on Mer and Erub Islands dominated by **Lantana camara* are similarly designated with an appended (e) although in such cases, remnant status has been designated given that natural condition of these areas can be restored relatively easily through appropriate fire regime.

Photograph 183. Bamboo groves on a basalt headland within broader vine forest communities. Erub Island.

RE: Native Regrowth Communities: Native regrowth communities are recognised on the majority of island groups that have been subject to human occupation where they have been noted with an appended (R). These communities result from the clearing, or partial clearing of natural vegetation that is in varying stages of recovery to a natural condition. On Erub, such communities are often represented by groves of *Barringtonia calyptrata* on the margins of remnant vine forest vegetation, and on Boigu or Iama as mangrove shrubland.

Non-Remnant Communities of Local Cultural Significance: Anthropogenically altered forests with development influenced by intensive cultural land use covered extensive areas of Mer, Erub and Masig. The broad structural characteristics of the communities, being VC22a and VC22b are described below, followed by brief discussion on their likely derivation.

Vegetation Community 22a: Vegetation community 22a, found on Murray and Erub Islands, are typically represented by tall groves of *Cocos nucifera* below which a closed forest has formed. This closed forest component has a general canopy height range of 15 to 23m, comprising predominantly native species (Mango being an exception), although the species assemblage is heavily skewed in favour of traditional food trees such as *Syzygium branderhorstii* and *Syzygium bungadinnia* (on Mer Island). A typical canopy assemblage (or sub canopy below the dominant stratum of *Cocos nucifera*) on Erub (Site ER30) comprised *Syzygium branderhorstii, Myristica insipida, Cocos nucifera, Alectryon repandodentatus* (E), *Diospyros hebecarpa, Cupaniopsis anacardioides, Mangifera indica, Bombax ceiba* var. *leiocarpum, Pandanus* sp., *Canarium vitiense* and *Mimusops elengi.* Other prominent species may include *Alstonia spectabilis, Cerbera manghas,* and *Semecarpus australiensis.* An unusual feature noted in this community on both Mer and Erub is the prominence of *Lepidopetalum fructoglabrum* in the sub-canopy and shrub layers of a large number of these forest types. This species is not recorded in any other vine forest community examined. Where mapped, the majority of these areas are on level topography with a sparse understorey and free of the surface rock that is otherwise abundant on hillslope situations.

Photograph 184. A tall specimen of *Syzygium bungadinnia* mixing with *Cocos nucifera* in the canopy of VC22a (Site MU028, Mer Island).

Field evidence suggests that areas mapped as VC22a on Murray and Erub Islands, were once utilised as traditional garden sites where cultivation of food trees such as *Syzygium branderhorstii* and *Mangifera indica* occurred under coconut groves. In some instances old rotting Coconut stumps were observed in the understorey. Detailed knowledge of land use histories throughout Mer is undoubtedly held within the traditional owner clan groups and this is an essential foundation toward further ecological understanding of these systems. The role Torres Strait islander people have had in shaping the vegetation communities of the Torres Strait (see Parr and Carter 2003, Carter 2004, McNiven 2007, Rowe 2007, Barham 1999) is evident through the length of continuous occupation +2,500 years BP which relied on land and marine resource exploitation inclusive of extensive garden cultivations.

In respect to Mer Island, Haddon (1935) states ' *the great lava stream extends with an undulating surface from the central cone to the north-western end of the island, and forms a fertile tableland which is bounded by a steep slope. The disintegrated lava forms a reddish brown soil in which coconut palms grow in profusion, and the natives have their gardens of bananas, yams and sweet potatoes. There are also wild mangoes and other wild fruit and other trees*'. Carter (2004) makes reference to the observations of Yonge (1930) where large areas of the more fertile parts of the island supported extensive tropical horticulture, and further comments that "*the eastern interior tableland currently supports dense vine thicket, groves of bamboo, wild mango trees and secondary woodland regrowth interspersed with garden plots"* (Carter 2004, pp 165). It is apparent that a period of stability (or change in land usage) has allowed for the development of VC22a on both Mer and Erub.

Vegetation Community 22b: Vegetation Community 22b on Masig is represented as a low notophyll/microphyll vine thicket dominated by species which include *Buchanania arborescens, Drypetes deplanchei,* and *Terminalia subacroptera*. This community is reported by local people to represent former traditional garden areas that have long since regenerated to a relatively stable vine thicket dominated by native species. Whilst a number of similar communities, controlled and maintained by natural process, are present in other island locations, the communities on Masig lack sufficent cover of the original canopy for classification as remnant vegetation.

In summary, the modification of the natural environment by the indigenous cultures of the Torres Strait over centuries is recognised in both VC22a and VC22b and although classified as non-remnant vegetation, such areas retain significant cultural values with land ownership boundaries well defined within the local community.

Photograph 185. Anthropogenically altered vine thicket VC22b on Masig (Site YOS7).

5.5 Other Classifications

Areas Represented as R: Areas labelled R represent bare rock pavement formed on volcanic, granitoid or basaltic lithologies. Such areas lack soil development in any form and are generally found in exposed and precipitous locations, often at the base of coastal escarpments immediately above the intertidal zone. These areas are typically devoid of vegetation due to extreme exposure to both wind and salt spray, although stunted shrubs, herbs and grasses may occupy rock fractures where some shelter is provided. Due to extremely steep terrain, these communities are likely to be under-represented in the mapping with many areas obscured by steep slopes.

6.0 Spatial Extent of Regional Ecosystems

The spatial analysis of regional ecosystems presented in **Table 11** below, which compares pre-clearing extent with contemporary representation, enables the area of current vegetation cover to be compared to the pre-clearing extent. Results indicate that 98.9% of remnant vegetation cover remains. The most extensive loss of remnant vegetation cover is attributable to the following RE's.

- RE 3.7.1x1, a vine thicket type which is now restricted to narrow fragments adjacent to roadsides on ironstone exposures on the northern shores of Saibai Island (0.4% remains in remnant condition;
- RE 3.2.28, Evergreen notophyll vine forest on beach ridges on coral atolls, shingle cays and sand cays (45.4% remaining). Heavily impacted on Aureed, Warraber, and Masig;
- RE 3.3.69, *Melaleuca dealbata* and *Corymbia clarksoniana* open forest on alluvial plains restricted to Moa (47% remaining);
- RE 3.8.5, Semi deciduous and deciduous vine thicket restricted to Erub and Mer (58.8% remaining). Heavily fragmented through past native gardening with significant areas have been replaced by bamboo;
- RE 3.12.13, *Corymbia nesophila* ± *C. hylandii* subsp. *peninsularis* woodland on acid volcanic hills, restricted to Thursday, Zuna and Muralug (66.7% remaining);
- RE 3.2.6, *Casuarina equisetifolia* woodland of coastal foredunes (67.5% remaining). Heavily impacted community on foreshores in a number of island groups;
- RE 3.2.15, *Melaleuca viridiflora, Neofabricia myrtifolia* woodland on beach ridges occurring on Badu, Horn and Muralug (77.1% remaining). Nearly all of the clearing of this RE is associated with increased urbanization on Badu including clearing for airstrips (old and new); and
- RE 3.3.57, Tussock grassland on coastal plains of Moa, Gebar and Muralug (77.5% remaining). A fire disclimaz community that has been impacted by clearing on Moa Island (St Pauls).

Table 11. Analysis of pre-clearing regional ecosystems in the Torres Strait Island region.

Regional Ecosystem	Pre-clearing Area (ha)	Area (2007 Coverage-ha)	% Remaining
Land Zone 1- Estuarine muds and alluvium subject to saltwater incursion			
3.1.1	17908.8	17886.3	99.8
3.1.2	4327.01	4326.62	99.8
3.1.4	20.02	20.02	100
3.1.5	346.11	341.74	98.7
3.1.6	3325.38	3319.27	99.8
3.1.7	954.12	953.13	99.9

Regional Ecosystem	Pre-clearing Area (ha)	Area (2007 Coverage-ha)	% Remaining
Land Zone 2 - Coastal Dunes, Cheniers and Sand Sheets and associated Dune Swales.			
3.2.2	368.12	264.4	71.8
3.2.3	111.962	109.18	97.5
3.2.4	320.32	313.43	97.8
3.2.5	646.21	561.16	86.8
3.2.6	285.81	193.148	67.5
3.2.7	605.45	599.41	99.0
3.2.8	60.44	60.44	100.0
3.2.10	128.89	128.99	100.0
3.2.14	0.46	0.46	100.0
3.2.15	967.02	745.1	77.1
3.2.19	167.83	160.08	95.4
3.2.24	359.16	296.23	82.5
3.2.25	39.84	35.76	89.8
3.2.26	80.1	80.1	100.0
3.2.27	4.27	4.27	100.0
3.2.28	188.80	85.72	45.4
3.2.30	3.14	3.14	100.0
Land Zone 3 - Alluvial plains, alluvial fans, terraces and fluvial sediments			
3.3.1c	8.03	0	0.0
3.3.5c	103.83	103.83	100.0
3.3.6	46.97	46.97	100.0
3.3.7	18.09	10.95	100.0
3.3.9	179.77	179.77	100.0
3.3.10	476.21	467.00	98.0
3.3.12	33.75	33.75	100.0
3.3.13	55.47	55.47	100.0
3.3.14	208.75	204.32	97.8
3.3.17b	185.33	182.05	98.23
3.3.20c	1143..37	1120.68	98.0
3.3.22	553.72	537.6	97.08
3.3.27	2277.73	2201.02	96.6
3.3.28	253.21	227.39	89.8
3.3.42	2999.52	2931.18	97.7
3.3.48	1124.00	1112.13	98.9
3.3.51	111.72	111.72	100.0
3.3.57	273.07	211.61	77.5
3.3.62	1331.87	1290.36	96.9
3.3.63	105.7	105.7	100.0
3.3.68	90.02	90.02	100.0
3.3.69	139.82	65.60	46.9
3.3.70	148.41	144.254	97.1
Land Zone 5 – Sandy plains and rises/ Lateritic profiles and remnant alluvial/colluvial surfaces.			
3.5.5	2110.88	2110.88	100.0
3.5.8	73.37	73.37	100.0
3.5.15	3273.32	3273.32	100.0
3.5.17a	10.44	10.44	100.0
3.5.19	229.93	229.93	100.0
3.5.23x1	115.54	115.54	100.0
3.5.29	59.26	59.26	100.0
3.5.32	228.21	228.21	100.0
Land Zone 7 – Exposed or shallowly covered duricrust			

Regional Ecosystem	Pre-clearing Area (ha)	Area (2007 Coverage-ha)	% Remaining
3.7.1x1b	19.19	0.77	0.4
Land Zone 8 - Basalt escarpments and terraces/Volcanic cones formed on ash and scoria			
3.8.4	530.45	519.3	97.9
3.8.5	484.00	284.67	58.8
Land Zone 12 – Acid volcanic and plutonic rocks including hornfelsed granite parent rocks			
3.12.4	6049.01	5896.87	97.5
3.12.8	1664.26	1628.43	97.8
3.12.9	785.84	779.46	99.2
3.12.11	7998.49	7798.93	97.5
3.12.13	360.49	240.37	66.7
3.12.16	1795.76	1786.14	99.46
3.12.18	96.83	96.83	100.0
3.12.20	5660.53	5660.53	100.0
3.12.21a	365.18	328.58	89.9
3.12.23	2252.69	2252.69	100.0
3.12.29	927.73	909.03	97.9
3.12.30	489.68	488.15	99.7
13.12.31x1a	1408.50	1408.39	100.0
3.12.33	29.36	29.36	100.0
3.12.34	1833.99	1833.99	100.0
3.12.35	1156.18	1092.06	94.45
3.12.36	494.78	491.68	99.9
3.12.37	503.42	474.70	94.3
3.12.38	1661.64	1661.5	100.0
Total	**84613.2**	**83684.85**	**98.9**

7.0 Significant Vegetation and Flora

7.1 Summary of Significant Vegetation

The following section identifies vegetation types which have a restricted occurrence in the study area, recognising a number of vegetation communities potentially unique to the Torres Strait Islands. Vegetation which provides habitat to significant flora species including EVR's, disjunct populations and species at the limits of geographical range are also recognized.

1. Regional Ecosystem 3.1.1 (Closed forest of *Rhizophora stylosa* ± *Bruguiera gymnorhiza*) is described as a highly complex and variable RE occupying intertidal areas, generally on the seaward fringe of mangroves where tidal exchange is greatest. This RE includes small areas of Nypa forest on North-West Creek (Muralug) mapped as VC12a. The occurrence of Nypa forest on Muralag represents an extension of geographical range of the species north from the Jardine River mouth, being the only known occurrence between Cape York and PNG.
2. Regional Ecosystem 3.1.7 is a previously unrecognised unit describing *Schoenoplectus* spp. sedgelands in brackish estuarine environments. This ecosystem unit incorporates low open sedgeland (VC 27a) and tall sedgeland/estuarine wetland mosaics (VC 27b), the latter forming where freshwater drainage mixes with estuarine waters, generally on the

landward margins of mangrove forest complexes. The RE is confined to Saibai and Boigu Islands and is not currently recognised on mainland areas of Cape York.

3. The complexity of vine forest types on sand dunes within the island group is remarkable, warranting recognition as a single broad RE unit distinct from those identified in the existing RE schema. The new RE is formed by the VC's 2a, 2l, 2u, and 9b, occurring on nearly all island groups with best developed type examples represented on Saibai, Boigu, Erub, Muralug, Moa, Warral and Sassie Islands. These communities are semi-deciduous in nature with structural variation between vine thicket and vine forest, and occupy calcareous beach ridges, as distinct from the coralline sand deposits of the atolls which provide habitat for RE3.2.28. A unique expression (VC23c) occurs on inacessible parts of Sassie Island where coral rubble ridges provides habitat for tall transitional vine forest types. On Saibai Island, parts of the coast supporting this habitat continue to provide seasonal living and camping sites for traditional owners and are likely to also provide important ethnobotanical resources. The occurrence of **Cocus nucifera* and **Bambusa* spp. may be associated with settlement areas. The Erub occurrence of the RE provides habitat for the listed *Alectryon repandodentatus* (Endangered, NCA 1992) and *Neololeba atra* (Rare, NCA 1992). On Muralug Island, VC2u provides habitat for the vulnerable Cooktown Orchid (*Dendrobium biggibum*) and the Vulnerable listed (yet widespread) *Psydrax reticulata*. Populations of the Endangered vine *Muelleragia timorensis* are likely.
4. The occurrence of RE 3.2.2b (Semi-deciduous vine thicket on coastal dunes and beach ridges) on Moa Island, mapped as VC2p, provides the only known sand dune habitat for the Vulnerble palm *Arenga australasica* in the Torres Strait. This is also known habitat for the Endangered vine *Muelleragia timorensis*, and disjunct populations of *Aristolochia chalmersii*.
5. Regional Ecosystem 3.2.10c (*Eucalyptus tetrodonta, Corymbia clarksoniana* ± *E. brassiana* or *Erythrophleum chlorostachys* woodland on stabilised dunes - VC5j) is resticted to the western coast of Muralug Island where older dune systems are well-preserved and relatively extensive. This *Eucalyptus tetrodonta* dominant habitat represents the most northerly geographical limit of *E. tetrodonta* in Queensland. Additionally the ecosystem provides habitat for highly disjunct occurrences of *Corymbia latifolia*.
6. The newly described RE3.3.2x1 accommodates a unique variety of Semi-deciduous mesophyll/notophyll vine forest on alluvium, restricted to flood prone alluvial plains of the Northern Island Group. It incorporates VC2c on Saibai Island and closed shrubland/vine thicket type 14b an Boigu Island. These communities occupy a unique landform situation with no similar representation in either the broader island group or the Cape York Peninsula Bioregion. The representative communities are under imminent threat of extinction through sea level rise.
7. The tall evergreen notophyll vine forest type VC1j is represented only on the sandy alluvial soils of Tutalia Creek on Moa Island. The unique floristic assemblage which is dominated by *Acmena hemilampa* subsp. *hemilampra, Syzygium angophoroides* and associated *Acacia auriculiformis, Syzygium forte* subsp. *forte, Calophyllum sil* and *Buchanania arborescens* has no known comparable communities on Cape York Peninsula. The adjoining evergreen mesophyll vine forest (VC1i) on stream alluvia is similarly unique in the Torres Strait region. The community has floristic affinities (on account of abundant Horsfieldia in the canopy) to riparian vine forests on swampy alluvium associated with the lower catchment of the Lockhart River and tributaries. Provision of habitiat for *Pandanus zea*, listed as 'Rare' under provisions of the NCA is an additional significant habitat feature.
8. The mixed riparian forest type mapped as VC5h is restricted to Horn Island where it occupies swampy flood overflow plains carved into relict dune systems. The dominant canopy, always in open forest formation, ranges in height from 15 to 23m and is composed of *Melaleuca saligna, Corymbia stockeri* subsp. *peninsularis, Corymbia*

clarksoniana, *Eucalyptus brassiana* and *Eucalptus platyphylla.* This presents an unusual floristic assemblage and the record of *Eucalyptus brassiana* provides an extension of geographic limit of the species north from Cape York. The community provides for the only record of the species within the study area.

9. The *Melaleuca quinquinervia* dominant RE 3.3.12 (VC7d) is restricted in the Torres Strait to Moa and Badu Islands forming the most northerly known occurrence of the species on Badu. On Moa it occurs on the broad erosional plain of the north-west, and on Badu in deflation hollows and broad swales of old dune surfaces. On both islands, *M. quinquinervia* occurs in sparsely scattered swamplands.
10. Regional Ecosystem 3.2.14 (VC13h) is restricted to a single occurrence on Horn Island, where it is expressed as a low closed shrubland dominated by *Melaleuca arcana.* The community forms a semi-circular swamp within a broader relict dune system and represents an extension of geographical range of the species north from the Jardine River. The community is therefore unique in the Torres Strait regional context.
11. Regional ecosystem 3.3.18x1, incorporating VC7c and VC4d is restricted to coastal areas north of St. Pauls, Moa Island where it is represented as a tall open forest of *Melaleuca dealbata* and *Corymbia clarksoniana* in relatively equal proportions. The floristic composition of this community appears unique in a bio-regional context, and its spatial extent is extremely limited. This community has been heavily fragmented by past landuse practice and a dominant proportion of the landform that it once occupied has been cleared, highlighting the urgency to recognise the unique nature of this community.
12. Regional ecosystem 3.3.62a* (VC11a) comprises a mosaic of grassland, shrubland and low woodland types, confined mostly to Northern Islands group. The most extensive representation is provided on Saibai Island, although scattered areas also occur on Boigu, and southern representation is provided on Hammond and Moa Islands (Inner and Near Western Island Groups respectively). The community is confined to Torres Strait Region although extensive areas occur on the coastal plains of neighbouring PNG. Large areas of the unit are former prehistoric tropical field systems with characteristic physical traces of relict agricultural mounds and ditches indicating high cultural values (see Barham 1999).
13. The proposed creation of a new RE3.5.32 (VC9a) recognises the unique combination of *Asteromyrtus brassii, Syzygium angophoroides* and *Acmena hemilampra* subsp. *hemilampra* open forest on residual sand rises and sheets. The unusual landform association of these more typically swamp dwelling species is unique to Moa Island, and provides an unusual floristic variation of vegetation on a Land Zone 5 feature.
14. Native gasslands classified within RE3.8.4 (VC17b) on basalt vents & cones are restricted to the major basaltic islands of Erub and Mer, forming a considerable portion of the islands terrestrial habitat. Special significance is assigned to these communities, considering both the uniqueness of the volcanic landscape, and the rarity of basaltic grassland types in the broader bioregional area. Similar communities are represented near Hopevale in the south of the CYP bioregion. These ecosytems have long histories of anthropogenic management, although edaphic condition provides a fundamental control on their development. Understanding the impact of incremental land use change, evidenced today by shrub and lantana invasion and erosion, is vital for determining appropriate management strategies.
15. The proposed new Regional Ecosystem 3.12.1x1 (Semi-deciduous mesophyll/notophyll vine forest on granite slopes of the Torres Strait Sub-region) comprises a floristically diverse group of vegetation mapping units (2d, 2h, 2o, 2q, 2r, 6e) occurring on steep granitic and acid volcanic slopes of the larger continental islands. The most extensive occurrences are are recognised on Dauan, Iama and Gebar Islands, and on the Near Western and Inner Island Group. Vegetation community 2d, which is found on the steep boulder strewn mid to upper slopes of Dauan Island, supports disjunct populations of *Tetrameles nudiflora* and *Nothocnide repanda*, and is notable for its diversity of epiphytic plants including the 'Vulnerable' *Dischidia littoralis*. Vegetation community

2o on the sheltered slopes of Moa provides habitat for *Archidendron hirsutum* (Rare) and disjunct populations of *Polyalthia australis.* The best development of the ecosystem is provided on Muralug Island as VC2q where it occupies a series of rocky diorite knolls protruding above a broad alluvial plain. The type supports restricted occurrences of *Terminalia complanata, Albizia lebbeck, Cordia myxa, Lagerstroemia archeriana* and *Indigator fordii.* The latter represents the highly disjunct occurrence of an extremely rare species, previously known from only four to six trees on the southern slopes of the McIlwraith Range.

16. Regional Ecosystem 3.12.3x1 (VC6a) is a proposed new RE, accounting for *Acacia auriculiformis* open forest with vine forest understorey. This unique community is restricted to Iama Island (VC6a) with a minor occurrence also mapped on Gebar. High biodiversity values are given to this community given its uniqueness in the national, regional and local contexts, and through provision of habitat for a highly disjunct population of *Luvunga monophylla* (Rutaceae), being a new record for Queensland.
17. Regional Ecosystem 3.12.5x1 is proposed as a new RE recognising a unique expression of evergreen to complex evergreen mesophyll to notophyll vine forest and thicket on mountain ranges of Torres Strait Islands. The proposed new ecosystem represents a diverse range of floristic and structural variations that have been previously unrecognised. This ecosystem is extremely undersampled in regard to its botanical and faunal diversity and warrants more detailed investigation of these components in future studies. The likelihood of finding significant new botanical and faunal records within this community can be regarded as extremely high.
18. Vegetation Community 5f (proposed as a component of RE3.12.18) is restricted to Naghir Island, occupying the well-drained granitic soils of the footslope and colluvial apron on the islands western side. This community provides Australia's most northerly occurrence of *Eucalyptus leptophleba,* and is highly significant for this reason. The occurrence of this community is well-removed from examples on northern Cape York Peninsula, with the only other recognised occurrence of the species in the Torres Strait Group confined to scattered trees on Thursday Island. The taxon also occurs on the windswept coastal dunes of Naghir (RE3.2.25) as a component of VC14t.

Whilst the signifigance of regional ecosystems can be assessed on an individual basis, the values of the broader mosaic of vegetation across the Torres Strait Sub-region, including its complexity, diversity and connectivity should also be considered highly significant. The study revealed 77 regional regional ecosystems in the Torres Strait study area, accounting for approximately one third of the currently documented ecosystem diversity in the broader bioregion within a recognised sub-region contributing less than 0.01% to the bioregions total land area (12,050,307.0576 ha – IBRA Version 5). Of the islands represented, the diversity of the vegetation on Moa Island which ranges from upland complex rainforests, well-developed gallery rain forests, expansive plains with a variety of woodland, heathland, shrubland and swampland forms, provides biodiversity values that are unlikely to be matched on any mainland conservation area. At present, much of this landscape is free from degradation associated with invasive species and other impacts such as development.

7.2 Summary of Flora

7.2.1 Regional Flora

An analysis of the field survey data in combination with EPA Corveg and Herbrecs data and previous studies for the study area identifies a vascular flora of 1,330 species **(Appendix B)**[6].

[6] Analysis includes Herbrecs data from Albany Island which was not part of mapping area. Includes subspecies and varieties.

This includes 196 (15%) naturalised species. A breakdown of the flora into major groups together with a broad comparison to regional floras is provided in **Table 12** below.

Table 12. Summary of the native vascular flora of the Torres Strait Islands in comparison Cape York Peninsula (from Neldner and Clarkson 1995 in Neldner 1998) and Great Barrier Reef Continental Islands (from Batianoff and Dilleward 1997) and Queensland Flora (Bostock and Holland 2007).

	Pteridophytes	**Gymnosperms**	**Angiosperms**	**Total**
Families	15	1	158	174
Taxa	39	1	1,289	1,329
Cape York Peninsula	**Pteridophytes**	**Gymnosperms**	**Angiosperms**	**Total**
Families[7]	30	5	183	218
Taxa	157	6	3,173	3,338
Great Barrier Reef Continental Islands[8]	**Pteridophytes**	**Gymnosperms**	**Angiosperms**	**Total**
Families	25	5	165	195
Taxa	97	7	2,091	2,195
Qld Flora[9]	**Pteridophytes**	**Gymnosperms**	**Angiosperms**	**Total**
Taxa	396	70	9,424	9,890

In comparison to the Cape York Peninsula bioregion, the Torres Strait Islands support a high floristic diversity as evidenced by the presence of approximately 40% of the diversity of the vascular flora in 0.01% of the land area. On a statewide basis, the Torres Strait supports some 13% of the Queensland vascular flora. Taxa such as *Cycas scratchelyana, Dendrobium litorale, Dischidia littoralis, Globba marantina, Grastidium insigne, Ischaemum polystachyum,* and *Vrydagzynea elongata* reach their southern limit of distribution in the study area whilst *Croton waterhousea, Cycas badensis,* and *Secamone auriculata* are Torres Strait endemics. Floristic diversity reflects on the remarkable ecosystem diversity within the study area. Further analysis of the survey data in combination with available datasets is outside the scope of the current project however is necessary to allow comparisons of individual islands, and to assess the spatial distribution of taxonomic groups across the Straits.

7.2.2 Introduced and Naturalised Flora

The account of the introduced flora remains an underestimation despite the significant contributions by Waterhouse as part of ongoing AQIS work throughout the region and other collectors. The figure of 15%, which consitutes the proportion of the naturalised flora within the total flora, contrasts with; the National flora (13-15%) (Bean 1996); the Queensland Flora (15.6%) (Bostock and Holland 2007); the Northern Territory flora (5.2%) (Bowman *et al*. 1988); Cape York Peninsula flora (7.4%) (Neldner 1998); and the Great Barrier Reef Contiental Islands flora (9.8%) (Batianoff and Dillewaard 1997). Eight species are listed as Declared on the *Land Protection (Pest and Stock Route Management) Act 2002* **(**see **Table 13).** A summary of invasive species with the potential to invade native ecosystems provided in **Table 14** below is informed by personal communication with Barbara Waterhouse.

[7] Cape York flora utilises Henderson (2002).

[8] Batianoff and Dilleward (1997) identify 552 continental islands along the east coast of Queensland within the Great Barrier Reef Marine Park (GBRMP), a total land area of about 1,627 km2.

[9] Bostock and Holland (2007).

Table 13. Summary of declared species listed on the *Land Protection Act 2002*.

Class	Declared Species	Comments
2	Bellyache Bush *(Jatropha gosypifolia)*	**Badu Island.** Notes in Herbrecs (2007) from Waterhouse collections indicate that it occurs as an ornamental in gardens and as wild plants in small populations of 5-10 plants that have grown from discarded garden water adjacent to beach and mangrove at northeast end of settlement and around council dump. **Boigu Island.** Small populations in township.
2	Pond Apple *(Annona glabra)* Weed of National Significance.	**Horn Island**. Two collections from from sand and gravel storage area adjacent to Eilkam Holiday Park in disturbed site adjacent to Melaleuca woodland and mangroves. **Thursday Is**. Record from approx. 100m north of Torres Shire Water Supply sign on track between Sadie's Beach and Waiben. **Muralug**. Isolated occurrences reported.
2	Prickly Pear *(Opuntia stricta)*	**Horn Is.** Isolated occurrences **Hammond Is.** Isolated occurrences **Moa Is (St Pauls).** Isolated occurrences
2	Americans Rats Tail Grass *(Sporobolus jacquemontia)*	**Thursday Is**. Single record from town area.
3	Lantana *(Lantana camara)* Weed of National Significance.	**Erub**. Widespread **Mer**. Widespread **Masig**. Naturalised and originating from garden plants. **Warraber**. Isolated occurrence **Albany**. Isolated occucrence
3	Singapore Daisy *(Sphagneticola trilobata)*	**Dauan.** Infestation of several hundred square metres occupying lower slope of hillside behind church. **Erub**. Spreading from garden plants. **Moa (Kubin).** Spreading from garden plants on edge of town area. **Badu**. Occurs in a number of situations such as on track verges to water treatment plant and behing quarry. Also in swamp forest and stream banks near town.
2	Sicklepod *(Senna obtusifolia, S. tora)*	**Ugar.** Isolated occurrence. **Thursday.** Isolated occurrence.

Table 14. Summary of highly invasive species.

Species	Island
Gloriosa Lilly *(Gloriosa superba)*	Masig, Erub, Mer, Poruma
Grader Grass *(Themeda quadrivalvis)*	Dauan, Erub, Gebar, Masig, Saibai, Thursday
Barleria prionitis	Boigu
Leucaena *(Leucaena leucocephala)*	Boigu, Hammond, Horn, Naghir, Mer, Moa, Muralug, Saibai, Thursday, Ugar, Warraber
Japanese Sunflower *(Tithonia diversifolia)*	Ugar
Praxelis *(Praxelis clematidea)*	Mabuiag, Masig, Moa, Thursday, Badu, Mer, Horn
Siratro *(Macroptlium atropurpurea)*	Badu, Erub, Thursday
Desmodium tortuosum	Iama, Masig, Mer, Muralug, Saibai, ugar, Thursday
Poinciana *(Delonix regia)*	Erub, Mer
Sensitive Weed *(Mimosa pudica)*	Badu, Mabuiag, Saibai
Althernanthera brasiliana	Widespread
Khaki Weed *(Alternanthera pungens)*	Mer, Erub, Saibai, Thursday
Mission Grass (Pennisetum penicellata)	Horn, Masig, Poruma
Tecoma stans	Mabuiag
Snake Weed *(Stachytarpheta jamaicensis)*	Badu, Erub, Mer, Poruma, Masig, Mabuiag, Thursday, Goods, Moa, Hammond
Cashew (Anacardium occidentale)	Badu, Horn

Species	Island
Ipomoea hederifolia	Iama, Poruma, Erub, Mer, Moa, Mabuiag, Naghir, Ugar, Thursday
Agave sisalana	Dauan, Iama, Masig, Moa
Castor Oil Bush *(Ricinus communis)*	Poruma, Mer
Angelonia salicariifolia	Badu, Boigu, Erub, Hammond, Horn, Moa, Muralug, Saibai

7.2.3 Significant Flora

The field survey recorded a number of significant flora species. Thirteen of the 31 EVR species known for the study area were recorded with one new record for Queensland and some 50 new records for the Torres Strait. The latter includes disjunct occurrences, and numerous range extensions within the Torres Strait sub-region.

A summary of all EVR species records for the Torres Strait provided in **Table 15** is derived from an analysis of Herbrecs (2007 extract) data, previous relevant studies and is supplemented by survey data. Survey records of EVR's including brief notes on habitat and distribution are summarised in **Table 16** below. **Table 17** lists some significant (non-EVR) flora records.

Photo 186. Disjunct occurrence of *Chrysophyllum roxburghii* in non-remnant vegetation on Mer.

Table 15. Summary of EVR flora records for Torres Strait Islands (Source: Herbrecs data Oct. 2007 extract). Bold denotes taxa also recorded on 3D field survey, **X** denotes new records based on 3D survey results.

NCA	EPBC	Botanical_Name	Albany	Badu	Booby	Dauan	Erub	G.Woody	Iama	Kirriri	Masig	Mer	Moa	Naghir	Horn	Pumpkin	Saibai	Tudu	Ugar	Waiben	Warraber	Warral
E	-	***Alectryon repandodentatus***				**X**	**X**					**4**										
E	-	*Costus potierae*				2							2									
E	-	*Muellerargia timorensis*				2			1			1	1			1		1		2	1	1
V	**V**	***Arenga australasica***				**1**						**X**		**X**								
V	-	*Cissus aristata*				1																
V	**V**	***Dendrobium bigibbum***					**1**			**2**					**1**							
V	**V**	*Dendrobium johannis*	1							1												
V	**V**	*Dendrobium x superbiens*						1														
V	**V**	***Dischidia littoralis***				**1**							**X**									
V	**V**	*Germainia capitata*		**2**									3									
V	**V**	*Hydriastele costata*			1																	
V	-	***Psydrax reticulata***		**X**		**X**			**X**	**X**			**3**	**X**	**X**					**2**		**X**
R	-	*Apluda mutica*					1					2					1					
R	-	***Archidendron hirsutum***		**X**									**1**									
R	-	*Cadetia wariana*											**3**									
R		*Chrysophyllum roxburghii*										**X**										
R	-	*Diospyros* sp. (Bamaga B.P.Hyland 2517)		**X**		**X**							**X**									
R	-	*Eremochloa ciliaris*		**4**									1									
R	-	*Fatoua villosa*					1					5		1								
R	-	*Globba marantina*										1	3									
R	-	*Hoya revoluta*											3									
R	-	*Lepturus geminatus*																		1		
R	-	*Lobelia douglasiana*																		1		
R	-	*Neololeba atra*		**X**		**X**	**1**		**1**			**2**	**X**	1					1			
R	-	*Operculina brownii*				1	1		2							1				2		
R	-	***Pandanus zea***											**X**									
R	-	*Pimeliodendron amboinicum*											**X**									
R	-	*Secamone auriculata*											**1**									
R	-	*Sterculia shillinglawii* subsp *shillinglawii*											**X**									
R	-	*Syzygium aqueum*									1											
R	-	*Syzygium buettnerianum*											**1**									

Table 16. Summary of survey records for EVR flora

EVR Taxa	Previously Records in Torres Straits	Survey Records / Vegetation Communities	Notes
Alectryon repandodentatus - Endangered	4 collections from Mer	Erub – 2i, 2j, 22a Mer – 2j, 2j(e), 21a, 22a, 2j/15a, 2j (x) Dauan -1a	Widespread and common species in all forms of vine forest and vine thicket and regrowth on Mer and Erub. Survey record from Mt Cornwallis on Dauan extends range eastwards.
Muelleragia timorensis - Endangered	Dauan, Iama, Mer, Moa, Pumpkin, Tuda, Waiben	-	Not recorded on survey however known from coastal vine thickets. Requires wet or post wet season surveys.
Dischidia littoralis - Vulnerable	Dauan	Dauan - 1a	Common on upper slopes of Mt Cornwallis with a tentative record from Mabuiag.
Arenga australasica – Vulnerable (NB. Confirmation of specimens required with possibility of *A. microcarpa*)	Moa, Dauan, Naghir	Moa – 1e, 2p, 3c, 3d Naghir – 2a, 2v Dauan – 1a	New record for Naghir. Recorded from Moa in beach scrub, foothill vine forest and mountain vine forest on Moa. Previously known from Mt Cornwallis on Dauan (Herbrecs).
Psydrax reticulata - Vulnerable	Waiben, Warral, Muralug, Iama, Badu, Moa, Naghir, Horn, Zuna	Muralug – 2u, 16d Mabuiag – 2x, 4a, 18a Friday – 4g, 7b Moa – 4b, 14a, 14d Wednesday – 5i, 5q, 14c Hammond – 6e Mt Adolphus – 14c Zuna – 14g, 14l Warral – 18a, 18d	Common shrub/small tree on acid volcanics and granites recorded throughout continental islands.
Dendrobium biggibum - Vulnerable	Erub, Hammond, Horn	Muralug – 13j, 13k	Coastal vine thicket and Melaleuca woodlands Muralug, Horn, Zuna, Moa, Wednesday, Hammond.
Archidendron hirsutum - Rare	Moa, Badu	Moa – 1e, 1f, 2o, 3d, 4a Badu - 4a	Occasional in footslope and upland vine forest.
Chysophyllum roxburghii - Rare	Mer	Mer – Non remnant	
Diospyros sp. (Bamaga B.P.Hyland 2517) -Rare	Previosly reported on Moa by Wannan.	Mabuiag – 4a Moa – 1a Badu – 4a	Understorey of Welchiodendron dominated closed forests, footslope and upland rainforest.
Neololeba atra - Rare	Moa Erub Naghir	Moa – 1i, 2o, 3d Badu – 4a Dauan – 7a Mer – 2j Iama, Erub, Naghir	
Pandanus zea - Rare	Moa	Moa – 1g, 1f, 3c, 3d	In best development of ENVF on swampy and riverine alluvium and upland granite.
Pimeliodendron	Moa	Moa – 1e	In best development of

EVR Taxa	Previously Records in Torres Straits	Survey Records / Vegetation Communities	Notes
amboinicum - Rare			ENVF on upland granite.
Sterculia shillinglawii subsp *shillinglawii* - Rare	Moa	Moa – 1e, 3c	SDNVF granite footslopes & swampy alluvium.

Table 17. Summary of significant (non-EVR) Flora Records

Species	Known Distribution	Survey Records
Pending New Records for Qld and Cook		
Luvunga monophylla	Kimberley, NT, Timor	Iama – 2n, 6a
Corymbia latifolia	Single record from Muralug (NSW Herbarium), NT, WA, SW Papua (Conn *et al.* 2008).	Muralug – 5k, 5n, 8c Zuna – 5l
Peltophorum pterocarpum	NT	Erub (New record for Cook)
Some New Records for Torres Strait	**Known Northern Distribution**	**Survey Records**
Aglaia sapindina	Lockerbie, PNG	Moa - 1f
Anthocarapa nitidula	Lockerbie, Manduban (PNG)	Moa - 1g,1f, 3c
Aristolochia chalmersii	Laura Basin	Masig - 2m Mabuiag - 2u Iama - 6a
Arytera divaricata	Lockerbie, PNG	Dauan - 1a, 2s Moa - 1e Mabuiag -1i Hammond - 4b
Carissa ovata	Hyland *et al.* (2003) record northern limit at Bathurst Bay. No Herbrecs record for study area. Corveg record from Inner group.	Muralug - 4a, 14g Friday – 5l
Clausena brevistyla	Jardine, Lockerbie	Moa - 2v
Cordia myxa	Mer	Muralug – 2q
Corypha utan	Aurukun	Muralug – 5n
Cupaniopsis flagelliformis var. *flagelliformis*	Lockerbie	Hammond – 2r, 4b, 6e Iama – 2h Muralug - 2q, 4b Badu – 4a
Dysoxylum latifolium	Lockerbie	Moa – 1e, 4a Hammond – 4b
Eucalyptus brassiana	CYP	Horn – 5h
Eucalyptus tetrodonta	CYP. No Herbrecs collections but community type previously mapped on Muralug by Neldner & Clarkson (1995).	Muralug – 5j, 5k, 5l, 5n, 14j Zuna – 5l, 14g
Endiandra impressicosta	Iron Range, Lockerbie, PNG	Dauan – 1a Muralug - 2q Hammond - 2r
Erythroxylum sp. (Mosquito Creek J.R.Clarkson 9991+)	North east coast - Cape York	Friday - 6a, Hammond - 4a
Garcinia sp. (Claudie River L.J.Brass 19658)	Iron Range Moa	Moa – 1f
Gomphandra australiana	Lockerbie, PNG	Moa – 1e, 1f, 3c
Harpullia arborea	Lockerbie, PNG	Erub - 22a Dauan – 1a, Muralug – 2q Moa – 1e, 1f
Helicretes semiglabra	Pascoe River (also PNG)	Saibai – 13b

Species	Known Distribution	Survey Records
Horsfieldia australiana	Lockerbie, Badu (Garnett & Jackes), PNG	Moa – 1i, 3c, 3d Badu – 3e, 3g
Indigator fordii	Highly disjunct. Known from 6 plants in southern Mcilwraith.	Muralug – 2q
Lagerstroemia archeriana	Lockerbie	Muralug – 2q
Livistona benthamii	Lockerbie, PNG	Saibai – 2c; Badu -
Melaleuca arcana	Jardine	Horn – 13a, 13h
Miliusa horsfieldii	Lockerbie	Muralug – 2q
Neolitsea brassii	Lockerbie, PNG	Moa – 1g, 3d
Notelaea longifolia	Lockerbie	Friday- 4a Mabuiag – 2x, 4a Muralug – 4a, 4b Horn – 5i, 14n Wednesday – 14c
Nypa fruticans	Jardine mouth, PNG	Muralug – 24c
Palaquium galatoxylon	Lockerbie, PNG	Moa – 1f
Pandanus zea	Lockerbie	Moa – 1g, 1f, 3c, 3d
Pimeliodendron amboinicum	Lockerbie, PNG	Moa – 1f
Polyalthia australis	Lockerbie	Moa – 1f
Sterculia shillinglawii subsp. *shillinglawii*	Lockerbie, PNG	Moa – 1e
Tetrameles nudiflora	Schram Creek (Herbrecs). Also PNG (Conn *et al.* 2008).	Dauan – 2b
	Range Extensions within TSI[10]	
Acmena hemilampra subsp. *hemilampra*	Badu (Garnett & Jackes 1983)	Moa – 1i, 1j, 3a, 9a Badu – 3e, 3g, 6g
Adenanthera pavonina	Mer	Erub, Dauan, Muralug
Aglaia tomentosa (material currently being assessed for *A. ferruginea* by Pannel)	Moa	Muralug – 2q Moa – 1e, 2o, 3c Dauan – 1a Hammond – 2r, 4a
Albizia lebbeck	Waiben, Mer	Muralug – 2q
Antidesma parvifolium	Albany, Friday, Moa, Gebar	Saibai – 2c
Atalaya sericopetala	Single collection from Gebar	Naghir – 2t, 2u Erub – 2k, 17b Moa – 2o, 4a Muralug – 16d Friday – 16e
Diospyros sp. (Bamaga B.P.Hyland 2517)	Previously reported on Moa by Wannan.	Moa – 1e Badu - 4a Mabuiag – 1d, 1h, 4a
Glycosmis trifoliata	Dauan, Moa, Ugar	Badu – 4a Erub – 2k Iama – 2h, 2u, 2n, 6a Saibai – 2c Mabuiag – 2x Mer – 2j
Rhodamnia australis	Lockerbie, Moa	Mabuiag – 1d, 2x Moa – 3a
Triflorensia australis	Dauan, Moa	Saibai – 2c
Toechima daemellianum	Albany Is.	Moa – 3c
Voacanga grandiflora	Moa	Moa – 2v, 3d Badu – 4a

[10] Preliminary-further analysis required.

8.0 Ecosystem Condition

The notion of the 'naturalness' or 'integrity' of the Torres Strait Island region can be attributed to factors such its isolation in combination with underlying climatic conditions, geomorphic history and edaphic controls, but must also acknowledge the influences on the landscape associated with long-term human occupation. The concept of 'constructed landscapes' whereby Indigenous Australian's intentionally manipulated their environment through a number of processes is explored in the Torres Strait Islands by McNiven (2008), on Saibai Island by Barham (1999), on Moa and Badu Islands by Rowe (2006), and on coastal north-east Cape York Peninsula by Hynes and Chase (1982). It is not the intention to elaborate on these findings other than to identify the occurrence of the more readily recognisable aspects of disturbance as they affect or appear to affect ecosystem condition and distribution as observed during this study, and to offer brief descriptive comment. Additional work, which combines the ecological, geomorphological, archaeological and anthropological disciplines, is required to compliment the existing body of knowledge in this field, and the preliminary discussions provided here.

The more obvious anthropogenically altered landscapes have been identified in **Section 5.4** and include bamboo groves, which are prominent on the eastern basaltic islands of Mer, Erub and Ugar where they commonly form mosaic with vine forest and vine thicket communities, and have been identified in the mapping as such. Bamboo groves also occur on the continental islands of Moa, Iama, Mabiaug and Gebar. The mapping also identifies the extent of vegetation which is dominated by exotic or naturalised species other than bamboo, and recognises extensive areas of tall closed forest of *Mangifera indica* (Mango) or *Delonix regia* (Poinciana), and former grassland areas more recently invaded by *Lantana camara* (Lantana). Again, the occurrence of these types is most prominent on Mer and Erub where distinctive regrowth formations under tall and senescing *Cocos nucifera* (Coconut) groves, thought to be old garden sites, were also observed and are discussed in **Section 5.2.57**.

McNiven (2008) identifies species such as yams (*Dioscorea* spp.), taro (*Colocasia esculenta*), bananas (*Musa* spp.), sugarcane (*Saccharum* spp.) and sweet potatoes (*Ipomoea* spp.) as 'plant inclusions' defined as "*the strategic addition or translocation of certain 'exotic' plants and animals to areas*". In contrast to these species, which are often associated with gardens and margins of heavily disturbed areas, are species such as Poinciana, Mango and Coconut which, by way of their dispersal and adaptive qualities, occur in sufficient quantities to form distinct and mappable vegetation communities. Low shrubland and vine thicket on Masig Island mapped in VC22b, is recognised from analysis of aerial photography in combination with field survey and local input as advanced regeneration of former traditional gardens.

Regrowth vegetation, the result of past clearing or partial clearing of natural vegetation, in varying stages of recovery, is recognised on the majority of island groups that have been subject to human occupation and are represented in the mapping as the Unit 'Re'. The derivation of regrowth examples observed on Erub, where *Barringtonia calyptrata* groves occur on the margins of remnant vine forest vegetation, are unclear, however regenerating mangrove shrublands on Boigu and Iama are the result of recent mechanical actions. On Boigu Island, mangrove shrublands shown in **Photographs 187** and **188** are a result of land reclamation initiatives. Contemporary evidence of vegetation clearance (vine forest/thicket on beach ridges) for traditional gardens is noted Boigu Island in RE 3.2.2b (see **photograph 189**). Examples of larger scale remnant vegetation clearing on Masig Island (in RE 3.2.6) are associated with recent major infrastructure developments. Prehistoric gardens on Saibai described by Barham (1999) are recognised within a discrete mapping unit (VC1e) as distinct from the extensive and widespread Pandanus associated grassland communities (VC11a).

Photograph 187. Regrowth mangrove shrublands on Boigu Island.

Photograph 188. Bunding on Boigu Island for the purpose of land reclamation.

Photograph 189. Recent clearing of semi-deciduous vine forest on a dune flanked by mangroves on Boigu Island.

Note should also be made to the impact of the bech-de-mer industry on fragile island environments. The demands of the industry for a constant supply of wood to fuel trepang boilers and smokehouses and to service beacon fires used to guide passage to working boats throughout the late 1880's resulted in island ecosystems being heavily denuded (Shnukal 2004). On Masig, incidents such as the cutting of wongai *(Manilkara kauki)* stands for trepang drying, to fuel mission steamers, and for slipway and boat building are reported severely depleted important seasonal food recources (Shnukal 2004), while the deforestation of Uthu, Yarpar and Auridh contributed to relocation of inhabitants (Teske, 1991 in Shnukal 2004).

The use of fire is evident on the majority of islands surveyed and there is no doubt that its ongoing use has been fundamental in shaping and modifying vegetation cover and influencing habitat diversity across the islands. McNiven (2008) notes the ethnographic record of Haddon (1935) where fire use forms an integral part of garden preparation and land cleaning in the late 1800's and evidence of fire is also in the pollen and phytolith record (Rowe 2006, Parr and Carter 2003).

Observations made during the field survey of late season burning of isolated patches of Sporobolus grasslands surrounded by mangroves on Boigu Island (see **Photograph 13,** RE3.1.5) are evidence of targeted actions to manage grassland ecosystems, possibly to maintain access for fishing and hunting through halting the invasion of mangrove shrubs. Similarly, widespread annual burning on Saibai Island appears to maintain open Pandanus grasslands and facilitates hunting of introduced deer. Field observations from the more remote eastern areas of Saibai however reveals that succession of grassland to dense shrublands of *Melaleuca cajuputi* subsp. *platyphylla* and *Acacia leptocarpa* may be occurring in the absence of fire. The phenomenon of rapid landscape change from grassland to melaleuca dominant shrublands and woodlands is reported in similar landscapes of southwest Papua where the primary disturbance agent is believed to be Rusa Deer (*Cervus timorensis*) (Bartolo *et al.* 2002, Stronach, 2000). Rusa Deer are known to occur on Saibai, Boigu and on Muralug. Aerial surveys conducted by AQIS in November 2007 estimate 60 deer on Boigu, and 100 on Saibai (Tim Kerlin, pers. comm. June 2008).

Eden (1974) investigated environmental and human factors affecting widespread areas of savanna and grassland in southern Papua New Guinea and indicated that these ecosystems, over part of their extent, result from the combined effects of shifting cultivation and burning. The influence of past climatic fluctuations on the origins of these formations are unclear, however, their maintenance appears to be attributable to human activities, in particular burning (Eden 1974). Evidence from a number of islands, particularly Moa and Dauan, indicates fire has been a significant control on the distribution of native grassland, particularly on footslope positions where the vine forest margins have retreated upslope through repetitive burning. Analysis of the aerial photo record shows that extensive grassland complexes dominated by *Imperata cylindrica* (VC17a) on Moa Island, an inferred result of repetitive burning, are relatively stable with little change in areal extent between 1971 and the present.

While the influence of fire in the present landscape is considered similar to that of aboriginal burning practices on mainland Cape York Peninsula, it is evident that the fundamental conditions of climate, soil fertility, drainage and topography also exhibit substantial control on the vegetation complexity and ecology of the islands. This observation is particularly so for Moa and can be extended to the majority of the larger continental islands including Badu and Muralug, which support outstanding biodiversity values.

In comparison to Cape York Peninsula, where coastal and sub-coastal grasslands are under pressure from exotic weeds and from woodland and rainforest encroachment associated with reduced burning frequency and intensity (Neldner *et al.* 1997, Russell-Smith *et al.* 2002), the

Saibai Island grasslands and other examples identified on Torres Strait Islands are in very good condition. Weed infestations generally associated with grazing pressure, high populations of feral pigs, and agricultural development on Cape York Peninsula are absent from the island environments. The exceptions are the grassland formations on the basaltic islands, where a discussion on the role of fire is provided in previous sections (**Sections 5.2.58** and **5.2.59).** On Erub and to a lesser extent on Mer, the implications of large-scale Lantana infestations in terms of its influence on fire behavior on rainforest margins are significant. Lantana's ability to suppress cool fires yet burn fiercely under severe conditions, promotes serious damage to rainforest margins, and leads to a permanent loss of habitat by its ability to then invade damaged areas (Stanton and Fell 2005).

9.0 Recommendations

9.1 Additional Survey Requirements

The recommendations offered below refer to future survey and analysis that will significant benefit the understanding of the vegetation on the islands. Due to constraints placed on field verification, the vegetation on Badu Island remains as significant knowledge gap and relatively low confidence is applicable to vegetation mapping over the majority of the island. Completion of field survey on the island is likely to reveal a number of undescribed and unique vegetation communities. A number of vegetation communities, remain poorly characterised as a result of time and budget restrictions and are listed below for future consideration.

- Badu Island;
- Gebar Island and Naghir Island where steep gully vine forests remain poorly characterised;
- Floristic assessment of vine forests and thickets of Waier and Dauar (Mer Group) would benefit characterisation on vine forests in the region;
- Ugar Island was not visited in the survey due to time/budgetary constraints and would benefit from further structural and floristic assesment;
- Deliverance Island, the most westerly island in the Torres Strait, was not visited during the field survey due to time/budgetary constraints. Further assessment would increase the understanding of ecology on this remote and potentially unique isle;
- A large number of small, vegetated island atolls and cays have limited field survey coverage and remain poorly described. Vegetation on the coral cay islands is poorly sampled in relation to the larger continental islands; and
- Mt Adolphus Island remains enigmatic, with a number of potentially unique forest types requiring description. Negotiation with traditonal landowners will be required prior to future access.

9.2 Future Opportunities

In addition to the above, a number of the possible initiatives identified in Section 4 of the Land and Sea Management Strategy for Torres Strait are supported. The majority relate to landscapes, biodiversity and species management and build on the extensive data set developed as part of the RE mapping project.

1. Undertake surveys involving local island parataxonomists and botanists/ecologists, etnotaxonomists/anthropologists to document traditional and contemporary ecological knowledge including plant names, plant use and land management practises. Using the

vegetation community data set as a base, spatially identify culturally significant environmental landscapes;

2. Identify and determine the status of culturally important species and instigate appropriate management actions as required;
3. Undertake further analysis of vegetation data set to map out wetland types, riparian and other sensitive vegetation types;
4. Using the flora and vegetation data set undertake additional targeted surveys of threatened and significant flora species and develop habitat maps to spatially identify known and potential populations. Use this information to inform and determine the regional status of national and state species listed under legislation. Prioritise flora species for management and protection within Torres Strait and to develop recovery and monitoring programs for selected species and habitats;
5. Using the flora and vegetation data set undertake additional analysis on weed distribution as a resource to develop pest management plans toward management of highly invasive weeds;
6. Commission research into fire ecology of grasslands on Mer, Erub and Saibai and develop fire management plans for priorty islands;
7. Develop culturally appropriate individual island land management guides incorporating vegetation maps and flora assessments suitable for use as a resource for island councils, land and sea rangers and schools;
8. Support publication of the findings of the current project.

Photo 190. Authors David Stanton (left) and David Fell.

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11. Appendices

Appendix A1. Map Legend - Vegetation Communties

Legend

Evergreen vine forest and vine thicket

1a, Evergreen notophyll vine forest + *Acmenospermum claviflorum + Syzigium puberulum + Ganophyllum falcatum + Arytera divaricata + Ficus microcarpa + *Mangifera indica*.Granite ranges.

1b, Evergreen notophyll vine thicket (windsheared) + *Manilkara kauki + Intsia bijuga + Pouteria sericea + Aglaia eleagnoidea + Garcinia warrenii + Pandanus sp*. Granite footslopes.

1c, Evergreen notophyll vine thicket (windsheared) + *Manilkara kauki + Celtis philippensis + Terminalia muelleri + Diospyros maritima + Thespesia populniodes + Drypetes deplanchei*.Coastal dunes.

1d, Mesophyll/notophyll vine forest + *Endiandra glauca + Acacia polystachya + Syzygium bungadinia + Canarium australianum + Dysoxylum oppositifolium*. Granite and rhyolite slopes

1e, Mesophyll/notophyll vine forest + *Myristica insipida + Maranthes corymbosa + Cryptocarya cunninghamii + Dysoxylum latifolium + Calophyllum sil +/- Arenga australasica*. Granite footslopes.

1f, Complex notophyll vine forest + *Pouteria sp. + Calophyllum sil sp. + Argyrodendron polyandrum + Palaquim galactoxylon + Acmenospermum claviflorum + Licuala ramsayii*. Upper slopes on granite.

1g, Evergreen notophyll vine thicket + *Calophyllum sil + Syzygium branderhorstii + Diospyros hebecarpa + Schefflera actinophylla + Podocarpus grayae +Licuala ramsayi.* Upper slopes on granite.

1h, Evergreen notophyll vine thicket with *Buchanania arborescens + Drypetes deplanchei + Eleaodendron melanocarpum + Endiandra glauca + Elaeocarpus amhemicus + Chionanthus ramiflora*. Talus slopes on rhyolite.

1i. Evergreen mesophyll vine forest + *Horsfieldia australiana, Syzygium bamagense + Acmena hemilampra subsp. hemilampra + Buchanania arborescens*

1j, Tall evergreen notophyll vine forest + *Syzygium angophoroides+Acmena hemilampra + Acacia aulacocarpa +Syzygium forte subsp. forte + Podocarpus greyae*

Deciduous/Semi deciduous vine forest and vine thicket

2a, Deciduous/Semi-deciduous vine forest + *Erythrina variegata + Manilkara kauki + Terminalia subacroptera + Mimusops elengii + Cordia subcordata*.Calcareous beach ridges.

2b, Semi deciduous vine forest/thicket + *Canarium australianum + Terminalia subacroptera + Bombax ceiba var. leiocarpum + Cochlospermum gillivreai + Cleistanthus peninsularis + Ficus virens var. sublanceolata*. Footslopes on granite and rhyolite.

2c, Semi-deciduous vine thicket + *Mimusops elengii + Acacia auricauliformis + Terminalia subactroptera + Diospyros spp. +/- Manilkara kauki +/- Melaleuca cajuputi subsp. platyphylla*. Alluvial plains

2d, Semi deciduous vine forest + *Tetrameles nudiflora + Canarium australianum + Ficus spp. + Bombax ceiba var. leiocarpum +/- Alstonia spectabilis*. Granite slopes.

2e, Semi deciduous vine thicket + *Terminalia subacroptera + Intsia bijuga + Hibiscus tiliaceus + Excoecaria agallocha + Thespesia populneoides + Cathormion umbellatum subsp. moniliforme.*

2f, Semi-deciduous vine thicket + *Canarium australianum + Manilkara kauki + Dalbergia densa var. australis + Buchanania arborescens + Sterculia sp*. (Annan River L.J. Brass 20319) + *Cochlospermum gillivraei*. Coastal escarpments on rhyolite.

2g, Semi deciduous notophyll vine forest + *Canarium australianum + Terminalia subacroptera + Semecarpus australiensis + Buchanania arborescens + Acacia auricauliformis +/- Erythrina variegata +/- Welchiodendron longivalve +/- Parinari nonda +/- Chionanthus ramiflora*

2h, Deciduous notophyll vine forest + *Erythrina insularis +/- Antiaris toxicaria var. macrophylla+/- Terminalia subacroptera +/- Bombax ceiba var. leiocarpum +/- Canarium australianum + Acacia auricauliformis*. Granite and rhyolite footslopes.

2i, Semi deciduous notophyll vine thicket + *Berrya javanica + Cupaniopsis anacardioides + Bombax ceiba var. leicocarpum + Diospyros hebecarpa + Mimusops elengii + Melicope peninsularis*. Basalt escarpments.

2j, Semi-deciduous notophyll vine forest +*Bombax ceiba var. leicocarpum + Diospyros hebecarpa +/- Alectryon repandodentatus + Cupaniopsis anacardiodes + Alstonia spectabilis +/- Melicope peninsularis*. Basalt hills.

2k, Deciduous vine forest + *Gyrocarpus americanus + Bombax ceiba var. leiocarpum + Antiaris toxicarya var. macrophylla + Canarium australianum + Cathormion umbellatum subsp. monoliforme + Garuga floribunda var. floribunda +/- Adenanthera pavonina +/- Maranthes corymbosa* .Basalt footslopes.

2l, Semi-deciduous notophyll vine forest + *Bombax ceiba var. leiocarpum + Gyrocarpus americanus + Garuga floribunda var. floribunda + Manilkara kauki + Diospyros maritima + Celtis philippensis.* Coastal dune.

2m, Semi-deciduous notophyll vine forest + *Milletia pinnata + Terminalia spp. + Diospyros maritima + Manilkara kauki + Aglaia eleagnoidea + Pouteria obovata + Drypetes deplanchei +/- Erythrina spp*. Coral cays.

2n, Semi deciduous notophyll vine thicket + *Canarium australianum + Antiaris toxicarya var. macrophylla + Acacia auricauliformis + Terminalia subacroptera + Manilkara kauki + Bombax ceiba var. leiocarpum.* Granite headlands.

2o, Semi deciduous notophyll vine forest + *Acacia sp.* (DGF8919+) + *Barringtonia calyptrata + Maranthes corymbosa + Syzygium forte subsp. forte + Bombax ceiba var. leicarpum + Canarium australianum.* Footslopes on metagranite.

2p, Semi deciduous vine thicket (windsheared) + *Bombax ceiba var. leiocarpum + Premna serratifolia + Acacia crassicarpa + Manikara kauki + Drypetes deplanchei + Terminalia subacroptera +/- Arenga australasica*. Coastal dunes.

2q, Tall semi deciduous vine forest + *Bombax ceiba var. leiocarpum + Berrya javanica + Antiaris toxicarya var. macrophylla + Garuga floribunda var. floribunda + Canarium australianum +/- Albizia lebbeck +/- Syzygium bamagense +/- Maranthes corymbosa.* Diorite knolls and footslopes.

2r, Semi deciduous vine forest + *Sterculia quadrifida + Canarium australianum + Cleistanthus peninsularis + Terminalia subacroptera + Antiaris toxicarya var. macrophylla +/- Paraserianthes toona + Alstonia actinophylla +/- Xanthoxylon rhetsa +/- Maniltoa lenticellata var. lenticellata.* Diorite footslopes.

2s, Semi-deciduous notophyll vine thicket (windsheared) + *Pouteria sericea + Ficus virens var. sublanceolata + Schefflera actinophylla + Garcinea warrenii + Syzygium puberulum*. Granite hillslopes.

2t, Semi-deciduous notophyll vine forest and occasional thicket with *Bombax ceiba var. leiocarpum + Canarium australianum + Terminalia spp. + Acacia polystachya*.

2u, Semi-deciduous vine forest + *Manilkara kauki + Terminalia spp. + Sterculia quadrifida + Premna serratifolia + Acacia crassicarpa + Drypetes deplanchei + Millettia pi¤ata.* Coastal dunes.

2v, Semi-deciduous vine thicket + *Acacia polystachya and Terminalia subacroptera*. Coastal headlands on rhyolite and granite.

2w, Deciduous vine thicket + *Garuga floribunda var. floribunda+ Gyrocarpus americana + Bombax ceiba var. leiocarpum +/- Antiaris toxicarya var. macrophylla.* Escarpments on basalt and scoria cones.

2x, Deciduous vine thicket + *Cochlospermum gillivraei + Bombax ceiba var. leiocarpum + Terminalia subacroptera +Sterculia quadrifida + Psydrax reticulata + Drypetes deplanchei.* Acid volcanic pavements.

2y, Semi-deciduous vine thicket + *Manilkara kauki + Terminalia subacroptera + Cordia subcordata + Premna serratifolia + Indeterminate species.* Coral cays.

2z, Low groved notophyll vine thicket + *Sterculia quadrifida + Manilkara kauki + Eugenia reinwardtiana + Pandanus sp.* Beach ridges.

Legend- Vegetation Communities and Broad Vegetation Groups of the Torres Strait Islands

Client Torres Strait Regional Authority

3D Environmental
Vegetation Assessment & Mapping Specialists
P. O. Box 959
Kenmore, Qld 4069
Phone: (07) 3411 9072; (07) 3878 4344
Mobile: 0404 577 285; 0409 426 916
www.3denvironmental.com.au

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Legend

Swamp and riparian forest complexes

3a, *Lophostemon suaveolens + Melaleuca quinquenervia + Syzygium angophoroides + Asteromyrtus brassii + Dillenia alata* swamp forest complex. Alluvial depressions, drainage lines and dune swales.

3b, Medium to tall *Melaleuca leucandendra +/- Melaleuca argentea + Syzygium forte subsp. forte + Dillenia alata* open forest. Fluvial sands and silts.

3c, Tall *Melaleuca dealbata / Melaleuca leucadendra* open forest/*Acacia sp*. open forest / *Mesophyll* vine forest complex. Seasonal swamps.

3d, Evergreen mesophyll vine forest / *Sclerophyll vine forest complex + Syzygium forte subsp. forte + Syzygium bamagense + Horsfieldia Australiana +/- Melaleuca leucadendra +/- Lophostemon suaveolens*. (1i/3b- 50/50)

3e, *Melaleuca quinquenervia + Pandanus sp. +/- Deplanchea tetraphylla swamp forest/ Lophostemon suaveolens +/- Asteromyrtus brassii +/- Acacia crassicarpa +/- Deplanchea tetraphylla* open swamp forest complex (7d/8b -50/50).

3f, *Lophostemon suaveolens + Melaleuca leucadendra + Corymbia clarksoniana* open forest.

3g, Tall *Melaleuca dealbata + Acacia crassicarpa + Acmena hemilampra + Deplanchea tetraphylla + Syzygium forte subsp. forte* swamp forest complex.

Welchidendron dominant closed to open forests and wo

4a, *Welchiodendron longivalve + Acacia polystachya +/- Terminalia subacroptera +/- Canarium australianum +/- Bombax ceiba var. leiocarpum* open to closed forest.

4b, *Welchiodendron longivalve* low woodland, low open woodland and tall open shrubland

4c, Low *Welchiodendron longivalve + Melaleuca dealbata* open forest. Granite footslopes and peidmont fans.

Eucalypt dominant open forests and woodlands

5a, *Corymbia novoguinensis +/- Eucalyptus stockeri subsp. peninsularis* woodland and open forest. Remnant sandy plains.

5b, *Corymbia clarksoniana + Corymbia nesophila +/- Corymbia tessellaris +/- Corymbia stockerii subsp. Peninsularis +/- Welchidendron longivalve* woodland and open forest. Alluvial, remnant sandy plains and granite footslopes.

5c, *Corymbia clarksoniana + Melaleuca stenostachya + Melaleuca viridiflora +/- Asteromyrtus symphiocarpa +/- Parinari nonda +/- Asteromyrtus brassii* woodland. Alluvial plains and sandy rises.

5d, Low *Corymbia clarksoniana + Melaleuca viridiflora + Welchiodendron longivalve + Asteromyrtus brassii + Acacia leptocarpa* woodland and shrubland complex. Acid volcanic hills.

5e, Low to medium *Corymbia nesophila +/- Welchiodendron longivalve +/- Eucalyptus leptophleba* open forest and woodland. Acid volcanic hillslopes.

5f, *Eucalyptus leptophleba +/- Acacia polystachya* woodland and open forest. Granite footslopes.

5g, *Corymbia tessellaris + Acacia polystachya +/- Welchiodendron longivalve* woodland and open forest. Granite hillslopes and sandy alluvium.

5h, *Corymbia spp. + Melaleuca saligna + Acacia crassicarpa +/- Eucalyptus platyphylla +/- Eucalyptus brassiana* open forest. Swampy drainage lines.

5i, *Corymbia clarksoniana +/- Corymbia novoguinensis +/- Livistona muelleri* woodland and open forest. Coastal dunes and sandy alluvial outwash.

5j, *Eucalyptus tetrodonta + Corymbia nesophila +/- Corymbia clarksoniana +/- Corymbia novoguinensis +/- Corymbia stockeri subsp*. peninsularis open forest. Coastal dunes and remnant sandy plains.

5k, *Corymbia nesophila +/- Corymbia stockeri subsp. peninsularis +/- Eucalyptus tetrodonta* woodland and open forest. Alluvial plains, sandy rises and stabilised dunes.

5l, *Corymbia stockeri subsp. peninsularis +/- Corymbia nesophila +/- Eucalyptus tetrodonta +/- Eucalyptus cullenii* woodland. Hillslopes on rhyolite and granite.

5m, Low *Corymbia spp. (C. stockeri, C. nesophila, C. clarksoniana) + Melaleuca stenostachya +/- Melaleuca viridiflora +/- Asteromyrtus symphiocarpa* woodland. Alluvial outwash and degraded dunes.

5n, *Eucalyptus platyphylla + Erythrophloeum chlorostachys +/- Corymbia nesophila +/- Corymbia novoguinensis +/- Eucalyptus tetrodonta +/- Corymbia stockeri subsp. peninsularis* woodland and open forest. Alluvial terraces and degraded dunes.

5o, *Corymbia tessellaris +/- Corymbia clarksoniana* woodland and open woodland. Coastal dunes, alluvial plains and acid volcanic hillslopes.

5p, Low *Corymbia polycarpa/Corymbia novoguinensis + Acacia crassicarpa + Teminalia subacroptera +/- Sterculia quadrifida +/- Syzygium suborbiculare* woodland and open woodland. Coastal dunes

5q, Low *Corymbia stockeri subsp. peninsularis* open forest. Alluvial plains and degraded dunes

5r, *Corymbia nesophila* woodland and open forest. Acid volcanic hills, alluvial plains and residual sands.

5s, *Corymbia clarksoniana +/- Corymbia tessellaris* woodland. Acid volcanic hillslopes and coastal alluvial plains.

5t, *Eucalyptus platyphylla +/- Corymbia stockeri subsp. peninsularis +/- Corymbia nesophila +/- Corymbia clarksoniana* woodland. Alluvial plains and acid volcanic hillslopes (and minor coastal dunes).

5u, *Eucalyptus platyphylla +/- Corymbia tessellaris* woodland and open woodland. Coastal dunes, alluvial plains and acid volcanic/plutonic headland and hillslopes.

5v, *Eucalytpus stockerii sub.sp peninsularis + Welchidendron longivalve + Acacia polystachya +/- Corymbia tessellaris* woodland/ open forest complex. Granite hills.

Acacia dominant open forests and woodlands

6a, Low to medium *Acacia auricauliformis +/- Terminalia subacroptera +/- Antiaris toxicarya var. macrophylla +/- Bombax ceiba var. leiocarpum* open forest/woodland/ (and occasional shrubland).Granite hillslopes

6b, Low to medium *Acacia auricauliformis +/- Parinari nonda +/- Pandanus sp. +/- Semecarpus australiensis* open forest/woodland (and occasional shrubland). Coastal alluvial plains

6c, Low *Acacia crassicarpa + Terminalia subacroptera + Sterculia quadrifida + Manilkara kauki + Syzygium suborbiculare* open forest and woodland. Beach ridges.

6d, Low *Acacia crassicarpa + Melaleuca spp*. open forest. Dune swales.

6e, Low *Acacia polystachya + Alstonia actinophylla + Buchanania arborescens + Manilkara kauki + Pouteria sericea + Sterculea quadrifida* open to closed forest. Exposed slopes on diorite.

6f, *Acacia sp*. closed shrubland**.** Acid volcanic escarpments.

6g, *Acacia crassicarpa +Asteromyrtus brassii* open forest and low open forest. Coastal dunes.

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Phone: (07) 3411 9072; (07) 3878 4344
Mobile: 0404 577 285; 0409 426 916
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Melaleuca dominant open forests

7a, Low *Melaleuca cajuputi subsp. platyphylla* open forest. Alluvial plains and drainage depressions.

7b, *Melaleuca saligna* open forest. Alluvial plains, drainage depressions and dune swales.

7br, *Melaleuca saligna* open forest. Riparian fringes on alluvium.

7bs, *Melaleuca saligna* open forest. Alluvial margins of salt pans

7c, Tall *Melaleuca dealbata + Corymbia clarksoniana* open forest. Alluvial plains

7d, *Melaleuca quinquenervia +/- Melaleuca saligna +/- Melaleuca cajuputi subsp. platyphylla +/- Lophostemon suaveolens* open forest. Coastal dunes and alluvial swamps.

7e, Low *Melaleuca dealbata +/- Melaleuca saligna +/- Lophostemon suaveolens* open forest. Dune swales.

7f/7fs, *Melaleuca leucadendra* open forest. Seasonal swamps and riparian margins.

7g, *Melaleuca dealbata* woodland and open forest. Coastal dune complexes

Lophostemon dominant woodland and open forest

8a, *Lophostemon suaveolens +/- Melaleuca cajuputi subsp. platyphylla +/- Pandanus sp. +/- Livistona muelleri* woodland and open forest. Alluvial remnants of the Fly Platform.

8b, Low *Lophostemon suaveolens +/- Melaleuca saligna + Asteromyrtus brassii + Acacia crassicarpa* open forest. Sandy alluvial soils.

8c, Low *Lophostemon suaveolens + Corymbia clarksoniana + Asteromyrtus symphiocarpa + Melaleuca saligna + Melaleuca viridiflora +/- Corymbia latifolia* open woodland. Degraded dune margins.

Asteromyrtus/Neofabricia dominant open forests

9a, *Asteromyrtus brassii + Syzygium angophoroides + Acmena hemilampra subsp. hemilampra +/- Acacia crassicarpa +/- Melaleuca quinquenervia* open forest. Sandy rises erosional plain.

9b, *Neofabricia myrtifolia + Parinari nonda + Sterculia quadrifida + Terminalia muelleri +Milletia pinnata* closed to open forest. Coastal dunes

Casuarina dominant woodland and open forest

10a, *Casuarina equisetifolia* open forest + *Diospyros maritima + Premna serratifolia + Milletia pinnata.* Coral cays

10b, *Casuarina equisetifolia* woodland and open forest +/- *Terminalia catappa* woodland and open forest. Coastal foredune

Pandanus dominant woodland and shrubland

11a, *Pandanus sp. +/- Melaleuca catjaputi subsp. platyphylla +/- Acacia leptocarpa +/- Melaleuca acacioides* shrubland and low woodland. Alluvial plains (Quaternary and Pleistocene).

11b, *Pandanus sp. +/- Melaleuca viridiflora* open forest, woodland and shrubland. Seepage zones on alluvium, dune swales and granite headlands.

Palm dominant forest and woodlands

12a, *Livistona meulleri* woodland. **Granite footslopes.**

12b, Low *Nypa fruiticans* closed forest. **Brackish tidal areas**

Melaleuca dominant shrublands and woodlands

13a, *Melaleuca viridiflora +/- Pandanus sp.* shrubland and low woodland. Alluvial plains, residual sands, acid volcanic slopes and coastal dunes.

13b, *Melaleuca cajuputi subsp. platyphylla +/- Pandanus sp*. shrubland. Alluvial plains.

13c, *Melaleuca viridiflora + Asteromyrtus symphiocarpa +/-Asteromyrtus brassii + /- Banksia dentata +/- Melaleuca saligna +/- Leucopogon ruscifolius* shrubland. Alluvial soils and residual sand plains.

13d, *Melaleuca saligna + Melaleuca viridiflora + Asteromyrtus symphiocarpa +/- Asteromyrtus brassii +/- Corymbia spp. +/- Banksia dentata* low woodland. Alluvial outwash plains, residual sands and coastal dunes.

13e, *Melaleuca acacioides* shrubland. Alluvial outwash on saline margins.

13f, Low *Melaleuca viridiflora + Corymbia clarksoniana* woodland. Alluvial plains and residual sands.

13g, Low *Melaleuca saligna* shrubland. Seasonal swamps.

13h, Low *Melaleuca arcana* closed shrubland. Dune swamps.

13i, *Melaleuca stenostachya shrubland +/- Melaleuca viridiflora* low woodland. Alluvial plains and granite headlands.

13j, *Melaleuca acacioides +/- Melaleuca viridiflora* open shrubland. Alluvial outwash on saline margins.

Shrublands and shrubland complexes

14a, Dwarf *Welchiodendron longivalve + Alyxia spicata +/- Melaleuca viridiflora +/- Acacia spp. +/- Asteromyrtus brassii* shrubland. Coastal headlands and ridgelines.

14b, *Melaleuca catjaputi subsp. platyphylla + Acacia auricauliformis +/- Terminalia subacroptera* open scrub and low open forest. Alluvial remnants of the Fly Platform.

14c, *Welchiodendron longivalve* shrubland. Escarpments and hillslopes on rhyolite and granite

14d, *Cochlospermum gillivraei +/- Canarium australianum +/- Welchiodendron longivalve* deciduous shrubland. Coastal headlands on acid volcanic rocks

14e, Low open shrubland with *Baeckea frutescens, Melaleuca viridiflora and Asteromyrtus brassii*. Residual sand dunes.

14f, *Melaleuca viridiflora + Melaleuca stenostachya + Welchiodendron longivalve + Acacia leptocarpa +/- Cochlospermum gillivraei* shrubland. Coastal headlands on rhyolite and granite.

14g, *Low Alyxia spicata + Manilkara kauki +/- Buchanania arborescens +/- Canarium australianum +/- Diospyros spp. +/- Pandanus sp.* low closed shrubland/ rock pavement complex.

14h, *Acacia polystachya +/- Welchiodendron longivalve* closed shrubland. Granite hillslopes

14i, *Asteromrytus brassii + Melaleuca saligna + Baeckea frutescens + Leucopogon yorkensis + Leucopogon ruscifolius +/- Lophostemon suaveolens* shrubland and low shrubland. Residual sand plains.

14j, *Acacia brassii +/- Welchiodendron longivalve* closed shrubland. Acid volcanic pavements.

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Mobile: 0404 577 285; 0409 426 916
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Legend

Shrublands and shrubland complexes (Continued)

14k, Low *Melaleuca stenostachya + Asteromyrtus symphiocarpa + Jacksonia thesioides + Melaleuca viridiflora* shrubland. Acid volcanic pavements.

14l, Low *Melaleuca sp.* (Zuna DGF9257+) + *Welchiodendron longivalve + Corymbia spp. + Acacia brassii + Melaleuca stenostachya + Jacksonia thesioides* shrubland. Coastal headlands on acid volcanic and igneous rocks.

14m, *Grevillea striata + Acacia crassicarpa + Melaleuca viridiflora + Parinari nonda + Pandanus sp. + Corymbia tessellaris* shrubland. Alluvial plains.

14n, *Acacia crassicarpa + Leucopogon ruscifolius +/- Neofabricia myrtifolia +/- Pouteria sericea +/- Psydrax banksii +/- Halfordia kendack* shrubland and open shrubland.

14o, *Melaleuca saligna* dominant riparian shrubland complex. Riparian alluvial fringes and gravel beds.

14p, *Asteromyrtus brassii + Petalostigma pubescens + Melaleuca viridiflora + Asteromyrtus brassii + Acacia crassicarpa + Corymbia clarksoniana* shrubland. Acid volcanic hills.

14q, Low *Cycas sp.* open shrubland. Relict beach ridges.

14r, *Acacia crassicarpa + Pandanus sp. + Melaleuca viridiflora +/- Parinari nonda +/- Banksia dentata +/- Lophostemon suaveolens* shrubland. Coastal outwash plains.

14s, Low sparse *Leucopogon ruscifolius + Acacia crassicarpa + Syzygium sub-orbiculare shrubland* with *Corymbia novoguinensis* emergents.

14t, Low sparse shrubland of *Cochlospermum gillivraei, Canarium australianum, Eugenia reinwardtiana, Terminalia sp. with Pandanus sp.* Coastal dunes.

14u, Low *Corymbia stockerii subsp. stockerii + Welchiodendron longivalve* open forest/ *Welchidendron longivalve* closed scrub/ deciduous shrubland/rock pavement complex (5v/4a/18a/18d – 30/40/20/10)

14v, *Eucalyptus leptophleba + Grevillea parallela + Exocarpos latifolius + Terminalia sp. + Acacia crassicarpa* shrubland. Aeolian dunes.

14w, *Eucalyptus cullenii + Corymbia stockeri subsp. peninsularis* woodland +/- *Eucalyptus tetrodonta + Welchiodendron longivalve + Melaleuca stenostachya* shrubland / *Low Acacia brassii* shrubland/ Deciduous shrubland complex (5l/14x/14j/18a – 20/40/30/10).

14x, *Eucalyptus tetrodonta + Welchiodendron longivalve + Melaleuca stenostachya* open to sparse shrubland. Acid volcanic pavements.

14y, Low *Premna serratifolia + Cordia subcordata +/-Pemphis acidula +/-Drypetes deplanchei* shrubland.

Coastal headland forest complexes

15a, Semi deciduous vine thicket / *Pandanus sp.* open forest complex. Basalt escarpment.

Coastal dune complexes

16a, Coastal foredune grassland, herbland and shrubland complex. (17j/14y – 70/30).

16b, Coastal foredune grassland/ Casuarina equisetifolia +/- Pandanus sp. +/- Acacia crassicarpa shrubland complex. (17j/ 10b/6c – 30/20/50).

16c, Coastal dune swale shrubland/Low open forest complex + *Cochlospermum gillivraei + Canarium australianum + Terminalia subacroptera + Acacia crassicarpa + Melaleuca saligna + Melaleuca acacioides*. (14t/7b – 70/30)

16d, Coastal dune shrubland and vine forest complex (14t/2z – 70/30).

16e, *Corymbia tessellaris* woodland and open forest/ shrubland/ vine thicket complex (5o/14t/2z– 40/40/20)

16f, *Casuarina equisetifolia* woodland and open forest/vine thicket complex (10b/2z – 60/40).

16g, Low *Acacia crassicarpa/ Melaleuca dealbata* open forest dune swale complex (6c/7g - 80/20).

16h, Low groved notophyll vine thicket + *Terminalia muelleri + Diospyros maritima + Premna serratifolia + Thespesia populneoides + Manilkara kauki* (2y/17j – 80/20).

16j, Low groved notophyll vine thicket/ grassland and herbland complex.(2z/17j - 80/20)

16k, Coastal foredune grassland, herbland, woodland and vine thicket complex. (17j/17d/10b/1c – 50/20/20/10).

Grasslands and grassland complexes

17a, Tall *Ischeamum australe +/- Imperata cylindrica +/- Themeda triandra +/- Mnesithea rottboellioides +/- Heteropogon triticeus* grassland. Alluvial remnants of the Fly Platform.

17b, *Themeda sp. +/- Imperata cylindrica +/- Mnesithea rottboellioides* grassland. Basalt hillslopes

17be, *Themeda sp. +/- Imperata cylindrica +/- Mnesithea rottboellioides* grassland (Lantana degraded). Basalt hillslopes

17bs, *Themeda sp. +/- Imperata cylindrica +/- Mnesithea rottboellioides* grassland (severe erosion). Basalt hillslopes

17c, Open to closed tussock grassland with emergent shrubs. Coastal headlands

17d, Medium to tall *Mnesithea rottboellioides + Heteropogon triticeus + Cymbopogon spp. +/- Imperata cylindrica +/- Themeda triandra* grassland. Alluvial and residual plains, coastal dunes and granite footslopes.

17e, Relict cultivated alluvial plains with anastomosing channel morphology. Alluvial remnants of the Fly Platform.

17f, *Imperata cylindrica* dominant grassland. Coastal dunes.

17g, *Imperata/Themeda* grassland complex with emergent shrubs. Alluvial plains.

17h, *Imperata cylindrica + Themeda triandra* grassland/*Welchiodendron longivalve* open forest and woodland complex. Fire degraded granite slopes.

17i, Low sedgeland with emergent shrubs and trees. Residual sand plains and degraded dunes.

17j, *Low Spinifex sericeus+ Vigna marina+Ipomoea pes-caprae + Sesuvium portulacastrum* grassland and forbland complex

Rock pavement complexes

18a, Deciduous shrubland/Rock pavement complex. Rocky slopes on acid volcanic and plutonic rocks.

18b, Low *Acacia brassii +/- Welchiodendron longivalve +/- Cochlospermum gillivraei* shrubland/ rock pavement complex (18a/14j -50/50).

18c, *Welchiodendron longivalve +/- Acacia polystachya* closed shrubland / Low deciduous shrubland/rock pavement complex (18a/14c – 50/50)

18d, *Corymbia stockerii subsp. peninsularis + Welchidendron longivalve + Psydrax banksi + Dodonoea sp. + Ficus platypoda* rock pavement complex.

Boulder slope vineland/shrubland complexes

19a, Open vineland/deciduous shrubland/boulder slope complex. Granite talus and boulder slopes.

Wetland complexes and mosaics

20a, *Eleaocharis dulcis* closed sedgeland.Seasonal swamps.

20b, Open wetland complex. Perennial swamps.

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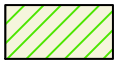
Legend



Successional vine forest communities

21a, Low vine forest and vine thicket with *Barringtonia calyptrata* + *Macaranga involucrata* + *Hibiscus tiliaceus* + *Semecarpus australiensis* successional vine forest and thicket. Basaltic cones.

Anthropogenically altered (secondary) vine forest an

22a, Tall palm (Cocos nucifera) woodland and open forest with *mesophyll/notophyll* vine forest sub-canopy of *Myristica insipida and Lepidopetalum fructoglabrum*. Basalt terraces

22b, Semi deciduous vine thicket + *Buchanania arborescens* + *Manilkara kauki* + *Scolopia braunii* + *Drypetes deplanchei* + *Terminalia muelleri*. Relict gardens of coral cays.

Saline transitional communities

23a, Low *Excoecaria agallocha* + *Hibiscus tiliaceus* + *Thespesia populneoides* + *Melaleuca cajuputi subsp. platyphylla* open forest. Saline margins of alluvial plains.

23b, *Pemphis acidula* +/- *Terminalia subacroptera* +/- *Premna serratifolia* closed shrubland. Calcareous sands.

23c, Semi deciduous transitional vine forest + *Xylocarpus granatum* + *Manilkara kauki*. Calcareous beach ridges.

Mangrove forest, woodland and shrubland complexes

24a, Mangrove closed and open forest, woodland and shrubland complexes (24d/24c – 80/20).

24b, *Pemphis acidula* + *Osbornia octodonta* closed shrubland.

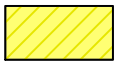
24c, *Avicennia marina subsp. eucalyptifolia* open to closed forest. Saline alluvial soils.

24d, Open to closed forest of *Bruguiera gymnorhiza* +/- *Rhizophora stylosa*. Intertidal coral platforms.

Samphire herblands and shrublands and salt pans.

25a, Dwarf *halophytic* shrubland and saltpan. Hypersaline muds.

25b, Salt pan. Hypersaline muds.



Samphire grasslands

26a, Closed *Sporobulus sp.* grassland.

26b, *Sporobulus sp.* grassland/Chenopod forbland and herbland complex

Estuarine wetland complexes and mosaics

27a, *Schoenoplectus sp.* sedgeland.

27b, Tall *Schoenoplectus sp.* sedgeland/ wetland complex

Tidal Lagoon

Tidal Lagoon

Rock

R, Rock

Artificial wetland

Artificial wetland

Exotic species

Ex, Communities dominated by exotic species

Bamboo, Bamboo thicket

Reclaimed land

RL, Reclaimed land

Regrowth

Re, Regrowth

Cleared

Cl, Cleared

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Appendix A2. Map Legend – Land Zones

Legend - Land Zones of the Torres Strait Islands

Land Zone

Land Zone 1

E. Estuarine muds including saline and brackish alluvium.

Land Zone 2

D. Coastal dunes, cheniers, calcareous beach sands (including atolls), beach ridges and associated swales.

Land Zone 3

A. Alluvial plains, alluvial fans, terraces and fluvial sediments.

Land Zone 5

AS. Residual sandy plains and sandy terraces

L. Exposed duricrust

T. Remnant colluvial surfaces.

Land Zone 8

B. Basalt escarpments and terraces

V. Volcanic cones formed on ash and scoria

Land Zone 12

G. Granite hillslopes and footslopes including boulder talus and colluvium.

GD. Diorite hills and knolls

MG. Metamorphosed granitoid rocks including hornfels

R. Acid volcanic hillslopes and footslopes including rhyolites and dacites.

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Appendix B. Torres Strait Islands Flora Species List[11]

Family_Name	Botanical_Name	BRI	C'veg	3DE
Pteridiophytes				
Adiantaceae	Adiantum atroviride Bostock	X		
	Adiantum philippense L.	X		X
	Cheilanthes caudata R.Br.	X		
	Cheilanthes contigua Baker	X		
	Cheilanthes nitida (R.Br.) P.S.Green	X		X
	Cheilanthes nudiuscula (R.Br.) T.Moore	X		X
	Cheilanthes prenticei Luerss.	X		
	Cheilanthes pumilio (R.Br.) F.Muell.	X		
	Cheilanthes tenuifolia (Burm.f.) Sw.	X		X
	Doryopteris concolor (Langsd. & Fisch.) Kuhn	X		X
Aspleniaceae	Asplenium nidus L.	X		X
Blechnaceae	Blechnum indicum			X
	Stenochlaena palustris (Burm.f.) Bedd.	X		X
Davalliaceae	Davallia denticulata (Burm.f.) Mett. var. denticulata	X		X
	Humata pectinata (Sm.) Desv.	X		
Gleicheniaceae	Dicranopteris linearis (Burm.f.) Underw. var. linearis	X		
Lindsaeaceae	Lindsaea brachypoda (Baker) Salomon	X		
	Lindsaea ensifolia Sw. subsp. ensifolia	X		X
	Lindsaea media R.Br.	X		X
Nephrolepidaceae	Nephrolepis obliterata (R.Br.) J.Sm.	X		X
Ophioglossaceae	Helminthostachys zeylanica (L.) Kaulf.	X		X
	Ophioglossum sp.	X		
Parkeriaceae	Ceratopteris thalictroides (L.) Brongn.	X		X
Polypodiaceae	Drynaria quercifolia (L.) J.Sm.	X		X
	Drynaria sparsisora (Desv.) T.Moore	X		X
	Lecanopteris sinuosa (Wall. ex Hook.) Copel.	X		
	Microsorum grossum (Langsd. & Fisch.) S.B.Andrews	X		
	Microsorum punctatum (L.) Copel.	X		X
	Pyrrosia lanceolata (L.) Farw.	X		X
	Pyrrosia longifolia (Burm.f.) C.V.Morton	X		X
Pteridaceae	Acrostichum speciosum Willd.	X		X
Schizaeaceae	Lygodium flexuosum (L.) Sw.	X		X
	Lygodium microphyllum (Cav.) R.Br.	X		X
	Schizaea dichotoma (L.) Sm.	X		X
Selaginellaceae	Selaginella ciliaris (Retz.) Spring	X		
	Selaginella longiciliata Hieron.	X		
Thelypteridaceae	Cyclosorus interruptus (Willd.) H.Ito	X		X
Vittariaceae	Vittaria elongata Sw.	X		
	Vittaria ensiformis Sw.	X		X

[11] Preliminary pending identification of all survey records; Nomenclature follows Bostock and Holland (2007); * denotes naturalized species; BRI denotes Qld Herbarium Aug 2007 Herbrecs extract; Cveg denotes EPA Corveg records; 3DE denotes 3d Environmental 2007/2008 survey records.

Family_Name	Botanical_Name	BRI	C'veg	3DE
Gymnosperms				
Podocarpaceae	Podocarpus grayae de Laub.	X		X
Angiosperms				
Acanthaceae	Acanthus ilicifolius L.	X		X
	Asystasia australasica F.M.Bailey	X		X
	Asystasia gangetica (L.) T.Anderson subsp. gangetica*	X		
	Barleria cristata L.*	X		
	Barleria prionitis L.*	X		
	Brunonialis acaulis		X	
	Brunoniella australis (Cav.) Bremek.	X	X	
	Dicliptera ciliata Decne.	X		
	Dicliptera glabra Decne.	X		
	Dipteracanthus bracteatus (R.Br.) Nees	X		X
	Dipteracanthus prostratus (Poir.) Nees*	X		
	Graptophyllum pictum (L.) Griff.	X		
	Hygrophila angustifolia R.Br.	X		
	Hypoestes floribunda R.Br.	X		X
	Nelsonia campestris R.Br.	X		
	Pseuderanthemum variabile (R.Br.) Radlk.	X		X
	Ruellia tuberosa L.*	X		
	Ruellia tweediana Griseb.*	X		
	Staurogyne leptocaulis subsp. decumbens R.M.Barker	X		
	Thunbergia arnhemica F.Muell.	X		
Agavaceae	Agave sisalana Perrine*	X		X
	Agave vivipara L. var. vivipara*	X		
	Cordyline cannifolia			X
Aizoaceae	Sesuvium portulacastrum (L.) L.	X		X
	Trianthema portulacastrum L.*	X		X
Amaranthaceae	Achyranthes aspera L.	X		X
	Alternanthera angustifolia R.Br.	X		
	Alternanthera brasiliana (L.) Kuntze cv. Rubiginosa*	X		
	Alternanthera brasiliana (L.) Kuntze*	X		
	Alternanthera denticulata R.Br.	X		
	Alternanthera ficoidea (L.) P.Beauv.*	X		X
	Alternanthera micrantha (Benth.) Domin	X		
	Alternanthera nana R.Br.	X		X
	Alternanthera pungens Kunth*	X		X
	Alternanthera sessilis (L.) R.Br. ex DC.*	X		
	Alternanthera sp.	X		
	Amaranthus blitum L.*	X		
	Amaranthus hybridus L.*	X		
	Amaranthus interruptus R.Br.	X		
	Amaranthus sp.	X		
	Amaranthus undulatus R.Br.	X		
	Amaranthus viridis L.*	X		
	Celosia argentea L.*	X		

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Cyathula prostrata (L.) Blume	X		
	Deeringia amaranthoides (Lam.) Merr.	X		X
	Gomphrena breviflora F.Muell.	X		
	Gomphrena celosioides Mart.*	X		X
	Gomphrena conferta Benth.	X		
	Gomphrena flaccida R.Br.	X		
	Ptilotus distans subsp. capensis Benl	X		
Amaryllidaceae	Crinum angustifolium R.Br.	X		X
	Crinum uniflorum F.Muell.	X		X
	Proiphys amboinensis (L.) Herb.	X		X
Anacardiaceae	Anacardium occidentale L.*	X		X
	Buchanania arborescens (Blume) Blume	X	X	X
	Mangifera indica L.*	X		X
	Semecarpus australiensis Engl.	X		X
Annonaceae	Annona glabra L.* (Class 2)	X		
	Annonaceae sp. [12]	X		
	Meiogyne sp. (Moa Island DGFell 9718 + DJ Stanton)	X		X
	Desmos wardianus (F.M.Bailey) Jessup	X		X
	Haplostichanthus fruticosus Jessup	X		X
	Meiogyne cylindrocarpa subsp. trichocarpa Jessup	X		X
	Melodorum leichhardtii			X
	Melodorum scabridulum Jessup	X		
	Miliusa brahei			X
	Miliusa horsefieldii			X
	Miliusa traceyi Jessup	X		X
	Polyalthia australis			X
	Uvaria concava Teijsm. & Binn.	X		
	Uvaria rufa Blume	X		X
Apiaceae	Centella asiatica (L.) Urb.	X		X
Apocynaceae	Alstonia actinophylla (A.Cunn.) K.Schum.	X	X	X
	Alstonia spectabilis R.Br. subsp. spectabilis	X		X
	Alyxia spicata R.Br.	X	X	X
	Brachystelma glabriflorum (F.Muell.) Schltr.	X		
	Calotropis gigantea (L.) W.T.Aiton*	X		
	Carissa laxiflora Benth.	X		X
	Carissa ovata		X	X
	Catharanthus roseus (L.) G.Don*	X		X
	Cerbera manghas L.	X		X
	Cynanchum brachystelmoides P.I.Forst.	X		
	Cynanchum carnosum (R.Br.) Schltr.	X		X
	Cynanchum leptolepis (Benth.) Domin	X		
	Dischidia littoralis Schltr. (Vulnerable)	X		X
	Dischidia major (Vahl) Merr.	X		X
	Dischidia nummularia R.Br.	X	X	X

[12] M.Lawrie 122, Mer. Noted as an edible fruit tree. Possibly naturalized.

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Dischidia ovata Benth.	X	X	X
	Hoya australis R.Br. ex Traill subsp. australis	X		X
	Hoya australis subsp. sanae (F.M.Bailey) K.D.Hill	X		X
	Hoya revoluta Wight ex Hook.f. (Rare)	X		X
	Ichnocarpus frutescens (L.) W.T.Aiton	X		
	Marsdenia connivens P.I.Forst.	X		
	Marsdenia tricholepis (Schltr.) P.I.Forst.	X		
	Marsdenia velutina R.Br.	X		
	Marsdenia viridiflora subsp. tropica P.I.Forst.	X		
	Parsonsia velutina R.Br.	X		X
	Sarcostemma viminale subsp. brunonianum (Wight & Arn.) P.I.Forst.	X	X	X
	Secamone auriculata Blume (Rare)	X		X
	Secamone elliptica R.Br.	X		X
	Secamone lineata Blume	X		
	Tabernaemontana orientalis R.Br.	X		X
	Tabernaemontana pandacaqui Lam.	X	X	X
	Tylophora benthamii Tsiang	X		X
	Tylophora erecta F.Muell. ex Benth.	X		
	Voacanga grandifolia (Miq.) Rolfe	X		X
	Wrightia pubescens subsp. penicillata (F.M.Bailey) Ngan	X		X
	Wrightia saligna (R.Br.) F.Muell. ex Benth.	X	X	
	Wrightia versicolor S.T.Blake	X		X
Aquifoliaceae	Ilex arnhemensis subsp. ferdinandi (Harms) Pedley	X		X
Araceae	Alocasia macrorrhizos (L.) G.Don	X		
	Amorphophallus paeoniifolius (Dennst.) Nicolson	X		X
	Epipremnum pinnatum (L.) Engl.	X		X
	Epipremnum amplissimum			X
	Typhonium brownii Schott	X		
	Typhonium flagelliforme (Lodd.) Blume	X		
	Typhonium weipanum A.Hay	X		
Araliaceae	Polyscias australiana (F.Muell.) Philipson	X		X
	Polyscias elegans (C.Moore & F.Muell.) Harms	X		X
	Polyscias macgillivrayi (Seem.) Harms	X		X
	Polyscias scutellaria (Burm.f.) Fosberg	X		
	Schefflera actinophylla (Endl.) Harms	X		X
	Trachymene tenuifolia (Domin) B.L.Burtt	X		X
Arecaceae	Arenga australasica (H.Wendl. & Drude) S.T.Blake (Vulnerable)	X		X
	Cocos nucifera*			X
	Corypha utan			X
	Hydriastele costata F.M.Bailey (Vulnerable)	X		
	Hydriastele wendlandiana			X
	Licuala ramsayi			X
	Livistona benthamii			X
	Livistona muelleri F.M.Bailey	X	X	X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Metroxylon sagu			X
	Normanbya sp. (DGFell 9751 + DJStanton)			X
	Nypa fruticans			X
	Ptychosperma elegans (R.Br.) Blume	X		X
	Ptychosperma macarthurii			X
Aristolochiaceae	Aristolochia acuminata Lam.	X		X
	Aristolochia chalmersii (Endangered)			X
	Pararistolochia sp.	X		
	Paristolochia sp. (DGF9651+DJS)[13]			X
Asteraceae	Acanthospermum hispidum DC.*	X		X
	Acmella grandiflora var. brachyglossa (Benth.) R.K.Jansen	X		
	Ageratum conyzoides L. subsp. conyzoides*	X		X
	Allopterigeron filifolius (F.Muell.) Dunlop	X	X	
	Bidens bipinnata L.*	X		X
	Bidens pilosa L.*	X		X
	Bidens sp.	X		
	Blainvillea dubia Specht	X		
	Blumea diffusa R.Br. ex Benth.	X		
	Blumea lacera (Burm.f.) DC.	X		
	Blumea saxatilis Zoll. & Moritzi	X	X	X
	Cosmos caudatus Kunth*	X		
	Cyanthillium cinereum (L.) H.Rob.	X	X	X
	Eclipta prostrata (L.) L.	X		X
	Eleutheranthera ruderalis (Sw.) Sch.Bip.*	X		
	Emilia sonchifolia (L.) DC. var. sonchifolia*	X		X
	Epaltes australis Less.	X		X
	Glossocardia bidens (Retz.) Veldkamp	X		X
	Peripleura diffusa (N.T.Burb.) G.L.Nesom	X		X
	Phacellothrix cladochaeta (F.Muell.) F.Muell.	X	X	
	Pluchea indica (L.) Less.	X		X
	Praxelis clematidea R.M.King & H.Rob.*	X		X
	Pseudelephantopus spicatus (B.Juss. ex Aubl.) C.F.Baker*	X		
	Pterocaulon redolens (Willd.) Fern.-Vill.	X		X
	Pterocaulon sphacelatum (Labill.) F.Muell.	X		X
	Sphaeranthus africanus L.	X		
	Sphagneticola trilobata (L.) Pruski* (Class 3)	X		X
	Synedrella nodiflora (L.) Gaertn.*	X		X
	Tithonia diversifolia (Hemsl.) A.Gray*	X		
	Tridax procumbens L.*	X		X
	Vernonia junghuhniana J.Kost.*	X		
	Wedelia biflora		X	
	Wedelia longipes Klatt	X		
	Wedelia spilanthoides F.Muell.	X		X

[13] Requires confirmation

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Wollastonia biflora (L.) DC.	X		X
	Xanthium occidentale Bertol.*	X		
	Zinnia violacea Cav.*	X		
Avicenniaceae	Avicennia marina (Forssk.) Vierh.	X		X
	Avicennia marina subsp. australasica (Walp.) J.Everett	X		X
	Avicennia marina subsp. eucalyptifolia (Valeton) J.Everett	X	X	X
Bataceae	Batis argillicola P.Royen	X		
Bignoniaceae	Deplanchea tetraphylla (R.Br.) F.Muell.	X		X
	Dolichandrone alternifolia (R.Br.) Seem.	X		
	Dolichandrone heterophylla		X	
	Pandorea pandorana (Andrews) Steenis	X		X
	Tecoma stans (L.) Juss. ex Kunth var. stans*	X		X
Bombacaceae	Bombax ceiba var. leiocarpum A.Robyns	X	X	X
	Camptostemon schultzii Mast.	X		X
Boraginaceae	Argusia argentea (L.f.) Heine	X		X
	Carmona retusa (Vulnerable)			X
	Cordia dichotoma G.Forst.	X		X
	Cordia myxa			X
	Cordia subcordata Lam.	X		X
	Heliotropium vagum Craven	X		
Brassicaceae	Rorippa eustylis (F.Muell.) L.A.S.Johnson	X		X
Brownlowiaceae	Berrya javanica			X
	Indigator fordii			X
Burmanniaceae	Burmannia juncea Sol. ex R.Br.	X		
Burseraceae	Canarium australianum F.Muell. var. australianum	X	X	X
	Garuga floribunda Decne. var. floribunda	X		X
	Canarium vitiense			X
Byblidaceae	Byblis liniflora Salisb.	X		
Byttneriaceae	Abroma molle DC.	X		
	Commersonia bartramia[14]			X
	Melochia corchorifolia L.	X		
	Waltheria indica L.	X		X
Cactaceae	Opuntia stricta (Haw.) Haw.* (Class 2)	X		
Caesalpiniaceae	Bauhinia monandra Kurz*	X		
	Caesalpinia bonduc (L.) Roxb.	X		X
	Cassia fistula L.*	X		X
	Chamaecrista absus (L.) H.S.Irwin & Barneby var. absus	X		
	Chamaecrista mimosoides (L.) Greene	X		
	Chamaecrista nomame (Siebold) H.Ohashi var. nomame	X		
	Chamaecrista rotundifolia (Pers.) Greene var. rotundifolia*	X		
	Delonix regia (Bojer ex Hook.) Raf.*	X		X
	Erythrophleum chlorostachys (F.Muell.) Baill.	X	X	X

[14] Requires confirmation against Moa Is. Collection, Commersonia sp. (DGF8919a+)

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Intsia bijuga (Colebr.) Kuntze	X		X
	Lysiphyllum binatum (Blanco) de Wit	X		X
	Maniltoa lenticellata C.T.White var. lenticellata	X		X
	Peltophorum pterocarpum			X
	Senna alata (L.) Roxb.*	X		X
	Senna gaudichaudii (Hook. & Arn.) H.S.Irwin & Barneby	X		
	Senna obtusifolia (L.) H.S.Irwin & Barneby* (Class 2)	X		
	Senna occidentalis (L.) Link*	X		X
	Senna surattensis (Burm.f.) H.S.Irwin & Barneby	X		
	Senna tora (L.) Roxb.* (Class 2)	X		
Campanulaceae	Isotoma gulliveri F.Muell.	X		
	Lobelia dioica R.Br.	X		
	Lobelia douglasiana F.M.Bailey (Rare)	X		
	Lobelia stenophylla Benth.	X		
	Wahlenbergia caryophylloides P.J.Sm.	X		X
	Wahlenbergia gracilis (G.Forst.) A.DC.	X		X
Cannaceae	Canna indica L.*	X		X
Capparaceae	Capparis canescens Banks ex DC.	X	X	X
	Capparis lucida (DC.) R.Br. ex Benth.	X		X
	Capparis quiniflora DC.	X		X
	Capparis sepiaria L.	X		X
	Capparis sp.	X		
Caricaceae	Carica papaya*			X
Caryophyllaceae	Polycarpaea corymbosa var. torrensis Pedley	X		
Casuarinaceae	Allocasuarina littoralis (Salisb.) L.A.S.Johnson	X		X
	Casuarina equisetifolia L. subsp. equisetifolia	X		
	Casuarina equisetifolia subsp. incana (Benth.) L.A.S.Johnson	X		X
Celastraceae	Elaeodendron melanocarpum F.Muell.	X		X
	Gymnosporia inermis Merr. & L.M.Perry	X		X
	Pleurostylia opposita (Wall.) Alston	X		X
	Salacia chinensis L.	X		X
	Salacia disepala (C.T.White) Ding Hou	X		X
	Siphonodon pendulus F.M.Bailey	X	X	X
Ceratophyllaceae	Ceratophyllum demersum L.	X		
Chenopodiaceae	Salsola kali L.	X		X
	Tecticornia australasica (Moq.) Paul G.Wilson	X		X
Chrysobalanaceae	Maranthes corymbosa Blume	X		X
	Parinari nonda F.Muell. ex Benth.	X	X	X
Cleomaceae	Cleome aculeata L.*	X		
	Cleome gynandra L.*	X		
	Cleome tetrandra var. pentata Hewson	X		
	Cleome viscosa L.	X		X
Clusiaceae	Calophyllum australianum F.Muell. ex Vesque	X		X
	Calophyllum inophyllum L.	X		X
	Calophyllum sil Lauterb.	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Garcinia sp. (DGF9722+DJS)[15]			X
	Garcinia sp. (Claudie River L.J.Brass 19658)	X		X
	Garcinia warrenii F.Muell.	X		X
Colchicaceae	Schelhammera multiflora		X	
Cocholospermaceae	Cochlospermum gillivraei Benth.	X	X	X
Colchicaceae	Gloriosa superba L.*	X		X
Combretaceae	Lumnitzera sp.	X		X
	Lumnitzera littorea (Jack) F.Voigt	X		X
	Lumnitzera racemosa Willd.	X	X	X
	Quisqualis indica L.*	X		
	Terminalia arenicola Byrnes	X		X
	Terminalia catappa L.	X		X
	Terminalia complanata			X
	Terminalia muelleri Benth.	X	X	X
	Terminalia sericocarpa F.Muell.	X		X
	Terminalia subacroptera Domin	X		X
Commelinaceae	Aneilema siliculosum R.Br.	X		
	Cartonema baileyi F.M.Bailey	X		
	Cartonema parviflorum Hassk.	X		
	Cartonema spicatum R.Br.	X		
	Cartonema spicatum var. humile Hassk.	X		
	Commelina benghalensis L.*	X		X
	Commelina diffusa Burm.f.	X		X
	Commelina ensifolia R.Br.	X		X
	Commelina sp.	X		
	Cyanotis axillaris (L.) D.Don	X		
	Murdannia gigantea (Vahl) G.Brueckn.	X		
	Murdannia graminea (R.Br.) G.Brueckn.	X		X
	Murdannia vaginata (L.) G.Brueckn.*	X		
	Tradescantia spathacea Sw.*	X		
Convolvulaceae	Erycibe coccinea (F.M.Bailey) Hoogland	X		X
	Evolvulus alsinoides (L.) L.	X	X	X
	Evolvulus alsinoides var. decumbens (R.Br.) Ooststr.	X		X
	Ipomoea abrupta R.Br.	X		
	Ipomoea aquatica Forssk.	X		
	Ipomoea carnea subsp. fistulosa (Mart. ex Choisy) D.F.Austin*	X		
	Ipomoea eriocarpa R.Br.	X		
	Ipomoea graminea R.Br.	X		
	Ipomoea hederifolia L.*	X		
	Ipomoea macrantha Roem. & Schult.	X		X
	Ipomoea mauritiana Jacq.	X		X
	Ipomoea nil (L.) Roth*	X		
	Ipomoea pes-caprae subsp. brasiliensis (L.) Ooststr.	X		X

[15] Requires determination

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Ipomoea plebeia R.Br.	X		X
	Ipomoea polymorpha Roem. & Schult.	X		
	Ipomoea quamoclit L.*	X		
	Ipomoea tiliacea (Willd.) Choisy	X		
	Ipomoea triloba L.*	X		
	Jacquemontia paniculata (Burm.f.) Hallier f. var. paniculata	X		X
	Merremia dissecta (Jacq.) Hallier f.*	X		
	Merremia hirta (L.) Merr.	X		
	Merremia quinata (R.Br.) Ooststr.	X	X	
	Merremia umbellata (L.) Hallier f.	X		
	Merremia umbellata (L.) Hallier f. subsp. umbellata	X		
	Operculina brownii Ooststr. (Rare)	X		
	Operculina riedeliana (Oliv.) Ooststr.	X		
	Operculina turpethum (L.) Silva Manso	X		
	Polymeria sp. (Aurukun J.R.Clarkson 4320)	X		
	Polymeria subhirsuta Domin	X		
	Xenostegia tridentata (L.) D.F.Austin & Staples	X	X	X
Costaceae	Costus potierae F.Muell. (Endangered)	X		
Cucurbitaceae	Citrullus lanatus (Thunb.) Matsum. & Nakai var. lanatus*	X		X
	Cucumis sp.	X		
	Cucumis melo L.	X		X
	Diplocyclos palmatus (L.) C.Jeffrey	X		X
	Lagenaria siceraria (Molina) Standl.*	X		
	Luffa aegyptiaca Mill.	X		
	Muellerargia timorensis Cogn. (Endangered)	X		
	Mukia maderaspatana (L.) M.Roem.	X		X
	Neoalsomitra capricornica (F.Muell.) Hutch.	X		X
	Zehneria mucronata (Blume) Miq.	X		
Cycadaceae	Cycas badensis K.D.Hill	X		X
	Cycas scratchleyana F.Muell.	X		X
Cymodoceaceae	Halodule uninervis (Forssk.) Asch.	X		
	Thalassodendron ciliatum (Forssk.) Hartog	X		
Cyperaceae	Abildgaardia ovata (Burm.f.) Kral	X		
	Bulbostylis barbata (Rottb.) C.B.Clarke	X		X
	Cyperus angustatus R.Br.	X		
	Cyperus aquatilis R.Br.	X		X
	Cyperus castaneus Willd.	X		
	Cyperus compressus L.*	X		
	Cyperus cuspidatus Kunth	X		
	Cyperus decompositus (R.Br.) F.Muell.	X		X
	Cyperus dietrichiae Boeck. var. dietrichiae	X		
	Cyperus haspan L. subsp. haspan	X		X
	Cyperus iria L.	X		X
	Cyperus javanicus Houtt.	X		X
	Cyperus metzii (Hochst. ex Steud.) Mattf. & Kuek.*	X		

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Cyperus pedunculatus (R.Br.) J.Kern	X		
	Cyperus polystachyos Rottb. var. polystachyos	X		X
	Cyperus pumilus L.	X		
	Cyperus rotundus L.*	X		
	Cyperus scaber (R.Br.) Boeck.	X		
	Cyperus scariosus R.Br.	X		
	Cyperus sp. (Cape York J.R.Clarkson+ 8126)	X		
	Cyperus sp. (Mission Beach N.Byrnes MB14)	X		
	Cyperus sphacelatus Rottb.*	X		
	Cyperus squarrosus L.	X		
	Cyperus stoloniferus Retz.	X		
	Cyperus tetracarpus Boeck.	X		
	Cyperus zollingeri Steud.	X		
	Eleocharis dulcis (Burm.f.) Trin. ex Hensch.	X		X
	Eleocharis geniculata (L.) Roem. & Schult.	X		
	Eleocharis spiralis (Rottb.) Roem. & Schult.	X		X
	Fimbristylis acicularis R.Br.	X		X
	Fimbristylis aestivalis (Retz.) Vahl var. aestivalis	X		
	Fimbristylis bisumbellata (Forssk.) Bubani	X		
	Fimbristylis cinnamometorum (Vahl) Kunth	X		
	Fimbristylis cymosa R.Br.	X		
	Fimbristylis dichotoma (L.) Vahl	X		X
	Fimbristylis ferruginea (L.) Vahl	X		X
	Fimbristylis furva R.Br.	X		
	Fimbristylis insignis Thwaites	X		
	Fimbristylis lanceolata C.B.Clarke	X		
	Fimbristylis littoralis Gaudich.	X		
	Fimbristylis modesta S.T.Blake	X		
	Fimbristylis polytrichoides (Retz.) R.Br.	X		
	Fimbristylis rara R.Br.	X		
	Fimbristylis recta F.M.Bailey	X	X	
	Fimbristylis signata S.T.Blake	X		
	Fimbristylis simplex S.T.Blake	X		
	Fimbristylis tristachya R.Br.	X		
	Fuirena ciliaris (L.) Roxb.	X		X
	Gahnia aspera (R.Br.) Spreng.	X		X
	Hypolytrum compactum Nees & Meyen	X		X
	Lipocarpha microcephala (R.Br.) Kunth	X		
	Rhynchospora exserta C.B.Clarke	X		
	Rhynchospora heterochaeta S.T.Blake	X	X	
	Rhynchospora leae C.B.Clarke	X		
	Rhynchospora longisetis R.Br.	X		
	Rhynchospora pterochaeta F.Muell.	X		
	Schoenoplectus litoralis (Schrad.) Palla	X		X
	Schoenoplectus validus (Vahl) A.Love & D.Love	X		X
	Schoenus calostachyus (R.Br.) Roem. & Schult.	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Schoenus falcatus R.Br.	X		
	Schoenus punctatus R.Br.	X		
	Schoenus sparteus R.Br.	X	X	X
	Scleria brownii Kunth	X		X
	Scleria laxa R.Br.	X		X
	Scleria levis Retz.	X		
	Scleria lithosperma var. linearis Benth.	X		
	Scleria mackaviensis Boeck.	X		X
	Scleria pergracilis (Nees) Kunth	X		
	Scleria polycarpa Boeck.	X		X
	Scleria pygmaea R.Br.	X		
	Scleria rugosa R.Br.	X		
	Scleria sumatrensis (DGFell 9702+DJStanton)[16]			X
	Scleria tricuspidata S.T.Blake	X		
	Tricostularia undulata (Thwaites) J.Kern	X		
Datiscaceae	Tetrameles nudiflora			X
Dilleniaceae	Dillenia alata (R.Br. ex DC.) Martelli	X		X
	Tetracera daemeliana F.Muell.	X		X
Dioscoreaceae	Dioscorea bulbifera L. var. bulbifera	X		X
	Dioscorea esculenta (Lour.) Burkill*	X		
	Dioscorea pentaphylla var. papuana Burkill	X		X
	Dioscorea transversa R.Br.	X	X	X
Dracaenaceae	Pleomele angustifolia (Medik.) N.E.Br.	X	X	X
	Sansevieria trifasciata Prain*	X		
Droseraceae	Drosera burmanni Vahl	X		X
	Drosera indica L.	X		X
	Drosera lanata K.Kondo	X		
	Drosera spatulata			X
Ebenaceae	Diospyros calycantha O.Schwarz	X		X
	Diospyros compacta (R.Br.) Kosterm.	X	X	X
	Diospyros hebecarpa A.Cunn. ex Benth.	X		X
	Diospyros humils			X
	Diospyros littoralis			X
	Diospyros maritima Blume	X		X
	Diospyros sp.	X		X
	Diospyros sp. (Kuranda L.J.Webb+ 7265A)	X		
	Diospyros sp. (Mt White P.I.Forster PIF14415)	X		X
Elaeocarpaceae	Elaeocarpus arnhemicus F.Muell.	X		X
Elatinaceae	Bergia ammannioides Roxb.	X		
Ericaceae	Leucopogon ruscifolius R.Br.	X		X
	Leucopogon yorkensis Pedley	X	X	X
Eriocaulaceae	Eriocaulon clarksonii G.J.Leach	X		
	Eriocaulon depressum R.Br. ex Sm.	X		X
	Eriocaulon fistulosum R.Br. ex Sm.	X		

[16] Requires confirmation

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Eriocaulon nanum R.Br.	X		
Erythroxylaceae	Erythroxylum sp. (Mosquito Creek J.R.Clarkson 9991+)			X
Euphorbiaceae	Acalypha lanceolata Willd.	X		X
	Acalypha wilkesiana Muell.Arg.*	X		X
	Chamaesyce atoto (G.Forst.) Croizat	X		X
	Chamaesyce hirta (L.) Millsp.*	X		X
	Chamaesyce macgillivrayi (Boiss.) D.C.Hassall	X		
	Chamaesyce micradenia (Boiss.) D.C.Hassall	X		
	Chamaesyce mitchelliana (Boiss.) D.C.Hassall	X	X	
	Chamaesyce prostrata (Aiton) Small*	X		
	Chamaesyce vachellii (Hook. & Arn.) Hara	X		X
	Claoxylon hillii Benth.	X		X
	Codiaeum variegatum (L.) A.Juss. var. variegatum*	X		X
	Codiaeum variegatum var. moluccanum (Decne.) Muell.Arg.	X		X
	Croton arnhemicus Muell.Arg.	X	X	X
	Croton multicaulis P.I.Forst. subsp. multicaulis	X		
	Croton waterhouseae P.I.Forst.	X		
	Dimorphocalyx australiensis C.T.White	X		X
	Euphorbia cyathophora Murr*	X		X
	Euphorbia heterophylla L.*	X		X
	Euphorbia plumerioides Teijsm. & Binn.	X		
	Euphorbia tannensis Spreng. subsp. tannensis	X		X
	Euphorbiaceae sp.	X		
	Excoecaria agallocha L.	X	X	X
	Jatropha gossypiifolia L.* (Class 2)	X		
	Macaranga involucrata var. mallotoides (F.Muell.) L.M.Perry	X		X
	Macaranga tanarius (L.) Muell.Arg.	X		X
	Mallotus dispersus P.I.Forst.	X		
	Mallotus ficifolius (Baill.) Pax & K.Hoffm.	X		X
	Mallotus mollissimus (Geiseler) Airy Shaw	X		
	Mallotus nesophilus			X
	Mallotus philippensis (Lam.) Muell.Arg.	X	X	X
	Mallotus polyadenos F.Muell.	X		
	Mallotus repandus (Willd.) Muell.Arg.	X		
	Mallotus resinosus (Blanco) Merr.	X		
	Manihot esculenta Crantz*	X		X
	Microstachys chamaelea (L.) A.Juss. ex Hook.f.	X		
	Pimeleodendron amboinicum (Rare)			X
	Ricinus communis L.*	X		
	Tragia finalis P.I.Forst.	X		X
Fabaceae	Abrus precatorius L. subsp. precatorius	X	X	X
	Aeschynomene americana L. var. americana*	X		
	Aeschynomene indica L.	X		
	Alysicarpus ovalifolius (Schumach.) J.Leonard*	X		
	Alysicarpus schomburgkii Schindl.	X		

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Alysicarpus vaginalis (L.) DC.*	X		
	Aphyllodium schindleri Pedley	X		
	Calopogonium mucunoides Desv.*	X		X
	Canavalia cathartica Thouars	X		
	Canavalia papuana Merr. & L.M.Perry	X		X
	Canavalia rosea (Sw.) DC.	X	X	X
	Centrosema molle Mart. ex Benth.*	X		
	Clitoria ternatea L.*	X		X
	Crotalaria brevis Domin	X		
	Crotalaria calycina Schrank	X	X	X
	Crotalaria goreensis Guill. & Perr.*	X	X	X
	Crotalaria humifusa Graham ex Benth.	X		
	Crotalaria medicaginea Lam. var. medicaginea	X		X
	Crotalaria montana var. angustifolia (Gagnep.) Niyomdham	X	X	
	Crotalaria pallida var. obovata (G.Don) Polhill*	X		X
	Crotalaria retusa L. var. retusa*	X		
	Crotalaria sessiliflora var. anthylloides (Lam.) A.A.Ansari & Thoth.	X		
	Crotalaria sp. (Torres Strait J.R.Clarkson 2044)	X		
	Cullen badocanum (Blanco) Verdc.	X		
	Dalbergia densa var. australis Prain	X	X	X
	Dendrolobium arbuscula (Domin) H.Ohashi	X		
	Dendrolobium umbellatum (L.) Benth. var. umbellatum	X		X
	Derris rubrocalyx Verdc. subsp. rubrocalyx	X		X
	Derris sp. (Claudie River L.J.Webb+ 8348)	X		X
	Derris trifoliata Lour.	X		X
	Desmodium gangeticum (L.) DC.	X		
	Desmodium heterocarpon (L.) DC. var. heterocarpon	X		
	Desmodium heterocarpon var. strigosum Meeuwen	X		
	Desmodium pullenii Pedley	X		
	Desmodium scorpiurus (Sw.) Desv.*	X		
	Desmodium tortuosum (Sw.) DC.*	X		X
	Desmodium trichostachyum Benth.	X		
	Desmodium triflorum (L.) DC.*	X		
	Erythrina insularis F.M.Bailey	X		X
	Erythrina variegata L.	X		X
	Erythrina vespertilio Benth.	X		X
	Flemingia parviflora		X	X
	Galactia muelleri Benth.	X	X	
	Galactia sp. (Andoom A.Morton 1149)	X		
	Galactia tenuiflora (Spreng.) Willd. ex Wight & Arn.	X		X
	Glycine tomentella Hayata	X		X
	Gompholobium sp. (Tozers Gap C.H.Gittins 1030)	X		
	Gompholobium sp. (DGFell 9709+DJStanton)[17]			X

[17] Requires determination

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Indigofera colutea (Burm.f.) Merr.	X		
	Indigofera glandulosa Willd.	X		
	Indigofera linifolia (L.f.) Retz.	X		X
	Indigofera polygaloides M.B.Scott	X		
	Indigofera praatensis		X	
	Indigofera tinctoria L.*	X		
	Indigofera trifoliata L.	X		
	Jacksonia thesioides A.Cunn. ex Benth.	X	X	X
	Macroptilium atropurpureum (DC.) Urb.*	X		X
	Macroptilium lathyroides (L.) Urb.*	X		X
	Macroptilium lathyroides var. semierectum (L.) Urb.*	X		
	Millettia pinnata (L.) Panigrahi	X	X	X
	Mimosa pudica var. unijuga (Walp. & Duchass.) Griseb.*	X		X
	Mucuna gigantea (Willd.) DC.	X		X
	Mucuna pruriens var. utilis (Wall. ex Wight) Baker ex Burck*	X		
	Ormocarpum orientale (Spreng.) Merr.	X		
	Pachyrhizus erosus (L.) Urb.*	X		
	Pterocarpus indicus Willd.	X		
	Pueraria montana var. lobata (Willd.) Maesen & S.M.Almeida*	X		
	Pycnospora lutescens (Poir.) Schindl.	X		
	Rhynchosia acuminatissima Miq.	X		X
	Rhynchosia minima (L.) DC.	X		X
	Rhynchosia minima var. australis (Benth.) C.Moore	X		
	Sesbania cannabina (Retz.) Poir. var. cannabina	X		X
	Smithia conferta Sm.	X		
	Sophora tomentosa subsp. australis Yakovlev	X		X
	Stylosanthes hamata (L.) Taub.*	X		X
	Stylosanthes humilis Kunth*	X		X
	Stylosanthes scabra Vogel*	X		X
	Tephrosia sp.	X		
	Tephrosia filipes Benth. subsp. filipes	X		X
	Tephrosia juncea Benth.	X	X	
	Tephrosia laxa Domin	X		
	Tephrosia maculata Merr. & L.M.Perry	X		
	Tephrosia sp. (Muddy Bay P.I.Forster+ PIF15313)	X		
	Teramnus labialis (L.f.) Spreng.*	X		
	Uraria picta (Jacq.) Desv.	X		
	Vandasina retusa (Benth.) Rauschert	X		X
	Vigna sp.	X		
	Vigna adenantha (G.Mey.) Marechal, Mascherpa & Stainier*	X		
	Vigna marina (Burm.) Merr.	X		X
	Vigna radiate var. sublobata (Roxb.) Verdc.	X		
	Vigna vexillata var. angustifolia (Schumach. & Thonn.)	X		

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Baker			
	Vigna vexillata var. youngiana F.M.Bailey	X		
	Zornia areolata Mohlenbr.	X		
	Zornia dyctiocarpa var. filifolia (Domin) S.T.Reynolds & A.E.Holland	X		
	Zornia muelleriana Mohlenbr. subsp. muelleriana	X		
	Zornia muriculata Mohlenbr. subsp. muriculata	X		
	Zornia ramosa S.T.Reynolds & A.E.Holland	X		
Flacourtiaceae	Flacourtia jangomas (Lour.) Raeusch.*	X		
	Flacourtia sp. (Shiptons Flat L.W.Jessup+ GJD3200)	X		X
	Scolopia braunii (Klotzsch) Sleumer	X		X
Flagellariaceae	Flagellaria indica L.	X	X	X
Goodeniaceae	Goodenia debilis A.E.Holland & T.P.Boyle	X		
	Goodenia pilosa (R.Br.) Carolin	X		
	Lechenaultia filiformis R.Br.	X		
	Scaevola taccada (Gaertn.) Roxb.	X		X
	Velleia sp.	X		
Haemodoraceae	Haemodorum coccineum R.Br.	X	X	X
Haloragaceae	Gonocarpus acanthocarpus (Brongn.) Orchard	X		
	Myriophyllum sp.	X		
Helicteraceae	Helicteres isora L.	X		
	Helicretes semiglabra (F. muell.) F.M. Bailey			X
	Caesia parviflora R.Br. var. parviflora	X		
Hemerocallidaceae	Dianella caerulea Sims	X		X
	Dianella caerulea var. aquilonia R.J.F.Hend.	X		
	Dianella caerulea var. vannata R.J.F.Hend.	X		X
	Dianella longifolia R.Br.	X		X
	Dianella odorata Blume	X		
	Dianella pavopennacea var. major R.J.F.Hend.	X	X	X
Hernandiaceae	Gyrocarpus americanus Jacq. subsp. americanus	X		X
	Hernandia nymphaeifolia (C.Presl) Kubitzki	X		
Hugoniaceae	Hugonia jenkinsii			X
Hydrocharitaceae	Enhalus sp.	X		
	Enhalus acoroides (L.f.) Royle	X		
	Halophila minor (Zoll.) Hartog	X		
Hypoxidaceae	Curculigo ensifolia R.Br. var. ensifolia	X		
Johnsoniaceae	Caesia setifera Baker	X		
	Tricoryne anceps subsp. pterocaulon (Baker) Thongp.	X	X	X
Juncaginaceae	Triglochin dubium R.Br.	X		
Lamiaceae	Anisomeles malabarica (L.) R.Br. ex Sims	X		X
	Baslicum polystachyon			X
	Callicarpa brevistyla Munir	X		
	Callicarpa candicans (Burm.f.) Hochr.	X	X	
	Clerodendrum sp.	X		
	Clerodendrum costatum R.Br.	X		
	Clerodendrum floribundum R.Br.	X		X
	Clerodendrum inerme (L.) Gaertn.	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Clerodendrum longiflorum var. glabrum Munir	X		X
	Faradaya splendida F.Muell.	X		
	Glossocarya hemiderma (F.Muell. ex Benth.) Benth. & Hook.f. ex B.D.Jacks.	X		X
	Gmelina dalrympleana (F.Muell.) H.J.Lam	X	X	X
	Gmelina philippensis Cham.*	X		
	Hyptis suaveolens (L.) Poit.*	X	X	X
	Leucas decemdentata (Willd.) Sm.	X		
	Ocimum basilicum L.*	X		
	Ocimum tenuiflorum L.	X		
	Orthosiphon aristatus (Blume) Miq.	X		
	Platostoma longicorne (F.Muell.) A.J.Paton	X		
	Plectranthus amboinicus (Lour.) Spreng.*	X		
	Plectranthus parviflorus Willd.	X		X
	Plectranthus scutellarioides (L.) R.Br.	X		X
	Premna acuminata R.Br.	X	X	X
	Premna dallachyana Benth.	X		X
	Premna serratifolia L.	X		X
	Salvia misella Kunth*	X		
	Vitex helogiton K.Schum.	X		X
	Vitex rotundifolia L.f.	X		X
	Vitex trifolia L. var. trifolia	X		X
Lauraceae	Beilschmiedia obtusifolia			X
	Cassytha filiformis L.	X	X	X
	Cryptocarya bamagana			X
	Cryptocarya brassii C.K.Allen	X		X
	Cryptocarya cunninghamii Meisn.	X		X
	Cryptocarya exfoliata C.K.Allen	X		X
	Cryptocarya hypospodia F.Muell.	X		X
	Cryptocarya triplinervis R.Br.	X		X
	Endiandra glauca R.Br.	X	X	X
	Endiandra impressicosta			X
	Litsea breviumbellata C.K.Allen	X		X
	Litsea glutinosa (Lour.) C.B.Rob.	X		X
	Neolitsea brassii			X
Laxmanniaceae	Eustrephus latifolius R.Br. ex Ker Gawl.	X	X	X
	Lomandra banksii (R.Br.) Lauterb.	X	X	X
	Lomandra multiflora (R.Br.) Britten subsp. multiflora	X		X
	Thysanotus banksii R.Br.	X		
	Thysanotus tuberosus R.Br. subsp. tuberosus	X		
Lecythidaceae	Barringtonia acutangula (L.) Gaertn. subsp. acutangula	X		X
	Barringtonia calyptrata (R.Br. ex Miers) R.Br. ex F.M.Bailey	X		X
	Barringtonia racemosa			X
	Planchonia careya (F.Muell.) R.Knuth	X	X	X
Lentibulariaceae	Utricularia sp.	X		X
	Utricularia bifida L.	X		

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Utricularia caerulea L.	X		
	Utricularia chrysantha R.Br.	X		
Loganiaceae	Mitrasacme connata R.Br.	X		
	Mitrasacme pygmaea R.Br.	X		
	Mitreola petiolata (J.F.Gmel.) Torr. & Gray	X		
	Strychnos lucida R.Br.	X		X
Loranthaceae	Amyema villiflora (Domin) Barlow subsp. villiflora	X		
	Amyema congener			X
	Amylotheca dictyophleba (F.Muell.) Tiegh.	X		
	Decaisnina angustata (Barlow) Barlow	X		
	Dendrophthoe curvata (Blume) Miq.	X		
	Dendrophthoe glabrescens (Blakely) Barlow	X		X
	Diplatia tomentosa Barlow	X		
Lythraceae	Ammannia multiflora Roxb.	X		
	Lagerstroemia speciosa (L.) Pers.*	X		
	Pemphis acidula J.R.Forst. & G.Forst.	X		X
	Sonneratia alba Sm.	X		X
Malpighiaceae	Ryssopterys timorensis (Blume) A.Juss.	X		X
Malvaceae	Abelmoschus manihot subsp. tetraphyllus (Roxb. ex Hornem.) Borss.Waalk.*	X		X
	Abelmoschus moschatus subsp. tuberosus (Span.) Borss.Waalk.	X		X
	Abutilon albescens Miq.	X		X
	Abutilon auritum		X	
	Abutilon indicum (L.) Sweet	X		X
	Abutilon sp.	X		X
	Gossypium barbadense L.*	X		
	Hibiscus meraukensis Hochr.	X	X	X
	Hibiscus normanii F.Muell.	X		
	Hibiscus rosasinensis L.*	X		X
	Hibiscus sabdariffa L.*	X		
	Hibiscus tiliaceus L.	X		X
	Hibiscus vitifolius L.	X		
	Malvastrum coromandelianum (L.) Garcke subsp. coromandelianum*	X		
	Sida acuta Burm.f.*	X		X
	Sida cordifolia L.*	X		
	Sida pusilla Cav.	X		
	Sida rhombifolia L.*	X		X
	Thespesia populnea (L.) Sol. ex Correa	X		X
	Thespesia populneoides (Roxb.) Kostel.	X		X
	Urena lobata L.*	X		X
Melastomataceae	Melastoma malabathricum L. subsp. malabathricum	X		X
	Osbeckia chinensis L.	X		X
	Pternandra coerulescens Jack	X		
Meliaceae	Aglaia brownii Pannell	X		X
	Aglaia elaeagnoidea (A.Juss.) Benth.	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Aglaia sapindina			X
	Aglaia tomentosa Teijsm. & Binn.	X		X
	Anthocarapa nitidula			X
	Dysoxylum acutangulum subsp. foveolatum (Radlk.) Mabb.	X		X
	Dysoxylum oppositifolium F.Muell.	X		X
	Dysoxylum latifolium			X
	Sandoricum koetjape (Burm.f.) Merr.*	X		
	Turraea pubescens Hellen.	X		X
	Vavaea amicorum Benth.	X		X
	Xylocarpus granatum K.D.Koenig	X		X
	Xylocarpus moluccensis (Lam.) M.Roem.	X		X
	Xylocarpus rumphii (Kostel.) Mabb.	X		X
Memecylaceae	Memecylon pauciflorum Blume var. pauciflorum	X		X
Menispermaceae	Hypserpa decumbens (Benth.) Diels	X		X
	Pachygone ovata (Poir.) Hook.f. & Thomson	X		X
	Stephania japonica (Thunb.) Miers	X		X
	Stephania japonica (Thunb.) Miers var. japonica	X		X
	Stephania japonica var. timoriensis (DC.) Forman	X		X
	Tinospora smilacina Benth.	X	X	X
Menyanthaceae	Nymphoides sp.	X		
	Nymphoides aurantiaca (Dalzell) Kuntze	X		
	Nymphoides exiliflora (F.Muell.) Kuntze	X		
	Nymphoides triangularis Aston	X		
	Villarsia sp. (Laura C.Dalliston CC18)	X		
Mimosaceae	Acacia aulacocarpa A.Cunn. ex Benth.	X		
	Acacia auriculiformis A.Cunn. ex Benth.	X		X
	Acacia brassii Pedley	X	X	X
	Acacia crassicarpa A.Cunn. ex Benth.	X	X	X
	Acacia holosericea			X
	Acacia humifusa A.Cunn. ex Benth.	X		X
	Acacia leptocarpa A.Cunn. ex Benth.	X	X	X
	Acacia oraria F.Muell.	X		X
	Acacia platycarpa F.Muell.	X		X
	Acacia polystachya A.Cunn. ex Benth.	X	X	X
	Acacia simsii A.Cunn. ex Benth.	X	X	X
	Adenanthera pavonina L.	X		X
	Albizia lebbeck (L.) Benth.	X		X
	Archidendron grandiflorum (Sol. ex Benth.) I.C.Nielsen	X		X
	Archidendron hirsutum I.C.Nielsen (Rare)	X		X
	Cathormion umbellatum subsp. moniliforme (DC.) Brummitt	X		X
	Entada phaseoloides (L.) Merr.	X		X
	Entada rheedii Spreng.	X		X
	Leucaena leucocephala (Lam.) de Wit subsp. leucocephala*	X		X
	Mimosa pudica var. unijuga (Walp. & Duchass.)	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Griseb.*			
	Paraserianthes toona (F.M.Bailey) I.C.Nielsen	X	X	X
Molluginaceae	Glinus oppositifolius (L.) A.DC.	X		X
	Mollugo pentaphylla L.*	X		X
Monimiaceae	Wilkiea rigidifolia (A.C.Sm.) Whiffin & Foreman	X		X
Moraceae	Antiaris toxicaria var. macrophylla (R.Br.) Corner	X		X
	Fatoua villosa (Thunb.) Nakai (Rare)	X		
	Ficus sp.	X		
	Ficus drupacea Thunb. var. drupacea	X		X
	Ficus fraseri Miq.	X		
	Ficus microcarpa L.f.	X		X
	Ficus microcarpa var. hillii (F.M.Bailey) Corner	X		X
	Ficus obliqua G.Forst.	X		X
	Ficus opposita Miq.	X		X
	Ficus opposita var. aculeata (Miq.) R.J.F.Hend.	X		
	Ficus racemosa			X
	Ficus superba var. henneana (Miq.) Corner	X		X
	Ficus virens Aiton	X		
	Ficus virens var. sublanceolata (Miq.) Corner	X		X
	Streblus brunonianus			X
	Trophis scandens (Lour.) Hook. & Arn. subsp. scandens	X		X
Moringaceae	Moringa oleifera Lam.*	X		
Myristicaceae	Horsfieldia australiana			X
	Myristica insipida R.Br. var. insipida	X		X
Myrsinaceae	Aegiceras corniculatum (L.) Blanco	X	X	X
	Myrsine urceolata R.Br.	X	X	X
Myrtaceae	Acmena hemilampra (F.Muell. ex F.M.Bailey) Merr. & L.M.Perry subsp. hemilampra	X		X
	Acmenosperma claviflorum			X
	Asteromyrtus brassii (Byrnes) Craven	X		X
	Asteromyrtus symphyocarpa (F.Muell.) Craven	X	X	X
	Baeckea frutescens L.	X		X
	Corymbia clarksoniana		X	X
	Corymbia latifolia			X
	Corymbia nesophila (Blakely) K.D.Hill & L.A.S.Johnson	X	X	X
	Corymbia novoguinensis (D.J.Carr & S.G.M.Carr) K.D.Hill & L.A.S.Johnson	X	X	X
	Corymbia polycarpa (F.Muell.) K.D.Hill & L.A.S.Johnson	X		X
	Corymbia stockeri (D.J.Carr & S.G.M.Carr) K.D.Hill & L.A.S.Johnson subsp. stockeri	X		
	Corymbia stockeri subsp. peninsularis (K.D.Hill & L.A.S.Johnson) A.R.Bean	X	X	X
	Corymbia tessellaris (F.Muell.) K.D.Hill & L.A.S.Johnson	X	X	X
	Eucalyptus brassiana			X
	Eucalyptus cullenii Cambage	X	X	X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Eucalyptus leptophleba F.Muell.	X		X
	Eucalyptus platyphylla F.Muell.	X	X	X
	Eucalyptus tetrodonta			X
	Eugenia reinwardtiana (Blume) DC.	X		X
	Gossia floribunda (A.J.Scott) N.Snow & Guymer	X		X
	Lithomyrtus obtusa (Endl.) N.Snow & Guymer	X	X	X
	Lithomyrtus retusa		X	X
	Lophostemon suaveolens (Sol. ex Gaertn.) Peter G.Wilson & J.T.Waterh.	X		X
	Melaleuca acacioides F.Muell.	X	X	X
	Melaleuca arcana			X
	Melaleuca argentea			X
	Melaleuca cajuputi subsp. platyphylla Barlow	X		X
	Melaleuca dealbata S.T.Blake	X		X
	Melaleuca leucadendra (L.) L.	X		X
	Melaleuca nervosa			X
	Melaleuca quinquenervia (Cav.) S.T.Blake	X		X
	Melaleuca saligna Schauer	X	X	X
	Melaleuca sp. (Zuna DGF9257+)[18]			X
	Melaleuca stenostachya S.T.Blake	X	X	X
	Melaleuca viridiflora Sol. ex Gaertn. var. viridiflora	X	X	X
	Neofabricia myrtifolia (Gaertn.) Joy Thomps.	X	X	X
	Osbornia octodonta F.Muell.	X		X
	Rhodamnia australis A.J.Scott	X		X
	Rhodomyrtus macrocarpa Benth.	X		X
	Syzygium angophoroides (F.Muell.) B.Hyland	X		X
	Syzygium aqueum (Burm.f.) Alston (Rare)	X		X
	Syzygium bamagense B.Hyland	X		X
	Syzygium branderhorstii Lauterb.	X		X
	Syzygium buettnerianum (K.Schum.) Nied. (Rare)	X		X
	Syzygium bungadinnia (F.M.Bailey) B.Hyland	X		X
	Syzygium fibrosum (F.M.Bailey) T.G.Hartley & L.M.Perry	X		X
	Syzygium forte (F.Muell.) B.Hyland subsp. forte	X		X
	Syzygium puberulum Merr. & L.M.Perry	X		X
	Syzygium suborbiculare (Benth.) T.G.Hartley & L.M.Perry	X	X	X
	Welchiodendron longivalve (F.Muell.) Peter G.Wilson & J.T.Waterh.	X	X	X
Nyctaginaceae	Boerhavia sp.	X		
	Boerhavia albiflora Fosberg var. albiflora	X		
	Boerhavia dominii Meikle & Hewson	X		
	Boerhavia mutabilis R.Br.	X		X
	Pisonia aculeata L.	X		X
	Pisonia grandis R.Br.	X		

[18] Requires determination

Family_Name	Botanical_Name	BRI	C'veg	3DE
Nymphaeaceae	Nymphaea violacea Lehm.	X		
Olacaceae	Ximenia americana L.	X		X
Oleaceae	Chionanthus ramiflora Roxb.	X		X
	Jasminum didymum G.Forst. subsp. didymum	X		X
	Jasminum elongatum (Bergius) Willd.	X		X
	Notelaea longifolia			X
Onagraceae	Ludwigia hyssopifolia (G.Don) Exell*	X		X
	Ludwigia octovalvis (Jacq.) P.H.Raven	X		X
	Ludwigia perennis L.	X		
Opiliaceae	Cansjera leptostachya Benth.	X		X
	Opilia amentacea Roxb.	X	X	X
Orchidaceae	Arthrochilus irritabilis F.Muell.	X		
	Arthrochilus sabulosus D.L.Jones	X		
	Bulbophyllum sp.	X		X
	Cadetia maideniana (Schltr.) Schltr.	X		
	Cadetia wariana Schltr. (Rare)	X		X
	Chiloschista phyllorhiza (F.Muell.) Schltr.	X		
	Crepidium marsupichilum (Upton) Szlach.	X		
	Dendrobium canaliculatum		X	X
	Dendrobium bigibbum Lindl. (Vulnerable)	X	X	X
	Dendrobium discolor			X
	Dendrobium johannis Rchb.f. (Vulnerable)	X		X
	Dendrobium litorale Schltr.	X		X
	Dendrobium smillieae F.Muell.	X		
	Dendrobium trilamellatum J.J.Sm.	X	X	X
	Dendrobium x lavarackianum M.A.Clem.	X		
	Dendrobium x superbiens Rchb.f. (Vulnerable)	X		
	Diplocaulobium glabrum (J.J.Sm.) Kraenzl.	X		
	Dockrillia calamiformis (Lodd.) M.A.Clem. & D.L.Jones	X		
	Empusa habenarina (F.Muell.) M.A.Clem. & D.L.Jones	X		
	Eria fitzalanii F.Muell.	X		
	Grastidium insigne (Blume) M.A.Clem. & D.L.Jones	X		
	Grastidium luteocilium (Rupp) Rauschert	X		
	Habenaria elongata R.Br.	X		
	Habenaria propinquior Rchb.f.	X		
	Luisia teretifolia Gaudich.	X		
	Nervilia sp.	X		
	Nervilia holochila (F.Muell.) Schltr.	X		
	Nervilia peltata B.Gray & D.L.Jones	X		
	Nervilia plicata (Andrews) Schltr.	X		
	Pholidota imbricata Hook.	X		
	Taeniophyllum sp. (DGF9319+)[19]			X
	Vrydagzynea elongata Blume	X		
Oxalidaceae	Biophytum petersianum Klotzsch	X		

[19] Requires determination

Family_Name	Botanical_Name	BRI	C'veg	3DE
Pandanaceae	Pandanus sp.	X		X
	Pandanus conicus			X
	Pandanus tectorius Parkinson	X		X
	Pandanus zea (Rare)			X
Passifloraceae	Adenia heterophylla (Blume) Koord.	X		X
	Adenia heterophylla subsp. australis (R.Br. ex DC.) W.J.de Wilde	X		X
	Passiflora aurantia G.Forst. var. aurantia	X		X
	Passiflora foetida L.*	X	X	X
	Passiflora suberosa L.*	X		X
Pedaliaceae	Josephinia imperatricis Vent.	X		X
Pentaphylacaceea	Ternstroemia cherryi			X
Petiveriaceae	Rivina humilis L.*	X		X
Phyllanthaceae	Actephila venusta P.I.Forst.	X		X
	Antidesma bunius (L.) Spreng.	X		X
	Antidesma ghaesembilla Gaertn.	X		X
	Antidesma parvifolium Thwaites & F.Muell.	X		X
	Breynia cernua (Poir.) Muell.Arg.	X	X	X
	Breynia oblongifolia (Muell.Arg.) Muell.Arg.	X		X
	Bridelia finalis P.I.Forst.	X		X
	Bridelia tomentosa Blume	X		X
	Cleistanthus apodus Benth.	X		X
	Cleistanthus peninsularis Airy Shaw & B.Hyland	X		X
	Cleistanthus xerophilus Domin	X		X
	Flueggea virosa subsp. melanthesoides (F.Muell.) G.L.Webster	X	X	X
	Glochidion apodogynum			X
	Glochidion disparipes Airy Shaw	X		X
	Phyllanthus amarus Schumach.*	X		
	Phyllanthus novae-hollandiae Muell.Arg.	X		X
	Phyllanthus reticulatus Poir.	X		X
	Phyllanthus sp.	X		
	Phyllanthus virgatus G.Forst.	X	X	X
	Sauropus androgynus (L.) Merr.*	X		
Picrodendraceae	Petalostigma pubescens			X
Piperaceae	Piper caninum Blume	X		X
	Piper sarmentosum Roxb.*	X		
Pittosporaceae	Bursaria incana Lindl.	X		X
	Pittosporum ferrugineum subsp. linifolium (A.Cunn.) L.W.Cayzer, Crisp & I.Telford	X		X
	Pittosporum ferrugineum W.T.Aiton subsp. ferrugineum	X		X
	Pittosporum venulosum F.Muell.	X		X
Plumbaginaceae	Aegialitis annulata R.Br.	X		X
	Plumbago zeylanica L.	X		
Poaceae	Alloteropsis cimicina (L.) Stapf	X		X
	Alloteropsis semialata (R.Br.) Hitchc.	X	X	X
	Apluda mutica L. (Rare)	X		

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Aristida dominii B.K.Simon	X		
	Aristida holathera Domin var. holathera	X		X
	Aristida perniciosa Domin	X		
	Aristida utilis F.M.Bailey var. utilis	X		
	Arthraxon castratus (Griff.) V.Naray. ex Bor	X		
	Arundinella nepalensis Trin.	X	X	X
	Arundinella setosa Trin.	X		X
	Arundo donax L.*	X		
	Axonopus compressus (Sw.) P.Beauv.*	X		X
	Bambusa sp.	X		X
	Bambusa vulgaris Schrad.*	X		X
	Bothriochloa bladhii (Retz.) S.T.Blake	X		X
	Bothriochloa bladhii (Retz.) S.T.Blake subsp. bladhii	X		
	Bothriochloa pertusa (L.) A.Camus*	X		X
	Capillipedium parviflorum (R.Br.) Stapf	X	X	
	Cenchrus brownii Roem. & Schult.*	X		
	Cenchrus echinatus L.*	X		X
	Cenchrus elymoides var. brevisetosus B.K.Simon	X		
	Chionachne cyathopoda (F.Muell.) F.Muell. ex Benth.	X		
	Chloris gayana Kunth*	X		X
	Chloris inflata Link*	X		X
	Chrysopogon aciculatus (Retz.) Trin.*	X		
	Chrysopogon elongatus (R.Br.) Benth.	X		
	Chrysopogon setifolius Stapf	X		
	Cleistochloa subjuncea C.E.Hubb.	X		
	Coix lacryma-jobi L.*	X		
	Cymbopogon ambiguus A.Camus	X	X	X
	Cymbopogon bombycinus (R.Br.) Domin	X		X
	Cymbopogon globosus Henrard	X		
	Cynodon dactylon (L.) Pers. var. dactylon*	X		X
	Dactyloctenium aegyptium (L.) Willd.*	X		
	Dactyloctenium radulans (R.Br.) P.Beauv.	X		X
	Dichanthium aristatum (Poir.) C.E.Hubb.*	X		
	Dichanthium fecundum S.T.Blake	X		
	Digitaria sp.	X		X
	Digitaria bicornis (Lam.) Roem. & Schult.	X		
	Digitaria ciliaris (Retz.) Koeler*	X		X
	Digitaria ctenantha (F.Muell.) Hughes	X		
	Digitaria gibbosa (R.Br.) P.Beauv.	X		
	Digitaria ramularis (Trin.) Henrard	X		X
	Digitaria setigera Roth ex Roem. & Schult.	X		
	Echinochloa colona (L.) Link*	X		X
	Ectrosia agrostoides Benth.	X		
	Ectrosia lasioclada (Merr.) S.T.Blake	X		
	Ectrosia leporina R.Br.	X	X	
	Eleusine indica (L.) Gaertn.*	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Elionurus citreus (R.Br.) Munro ex Benth.	X		
	Eragrostis amabilis (L.) Wight & Arn. ex Nees*	X		
	Eragrostis brownii (Kunth) Nees ex Wight	X		X
	Eragrostis cumingii Steud.	X		
	Eragrostis pubescens (R.Br.) Steud.	X		
	Eragrostis spartinoides Steud.	X		X
	Eragrostis unioloides (Retz.) Nees ex Steud.	X		
	Eremochloa bimaculata		X	
	Eremochloa ciliaris (L.) Merr. (Rare)	X		X
	Eriachne armitii F.Muell. ex Benth.	X		
	Eriachne burkittii Jansen	X		
	Eriachne ciliata R.Br.	X		
	Eriachne humilis W.Hartley	X		
	Eriachne obtusa R.Br.	X		
	Eriachne pallescens R.Br.	X		X
	Eriachne pallescens R.Br. var. pallescens	X		X
	Eriachne squarrosa R.Br.	X		
	Eriachne triseta Nees ex Steud.	X	X	
	Eriochloa fatmensis (Hochst. & Steud.) Clayton	X		
	Eriochloa procera (Retz.) C.E.Hubb.	X		X
	Eriochloa pseudoacrotricha (Stapf ex Thell.) J.M.Black	X		
	Eulalia sp. (Sabai Island J.R.Clarkson 7801)	X		
	Eulalia mackinlayi		X	
	Germainia capitata Balansa & Poitr. (Vulnerable)	X		
	Heterachne gulliveri		X	
	Heteropogon contortus (L.) P.Beauv. ex Roem. & Schult.	X	X	X
	Heteropogon triticeus (R.Br.) Stapf	X	X	X
	Imperata cylindrica (L.) Raeusch.	X	X	X
	Ischaemum australe R.Br. var. australe	X		X
	Ischaemum australe var. villosum (R.Br.) Benth.	X		X
	Ischaemum fragile R.Br.	X		X
	Ischaemum muticum L.	X		
	Ischaemum polystachyum J.Presl	X		
	Ischaemum rugosum Salisb. var. rugosum	X		
	Ischaemum rugosum var. segetum (Trin.) Hack.	X		
	Ischaemum triticeum R.Br.	X		
	Ischaemum tropicum B.K.Simon	X		
	Leptaspis banksii R.Br.	X		
	Leptochloa fusca (L.) Kunth subsp. fusca	X		X
	Leptochloa simoniana N.Snow	X		
	Lepturus geminatus C.E.Hubb. (Rare)	X		
	Lepturus repens (G.Forst.) R.Br.	X		
	Megathyrsus maximus (Jacq.) B.K.Simon & S.W.L.Jacobs var. maximus*	X		X
	Melinis minutiflora P.Beauv.*	X		
	Melinis repens (Willd.) Zizka*	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Mnesithea formosa (R.Br.) de Koning & Sosef	X	X	
	Mnesithea granularis (L.) de Koning & Sosef	X		
	Mnesithea rottboellioides (R.Br.) de Koning & Sosef	X	X	X
	Neololeba atra (Lindl.) (Rare)	X		X
	Ophiuros exaltatus (L.) Kuntze	X		
	Oplismenus aemulus (R.Br.) Roem. & Schult.	X		X
	Oplismenus burmannii (Retz.) P.Beauv.	X		X
	Oplismenus compositus (L.) P.Beauv.	X		
	Panicum laevinode Lindl.	X		
	Panicum mindanaense Merr.	X		
	Panicum seminudum Domin var. seminudum	X		
	Panicum seminudum var. cairnsianum Domin	X		
	Panicum trichoides Sw.	X		X
	Paspalidium distans (Trin.) Hughes	X		X
	Paspalum distichum L.	X		
	Paspalum scrobiculatum L.	X		X
	Paspalum vaginatum Sw.	X		X
	Pennisetum ciliare (L.) Link*	X		
	Pennisetum pedicellatum subsp. unispiculum Brunken*	X		
	Pennisetum pedicellatum Trin. subsp. pedicellatum*	X		
	Pennisetum setigerum (Vahl) Wipff*	X		
	Perotis rara R.Br.	X		
	Phragmites australis (Cav.) Trin. ex Steud.	X		X
	Phragmites karka (Retz.) Trin. ex Steud.	X		X
	Pseudopogonatherum contortum (Brongn.) A.Camus	X	X	
	Pseudopogonatherum irritans (R.Br.) A.Camus	X		
	Pseudoraphis spinescens (R.Br.) Vickery	X		
	Rottboellia cochinchinensis (Lour.) Clayton*	X	X	
	Saccharum officinarum L.*	X		X
	Sacciolepis indica (L.) Chase	X		
	Sarga angustum (S.T.Blake) Spangler	X		
	Sarga plumosum (R.Br.) Spangler	X	X	X
	Schizachyrium fragile (R.Br.) A.Camus	X	X	X
	Schizachyrium pachyarthron C.A.Gardner	X		
	Sehima nervosum (Rottler) Stapf	X		
	Setaria apiculata (Scribn. & Merr.) K.Schum.	X		
	Setaria australiensis (Scribn. & Merr.) Vickery	X		
	Setaria pumila subsp. pallidefusca (Schumach.) B.K.Simon*	X		
	Setaria surgens Stapf	X		X
	Sorghum halepense (L.) Pers.*	X		
	Sorghum nitidum (Vahl) Pers. forma nitidum	X		X
	Sorghum nitidum forma aristatum C.E.Hubb.	X		
	Spinifex longifolius R.Br.	X		X
	Sporobolus jacquemontii Kunth* (Class 2)	X		
	Sporobolus lenticularis S.T.Blake	X		
	Sporobolus pulchellus R.Br.	X		

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Sporobolus virginicus (L.) Kunth	X	X	X
	Thaumastochloa heteromorpha		X	
	Thaumastochloa major S.T.Blake	X		X
	Thaumastochloa monolifera		X	
	Thaumastochloa pubescens (Benth.) C.E.Hubb.	X		
	Themeda arguens (L.) Hack.	X		X
	Themeda intermedia (Hack.) Bor*	X		
	Themeda quadrivalvis (L.) Kuntze*	X		
	Themeda triandra Forssk.	X		X
	Thuarea involuta (G.Forst.) R.Br. ex Roem. & Schult.	X		X
	Urochloa distachya (L.) Nguyen*	X		
	Urochloa holosericea (R.Br.) R.D.Webster	X		
	Urochloa holosericea (R.Br.) R.D.Webster subsp. holosericea	X		
	Urochloa mosambicensis (Hack.) Dandy*	X		
	Urochloa mutica (Forssk.) Nguyen*	X		
	Urochloa panicoides var. pubescens (Kunth) Bor*	X		
	Urochloa piligera (F.Muell. ex Benth.) R.D.Webster	X		
	Urochloa pubigera (Roem. & Schult.) R.D.Webster	X		
	Urochloa ramosa (L.) R.D.Webster*	X		
	Urochloa subquadripara (Trin.) R.D.Webster*	X		
	Vacoparis laxiflorum (F.M.Bailey) Spangler	X		
	Whiteochloa airoides (R.Br.) Lazarides	X		
Polygalaceae	Polygala exsquarrosa Adema	X		
	Polygala longifolia Poir.	X		
	Polygala rhinanthoides Sol. ex Benth.	X		
	Polygala sp. (Portland Roads L.Pedley 2757)	X		
	Salomonia ciliata (L.) DC.	X		
Polygonaceae	Antigonon leptopus Hook. & Arn.*	X		
	Muehlenbeckia zippelii (Meisn.) Danser	X		
Portulacaceae	Calandrinia gracilis Benth.	X		
	Portulaca australis Endl.	X		
	Portulaca oleracea L.*	X		
	Portulaca pilosa L.*	X		
	Portulaca tuberosa Roxb.	X		
	Talinum triangulare (Jacq.) Willd.*	X		
Proteaceae	Banksia dentata L.f.	X	X	X
	Grevillea coriacea McGill.	X		X
	Grevillea parallela Knight	X	X	X
	Hakea pedunculata		X	X
	Helicia australasica F.Muell.	X		X
	Persoonia falcata			X
	Xylomelum scottianum (F.Muell.) F.Muell.	X	X	X
Ptaeroxylaceae	Harrisonia brownii A.Juss.	X		X
Putranjivaceae	Drypetes deplanchei (Brongn. & Gris) Merr.	X	X	X
Restionaceae	Dapsilanthus elatior (R.Br.) B.G.Briggs & L.A.S.Johnson	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Dapsilanthus spathaceus (R.Br.) B.G.Briggs & L.A.S.Johnson	X		X
	Leptocarpus sp.	X		X
Rhamnaceae	Alphitonia excelsa (A.Cunn. ex Fenzl) Reissek ex Benth.	X		X
	Alphitonia obtusifolia		X	
	Colubrina asiatica Brongn.	X		X
	Ziziphus oenopolia (L.) Mill.	X	X	X
Rhizophoraceae	Bruguiera cylindrica (L.) Blume	X		X
	Bruguiera exaristata Ding Hou	X		X
	Bruguiera gymnorhiza (L.) Savigny	X		X
	Bruguiera parviflora (Roxb.) Wight & Arn. ex Griff.	X		X
	Carallia brachiata (Lour.) Merr.	X		X
	Ceriops tagal (Perr.) C.B.Rob.	X	X	X
	Rhizophora apiculata Blume	X		X
	Rhizophora stylosa Griff.	X		X
Rubiaceae	Aidia racemosa (Cav.) Tirveng.	X		X
	Antirhea ovatifolia (M.E.Jansen) Chaw	X		X
	Atractocarpus sessilis (F.Muell.) Puttock	X		X
	Cyclophyllum brevipes (Merr. & L.M.Perry) S.T.Reynolds & R.J.F.Hend.	X		X
	Cyclophyllum maritimum S.T.Reynolds & R.J.F.Hend.	X	X	X
	Dentella repens (L.) J.R.Forst. & G.Forst.	X		
	Everistia vacciniifolia S.T.Reynolds & R.J.F.Hend.	X		X
	Guettarda speciosa L.	X		X
	Hydnophytum moseleyanum Becc. var. moseleyanum	X		X
	Ixora timorensis Decne.	X	X	X
	Mitracarpus hirtus (L.) DC.*	X		
	Morinda citrifolia L.	X		X
	Morinda reticulata Benth.	X	X	X
	Myrmecodia platytyrea subsp. antoinii (Becc.) C.R.Huxley & Jebb	X		X
	Oldenlandia biflora L.	X		
	Oldenlandia corymbosa L. var. corymbosa*	X		
	Oldenlandia galioides (F.Muell.) F.Muell.	X		X
	Pavetta australiensis Bremek. var. australiensis	X		X
	Pavetta brownii Bremek. var. brownii	X		
	Pavetta brownii var. glabrata S.T.Reynolds	X		X
	Pogonolobus reticulatus F.Muell.	X	X	X
	Psilanthus brassii (J.-F.Leroy) A.P.Davis	X		
	Psychotria coelospermum			X
	Psychotria loniceroides Sieber ex DC.	X		X
	Psychotria nesophila F.Muell.	X		X
	Psychotria poliostemma Benth.	X		X
	Psydrax banksii S.T.Reynolds & R.J.F.Hend.	X		X
	Psydrax graciliflora (Merr. & L.M.Perry) S.T.Reynolds & R.J.F.Hend.	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Psydrax lamprophylla forma latissima S.T.Reynolds & R.J.F.Hend.	X		X
	Psydrax odorata (G.Forst.) A.C.Sm. & S.P.Darwin	X		X
	Psydrax reticulata (C.T.White) S.T.Reynolds & R.J.F.Hend. (Vulnerable)	X		X
	Richardia scabra L.*	X		
	Scyphiphora hydrophylacea Gaertn.	X		X
	Spermacoce brachystema R.Br. ex Benth.	X		X
	Spermacoce papuana F.Muell.	X		
	Spermacoce remota Lam.*	X		
	Spermacoce sp.	X		
	Spermacoce sp. (Lorim Point A.Morton AM1237)	X		
	Timonius timon (Spreng.) Merr. var. timon	X		X
	Triflorensia australis (Benth.) S.T.Reynolds	X		X
Ruppiaceae	Ruppia sp	X		
Rutaceae	Acronychia imperforata			X
	Acronychia sp. (Batavia Downs J.R.Clarkson+ 8511)	X		
	Clauesena brevistyla			X
	Glycosmis trifoliata (Blume) Spreng.	X		X
	Halfordia kendack (Montrouz.) Guillaumin	X	X	X
	Luvunga monophylla			X
	Melicope peninsularis T.G.Hartley	X		X
	Melicope rubra (Lauterb. & K.Schum.) T.G.Hartley	X		
	Micromelum minutum (G.Forst.) Wight & Arn.	X	X	X
	Murraya ovatifoliolata			X
	Murraya paniculata (L.) Jack	X		X
	Zanthoxylum parviflorum Benth.	X		
	Zanthoxylum rhetsa (Roxb.) DC.	X		X
Santalaceae	Exocarpos latifolius R.Br.	X	X	X
Sapindaceae	Alectryon reticulatus			X
	Alectryon repandodentatus Radlk. (Endangered)	X		X
	Alectryon tomentosus (F.Muell.) Radlk.	X		X
	Allophylus cobbe (L.) Blume	X		X
	Arytera bifoliolata S.T.Reynolds	X		X
	Arytera divaricata			X
	Arytera pseudofoveolata H.Turner	X		
	Atalaya australiana Leenh.	X		
	Atalaya sericopetala S.T.Reynolds	X		X
	Cupaniopsis anacardioides (A.Rich.) Radlk.	X		X
	Cupaniopsis flagelliformis subsp. flagelliformis			X
	Dictyoneura obtusa Blume	X		X
	Dodonaea polyandra Merr. & L.M.Perry	X	X	X
	Dodonaea viscosa Jacq. subsp. viscosa	X		X
	Ganophyllum falcatum Blume	X	X	X
	Harpullia arborea			X
	Jagera pseudorhus (A.Rich.) Radlk. var. pseudorhus	X		X
	Lepidopetalum fructoglabrum Welzen	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Mischocarpus lachnocarpus (F.Muell.) Radlk.	X		X
	Mischocarpus stipitatus S.T.Reynolds	X		X
	Toechima daemelianum (F.Muell.) Radlk.	X		X
	Tristiropsis acutangula (Rare)			X
Sapotaceae	Chrysophyllum roxburgii			X
	Manilkara kauki (L.) Dubard	X		X
	Mimusops elengi L.	X		X
	Palaquium galactoxylon			X
	Pouteria myrsinodendron (F.Muell.) Jessup	X		
	Pouteria obovata (R.Br.) Baehni	X		X
	Pouteria sericea (Aiton) Baehni	X	X	X
	Pouteria sp. (DGFell 9168+DJStanton)			X
	Pouteria unmackiana (F.M.Bailey) Erlee	X		
Scrophulariaceae	Adenosma caerulea R.Br.	X		
	Angelonia salicariifolia Bonpl.*	X		
	Buchnera gracilis R.Br.	X		
	Buchnera linearis R.Br.	X		X
	Buchnera ramosissima R.Br.	X		
	Buchnera tetragona R.Br.	X		
	Limnophila fragrans (G.Forst.) Seem.	X		
	Lindernia antipoda (L.) Alston	X		
	Lindernia ciliata (Colsm.) Pennell	X		
	Lindernia crustacea (L.) F.Muell.	X		
	Lindernia scapigera R.Br.	X		
	Lindernia tenuifolia (Colsm.) Alston	X		
	Mecardonia procumbens (Mill.) Small*	X		X
	Scoparia dulcis L.*	X		X
	Striga curviflora (R.Br.) Benth.	X		
	Striga parviflora (R.Br.) Benth.	X		
Simaroubaceae	Brucea javanica (L.) Merr.	X		X
Smilacaceae	Smilax australis R.Br.	X	X	X
	Smilax calophylla Wall. ex A.DC.	X		X
	Smilax glyciphylla		X	
Solanaceae	Capsicum annuum var. glabriusculum (Dunal) Heiser & Pickersgill*	X		
	Capsicum frutescens L.*	X		
	Datura inoxia Mill.*	X		
	Datura wrightii Regel*	X		
	Lycianthes shanesii (F.Muell.) A.R.Bean	X		
	Physalis angulata L.*	X		
	Physalis pubescens L.*	X		
	Solanum seaforthianum Andrews*	X		X
	Solanum viridifolium Dunal	X		X
Sparrmanniaceae	Corchorus aestuans L.	X		X
	Grewia breviflora Benth.	X		X
	Grewia latifolia		X	X
	Grewia oxyphylla Burret	X		X

Family_Name	Botanical_Name	BRI	C'veg	3DE
	Grewia retusifolia		X	X
	Triumfetta pentandra A.Rich.*	X		
	Triumfetta rhomboidea Jacq.*	X		X
Stackhousiaceae	Stackhousia intermedia F.M.Bailey	X		
	Stackhousia viminea Sm.	X		
Stemonuraceae	Gomphandra australiana			X
Sterculiaceae	Argyrodendron polyandrum L.S.Sm.	X		X
	Heritiera littoralis Dryand.	X		X
	Sterculia quadrifida R.Br.	X		X
	Sterculia shillinglawii subsp. shillinglawii (Rare)			X
	Sterculia sp. (Annan River L.J.Brass 20319)	X		X
Stylidiaceae	Stylidium alsinoides R.Br.	X		X
	Stylidium schizanthum F.Muell.	X		
	Stylidium tenerum Spreng.	X		
Surianaceae	Suriana maritima L.	X		X
Taccaceae	Tacca leontopetaloides (L.) Kuntze	X	X	X
Thymelaeaceae	Phaleria octandra (L.) Baill.	X		X
	Thecanthes cornucopiae (Vahl) Wikstr.	X		
	Wikstroemia indica (L.) C.A.Mey.	X	X	X
Turneraceae	Turnera ulmifolia L.*	X		
Ulmaceae	Celtis paniculata (Endl.) Planch.	X		X
	Celtis philippensis Blanco var. philippensis	X		X
	Trema tomentosa (Roxb.) Hara var. tomentosa	X		
	Trema tomentosa var. aspera (Brongn.) Hewson	X		X
Urticaceae	Laportea interrupta (L.) Chew	X		
	Nothocnide repanda (Blume) Blume			X
	Pipturus argenteus (G.Forst.) Wedd.	X		X
	Pouzolzia zeylanica (L.) Benn.	X		
Verbenaceae	Lantana camara L.*	X		X
	Stachytarpheta jamaicensis (L.) Vahl*	X		X
Violaceae	Hybanthus enneaspermus (L.) F.Muell.	X	X	X
Viscaceae	Viscum articulatum Burm.f.	X		
Vitaceae	Ampelocissus acetosa (F.Muell.) Planch.	X		X
	Cayratia acris (F.Muell.) Domin	X		X
	Cayratia cardiophylla Jackes	X		X
	Cayratia clematidea (F.Muell.) Domin	X		X
	Cayratia maritima Jackes	X		X
	Cayratia trifolia (L.) Domin	X		X
	Cissus adnata Roxb.	X		X
	Cissus aristata Blume (Vulnerable)	X		
	Cissus opaca F.Muell.	X		X
	Cissus reniformis Domin	X		X
	Cissus repens Lam.	X		X
	Leea indica (Burm.f.) Merr.	X		X
Xyridaceae	Xyris complanata R.Br.	X	X	X
Zingiberaceae	Alpinia caerulea (R.Br.) Benth.	X		X

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	Alpinia sp.	X		
	Curcuma australasica Hook.f.	X	X	X
	Globba marantina L. (Rare)	X		
	Kaempferia sp. (Murray Island M.Lawrie 5)	X		
	Zingiber officinale Roscoe*	X		
	Zingiber zerumbet (L.) Sm.*	X		
Zygophyllaceae	Tribulopis solandri R.Br.	X		
	Tribulus cistoides L.	X		X