



PROFILE FOR MANAGEMENT OF THE HABITATS AND RELATED ECOLOGICAL AND CULTURAL RESOURCE VALUES OF **MASIG ISLAND**

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Prepared by 3D Environmental for
Torres Strait Regional Authority Land & Sea Management Unit



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TSRA
www.tsra.gov.au

3D Environmental
vegetation analysis and mapping specialists

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EXECUTIVE SUMMARY

Masig (Yorke) Island is located approximately 160 km north-east of Thursday Island, Queensland. The island is part of the Central Island Group, a geologically diverse group of small islands that also include the inhabited islands of Warraber (Sue), Poruma (Coconut) and lama (Yam) and numerous uninhabited islands the largest being Sassie, Gebbar, Naghir (Mt Ernest). The Central Island group includes sand cays on coral platforms, mangrove islands, and islands formed on igneous basement rock.

A total of six natural vegetation communities, within three broad vegetation groups and five regional ecosystems are recognised on the island. There are currently 209 plant species recorded, within 85 families and 154 genera, and comprising 144 natives (69 % of total species) and 65 (31 %) which are naturalised. This represents approximately 15% of the known flora for the Torres Strait Island group. No plant species are considered threatened, three species are significant at the regional level and 71 (38%) are locally and/or culturally significant. The dominant families (native species) are Fabaceae 12, Poaceae 9, Phyllanthaceae 8, Rubiaceae 7, and Celastraceae, Combretaceae, Cyperaceae, Malvaceae, and Moraceae each with four species.

A review of available desktop resources identified 65 fauna species that have been reported for the island. This includes one frog, four reptile, 57 bird and three mammal species. This represents 17% of the 384 terrestrial fauna species that have been reported for the broader Torres Strait Island group. Of the animals reported for the island, one reptile, one bird and two mammal species are introduced. An additional two species have been identified by the Protected Matters Search Tool as possibly occurring on the island. Given its small size and ease of access, there has been a number of ecological studies carried out on Masig including avifauna (Draffan 1983), fauna (RPS 2010b), vegetation and flora (Stanton et al, 2009), and flora (collections dominated by Waterhouse for Department of Agriculture, Fisheries and Forestry (DAFF)). While it is amongst the most intensively surveyed islands in the broader Torres Strait Island group per unit area, both for fauna and flora, there remains almost no information on the biodiversity of the numerous smaller islands which form part of the broader Masig group.

Within the four broad vegetation groups (or management units) identified on the island, a number of issues for future management are identified as necessary for the future biodiversity maintenance and ecological health of the island. These are:

- Monitoring for the introduction and spread of a number of exotic species, both fauna and flora, throughout the island landscape.
- A requirement for further survey work to document aspects of the faunal assemblage on the island and adjacent uninhabited islands.
- Continued collection of floristic information, specifically those plants with cultural and biodiversity significance.

- Further survey and documentation of the complex and diverse cultural landscape on the island.
- Baseline vegetation mapping, flora and fauna surveys on the numerous smaller coral cay islands and islets which form part of the Masig group.

It is important that any future surveys are undertaken in collaboration with the Masig people and include study of traditional ecological knowledge and ethnotaxonomy. Furthermore all mapping and assessment work must comply with Masig research protocols (to be finalised), must be approved by the Masigalgal (Torres Strait Islanders) Corporation, and involve and be guided by the Masigalgal Rangers.

ACKNOWLEDGEMENTS

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Initial fauna information and text provided for other Torres Strait Islands by Terry Reis was adapted for the purpose of this report and his provision of raw data and preparation of species profiles is greatly appreciated. Staff of the Queensland Herbarium assisted with identification of plant specimens and provided advice on the ecology and distribution of significant species. Barbara Waterhouse and Steven McKenna of the Department of Agriculture Fisheries and Forestry provided valuable information on the occurrence and distribution of weeds.

Table of Contents

1.0 Introduction	1
1.1 Cultural Setting	1
1.2 Geographic Setting	1
1.3 Geological Context	2
2.0 Methods	3
3.0 Aims and Objectives	3
4.0 Legislative and Policy Considerations	4
5.0 Vegetation	7
5.1 Vegetation Groups and Mapping.....	7
5.2 Flora Species.....	10
5.2.1 Flora Species with Conservation Significance	10
5.2.2 Flora with Cultural Significance	13
5.2.3 Introduced Plants.....	13
6.0 Fauna (Animals)	20
6.1 Culturally Important Fauna Species	20
6.2 Fauna Habitat Values	21
6.3 Fauna Species with Conservation Significance	21
6.3.1 Endangered, Vulnerable and Near-Threatened Species	22
6.3.2 Migratory species.....	25
6.3.3 Species of Regional Significance	27
6.4 Pest Fauna Species	27
6.5 Threats	27
6.6 Future work.....	28
7.0 Profiles for Masig Island Habitats	29
7.1 Deciduous/Semi- Deciduous Vine Forest and Vine Thicket.....	29
7.1.1 Status of Ecological Knowledge	29
7.1.2 Ecological / Cultural Considerations.....	30
7.1.3 Management Considerations.....	30
7.1.4 Summary of Recommended Management Actions.....	31
7.2 Casuarina Dominant Woodland and Open Forest.	33
7.2.1 Status of Ecological Knowledge	33
7.2.2 Ecological / Cultural Considerations.....	34
7.2.3 Management Considerations.....	35
7.2.4 Summary of Recommended Management Actions.....	35
7.3 Coastal Dune Complexes.....	37
7.3.1 Status of Ecological Knowledge	37
7.3.2 Ecological / Cultural Considerations.....	38
7.3.3 Management Considerations.....	39
7.3.4 Summary of Recommended Management Actions.....	39
7.4 Anthropogenically Altered (Secondary) Vine Forest and Thicket.....	41

7.4.1 Status of Ecological Knowledge	41
7.4.2 Ecological / Cultural Considerations.....	42
7.4.3 Management Considerations.....	43
7.4.4 Summary of Recommended Management Actions.....	43
7.5 Cleared Areas, Exotic Vegetation and Regrowth Forests.....	44
7.5.1 Management Implications.....	45
7.5.2 Summary of Recommended Management Actions.....	45
8.0 References.....	47
9.0 Glossary.....	54
10.0 Appendices.....	55
Appendix A. Queensland Govt. Vegetation Structural Classification.....	56
Appendix B. Flora Species List – Masig, Torres Strait, Queensland.	57
Appendix C. Preliminary List of Culturally Significant Plants for Masig.....	68
Appendix D Terrestrial Vertebrates Known ¹ or Predicted ² to Occur on the Islands of Torres Strait and their Occurrence on Masig.	74
Appendix E. Profiles of Migratory Fauna Species Potentially occurring on Masig Island and Surrounding Islets	88

List of Figures

Figure 1. Location of Masig (Yorke) Island.	2
Figure 2. Diagrammatic illustration of the hierarchy and relationship between components of the vegetation classification system used in the Torres Strait Island vegetation mapping study (Stanton <i>et al.</i> 2009).	8
Figure 3. Distribution of evergreen vine forest and thicket Masig Island (place names after Lawrie, 1970).	31
Figure 4. Location of casuarina dominated forest on Masig (place names after Lawrie, 1970).....	34
Figure 5. Distribution of coastal dune complex habitats (place names after Lawrie, 1971).	38
Figure 6. The location of anthropogenically altered vine forest communities on Masig (place names after Lawrie, 1970).	42

List of Tables

Table 1. Broad vegetation groups and relative contributions to island vegetation.....	8
Table 2. Descriptions of component vegetation communities and association with regional ecosystems currently recognised on Masig (from Stanton <i>et al.</i> 2009).	9
Table 3. Summary of flora with conservation significance on Masig.	10
Table 4. Environmental weeds	15
Table 5. Major weed threats.....	19
Table 6. Endangered, Vulnerable and Near-Threatened fauna species ¹ reported or predicted ² to occur on Masig.....	22
Table 7. Migratory species reported or predicted to occur on Masig.	25

Table 8. Summary of management actions for evergreen and semi evergreen vine forests	32
Table 9. Summary of management actions for casuarina dominant forests.....	35
Table 10. Summary management recommendations for coastal beach complexes.	39
Table 11. Summary of management actions for anthropogenically altered vine forest and thicket.	43
Table 12. Summary of management actions for cleared and disturbed areas.	45

1.0 Introduction

Masig, also known as Yorke Island, is one of 6 inhabited islands selected in a secondary phase of assessment for development of a biodiversity management profile. The profile provides summary of current ecological knowledge for the island. It aims to identify the biodiversity features, landscape processes, and cultural values that are intrinsic to the island, and provides preliminary management advice to assist future preservation of these values. The document also seeks to identify at a preliminary level those sites and landscape features of specific cultural importance to the Masig people. The management recommendations detailed will inform more detailed work plans that will guide the land based operations of the ranger program.

1.1 Cultural Setting

The population of Masig consists of 336 people (2008 census) with 93% indigenous occupancy. Land tenure is DOGIT (Deed of Grant in Trust) and the Registered Native Title Body Corporate¹ (RNTBC or PBC in shortened form) is the Masigalgal (Torres Strait Islanders) Corporation who administer the native title rights and interests over the Island on behalf of the Masig and Damuth people. Native title was granted in July 2000. The Corporation also administers two Indigenous Land Use Agreements between the Masig and Damuth people and Telstra and Ergon Energy respectively (Native Title Research Unit 2012). The people of the Central Island Group of Torres Strait are recognised as 'Kulkalgal'. The local dialect is Kalaw Lagaw Ya.

Native title also exists in relation to the land and inland waters of Adal (Kodall) Islet, Umaga (Keats) Island, Igaba (Marsden) Island, Kabbikane Islet, Mimay (Mimi) Islet, Aukane Islet, Yau (Layoak) Islet, Mauar (Rennel) Island, Roag (Smith) Cay, Damuth (Dalrymple) Islet, and Bak (Bourke) Island (Native Title Research Unit 2012).

It is significant to recognise that the Kulkalgal of Masig recognise 'home' as not a single island i.e. Masig Island, but a group of neighbouring islands and cays, which they regularly visited to and patrolled in response to past resource availability (Shnukal 2004). Access to these uninhabited islands for sea and land resources continues (Francis Nai pers. com. May 2012).

1.2 Geographic Setting

Masig is located approximately 160 km north-east of Thursday Island (see **Figure 1**). It is part of the Central Island Group, a geologically diverse group of small islands that also include the inhabited islands of Poruma (Coconut), Warraber (Sue), and Iama (Yam) Islands and the

¹ Registered Native Title Body Corporate – the organisation that is recognised as holding native title in trust for the benefit of the native title holders. It contacts native title holders and administers business between them and outsiders, such as government, industry and developers.

uninhabited Sassie, Gebbar, and Naghir (Mt Ernest) islands. The Central Island group includes sand cays on coral platforms, mangrove islands, and islands formed on igneous basement rock. The island has a total area of 154 ha, is approximately 2.8 km long, 800m at its widest point and is elevated to a general height of 3m above local mean sea level (Conics 2009). The village straddles the central part of the island to the north of the islands airstrip. The mean annual rainfall of 1 415mm (BOM 2008a) can be compared to Badu which at 1 983mm is the wettest recording station in the Torres Strait Islands (BOM 2008b), and Dauan at 1 082mm which is the driest.

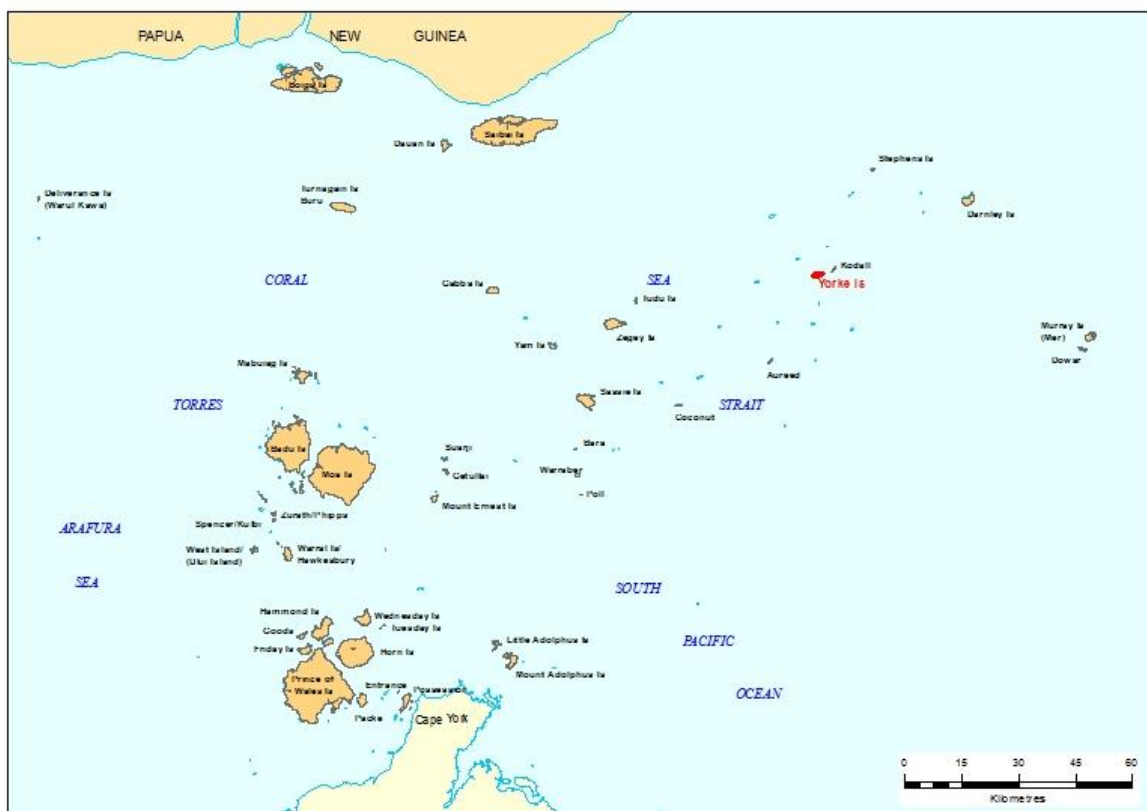


Figure 1. Location of Masig (Yorke) Island.

1.3 Geological Context

Masig is typical of a number of islands in the Central Island Group, being a sand cay formed by coarse calcareous sand accumulated atop a coral platform. The island sand cays of the Torres Strait are very low lying and not more than 6m high (Willmott 1972) with heights for Warraber reported as 2-8m above mean sea level (Hart *et al.* 2007) and a well formed dune system on Poruma to 12m (RPS 2010c). Comparatively Masig, at 3m above mean sea level, is extremely low lying. 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. Being low lying and without the foundation of continental basement rock, Masig is exposed to erosion caused by storm surges and tides, extreme tidal events and the incipient impacts of long term sea level rise.

2.0 Methods

This document provides a compendium of information that has been compiled from a range of data sources. It draws on information from previous surveys relevant to flora, fauna and to a lesser extent cultural heritage. Literature resources utilised include but are not limited to:

- Vegetation Communities and Regional Ecosystems of the Torres Strait Islands (Stanton *et al.* 2009).
- Queensland Herbarium's HerbreCs Database.
- Queensland Museum fauna record extracts.
- Birds Australia database extract.
- WildNet database extracts (DERM 2010a to 2010g).
- RPS Flora and Flora Assessment of Masig (RPS 2010a)
- Various technical papers relating to both flora and fauna (see references section).

The preparation of a preliminary desktop report was completed prior to a field visit conducted over two days in May 2012. With the involvement and support of the TSRA land team and island rangers, the field team traversed the island enabling important habitats, plants, animal species and management issues to be identified, and flora lists to be updated. This process facilitated a two-way information and learning exchange between the newly appointed ranger team, the TSRA land team, and the research team, and included a formal meeting with the PBC community members and council representatives. Knowledge gained from the visit has been incorporated into the final report.

3.0 Aims and Objectives

The aim of this document is to compile existing information relating to:

1. The extent, values and condition of island habitats and the plants and animals which occur on them.
2. Island-scale ecological processes, that is, the environmental and human factors which are influencing habitats, plants and animals.
3. The cultural interactions with these processes, that is, the ways that Masig people interact with the natural environment including identification of values.
4. The establishment of a list of management actions intended to be used by island rangers and managers toward updating Land and Sea Ranger Work Plans and increasing the effectiveness of ecological and cultural value management.

Owing to the long term occupancy of the islands (>4 000yrs) (McNiven & Wright 2008), the apparent stability of the majority of landscapes, and general lack of detailed ecological information pertaining to these landscapes, it is assumed that maintaining the existing landscape condition and process (in all but a few cases) is the safest management option.

Habitat maintenance has therefore been a primary consideration during the compilation of this document. The specific actions that are adopted and direction of island-scale ecological management will however be ultimately up to the discretion of the Masigalgal Rangers and the Masig and Damuth people, who are represented by the Masigalgal (Torres Strait Islanders) Corporation.

4.0 Legislative and Policy Considerations

Biodiversity (plants, animals and their habitats) is regulated at state and national levels by a range of legislative mechanisms which classify animal species, plant species and habitats according to their rarity, population size, distribution and threats. The legislative classification is used by western science as a way to assign significance to a particular species or ecological value. If an animal, plant or vegetation type is listed on any Australian or Queensland government legislation, it is subject to rules which protect it from being destroyed or harmed.

For example, if a certain orchid species is listed on the legislation it would mean that the orchid could not be collected from the bush and sold at a nursery without the necessary authorisation and permits. Similarly, if an animal such as a bat species or bat colony, which was listed as threatened under legislation, lived in a rock shelter where a housing development was proposed, then detailed studies and assessments would be required to determine how the bats would be affected by the development. A description of relevant components of the major legislation mechanisms requiring consideration is provided briefly below.

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act): The EPBC Act, an initiative of the Australian Government, provides recognition of four classes of wildlife and habitat being those which are:

- Extinct in the Wild.
- Critically Endangered.
- Endangered.
- Vulnerable.

Plant and animal species and habitats scheduled under these categories are referred to collectively as 'Threatened Wildlife'. The EPBC Act also provides for protection of those species which are considered migratory under international conventions which include:

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).
- China-Australia Migratory Bird Agreement (CAMBA).
- Japan-Australia Migratory Bird Agreement (JAMBA).
- Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Interference or destruction of plants, animals or areas of habitat for species listed as threatened under the EPBC Act requires specific authorisation from the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) who are likely to provide conditions under which the interference can take place. Interference (such as killing of a protected bird species) without authorisation is in breach of the EPBC Act.

Nature Conservation Act 1992: *The Nature Conservation Act* (NC ACT) is a legislative mechanism of the Queensland Government that is regulated by the Department of Environment and Heritage Protection (EHP, formerly DERM). The *Nature Conservation (Wildlife) Regulation 2006* is subordinate to the NC ACT and defines five classes that are:

- Extinct in the Wild.
- Endangered.
- Vulnerable.
- Near-Threatened.
- Least concern.

These classes collectively relate to native species that are protected wildlife (plants and animals).

Vegetation Management Act: *The Vegetation Management Act 1999* (VMA) is a state regulated planning initiative that underpins the regional management of vegetation in Queensland. Under the VMA, conservation significance to particular vegetation groups, termed regional ecosystems (REs), is assigned on a consistent state-wide basis. The classification of regional ecosystems is based on a hierarchical system with a three-part code which defines the bioregion, followed by the land zone, and then the vegetation structure and dominant floristics. Thirteen bioregions are classified in Queensland with the Torres Strait Islands being a sub-province of the broader Cape York Peninsula bioregion.

Land zones are geological and geomorphic categories that describe the major geologies and landforms of Queensland. The system is based primarily on geology, with geologic age considered an important determinant. The classification of land zone generally utilises available geological information (Neldner *et al.* 2005) although field inspection is utilised as a supplementary measure where geological mapping is inadequate.

The status of REs is based on their pre-clearing and remnant extent, and is gazetted under the VMA and listed in the Regional Ecosystem Description Database (REDD) maintained by EHP. The Vegetation Management Status (VMS) of a regional ecosystem is described in line with the following:

Endangered regional ecosystem: a regional ecosystem that is prescribed under a regulation and has either:

- less than 10% of its pre-clearing extent remaining, or

- 10% to 30% of its pre-clearing extent remaining and the remnant vegetation remaining is less than 10 000 hectares (ha).

Of Concern regional ecosystem: means a regional ecosystem that is prescribed under a regulation and has either:

- 10% to 30% of its pre-clearing extent remaining, or
- more than 30% of its pre-clearing extent remaining and the remnant vegetation remaining is less than 10 000 ha.

Least Concern regional ecosystem: means a regional ecosystem that is prescribed under a regulation and has more than 30% of its pre-clearing extent remaining and the remnant vegetation remaining is more than 10 000 ha.

Hence, the majority of vegetation scheduled under the VMA as 'Of Concern' on Masig (e.g. evergreen notophyll vine forest habitat RE3.2.28) is classified as such because on a regional level (Cape York Peninsula) more than 30% of the original habitat extent remains, although the total area of the habitat is less than 10 000 ha.

The regional ecosystem mapping available for Masig provides accurate information on the legislative significance of vegetation on the island offering an information planning resource for the Masig community, the TSIRC and the TSRA. For example, if a new building was proposed in an area which supported a regional ecosystem (vegetation type) that was considered 'Of Concern', then clearing of this vegetation without authorisation is in breach of the VMA. Liaison with regulators (EHP) is required to determine the conditions that must be met for clearing to be authorised. EHP also assigns a Biodiversity Status (BS) to REs, a non-statutory indicator of a regional ecosystems susceptibility to elements of degradation.

Land Protection (Pest and Stock Route Management) Act 2002: The *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) provides a framework and powers for improved management of weeds, pest animals and the stock route network. The act provides for designation of threat classes to species of plant and animal considered not native to Queensland (exotic or invasive) and which degrade natural resources, threaten conservation of biodiversity, threaten remnant vegetation, reduce rural production and interfere with human health and recreational activities. Exotic species that pose a threat are declared under one of the following three categories:

- Class 1 Pest: a pest that has potential to become a very serious pest in Queensland in the future.
- Class 2 Pest: a pest that has already spread over substantial areas of Queensland, but its impact is considered sufficiently serious to warrant control.

- **Class 3 Pest:** a pest that is commonly established in parts of Queensland but its control by landholders is not warranted unless the plant is impacting, or has potential to impact on a nearby environmentally sensitive area.

For example, if a Class 3 weed such as lantana (*Lantana camara*) was found on Masig, there is a requirement under the act for landowners to take reasonable steps to control and manage the weed.

Weeds of National Significance (WONS): Classification of pest plants as WONS is made at the national level and is not supported by any legislation. The determination of WONS is a system which prioritises weed problems for national action as part of the National Weeds Strategy. In addition to ranking the top 20 weeds in terms of impact to productivity and landscape, it provides indicators on which to base future weed decision-making and a framework for prioritising weeds at the state, regional and local levels (Thorp & Lynch 2000).

The Back on Track Species Prioritisation Framework: The 'Back on Track (BOT) species prioritisation framework' is a non-legislative Queensland Government initiative that prioritises Queensland's native species as a means to guide their conservation, management and recovery. The assessment method utilises multiple criteria allowing identification of those species that are threatened and facing population declines, and those species that have a high potential for recovery. The BOT methodology classifies four priority levels for action to remediate declining Queensland wildlife being 'Critical Priority (CR)', 'High Priority (H)', 'Medium Priority (M)' and 'Low Priority (L)'.

5.0 Vegetation

As described in the following sections, the classification of vegetation includes both nomenclature of individual species and the classification of groups of plants, the latter often forming unique assemblages that can be consistently recognised across islands (e.g. Masig), island groups (Central Island Group) or bioregions (Cape York Peninsula Bioregion).

5.1 Vegetation Groups and Mapping

The hierarchy of vegetation classification used in the Torres Strait Islands is described below with relationships illustrated in **Figure 2**. At the highest level, the classification of plant assemblages is based on vegetation structure considering the dominant life form (tree or grass), height of the tallest strata, and canopy closure or cover. The structural classification used by the Queensland Government is included within **Appendix B**.

Vegetation structural groupings (i.e. shrubland etc.) are used to define **broad vegetation groups** (BVGs) which provide the broadest level of vegetation classification recognised in vegetation mapping produced for the Torres Strait Islands (Stanton *et al.* 2009). BVGs may be an amalgamation of a number of more specific plant groupings known as **vegetation communities**. Vegetation communities (VCs) can be described as 'a unit of vegetation that

demonstrates similarities in both structure and floristic composition'. VCs are useful to describe fine scale variation in floristic composition that may occur due to the consistent dominance of a particular plant species or suite of plant species.

REs as described in **Section 4** comprise a group of vegetation communities, although unlike BVGs, consider regional distribution and geology within the classification. REs must be considered due to their legislative implications although in this document, for specific habitat management purposes, BVGs provide a more readily usable management grouping and have been used to define habitat management units.

Vegetation Classification on Masig: For management purposes, the islands vegetation is classified into broad vegetation groups (BVGs), herein referred to as habitats, as derived from Stanton *et al.* (2009). The spatial extent and relative contribution of these groupings is provided in **Table 1**, with descriptions of component vegetation communities and associated regional ecosystems provided in **Table 2**. Further characterisation of habitat types is provided in the following text.

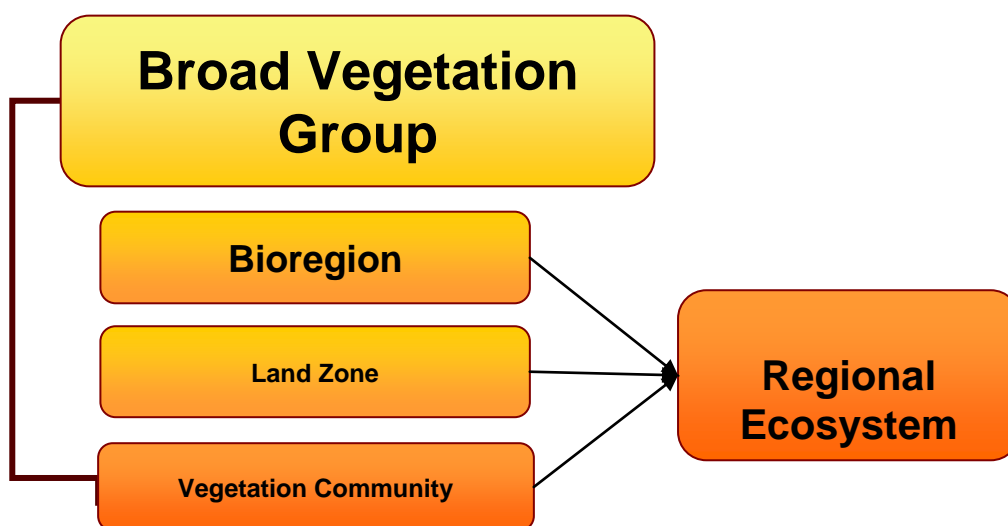


Figure 2. Diagrammatic illustration of the hierarchy and relationship between components of the vegetation classification system used in the Torres Strait Island vegetation mapping study (Stanton *et al.* 2009).

Table 1. Broad vegetation groups and relative contributions to island vegetation.

Broad Vegetation Group/ Habitat**	Component Vegetation Communities**	Area (ha)	Contribution (%)
Deciduous/Semi deciduous vine forest and vine thicket	2m	10.8	7.1
Casuarina dominant woodland and open forest	10a	60.6	39.4
Coastal dune complexes	16a, 16h, 14y, 17j	11.5	7.4

Broad Vegetation Group/ Habitat**	Component Vegetation Communities**	Area (ha)	Contribution (%)
Anthropogenically altered (secondary) vine forest and thicket	22b	20.7	13.4
Cleared land, regrowth and exotic species	CI, RE, EX	50.5	32.7
Total		154	100

Table 2. Descriptions of component vegetation communities and association with regional ecosystems currently recognised on Masig (from Stanton *et al.* 2009).

Vegetation Community	Description	Geological Association	Regional Ecosystem	VMS	BDS
2m	Semi-deciduous notophyll vine forest + <i>Milletia pinnata</i> + <i>Terminalia</i> spp. + <i>Diospyros maritima</i> + <i>Manilkara kauki</i> + <i>Aglaia elaeagnoidea</i> + <i>Pouteria obovata</i> + <i>Drypetes deplanchei</i> +/- <i>Erythrina</i> spp.	Calcareous sand	3.2.28	Of Concern	Of Concern
10a	<i>Casuarina equisetifolia</i> open forest + <i>Diospyros maritima</i> + <i>Premna serratifolia</i> + <i>Milletia pinnata</i> .	Calcareous sand	3.12.36b	Of Concern	Of Concern
14y	Low <i>Premna serratifolia</i> + <i>Cordia subcordata</i> +/- <i>Pemphis acidula</i> +/- <i>Drypetes deplanchei</i> shrubland.	Foredune deposits	3.2.25	Of Concern	Of Concern
17j	Low <i>Spinifex sericeus</i> + <i>Vigna marina</i> + <i>Ipomoea pes-caprae</i> subsp. <i>brasiliensis</i> + <i>Sesuvium portulacastrum</i> grassland and forbland complex.	Foredune deposits	3.2.24	Of Concern	Of Concern
16a	Coastal foredune grassland, herbland and shrubland complex. (17j/14y – 70/30).	Calcareous sand	3.2.24/3.2.25	Of Concern	Of Concern
16h	Low groved notophyll vine thicket + <i>Terminalia muelleri</i> + <i>Diospyros maritima</i> + <i>Premna serratifolia</i> + <i>Thespesia populneooides</i> + <i>Manilkara kauki</i> (2y/17j – 80/20).	Calcareous sand	3.2.2a/3.2.24	Least Concern/ Of Concern	Of Concern
22b	Semi deciduous vine thicket (secondary) + <i>Buchanania arborescens</i> + <i>Manilkara kauki</i> + <i>Scolopia braunii</i> + <i>Drypetes deplanchei</i> + <i>Terminalia muelleri</i> .	Calcareous sand	Non-remnant	Non-remnant	Non-remnant
CI	Cleared areas	Calcareous sand	Non-remnant	Non-remnant	Non-remnant
Re	Regrowth vegetation	Calcareous sand	Non-remnant	Non-remnant	Non-remnant
Ex	Exotic Species	Calcareous sand	Non-remnant	Non-remnant	Non-remnant

5.2 Flora Species

The composition of the island flora has been compiled from analysis of Queensland Herbarium data (Herbrechts 2011), unpublished data from Barbara Waterhouse and Stephen McKenna of the Australian Quarantine Inspection Service (DAFF 2010), and field surveys carried out by 3D Environmental in October 2007, and May 2012, (refer **Appendix B**).

There are currently 209 plant species recorded, within 85 families and 154 genera. This is composed of 144 natives (69% of total species) and 65 (31%) which are naturalised. This represents approximately 15% of the known flora for the Torres Strait Island group. No plant species are considered threatened, three species are significant at the regional level, and 71 (38%) are locally and/or culturally significant. The dominant families (native species) are Fabaceae 12, Poaceae 9, Phyllanthaceae 8, Rubiaceae 7, and Celastraceae, Combretaceae, Cyperaceae, Malvaceae, and Moraceae each with four species.

5.2.1 Flora Species with Conservation Significance

An assessment of significant flora species draws on the data sources identified above. Species have been broadly categorised into significance categories (i.e. national, state, regional and cultural) based on criteria which includes legislative status, keystone/focal, threatened or sensitive, restricted, otherwise noteworthy or of cultural interest value. Culturally significant species are assessed separately (refer **Section 5.2.2** and **Appendix C**). The species identified as having significance at the national, state, and regional level are summarised in **Table 3** below.

Table 3. Summary of flora with conservation significance on Masig.

Species	National EPBC	State NC ACT	Regionally Significant	BVG	VC	RE
Known						
<i>Aristolochia chalmersii</i>	-	-	Disjunct; Host for larvae of big greasy and Cairns birdwing butterflies.	Anthropogenically altered (secondary) vine forest and thicket	22b	Non-remnant
<i>Pisonia grandis</i>	-	-	Disjunct and forming north (eastern) limit of Australian distribution.	Casuarina dominant woodland and open forest	10a	3.12.36b
<i>Spermacoce</i> sp. (Lorim Point A. Morton AM1237)	-	-	Undescribed and disjunct	Anthropogenically altered (secondary) vine forest and thicket	22b	Non-remnant

National Significance

No species listed on the EPBC Act are known to occur.

State Significance

No species listed on the amended regulations of the NC Act are known to occur.

Regional Significance

The classification of regional significance takes into account factors such as disjunct occurrence, endemism (at the bioregional, bioprovince, and island scales), limits of geographic distribution, and local rarity in the landscape. Three species are recognised for the island.

Chalmers aristolochia (*Aristolochia chalmersii*)

A slender vine inhabiting coastal vine forest/thicket and dune shrubland. The leaf blades are soft in texture, about 3.5-11 x 5-15 cm, with slender petioles about 3-8 cm long. Petioles are distinctly thickened and twisted near the base forming a type of tendril (Hyland *et al.* 2010). It is a bioregional endemic known from south-eastern Cape York Peninsula (Laura Basin including Cape Melville, Silver Plains, Coen), Lizard Island and Torres Strait (DERM 2011c). It is not common in Torres Strait, known from Mer, Pulu, and Poruma. The occurrence on Masig is disjunct and represents part of its northern limits of distribution. The vine is a food plant for the larvae of the big greasy and Cairns birdwing butterflies (Hyland *et al.* 2010).



Photograph 1. Chalmers aristolochia (*Aristolochia chalmersii*) in vine forest on Poruma.

Bird lime tree (*Pisonia grandis*)

The occurrence of the bird lime tree (*Pisonia grandis*) represents part of its disjunct distribution within Australian territory. It was originally described by Robert Brown (botanist aboard Flinders' *Investigator*), from islands in the Gulf of Carpentaria. Elsewhere in the GBR, *Pisonia grandis* has been recorded on 44 islands with the majority of occurrences located on coral cays in the southern parts of the reef in the Capricorn-Bunker group (Walker 1991). The total distribution of *Pisonia* forest on GBR

islands is 160 ha of which 94% is concentrated on the southern cays (Walker 1991). It is otherwise almost entirely confined, in the wild state, to small scattered and often uninhabited islands from as far east as the Tuamotu Archipelago in the Pacific, and as far west as the Mascarene Islands and Seychelles in the Indian Ocean (Airy-Shaw 1952).

Within Torres Strait, well developed *Pisonia grandis* forests are only found on Warul Kara (Deliverance Is.) (Fell 2012a). In the south-eastern part of Torres Strait and within the far northern part of the Great Barrier Reef (GBR), historic reports of *Pisonia* trees from Garboi (Arden Island) by MacGillivray (1852) have been discounted. And a single tree is known from Utub (Dove Island), (Walker 1991).

The occurrence on Masig has been previously recorded by Walker (1991) who reported two trees located adjacent to the island airstrip, and by a herbarium specimen and field observation by Barbara Waterhouse of DAFF. More recent observations of a single tree on Masig were made by 3D Environmental in 2007. Field observations in 2012 suggest that the population on Masig is limited possibly to two remaining trees. Historical information of Shnukal (2004) indicates large-scale impacts to wongai forests on Masig and other islands in the Central group by timber cutting for the bech de mer and trepang industries, and for boat building. The location of the trees is adjacent to the airstrip and there is a possibility that more trees occurred prior to vegetation clearing. The extant trees have recently been damaged by a fire along the edge of the *Casuarina* forest bordering the airstrip. The tree has the ability to reshoot from fallen branches. Regeneration by seed is not known and no evidence of seedling regeneration was observed.



Photograph 2. The pale trunks of the bird lime tree (*Pisonia grandis*) in the background of the photograph on the margin of *Casuarina* dominant vine forest vegetation on Masig.

***Spermacoce* sp. (Lorim Point A. Morton AM1237)**

This currently undescribed perennial herb is known from northern Cape York Peninsula (near Somerset), Torres Strait (Badu, Mua, Dauan, Warraber, and Poruma), and Papua New Guinea (Mabadauan), (DERM 2011c). Masig populations form part of its disjunct northern limit of distribution. It occurs on sandy soils supporting savanna woodlands

and coastal grasslands and shrublands (DERM 2011c). On Masig it has been recorded from regenerating dune shrublands. The population size is unknown.

5.2.2 Flora with Cultural Significance

Information on useful plants of Masig is currently being documented by the Land and Sea Ranger team. More detailed ethnobotanical studies to derive baseline information of useful plants and the local language names should include information on uses, seasonality, habitat, distribution, abundance, phenology, and most importantly the relationships to story and culture. Useful plant species recorded by Lawrie (DERM 2011c) and by the authors during the November 2007 and May 2012 field survey have been annotated in the species lists provided in **Appendix B & C**. The available information indicates 71 plant species (38% of the island flora) are culturally significant. Of these, 61 are native and 10 are naturalised.

5.2.3 Introduced Plants

Information on weed species has been sourced from Qld Herbarium voucher data (DERM 2001c), the land use planning report of Conics (2009), field data of Barbara Waterhouse and Stephen McKenna from DAFF, and field surveys by 3D Environmental in November 2007 and May 2012.

With reference to the flora list (**Appendix B**), there are 65 naturalised species currently known to occur on the island (31 % of the total island flora). As for the majority of the inhabited islands in the Straits, the developed and disturbed areas are a major dispersal point for weeds. Those species considered a current threat to biodiversity on the island and requiring management action are summarised below. Further surveys are required to determine the extent of impact and threats of individual weeds to the islands ecology.

Declared Weeds

Four species declared on the LP Act are currently known to occur on Masig.

Lantana (*Lantana camara*) – Class 3

Lantana is a Class 3 declared weed and listed as Weed of National Significance (WONS). Whilst the plant is not prolific on the island there are a number of infestations. It is currently widespread on Mer, Erub and is present on Ugar, Poruma and Warraber. Ongoing monitoring and prompt control of any infestations is recommended.



Photograph 3. Lantana infestation on Masig.

Yellow bells (*Tecoma stans* var. *stans*) – Class 3

A shrub or small tree to 5 m high native of tropical America, but now present through the Americas to south-western Argentina, and in northern and eastern Australia. Seeds are wind dispersed with papery wings. It is an ornamental which is widespread on numerous islands including Masig where it has the potential to invade dune shrublands.



Photograph 4. Yellow bells (yellow flowers lower left) on the margins of foreshore coastal shrubland Poruma.

Yellow oleander (*Cascabella thevetia*) – Class 3

This bushy shrub grows to between 2-6 metres and has been introduced as an ornamental tree in domestic gardens on account of its yellow flowers. In other parts of Queensland has it has become a highly invasive weed capable of forming dense thickets. All parts of the plant are poisonous, especially the seeds which can be fatal if ingested.

Environmental Weeds

The existing level of disturbance on the island is evident by a large number of introduced plants (over one-quarter of the islands flora). The limited extent of remnant vegetation is therefore increasingly susceptible to impacts from a number of weeds. Whilst weeds are primarily distributed throughout disturbed areas, a number pose more significant threats to native vegetation. Weeds which are not currently declared under state legislation are categorised in **Table 4** according to their invasiveness, dispersibility and potential threat under the following criteria:

High: These plants are considered to be the highest threat to the islands cultural and biodiversity values because they have a high potential to expand beyond existing infestations and could occupy a much larger area if not controlled. These plants have a high likelihood to spread and establish in new areas and are able to invade reasonably intact ecosystems areas.

Moderate: These plants are considered to be of secondary importance at present, although some could become a problem in the future. They are not considered as invaders yet, but are known to be invasive elsewhere in the region and/or are showing signs of extension (species which are in an early stage of invasion), or may be present on the island in disturbed areas. These plants have a moderate potential to spread and establish in new areas, both within native bush and disturbed areas.

Low: These are naturalised plants which are not considered as invaders given their low dispersal potential. They have a low potential to expand beyond existing areas of infestations and may already occupy as much area as likely to infest.

Table 4. Environmental weeds

Species	Life Form	Comments
HIGH		
Leucaena (<i>Leucaena leucocephala</i>)	Shrub	Leucaena is the most pressing weed threat to island with the potential to severely impact and transform the remaining natural ecosystems. It is a small tree up to about six metres tall with fine bipinnate leaflets, spherical creamy yellow flower heads, dense clusters of flattened pods up to 15 cm long with 20 glossy brown, and flat seeds that scatter when ripe (Biosecurity Queensland 2007). Its origins on Masig are not known although it is likely to have been brought in from other islands as an ornamental possibly for its seeds which can be used for necklaces. The current distribution of Masig has been subject to initial targeted control by the Land and Sea team.
Glory lily (<i>Gloriosa superbens</i>)	Climber	A tuberous climbing plant with brilliant wavy-edged yellow and red flowers. It is a serious weed on sandy coastal soils in south eastern Queensland and along the north coast of New South Wales (NSW), and is known to be fatally toxic to humans with the rootstock is the most toxic part of the plant. The plant has underground tubers and is difficult to control. It has been observed in gardens on a number of islands in the Torres Strait including Masig, Warraber, Mer, Ugar, Erub and Poruma. It is likely that it has been

Species	Life Form	Comments
		introduced as an ornamental for house gardens. There is a potential for it to escape into bushland.
Scarlet flower (<i>Ipomoea hederifolia</i>)	Vine	A slender vine originally from tropical America, now naturalised in Cape Yorke Peninsula (CYP), north-eastern Queensland and southwards to north-eastern New South Wales. Recorded on disturbed margins of the community invading shrublands and vine thicket margins. There is a high potential for its further proliferation.
Sisal, Manilla rope (<i>Agave sisilana</i>)	Succulent shrub	A robust succulent plant that is widely cultivated as a garden ornamental. The species has had traditional usage in the Torres Strait Islands providing a natural source of fibre. It generally occurs in coastal areas where it may form dense impenetrable thickets covering dune swales and riparian areas. It is also listed as one of the 35 most troublesome weed species in the state, occurring on sandy beaches and dunes along Queensland (Queensland Government 2012). Reports by RPS (2010b) of the species occurrence on the margins vine thicket habitats were confirmed during the May 2012 field survey.
Praxelis (<i>Praxelis clematidea</i>)	Herb	Praxelis is a highly invasive erect, branched, unpleasant-smelling herb known on Badu, Mua and recorded from Masig. It is a native of South America, and known to spread rapidly by wind-blown seeds along roadsides. It can spread into native bushland forming dense stands that exclude other vegetation.
Castor oil bush (<i>Ricinus communis</i>)	Shrub	A robust perennial spreading shrub to about 6m native to Africa and Eurasia. Leaves are large and palmately divided leaves when mature, with 7–9 lobes, and with a strong odour when crushed. Seeds ejected explosively. It was introduced to Australia in the early 1800's. Now widespread in mainland states where it occurs in disturbed areas and along rivers and creeks. It was cultivated for castor oil which was extracted from seeds which also contain the toxin ricin. Humans are sensitive to the toxin and a few seeds ingested may kill (Parsons & Cuthbertson 1992).
Annual mission grass (<i>Cenchrus pedicellatus</i> subsp. <i>pedicellatus</i>)	Grass	A robust annual grass known from northern Australia including northern CYP, and Mua. The invasion of annual mission grass is listed as a Key Threatening Processes under the EPBC Act. It threatens biodiversity in northern savannas by competing with native annual grass species and rapidly occupying disturbed areas with the ability to remain green until the late dry season providing fuel for fires which occur later and are hotter than normal seasonal fires (DEWHA 2011).
Coffee senna (<i>Senna occidentalis</i>)	Shrub	Annual to short-lived perennial shrub to 2m with 3–7 pairs of leaflets that are 2–10 cm long, 0.6–4 cm wide, and mounded gland at base of leaf stalk. Seedpod hairless, straight or sickle-shaped, opening at maturity, with seeds transverse in seedpods. Seeds ovate to oblong, flattened, olive to dark brown, 0.4–0.5 cm long. Widespread in Qld and northern Australia. Seeds have been used as a coffee substitute. Small infestations occur on Masig.
Resurrection plant (<i>Bryophyllum pinnatum</i>)	Succulent herb/ forb	Mother-of-millions are erect, smooth, fleshy succulent plants growing to 1 m or more in height with clusters of bell-shaped flowers formed on tall flower spikes. They are favoured as hardy garden plants which can establish on poor shallow soils and able to survive long periods of water stress. The plant reproduced vegetatively spawning large numbers of miniature plants on the margins of the leaves. Currently it is known from a single infestation on Masig however it has the potential to further disperse into both native and disturbed habitats.
MODERATE		

Species	Life Form	Comments
Beggar weed (<i>Desmodium tortuosum</i>)	Herb	An herbaceous annual 1-2m in height with a deep taproot. It is naturalised throughout temperate and tropical regions of the world. It is common on Masig occurring on disturbed areas around the village and roadsides. The sticky seed pods are easily dispersed by dogs, humans and machinery.
Indian couch (<i>Bothriochloa pertusa</i>)	Grass	A stoloniferous and/or tufted perennial, commonly with pink to red stolons. Widespread throughout the tropics and in urban lawns, parks and roadsides. Occurs in disturbed areas and along tracks and roads. Has potential to invade native dune grassland and herbland ecosystems in the long term.
Milkweed (<i>Euphorbia heterophylla</i>)	Herb	Erect herb to 1.5m with milky sap from damaged stems and leaves. Widespread in the tropics and throughout Torres Strait in particular on sand dunes and coral cays. Invades native grassland and herblands.
Painted spurge (<i>Euphorbia cyathophora</i>)	Herb	An introduced weed originally from tropical America naturalised in Queensland and NSW. Widespread throughout Torres Strait in particular on sand dunes and coral cays. Invades native grassland and herblands.
Mint weed (<i>Hyptis suaveolens</i>)	Herb	A robust annual herb forming a multi stemmed shrub to 2m. Native of tropical America but now widespread throughout the tropics and subtropics. Naturalised in Western Australia, Northern Territory (NT), CYP, north-eastern Queensland and southwards as far as south-eastern Queensland. It is widespread in and around a number of island communities with seeds dispersed by wind, water and birds.
Mossman River grass (<i>Cenchrus echinatus</i>)	Grass	Mossman River grass is a prostrate spreading grass with a spiny seed head that adheres to clothing and can penetrate the skin. The species has potential to become a troublesome dominant cover on grassy dune systems.
Siratro (<i>Macroptileum atropurpureum</i>)	Vine	Siratro is widespread throughout Torres Strait occurring in community areas and on the margins of tracks and roads. It is a vigorous sprawling leguminous climber that establishes rapidly and is considered capable of invading the groundcover of shrublands.
Snake weed (<i>Stachytarpheta jamaicensis</i>)	Herb	This low erect perennial herb is common on Masig. Its leaves are opposite with toothed margins and blue flowers borne on stiff spikes. They are also naturalised throughout Qld where they invade roadsides, creek lines and vine forests where soil has been disturbed.
Townsville stylo / secca (<i>Stylosanthes humilis</i>)	Erect herb	A perennial herb to 1 m high which was introduced as a pasture species in northern Australia and now widely naturalised. Leaves have three small leaflets which are narrow elliptic. Seedpods are 3–11 mm long and 1.5–2 mm wide, with 1–2 red-brown seeds. Common on Masig throughout disturbed areas.
True indigo (<i>Indigofera tinctoria</i>)	Low shrub	A low compact perennial shrub 1-2 metres in height naturalised in tropical and temperate regions. Common on numerous Torres Strait Islands inclusive of coral cays. Tends to be inhabit disturbed areas and able to tolerate coastal exposure. The plant is one of the original sources of indigo dye which is extracted from the leaves.
Grader grass (<i>Themeda quadrivalvis</i>)	Grass	A robust erect perennial grass to 1.5m in height which is a major weed in northern and coastal central Queensland which is capable of invading grassy woodlands and shrublands. Infestations are typically prominent along roadsides. The seeds are easily dispersed by machinery, vehicles and slashing, with colonisation typically following ground disturbance. The extent of infestation on Masig required further investigation. It was not observed during 2012 field surveys.
LOW		
Asthma plant (<i>Euphorbia hirta</i>)	Herb	Prostrate herb to 10cm with milky sap from stems and leaves. Widespread in the tropics and throughout Torres Strait in particular on sand dunes and coral cays. Invades

Species	Life Form	Comments
		native grassland and herblands.
Button grass (<i>Dactyloctenium aegyptium</i>)	Grass	A low perennial grass widespread throughout Qld and Torres Strait. Common on coral cay islands.
Cinderella weed (<i>Synedrella nodiflora</i>)	Herb	An annual herb which occurs on Masig and other Torres Strait Islands. Occurs in disturbed areas and on margins of native vegetation.
Cobblers peg (<i>Bidens pilosa</i>)	Herb	An annual herb widespread in disturbed areas.
Couch (<i>Cynodon dactylon</i>)	Grass	A low-growing perennial grass with grey-green leaves which spreads rapidly by seed and runners. It is widely planted as a lawn grass. It occurs in all states and territories. It invades wetlands and river edges in parts of Qld.
Crowsfoot (<i>Eleusine indica</i>)	Grass	Tufted erect perennial grass found throughout village area and along tracks and roads.
Pink periwinkle (<i>Catharanthus roseus</i>)	Herb	An upright herbaceous perennial with dark green, lance-shaped leaves and abundant pale pink flowers. Seeds are dispersed by ants, wind and water. It was first recorded as naturalised in south-east Queensland in 1909 and is widely spread from north Queensland south to the NSW border. Common throughout Torres Strait.
Poinciana (<i>Delonix regia</i>)	Tree	A large spreading deciduous tree with fine deciduous leaves and attractive red flowers. Known to be invasive throughout the Pacific Islands and on basalt islands of Mer and Erub.
Red Natal grass (<i>Melinis repens</i>)	Grass	A widespread perennial grassy weed common in the northern and eastern parts of Australia including Torres Strait. Occurs along disturbed areas with ability to invade margins of native vegetation and disturbed areas. On Masig it is found primarily on disturbed sites with ability to spread into natural habitats.
Stinking passionflower (<i>Passiflora foetida</i>)	Vine	A climbing or scrambling vine with leaves that are mostly 3-lobed and glandular hairy 4–12 cm long. Fruit are 2–4 cm wide, hairy, yellow-orange when ripe. Flowers are solitary, 3–5 cm wide, white to pale purple with a foetid smell. Small black seeds are spread by birds and mammals. Occurs throughout northern and subtropical Australia often in good condition vegetation. Ripe fruits have a pleasant flavour but green fruits and leafy material are toxic.
Tridax daisy (<i>Tridax procumbens</i>)	Herb	An annual herb which is widespread on Poruma and other Torres Strait Islands. Occurs in disturbed areas and as a groundcover on foredune grassland and herbland communities.
Streaked rattlepod (<i>Crotalaria pallida</i> var. <i>obovata</i>)	Low shrub	Originally from tropical America, and now widespread in northern Qld and north-eastern New South Wales. Occurs as scattered individuals in disturbed areas but capable of infesting disturbed areas and the margins of native vegetation.
Purple sow thistle (<i>Emilia sonchifolia</i> var. <i>sonchifolia</i>)	Herb	A weed of disturbed areas and gardens.
Ogiera (<i>Eleutheranthera ruderalis</i>)	Herb	A weed of disturbed areas and gardens.
Bauhinia (<i>Bauhinia monandra</i>)	Tree	A tree of gardens which has the ability to colonise disturbed areas.
Creeping tickfoil (<i>Desmodium triflorum</i>)	Herb	A prostrate creeping legume herb which occurs in disturbed areas and along tracks and roads.
Velvet bean (<i>Mucuna puriens</i> var. <i>utilis</i>)	Vine	A vigorous annual creeping vine with trifoliate leaves. Extent of population on Masig not known.
Summer grass (<i>Digitaria ciliaris</i>)	Grass	This grass is commonly found in lawns, gardens and disturbed areas.
Sweet broom (<i>Scoparia dulcis</i>)	Herb	This herb is commonly found in lawns, gardens and disturbed areas.

Weed Threats

Three weeds, as yet not recorded on Masig, are considered to have the capacity to cause long-term changes to the island's vegetation. These are listed in **Table 5**.

Table 5. Major weed threats.

Species	Comments
Barleria (<i>Barleria prionitis</i>)	This plant is considered an emerging environmental weed, which has the potential to seriously degrade habitats on coral cay islands, particularly in vine thickets/shrublands on sand dunes where there are canopy openings or disturbance. It is recognised as one of 28 weeds on the <i>Alert List for Environmental Weeds</i> (NHT 2003). The plant is currently known from Boigu Island.
Cupids flower (<i>Ipomoea quamoclit</i>)	A slender vine originally from India and now naturalised across northern Australia and on the east coast south to northern NSW. Existing infestations on other islands such as Mabuiag have the potential to disperse.
Indian calapo (<i>Calopogonium mucunoides</i>)	A vigorous short-lived viney creeper which is native to South America and introduced to northern Australia as a pasture legume. It establishes from seed, and rapidly forms dense mats of foliage 30-50 cm high often climbing and smothering adjoining vegetation. It is less common than siratro and butterfly pea however existing infestations on other islands such as Mabuiag indicate its potential to disperse.

6.0 Fauna (Animals)

For the purposes of this report, terrestrial fauna includes amphibious species such as crocodiles and amphibians and aerial species such as swifts. It does not include marine species and hence marine turtles, sea snakes and sea birds are excluded. Sea birds include all members of the Order Procellariiformes such as shearwaters and petrels, as well as frigatebirds (family *Fregatidae*), boobies (family *Sulidae*) and tropicbirds (family *Phaethontidae*). Some species of tern (family *Laridae*) are largely marine but are usually considered as shorebirds rather than sea birds (e.g. Pringle 1987).

As for the majority of Torres Strait Islands there is a lack of systematic survey of fauna habitats on the island. Given its small size however, Masig remains one of the most intensively surveyed islands in the broader Torres Strait Island group per unit area. A desktop review of the DERM WildNet (Wildlife Online) database, Online Zoological Collections of Australian Museums (OZCAM 2011), the EPBC Online Protected Matters Search Tool maintained by the DSEWPC (2011g), was supported by analysis of the survey results of RPS (2010b). Other records are incidental, or part of broader regional survey are targeted towards particular life forms (e.g. Draffan *et al.* 1983; Clarke 2004; Garnet *et al.* 2000; Hall 2008, Helgen 2004) of which studies of avifauna (birds) have been most comprehensive.

The desktop review identified 65 fauna species that have been reported for Masig (**Appendix D**). This includes one frog, four reptile, 57 bird and three mammal species. This can be compared with the 384 terrestrial fauna species that have been reported for the broader Torres Strait Island group. Of the animals reported for the island, one reptile, one bird and two mammal species are introduced. An additional two species have been identified by the Protected Matters Search Tool as possibly occurring on the island.

6.1 Culturally Important Fauna Species

Over 100 years ago, English anthropologist Alfred Cort Haddon (1912:230) noted Torres Strait Islanders' familiarity with the natural world:

'[they] are good field naturalists and have names for a large number of plants and animals. A considerable number of plants are utilised in one way or another, more so than we have mentioned in these Reports. Although the land fauna is deficient in forms of economic importance, the natives have names for animals which are not of value to them, and are acquainted with their habits; their knowledge of the natural history of marine animals being very extensive. The uses and properties of most of the plants are known to them'.

The region's birds, mammals and reptiles also have cultural significance for Torres Strait Islanders. Many feature in local myths and legends, and some are also clan totems (*augadh*).

On Masig Island, clan totems include turtle (*umay*), hammerhead shark (*sapur*) and eagle (*thabu*) and crocodile (*koedal*) (Haddon & Rivers 1904:154).

The calls of some birds are recognised as omens, foretelling events such as weather, the arrival of a ship or the death of a relative (e.g. Haddon 1908:260-261), others are 'calendar species' which alert people to the fact that a particular food resource is now available. Feathers from birds such as herons (*Egretta sacra* and *Ardea* spp.) and the cassowary (*Casuarus casuarus*) – obtained from Papua New Guinea traders continue to be used for traditional headdresses.

6.2 Fauna Habitat Values

Masig is a relatively small island with limited habitat diversity. Whilst 68 % of the island is covered in natural or near natural vegetation, this vegetation is dominated by three structural types which demonstrate significant overlap in constituent flora species. As Masig is a coral cay, the sandy substrate forms a uniform surface across the island and does not present to diversity of soil and landform types that are demonstrated on the larger continental islands. Hence the fauna diversity, as it is with all coral cays in the Torres Strait when compared to the larger continental islands, is relatively depauperate.

The major value of the island habitats is as a foraging resource, roosting and nesting site for birds. Of the 65 fauna species recorded on the island 57 (87 %) are birds, many of which are transient or migratory species. The vine forest habitats on Masig provide an important roosting site for a number of avian species plus a seasonal foraging resource for frugivorous birds. Littoral margins of the island, particularly in those less disturbed portions of the coastal fringe, provide a temporary stop-over for migratory species as well as serving an important habitat for a number of waders and terns including the little tern, eastern curlew and beach stone-curlew. These species are further discussed further in **Section 6.3**.

6.3 Fauna Species with Conservation Significance

In this report fauna of conservation significance include:

- Species listed as Critically Endangered, Endangered or Vulnerable under the Commonwealth's EPBC Act including those listed as Migratory.
- Species listed under Endangered, Vulnerable or Near-Threatened under Queensland's NC Act.
- Species considered of 'Critical' or 'High' priority under the Back on Track framework (DERM 2011a).

Other species may be assessed as being significant at the regional scale (i.e. Torres Strait) by the study team based on criteria such as local rarity, state and bioregional endemism, limits of distribution and disjunct occurrences.

6.3.1 Endangered, Vulnerable and Near-Threatened Species

A total of three species of conservation significance (threatened species) at either state or federal level have been reported on the island, with two additional species predicted to occur (see **Table 6**). There are also an additional 32 migratory species considered to have significance at federal level that are reported to occur on the island (**Appendix F**).

Table 6. Endangered, Vulnerable and Near-Threatened fauna species¹ reported or predicted² to occur on Masig.

Scientific Name ³	Common Name	Status ⁴			Source ⁶
		EPBC Act	NC Act	BoT ⁵	
SPECIES REPORTED					
<i>Esacus magnirostris</i>	Beach stone-curlew	-	V	-	Published record (Natural Solutions 2008)
<i>Sternula albifrons</i>	Little tern	M	E	High	WildNet, Reported in (Natural Solutions 2008)
<i>Numenius madagascariensis</i>	Eastern curlew	-	NT	-	18 islands in the Torres Strait including Boigu, Mua, Badu, Mer, Erub, Mabuig, Dauan and lama. Observed by 3D Environmental in May 2012 survey.
SPECIES PREDICTED²					
<i>Pteropus conspicillatus</i>	Spectacled flying fox	V	-	-	Predicted by the EPBC Protected Matters database
<i>Crocodylus porosus</i>	Saltwater crocodile	-	V	-	Predicted by the EPBC Protected Matters database

1. Listed as Endangered, Vulnerable, Near-Threatened or Migratory under the EPBC Act 1999 and/or the NC Act 1992 or of critical or high priority under the Back on Track prioritisation framework (DERM 2011a).
2. Predicted by the EPBC Protected Matters Search Tool maintained by DSEWPC (2011g). Only noted if not recorded from another source.
3. Nomenclature follows the Australian Faunal Directory (DSEWPC 2011d).
4. Status: E = Endangered, V = Vulnerable, NT = Near-Threatened, M = Migratory, LC = Least Concern (Common).
5. BoT = Back on Track priority species.
6. Known from Museum records, published literature (eg Draffan *et al.* 1983; Clarke 2004a, b), WildNet database and/or reports and other grey literature (eg Schaffer 2010). These sources are not necessarily mutually exclusive.

Little tern (*Sternula albifrons*)

EPBC Act: Migratory; **NC Act:** Endangered

Listed under the EPBC Act as *Sterna albifrons* (Bonn Convention, CAMBA, JAMBA, ROKAMBA).

The little tern is also considered of 'High' priority under the Back on Track species prioritisation framework (DERM 2011a).

The little tern is found along a variety of coastal areas, including open beaches, lagoons, estuaries, river mouths, lakes, bays, harbours and inlets, especially those with exposed

sandbanks. They feed primarily on small fish, crustaceans and other invertebrates and nest on open sandy beaches. Nesting occurs mainly from September to January but in northern Australia nesting also occurs from April to July. Little terns breed in small colonies (Pringle 1987; Higgins & Davies 1996).

The species occurs in Europe, Asia and Australasia and within Australia occurs along the coastal regions of eastern Australia, south to Tasmania, and across northern Australia, west to northern parts of Western Australia (Higgins & Davies 1996). The little tern is mainly a summer visitor to northern Australia, including Torres Strait, though there is a winter-breeding population in the Gulf of Carpentaria (Blakers *et al.* 1984). In the Torres Strait Draffan *et al.* (1983) reports the species from 13 islands, including Badu, Murray and Erub. It is also known from Boigu (Clarke 2004b; DERM 2010a), Mua (Ingram 2008) and Iama (Conics 2008b). A single WildNet record is reported from Dauan. Draffan *et al.* (1983) described it as an uncommon summer visitor throughout the Torres Strait. In summer of 2002, Clarke (2004b) recorded 151 individuals on Boigu Island, approximately one third of which were in, or near, full breeding plumage, suggesting that the northern Torres Strait Islands may be more important for the species than previously thought.

The little tern in Australia is both increasing in abundance and expanding its distribution. The species has a naturally high rate of breeding failure, with ground-nesting making it vulnerable to natural events that contribute to low success, such as loss of eggs and chicks through native predators, flooding of nesting sites (including high tides), and adverse weather conditions (Garnett & Crowley 2000). Little terns are also threatened by human disturbance at nesting colonies, encroachment of vegetation in colonies (Blakers *et al.* 1984), nest predation by rats, gulls and feral pigs, and by degradation of estuaries, pesticide residues in fish, and oil-fouling of both birds and beaches (Garnett & Crowley 2000). Little tern is unlikely to breed on Masig Island and therefore threats are considered to be minimal.

Beach Stone-curlew (*Esacus magnirostris*)

NC Act: Vulnerable

Beach stone-curlew is considered of 'Critical' priority under the Back on Track species prioritisation framework (DERM 2011a). The species was formerly known as beach thick-knee and as *Burhinus neglectus*.

The beach stone-curlew generally occurs singularly or in pairs, and occasionally in small groups of up to six birds. The species is exclusively coastal, occurring on all types of beaches, especially near river mouths, on mudflats, near mangroves, and occasionally on coastal lagoons. It is typically more common on islands than the mainland (Lane 1987; Marchant & Higgins 1993). The species is mainly nocturnal or crepuscular and adult birds appear to be sedentary. The species feeds predominately on crabs and other marine invertebrates in the intertidal zone and a single egg is laid in a scrape in the sand, often in the same area year after year (Clancy 1986; Marchant & Higgins 1993).

Beach stone-curlews are found around eastern and northern Australia from Nambucca Heads in New South Wales (and occasionally south to Victoria) to Port Cloates in Western Australia and extend into New Guinea, the Solomon Islands and Indonesia (Marchant & Higgins 1993). Draffan *et al.* (1983) report the species from 33 Torres Strait Islands in total, in every area except the north-west. A single Wildnet record is reported for Dauan.

This species is still found in locations where human activity is high but the lack of young birds in such areas indicates that reproduction is being affected by human disturbance (Freeman 2003). Breeding success may also be significantly reduced from predation by cats, dogs and feral pigs. Much of the species' habitat in Australia, particularly on islands, is secure. However, because beach stone-curlews occur at low densities and occupy linear habitats, the potential for local extinctions to become regional ones is increased (Garnett & Crowley 2000).

The species was observed on Masig to utilise vine forest habitats for roosting (Natural Solutions, 2008). The species may be threatened by feral species and disturbance by humans, particularly when nesting.

Eastern Curlew (*Numenius madagascariensis*)

EPBC Act: Migratory (Bonn Convention, CAMBA, JAMBA, ROKAMBA)

NC Act: Near-Threatened

The eastern curlew is mostly confined to coastal habitats, particularly estuaries, harbours and coastal lagoons. They mainly forage on open intertidal mudflats, sandflats and saltmarsh, often near mangroves, and occasionally on ocean beaches. Roosting occurs on sandy spits and islets, in mangroves and saltmarsh, and along high water mark on beaches (Pringle 1987; Higgins & Davies 1996). The species usually feeds individually or in small groups (Pringle 1987), though large numbers may congregate at high tide roosts (Lane 1987).

Eastern curlews breed in eastern Siberia during the northern hemisphere summer and arrive in north-eastern Australia as early as late July, but most individuals arrive in eastern Australia by late August and September (Ueta *et al.* 2002). Birds begin to depart to return to breeding grounds around March and April (Lane 1987). However, a significant percentage of the Australian population remains through the Australian winter, particularly in northern Australia (Pringle 1987; Driscoll & Ueta 2002). In Australia eastern curlews occur in suitable habitat on all coasts (Higgins & Davies 1996). In the Torres Strait Draffan *et al.* (1983) reported them from 18 islands, including Mua, Badu, Mer, Erub, Poruma and Boigu, and there is a single WildNet record from Mabuiag (DERM 2010e) and an unpublished record from Iama (Conics 2008a). The species is likely, at least on passage, on any island that has suitable foraging habitat.

The Australian eastern curlew population is estimated at 19 000 and numbers have fallen significantly in some southern areas. In Tasmania populations have declined by 65% (Reid &

Park 2003). It is unknown as to whether these declines are a result of overall population decline or a change in non-breeding range. Eastern curlews are easily disturbed by people at foraging and roosting sites (Higgins & Davies 1996; Taylor & Bester 1999) and are often the first species in a high-tide roost to take to flight if disturbed, relocating to alternative roosts often some considerable distance away (Lane 1987). Eastern curlews will take off when humans approach to within 30-100 m (Taylor & Bester 1999) and sometimes are disturbed within 250m of approach (Higgins & Davies 1996). Pollution may have also reduced food availability (Higgins & Davies 1996).

The species was confirmed by 3D Environmental during filed surveys in May 2012. Natural Solutions (2008) notes that the species was observed there during field surveys although the species is not recorded in their compiled species list for the island, nor are there any database records. Formal survey work is required to provide an accurate indication of their numbers on Masig. The species is most likely to be threatened by disturbance when foraging and such a threat would only be significant during passage to northern hemisphere breeding grounds.

6.3.2 Migratory Species

Fifty-seven bird species listed as Migratory under the EPBC Act are known to occur in Torres Strait (**Appendix F**). The Vulnerable (NC Act) salt-water crocodile is also listed as Migratory under the EPBC Act and is predicted by the EPBC MNES search engine to occur on Masig. A number of other species also migrate into or through the Torres Strait but are not listed under the EPBC Act. Unless otherwise stated it should be assumed that reference to Migratory species in this report refers only to those species listed as such under the EPBC Act. **Table 7** lists the 30 Migratory species reported to occur on Masig, with an additional 26 birds (and one reptile) that are likely to occur based on records on adjacent islands and suitable habitat. All species are listed as Least Concern under the NC Act unless otherwise noted.

Table 7. Migratory¹ species reported or predicted to occur on Masig.

Scientific Name ²	Common Name	Comments ³
SPECIES REPORTED		
<i>Ardea modesta</i> ⁴	Eastern Great Egret	WildNet & published records.
<i>Pandion cristatus</i> ⁵	Eastern Osprey	WildNet & published records.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	WildNet & published records.
<i>Pluvialis fulva</i>	Pacific Golden Plover	WildNet & published records.
<i>Pluvialis squatarola</i>	Grey Plover	WildNet & published records.
<i>Numenius madagascariensis</i> ⁶	eastern curlew	Draffan 1983, 3D Env 2012
<i>Charadrius mongolus</i>	Lesser Sand Plover	WildNet & published records.
<i>Charadrius leschenaultii</i>	Greater Sand Plover	WildNet & published records.
<i>Numenius phaeopus</i>	Whimbrel	WildNet & published records.
<i>Xenus cinereus</i>	Terek Sandpiper	Published record.
<i>Tringa brevipes</i> ⁸	Grey-tailed Tattler	WildNet & published records.
<i>Calidris ruficollis</i>	Red-necked Stint	Wildnet & published record
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	WildNet & published records.

Scientific Name ²	Common Name	Comments ³
<i>Anous stolidus</i>	Common Noddy	Wildnet & Published records
<i>Sternula albifrons</i> ¹⁰	Little Tern	Published record
<i>Sterna dougallii</i>	Roseate Tern	Wildnet & Published records
<i>Sterna Hirundo</i>	Common Tern	Wildnet & Published records
<i>Cuculus optatus</i> ¹²	Oriental Cuckoo	Published record
<i>Merops ornatus</i>	Rainbow Bee-eater	WildNet & published records.
<i>Xenus cinereus</i>	Terek Sandpiper	Published record
<i>Tringa nebularia</i>	Common Greenshank	WildNet & Published record.
<i>Rhipidura rufifrons</i>	Rufous Fantail	Wildnet & Published records
<i>Monarcha melanopsis</i>	Black-faced Monarch	WildNet & published records.
<i>Sterna sumatrana</i>	Black-naped Tern	WildNet & Published record.
<i>Limosa lapponica</i>	Bar-tailed Godwit	Published record
<i>Calidris tenuirostris</i>	Great Knot	WildNet & Published record.
<i>Ardea modesta</i>	Eastern Great Egret	WildNet & published records.
<i>Ardea ibis</i>	Cattle Egret	WildNet & published records.
<i>Egretta sacra</i>	Eastern Reef Egret	Wildnet & published record
<i>Arenaria interpres</i>	Ruddy Turnstone	Wildnet & published record
ADDITIONAL POSSIBLE MIGRATORY SPECIES		
<i>Crocodylus porosus</i>	Salt water Crocodile	Predicted to Occur – MNES database search
<i>Colonectris leucomelus</i>	Streaked Shearwater	Predicted to Occur – MNES database search
<i>Plegadis falcinellus</i>	Glossy Ibis	No Records
<i>Apus pacificus</i>	Fork-tailed Swift	No Records
<i>Gallinago megala</i>	Swinhoe's Snipe	No Records
<i>Thalasseus bengalensis</i> ¹¹	lesser crested tern	Leary & David 1994
<i>Limosa limosa</i>	Black-tailed Godwit	No Records
<i>Numenius minutus</i>	Little Curlew	No Records
<i>Plegadis falcinellus</i>	Glossy Ibis	No Records
<i>Apus pacificus</i>	Fork-tailed Swift	No Records
<i>Tringa stagnatilis</i>	Marsh Sandpiper	No Records
<i>Tringa glareola</i>	Wood Sandpiper	No Records
<i>Calidris melanotos</i>	Pectoral Sandpiper	No Records
<i>Onychoprion anaethetus</i>	Bridled Tern	No Records
<i>Actitis hypoleucos</i> ⁷	Common Sandpiper	No Records
<i>Hydroprogne caspia</i>	Caspian Tern	No Records
<i>Chlidonias leucopterus</i>	White-winged Black Tern	No Records
<i>Symposiachrus trivirgatus</i> ¹³	Spectacled Monarch	No Records
<i>Hirundo rustica</i>	Barn Swallow	No Records
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	No Records
<i>Coracina tenuirostris melvillensis</i>	(Melville) Cicadabird	No Records
<i>Hydroprogne caspia</i>	Caspian Tern	No Records
<i>Calidris ferruginea</i>	Curlew Sandpiper	No Records
<i>Tringa incana</i> ⁹	Wandering Tattler	No Records
<i>Tringa nebularia</i>	Common Greenshank	No Records
<i>Calidris canutus</i>	Red Knot	No Records

1. Listed as Migratory under the EPBC Act 1999.
2. Nomenclature follows the Australian Faunal Directory (DSEWPC 2011d).
3. Known from Museum records, published literature (eg Storr 1973; Draffan *et al.* 1983; Wilson 2005), WildNet database and/or reports and other grey literature (eg Smith & Smith 2006; Natural Solutions 2008). These sources are not necessarily mutually exclusive. No additional species was predicted by the EPBC Protected Matters Search Tool maintained by DSEWPC (2011g).
4. Listed under the EPBC Act (CAMBA, JAMBA) as Great Egret *Ardea alba*. Australian birds elevated to full species level as *A. modesta* (Kushlan & Hancock 2005; Christidis & Boles 2008).
5. Listed under the Bonn Convention as Osprey *Pandion haliaetus*. Australian birds have been elevated to species level as *P. cristatus* (Wink *et al.* 2004; Christidis & Boles 2008).
6. Listed as Near-Threatened under the NC Act.

7. Also listed under CAMBA and ROKAMBA as *Tringa hypoleucos*.
8. Also listed under the Bonn Convention and JAMBA as *Heteroscelus brevipes*.
9. Also listed under the Bonn Convention and JAMBA as *Heteroscelus incanus*.
10. Listed under the EPBC Act (Bonn Convention, CAMBA, JAMBA, ROKAMBA) as *Sterna albifrons*. Listed under the NC Act as Endangered.
11. Listed under the EPBC Act (CAMBA) as *Sterna bengalensis*.
12. Listed under the EPBC Act (CAMBA, JAMBA, ROKAMBA) as *Cuculus saturatus*. Australian birds elevated to full species level as *A. optatus* (Christidis & Boles 2008).
13. Listed under the EPBC Act (Bonn Convention) as *Monarcha trivirgatus*.

6.3.3 Species of Regional Significance

The *Action Plan for Australian Birds 2000* provides a list of bird species or subspecies that occur on Masig Island and meet the criteria for listing as Vulnerable under the EPBC Act. These species should be considered regionally significant although none of these species has been recorded on Masig.

6.4 Pest Fauna Species

Exotic (introduced) fauna species reported for Masig are house gecko, house sparrow (*Passer domesticus*), dog and cat.

House gecko is considered a threat to native species through competition in both natural habitats and on buildings (Case *et al.* 1994; Hoskin 2010). There are records of native geckoes on Masig, dubious dtella (*Gehrya dubia*). Mourning gecko is superficially similar in appearance to Asian house gecko and also inhabits buildings. Local information on geckoes is therefore unlikely to be reliable in regards to species and an assessment of the level of threat posed by house gecko requires survey effort.

House sparrow is unlikely to pose any threat to native species on Masig and no action is required for the species.

Dogs are present on the island and are a threat to ground nesting birds, particularly the beach stone-curlew as well as a disturbance factor for waders and terns. Cats are also reported for the island (Natural Solutions 2008). Although house cats in Australian suburbs have been shown to kill mainly introduced rats and mice, native wildlife are also killed, including mammals, birds, reptiles and frogs. With access to undisturbed habitat, it is likely that they would have a substantial impact on native fauna (Barratt 1997).

6.5 Threats

Exotic predators, such as dogs, cats, and possibly rats may have already impacted fauna populations with their continued presence posing an ongoing threat to native fauna, either directly through predation or by disturbance. Further habitat loss and fragmentation through vegetation clearing remains a potential threat. By far the greatest threat posed to the island in the long term is sea level rise although the impacts and rate of advancement are uncertain and difficult to mitigate.

Whilst rats have not been reported for the island they remain a potential threat requiring ongoing monitoring efforts. The black rat poses concern to culturally significant flora, and native fauna/bird species particularly during nesting where eggs may be vulnerable to foraging. Diets (2010) recorded high densities in and around houses and in all the vegetated habitats on Poruma, with reports of occasional outbreaks causing potentially serious health problems to the local islander community, damage to household goods and infrastructure. Vigilance against similar infestations on Masig is required.

6.6 Future work

Being a small island with a limited number of habitats, Masig is one of the most intensively surveyed islands in the Torres Strait. It is important however that continued information be collected on the islands fauna assemblage, particularly for avian species. In addition to general opportunistic survey methods, the following actions are recommended:

High Priority

Targeted surveys to identify important areas of habitat and roosting sites for the beach stone-curlew.

The location of any breeding sites for the beach stone-curlew should be recorded so that these sites can be monitored and afforded protection from threatening processes. Vigilant recording of any other species sited on the island, particularly the conservation significant species including eastern curlew, sooty oystercatcher and little tern should be an ongoing action.

Determining presence and populations of feral cats, wild dogs and exotic rodents.

Domestic cats occur on the island and it is likely that feral populations occur. In regard to the latter, the first priority is to carry out spotlighting surveys in and around the tip on a regular basis. If cats or dogs are evident, sand padding of tracks on the remote parts of the island will provide additional data on population size and movement. This information is critical to allow development of a targeted control plan. The process may require involvement of training in feral animal survey and control techniques.

7.0 Profiles for Masig Island Habitats

This section presents a summary of current knowledge, management issues and recommended management actions for the habitats that occur on Masig. The information presented has been derived from prior and recent field survey efforts, review of previous reports, input from experts at technical workshops, and consultation with island rangers and indigenous community members. As context it is noted that the vegetation on the island has been affected by human occupation and settlement.

“Pre-contact Kulkaigal had acted both deliberately and inadvertently upon their surroundings. For their gardens they cleared land, marked permanent boundaries, planted, harvested, placed increase statues, brought new plant species from elsewhere, collected seeds for replanting. For their settlements they built huts, kooda and skullhouses, cleared open spaces for meeting places, criss-crossed their islands with well-trodden paths, constructed burial mounds, put up temporary shelters and windbreaks, cut wood and bamboo to build fires, house supports, shelters and drying racks, took the hard wood of the mangrove to make digging sticks and the softer wongai wood to carve totemic figures and harpoon heads” (Shnukal 2004).

7.1 Deciduous/Semi- Deciduous Vine Forest and Vine Thicket

7.1.1 Status of Ecological Knowledge

Deciduous and semi-deciduous vine forest and thicket, as represented by vegetation community 2m, is mapped exclusively on coral cays of the central group of islands. **Figure 3** shows the distribution of the 10.8 ha of the ecosystem on the island. Small areas are present on Masig, and it is likely that it was once considerably more extensive. The habitat is distinct from the more extensive casuarina dominant forests which are floristically and structurally much simpler.

The canopy forms heights of between 18 to 25m and is composed of a mix of deciduous and evergreen species with including *Millettia pinnata*, *Terminalia subacroptera*, *Diospyros maritima*, *Manilkara kauki*, *Aglaia elaeagnoidea*, *Pouteria obovata*, *Drypetes deplanchei* and scattered *Erythrina variegata*. This vegetation community is reported to have been heavily impacted by firewood harvesting to service the Trepang industry and less so for boat building (see Shnukal 2004).



Photograph 5. The sub-canopy structure of VC2m on Masig Island.

7.1.2 Ecological / Cultural Considerations

Habitat Condition: Only a limited number of intact examples of this forest are present on Masig. Of these, only two examples demonstrate an undisturbed canopy with the best preserved habitat located on the north-west side of the airstrip. Regrowth habitats have a typical canopy dominance of *Millettia pinnata* which is often broken and interspersed with groves of *Manilkara kauki*. Despite the structural disturbance imposed on this habitat, few exotic species have penetrated into the canopy margins.

Fauna: The fauna assemblage associated with this habitat is simple, comprising a limited number of ground dwelling reptiles. It is however an important habitat for frugivorous birds and may provide roosting sites for beach stone-curlew and eastern curlew. Further survey across a range of seasons will aid characterisation of the habitats full faunal assemblage.

Flora: The regionally significant plant Chalmers aristolochia (*Aristolochia chalmersii*) is known to occur in this habitat.

Cultural Perspectives: Vine forests on Masig provide an abundance of cultural resources evidenced by the numerous culturally significant plant species occurring within. These forests provide the original habitat of wongai plum which is of high significance to Kulkalgal.

7.1.3 Management Considerations

The habitat has a restricted regional distribution and has been heavily fragmented and modified across much of its original extent. This is manifest in the 'Of Concern' status under the *Vegetation Management Act* (1999). Semi-deciduous vine forests associated with coral cays are a restricted and fragile habitat requiring highly specific edaphic conditions, in particular a threshold depth of well-drained calcareous substrate and availability of fresh groundwater.



Figure 3. Distribution of evergreen vine forest and thicket Masig Island (place names after Lawrie, 1970).

Historically the habitat has been reduced in area by resource use, clearing for settlement and infrastructure development. Whilst future clearing impacts remain a possibility, the habitat currently faces its greatest threat from further fragmentation and exotic weed species invasion. At present, minimal active management is required although the passive management situation may change rapidly given the range of potentially invasive plant species which currently occur on the island. Regular patrols, focusing initially on disturbed margins of vine forest areas should continuously monitor for expansion of existing species and any emergence of exotic plants such as barleria or praxelis which have not yet reached the island. Canopy openings and other forms of disturbance to this habitat may provide a niche for invasion of exotic species.

Longer-term threats include those impacts associated with coastal erosion, sea level rise and changing climatic regimes. Salinisation of the fresh groundwater lense through overdrawing of the water resource may also be a future threat to these forests. The impacts of changing shorelines and coastal erosion should also be monitored on a regular basis. Management actions can be further considered if damage to this habitat is noted.

7.1.4 Summary of Recommended Management Actions

The information provided in **Table 8** below aims to summarise the key issues, actions and priorities so as to aid the transfer of information into the Masig Island Working on Country

Plan. Priority categories are adapted from the Draft Plan of Management for Pulu Indigenous Protected Area (Hitchcock *et al.* 2009) as follows:

Immediate Priority Actions – Actions required for management issues which have potential to significantly alter or damage the islands natural or cultural values in the short term (0-5 years).

High Priority Actions – Actions required for management issues which have potential to result in significant damage of the islands natural or cultural values within the medium term (5-15 years) or where lack of knowledge significantly hampers the ability to manage a habitat effectively.

Moderate Priority Actions – Actions required for management issues which have potential to result in significant damage of the islands natural or cultural values within the long term (>15 years) or where there is a knowledge gap that does not detract significantly from the ability to manage a habitat effectively.

Table 8. Summary of management actions for evergreen and semi-evergreen vine forests

Management Category	Context/Issue	Actions	Priority
Fauna Surveys	Fauna composition within this habitat requires further definition.	Opportunistic collections of fauna and observations relating to fauna usage within this habitat should be undertaken as part of rangers general duties. Maintain focus on ethnotaxonomy to feed into Traditional Ecological Knowledge (TEK).	Moderate
Plant Surveys	Flora composition is documented although limited to rapid surveys. Potential for new records for the island of significant species particularly during the wet season. Monitoring through bi-annual ground flora surveys provides opportunities for ranger training and occurrence of new records for the island including invasive species.	Carry out regular flora field surveys with focus on ranger training, collection of new records for the island and important cultural resource species. Collect leaf specimens and photograph plants with known uses/values and that may have been used in the past, and catalogue. Update island species list as new information becomes available.	Moderate
Traditional Ecological Knowledge	Plant and animal lists provided in the appendices provide a good foundation for increasing TEK and ethnotaxonomy.	Collect and collate TEK knowledge within this habitat on an ongoing basis.	High
Fire Management	No fire management required.	No management actions required.	Not required
Threatened Species Management	<u>Flora</u> : The regionally significant vine (<i>Aristolochia chalmersii</i>) may occur on vine forest margins. The ecology of this species is poorly documented. <u>Fauna</u> : Composition of fauna	<u>Flora</u> : Targeted surveys to determine the population size of the vine Chalmers aristolochia and to determine threatening processes. <u>Fauna</u> : Further baseline	Moderate

Management Category	Context/Issue	Actions	Priority
	within this habitat has been subject to surveys by RPS.	information is required (see fauna surveys) before discrete management actions can be defined. Adopt a structured fauna assessment program as per recommendations set out in Section 6.6.	Immediate
Invasive Species Management	<u>Flora</u> : A number of weeds occur on the margins of vine forest vegetation and pose a threat in the long term.	<u>Flora</u> : Monitoring for new weed infestations, particularly for weeds including leucaena is required on a regular basis. Control of high priority weeds in adjoining areas will reduce the potential for future infestations.	Immediate
	<u>Fauna</u> : The impacts that rats, cats and possibly wild dogs are having on this habitat are unknown and needs to be ascertained.	<u>Fauna</u> : Populations of rats, cats and dogs should be assessed through appropriate methods with an eradication/control program considered if required.	Immediate
Monitoring	Observations relating to any changes to habitat condition, particularly those arising from impacts from feral animals, weeds, or coastal erosion are required on a regular basis.	Carry out informal observation of habitat condition including health of canopy (monitoring for dieback) and presence of invasive weed species, on a regular annual to bi-annual basis. Regular observations relating to impacts of coastal erosion on this habitat are required. Permanent monitoring points may be required in areas identified as being problematic.	Moderate

7.2 *Casuarina* Dominant Woodland and Open Forest.

7.2.1 Status of Ecological Knowledge

Open forest of garboi (*Casuarina equisetifolia*) forms the dominant natural habitat type on Masig forming 30% (60 ha) of the islands vegetation cover. Upon cursory inspection, generally from within the forest, these forests appear floristically and structurally similar to deciduous vine forest habitats. Structural measurements do however substantiate the dominant nature of the casuarina in these habitats warranting their separate classification. Canopy heights of casuarina ranges from 18 to 25m are typical over the dense sub-canopy of vine forest species which are dominated by *Diospyros maritima*, *Pouteria obovata*, *Aglaia elaeagnoidea*, *Diospyros compacta*, *Cyclophyllum maritimum* and *Terminalia subacroptera*.

It should be noted that the dominance of vine thicket species in the sub-canopy layers is suppressing the recruitment of casuarina which stand in testament to a period when the lower structural layers were more open and amenable to casuarina regeneration. Historic evidence from Shukul (2004) of widespread forest disturbance on Masig provides a clue to the possible emergence of *Casuarina* forests on the island. *Casuarina* may well have developed in response to canopy clearance of a once more widespread vine forest community. In the

long term, it is likely that the casuarina will senesce and vine forest species (and thus habitats) will prevail.



Photograph 6. Open forest of *Casuarina equisetifolia* with a vine forest sub-canopy on Masig (November 2007). The community is rapidly being fragmented to accommodate expanding sewerage infrastructure requirements.

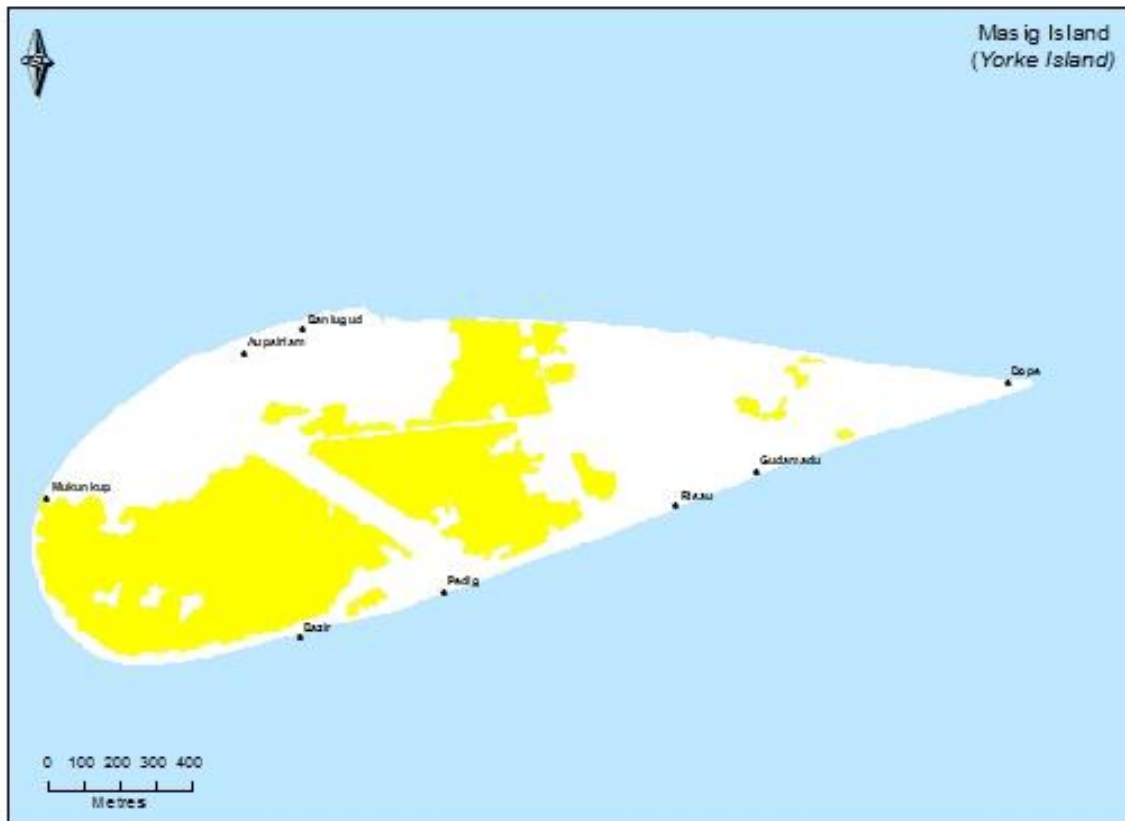


Figure 4. Location of casuarina dominated forest on Masig (place names after Lawrie, 1970)

7.2.2 Ecological / Cultural Considerations

Habitat Condition: The habitat is in good condition with a limited number of exotic species observed. Fragmentation of the habitat is however providing a niche for invasive species to establish. Infestations of leucaena have established on an easement cleared for sewerage works although these are currently under a control program. High level infestations of

leucaena will provide a seed bank for the species, facilitating spread across much broader areas of the island landscape.

Fauna: The fauna assemblage associated with this habitat is simple, comprising a limited number of ground dwelling reptiles. It is however an important habitat for frugivorous birds and may provide roosting sites for beach stone-curlew. Further survey across a range of season will aid characterization of the habitats full faunal assemblage.

Flora: The habitat supports a disjunct and regionally significant population of the bird lime tree (*Pisonia grandis*).

Cultural Perspectives:

The development of this habitat type is unusual in that casuarina requires an open canopy to recruit. Hence there has likely been a gradual thickening of sub-canopy layers over several generations which could only result from a changing management regime. This thickening possibly occurred as the local population shifted from a more traditional subsistence / garden lifestyle toward increasing urbanisation.

7.2.3 Management Considerations

In the short term, the habitat is threatened with fragmentation for development although long term threats are largely associated with sea level rise and changing climatic regimes. Salinisation of the fresh groundwater lense through overdrawing of the resource may also be a threat. Canopy openings and other forms of disturbance provide an opportunity for invasion of exotic species particularly leucaena and lantana. Regular patrols, focusing initially on disturbed areas should continuously monitor for introduction of exotic species such as leucaena, with prompt control measures implemented where infestations are located.

Whilst the long term viability of the casuarina that characterises this habitat is limited, there is little to be gained by opening the sub-canopy to enhance recruitment. Such actions are likely to create niche point for weed invasion, presenting a much greater threat to the islands biodiversity.

7.2.4 Summary of Recommended Management Actions

Table 9. Summary of management actions for casuarina dominant forests.

Management Category	Context/Issue	Actions	Priority
Fauna Surveys	Fauna composition within this habitat requires further definition.	Opportunistic collections of fauna and observations relating to fauna usage within this habitat should be undertaken as part of rangers general duties. Maintain focus on ethnotaxonomy to feed into TEK.	Moderate

Management Category	Context/Issue	Actions	Priority
Plant Surveys	Flora composition is documented although limited to rapid surveys in dry season. Potential for new records for the island of significant species particularly during the wet season.	Carry out additional flora field surveys with focus on collection of new records for the island and important cultural resource species. Collect leaf specimens and photograph plants with known uses/values and that may have been used in the past, and catalogue. Update island species list as new information becomes available.	Moderate
Traditional Ecological Knowledge	Composition of TEK within this habitat is poorly documented. Plant and animal lists provided in the appendices provide a good foundation for increasing TEK and ethnotaxonomy.	Collect and collate TEK knowledge within this habitat on an ongoing basis.	High
Fire Management	Recent fire on the margins of the airstrip has impacted the forest edge.	Fire should be excluded from this habitat as far as practical.	High
Threatened Species Management	<u>Flora</u> : The community provided habitat for the regionally significant Bird lime tree (<i>Pisonia grandis</i>) and the regionally significant vine (<i>Aristolochia chalmersii</i>) may occur on forest margins. <u>Fauna</u> : Composition of fauna within this habitat is known from previous surveys of RPS.	<u>Flora</u> : Carry out surveys to establish the extent of the <i>Pisonia</i> population and if the species is regenerating. <u>Fauna</u> : Further baseline information is required (see fauna surveys) before discrete management actions can be defined. Adopt a structured fauna assessment program as per recommendations set out in Section 6.5 .	Moderate Immediate
Invasive Species Management	<u>Flora</u> : A number of weeds occur on the margins of this habitat and pose a threat in the long term. <u>Fauna</u> : The impacts that rats, cats and possibly wild dogs are having on this habitat are unknown and needs to be ascertained.	<u>Flora</u> : Monitoring for new weed infestations, particularly for weeds including leucaena and lantana, is required on a regular basis. <u>Fauna</u> : Populations of rats, cats and dogs should be assessed through appropriate methods with an eradication/control program considered if required.	Moderate Immediate
Monitoring	Observations relating to any changes to habitat condition, particularly those arising from utilisation by feral animals, or coastal erosion are required on a regular basis.	Carry out informal observation of habitat condition including health of canopy (monitoring for dieback) and presence of invasive weed species, on a regular annual to bi-annual basis.	Moderate

7.3 Coastal Dune Complexes

7.3.1 Status of Ecological Knowledge

This habitat is essentially a mosaic of grassland, forbland, shrubland and vine thicket copses located on coastal foredune locations around the perimeter of the island. It occupies 11.5 ha (7.4%) of the islands area (refer **(Fig. 5)**). The habitat represents the primary seral stage in the succession of bare beach sand to stable dune woodland / forest vegetation.

Coastal dune complexes on Masig comprise a mosaic of three dominant vegetation communities including:

- An open to closed 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* (VC17j).
- Low vine thickets comprising *Terminalia muelleri*, *Guettardia speciosa*, *Eugenia reinwardtiana*, *Acacia crassicarpa*, *Diospyros maritima*, *Premna serratifolia*, *Thespesia populneoides*, *Manilkara kauki* and *Psydrax banksii*. (VC2y).
- Low shrublands formed by *Premna serratifolia*, *Casuarina equisetifolia*, *Cordia subcordata*, *Pemphis acidula* and *Drypetes deplanchei* (VC14y).

The complex forms an almost universal cover on the majority of coastal foredune habitats throughout the Torres Strait Islands although its best development is often associated with sand cay islands of the eastern group, particularly on foredune communities where sand actively accumulates. The habitat, where better formed, has an uneven appearance 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.

These are colonising communities forming on recent (Holocene) dunes and foredunes with a primary ecological function of stabilising developing foredunes. They are highly sensitive to disturbance and destruction of colonising vegetation by fire, recreation or exotic animals, may have a destabilising effect on dune morphology, leading to beach erosion. For this reason, they should be considered highly sensitive habitats and protected from elements of human disturbance as far as is practical.



Photograph 7. Typical structure of RE3.2.24 (VC17j) on Masig.



Figure 5. Distribution of coastal dune complex habitats (place names after Lawrie, 1971).

7.3.2 Ecological / Cultural Considerations

Habitat Condition: Away from settlement areas, these habitats are generally in excellent condition. Closer to settlements, there is usually degradation associated with trampling and a number of forms of traffic. These areas lack significant infestations of exotic species although they are at risk of infestation by gloriosa lily which has been noted in garden areas within the village. This habitat will be the initial point of impact for beachside erosion related to sea level

rise and storm surges and is constantly adjusting its profile in response to changing seasonal conditions and sedimentation rates.

Fauna: The habitat provides an important nesting ground for marine turtles and a number of bird species including beach stone-curlew (*Esacus magnirostris*), listed as ‘Vulnerable’ under state legislation and the little tern (*Sternula albifrons*) which is listed as ‘Endangered’ under state legislation.

Flora: This habitat supports populations of the regionally significant herb *Spermacoce* sp. (Lorim Point A. Morton AM1237). Masig populations form part of its disjunct northern limit of distribution. The population size is unknown.

Cultural Perspectives: Groved thickets dispersed throughout community provide an extensive repository of cultural resources including a number of important food trees such as wongai (*Manilkara kauki*) and kurad (*Eugenia reinwardtiana*), and mipa (*Terminalia subacroptera*). The habitat also provides an important repository for food resources such as turtle eggs.

7.3.3 Management Considerations

The inherent sensitivity of these habitats presses the importance of appropriate management regimes. Recommendations relate largely to ensuring vehicular access is restricted in sensitive areas. Recreational access also has significant potential to degrade the habitat through dune destabilisation and potential vector for introduction of pest species. Continued monitoring for the invasion of exotic species is also required. Due to their sensitive and often transitional nature, fire should be excluded from the habitat due to its destabilising effect on landform and tendency to simplify habitat diversity.

7.3.4 Summary of Recommended Management Actions

Table 10. Summary management recommendations for coastal beach complexes.

Management Category	Context/Issue	Actions	Priority
Fauna Surveys	Limited previous survey.	Design and implement a structured fauna survey program supported by specialists. The program should target the identification of sensitive bird rookeries for management focus	High
Plant Surveys	Information on flora composition is limited to rapid surveys in the dry season.	Carry out additional flora field surveys across seasons with focus on wet season herbs and grasses. Collect specimens and photograph plants with known uses/values and that may have been used in the past, and catalogue.	Moderate
Threatened	<u>Flora:</u> <i>Spermacoce</i> sp. (Lorim	<u>Flora:</u> Ensure rangers can	Moderate

Management Category	Context/Issue	Actions	Priority
Species Management	Point A. Morton AM1237). <u>Fauna:</u> Dune complexes provide habitat for a range of significant fauna species including beach stone-curlew, little tern as well as nesting grounds for marine turtles.	identify this plant toward determination of population size and habitat area. <u>Fauna:</u> Further baseline is required (see fauna surveys) before discrete management actions can be fully defined. Survey should also identify the extent to which exotic predators (dogs and cats) are utilising these sites for hunting purposes. The location of nesting, and foraging sites for the beach stone-curlew should be identified by GPS for incorporation within the GIS database. A program for monitoring for numbers and timing of significant migratory birds should be developed and implemented. This to include ranger training in methods. The community should be made aware of any critical habitat areas and recreational activities within these areas should be monitored or controlled.	High
Traditional Ecological Knowledge	Composition of TEK within this habitat is poorly documented. Plant and animal lists provided in the Appendices provide a good foundation for increasing TEK and ethnotaxonomy.	Collect and collate TEK knowledge through fauna and flora survey actions, and from interviews with elders on an ongoing basis.	High
Fire Management	Burning leading to the loss of species diversity and habitat structure and destruction of cultural sites.	Fire should be excluded from these habitats.	Immediate
Invasive Species Management	<u>Flora:</u> The habitat has potential to be severely impacted by a number of weeds including gloriosa lily. <u>Fauna:</u> Composition of invasive fauna within this habitat is poorly known. Potential for impacts on fauna particularly nesting birds, by rats, feral cats and dogs.	<u>Flora:</u> All beachfront habitats should be monitored for infestation of exotic species, particularly gloriosa lily, during routine patrols. Any observed infestation should be documented and eradication/control measures implemented immediately. <u>Fauna:</u> Invasive fauna to be determined from fauna survey results. Assess cat activity levels through nocturnal spotlighting around dump, sand padding techniques, and consultation with community members. Implement control where appropriate.	High Moderate
Monitoring	Observations relating to any changes to habitat condition should be documented so that the risk these changes pose to long-term habitat stability can be assessed and appropriate	All beachfront habitats should be informally monitored for infestation of exotic species, and other aspects of land degradation on a minimum 3 monthly interval during routine	High

Management Category	Context/Issue	Actions	Priority
	management responses formulated.	patrols. It is important that location and track logs of informal monitoring exercises be recorded to ensure at risk habitats are not overlooked.	
Cultural Heritage	Known cultural heritage values occur within the habitat.	Implement systematic surveys of the cultural heritage values of this habitat zone with consideration given to protecting/managing any significant sites.	Immediate
Other Management Issues	Vehicular recreational access to dune complex habitats has considerable potential to destabilise dune landforms and lead to habitat degradation. Beach access also greatly increases the risk of exotic weed species introduction and spread.	Designate a single recreational access point for vehicles and close all alternative access points to usage. Ensure the reasons for these actions are communicated to the broader Island community. Regular observations relating to impacts of coastal erosion on this habitat are required. Permanent monitoring points may be required in areas identified as being problematic.	Immediate

7.4 Anthropogenically Altered (Secondary) Vine Forest and Thicket

7.4.1 Status of Ecological Knowledge

This habitat, represented solely by the vegetation community 22b, has been included for its unique cultural values. It occupies 20.7 ha (13.4%) of the island (see **Fig. 6**) and manifests as a low notophyll/microphyll vine thicket dominated by species which include *Buchanania arborescens*, *Drypetes deplanchei*, *Terminalia subacroptera* and *Gymnosporia inermis*. 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 lacks sufficient cover of the original canopy for classification as remnant vegetation. These areas however retain significant cultural values with land ownership boundaries well defined within the local community.

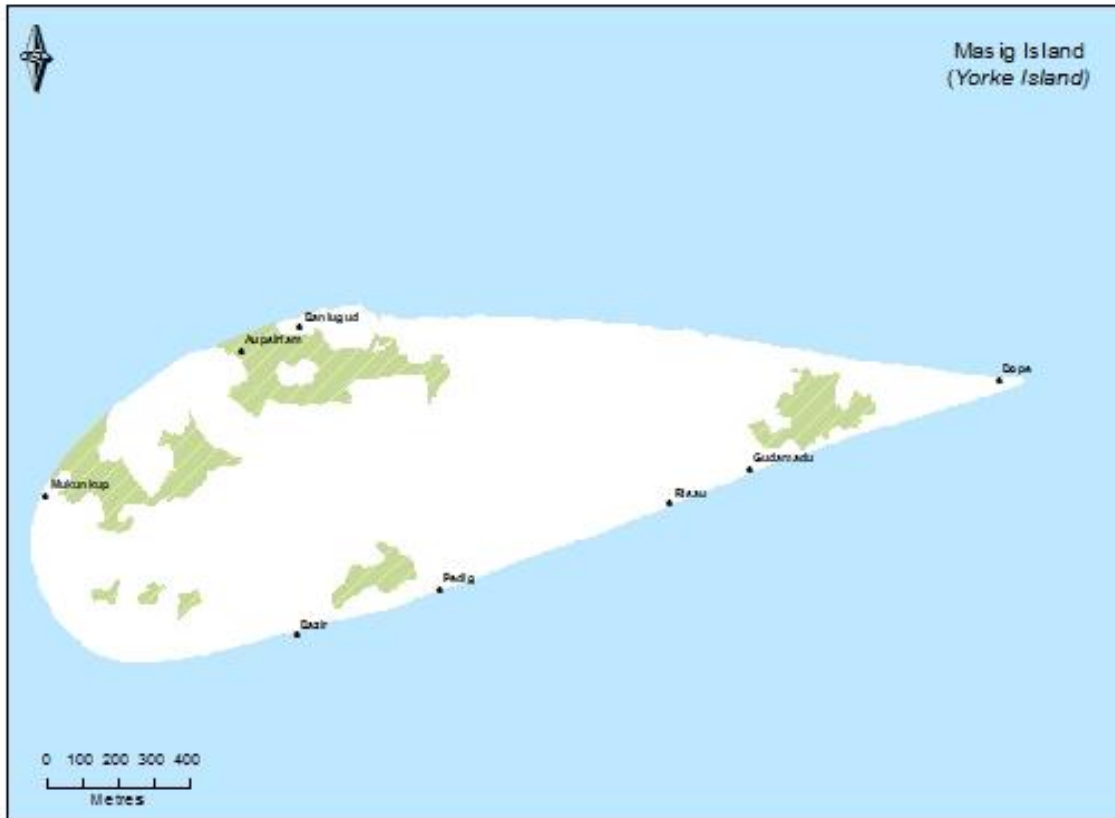


Figure 6. The location of anthropogenically altered vine forest communities on Masig (place names after Lawrie, 1970).



Photograph 8. Anthropogenically altered vine thicket VC22b on Masig.

7.4.2 Ecological / Cultural Considerations

Habitat Condition: This habitat is a product of anthropogenic alteration and hence habitat condition cannot readily be discussed in terms of naturalness or similarity to natural habitats. It is however rapidly developing the structure of an intact vine thicket habitat and in the long term, will present habitat values similar to intact semi-deciduous vine forest stands.

Fauna: The assemblage of fauna within this habitat will most likely mimic that of intact semi-deciduous vine forest and include ground dwelling reptiles as well as frugivorous birds. This habitat provides possible shelter and roosting sites for the beach stone-curlew.

Flora: Disjunct population of the undescribed and regionally significant herb *Spermacoce* sp. (Lorim point) occurs in this habitat.

Cultural Perspectives: The role Torres Strait Island people have had in shaping the vegetation communities of the Torres Strait (see Parr and Carter 2003, Rowe 2007, Barham 1999, Snukal 2004) 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.

This habitat is essentially a long term established permaculture with traditional food trees including mipa (*Terminalia subacroptera*), wongai (*Manilkara kauki*), kurad (*Syzygium reinwardtiana*) and sizenai (*Buchanania arborescens*). In this regard, it holds particular cultural significance, providing a record of traditional agricultural practice in the eastern Torres Strait Islands.

7.4.3 Management Considerations

This habitat is currently self-maintaining although it may be at long term risk of degradation through infestation of leucaena, lantana, and gloriosa lily. Whilst the habitat is classified as non-remnant under the VMA (1999), this by no means degrades its value as a significant habitat worthy of preservation.

7.4.4 Summary of Recommended Management Actions

The information provided in **Table 11** below summarises recommendations pertaining to the management of this habitat.

Table 11. Summary of management actions for anthropogenically altered vine forest and thicket.

Management Category	Context/Issue	Actions	Priority
Fauna Surveys	Fauna composition within this habitat is poorly documented.	Incidental observations and documentation of the fauna that utilise this habitat should be a component of the rangers general duties. Maintain focus on ethnotaxonomy to feed into TEK.	Moderate
Plant Surveys	Flora composition is poorly documented and limited to rapid surveys.	Carry out additional flora field surveys with focus on collection of important cultural resource species. Collect leaf specimens and/or photograph plants with known uses/values and that may have been used in the past, and	Moderate

Management Category	Context/Issue	Actions	Priority
		catalogue.	
Traditional Ecological Knowledge	TEK within this habitat is poorly documented. Plant and animal lists provided in the Appendices provide a good foundation for increasing TEK and ethnotaxonomy.	Collect and collate TEK knowledge within this habitat gained through fauna and flora survey actions on an ongoing basis. The significance of this habitat as a cultural resource as well as traditional farming practice which shaped the landscape should be documented for future reference.	High
Fire Management	This habitat is not threatened by fire incursion.	No actions required.	Not Required
Threatened Species Management	<u>Flora</u> : <i>Spermacoce</i> sp. (Lorim Point A. Morton AM1237). <u>Fauna</u> : The habitat may provide habitat for significant fauna species including beach stone-curlew.	<u>Flora</u> : Ensure rangers can identify this plant toward determination of population size and habitat area. <u>Fauna</u> : Further baseline data is required (see fauna surveys) before discrete management actions can be fully defined. Survey should also identify the extent to which exotic predators (dogs and cats) are utilising these sites for hunting purposes.	Not required Moderate
Invasive Species Management	<u>Flora</u> : Lantana, leucaena, and gloriosa lily may impact this habitat if infestations are unchecked. <u>Fauna</u> : The composition of invasive fauna within this habitat requires further study. There is considerable potential for impacts on fauna by feral cats and dogs.	<u>Flora</u> : No direct action required at present as there are a number of habitats suffering degradation that are in greater need of attention. Continued assessment of this habitat should be undertaken as a component of general ranger duties to identify any problematic weed outbreaks that require attention. <u>Fauna</u> : Further survey into the usage of this habitat by feral (and domestic) cats is required.	Moderate High
Monitoring	The success of any weed control efforts in promoting natural species recruitment and regeneration requires documentation.	Continued informal monitoring of this habitat should be undertaken as a regular component of ranger management duties to identify any potentially problematic weed outbreaks.	High

7.5 Cleared Areas, Exotic Vegetation and Regrowth Forests.

With a relatively large population and small land area, there is considerable pressure on Masig Islanders to modify the natural environment for a range of community needs. The trend of landscape modification has been ongoing on Masig Island since human arrival. At current levels, heavily modified environments (excluding anthropogenic vine thickets) account for 50.5 ha or 33% of the islands total area. Degraded areas have the potential to host a considerable number of exotic weed species which have potential to spread to less disturbed habitats on

Masig and adjacent Islets. The majority of the 50 introduced species on the island occur in degraded areas. The more problematic of these have been previously discussed previously however include:

- Leucaena (*Leucaena leucocephala*).
- Gloriosa lily (*Gloriosa superba*), and
- Lantana (*Lantana camara*).

7.5.1 Management Implications

A comprehensive program of weed assessment, followed by strategic control and eradication around the community is required to minimise the risk of spread of invasive species into natural habitats. Weed surveys are routinely carried out by DAFF. A close partnership between the DAFF field botanists and the rangers program is an important foundation to protecting the island from highly invasive weeds. A focus on building the rangers knowledge on identifying, mapping and assessing weeds particularly those capable of inducing major environmental damage is required.

7.5.2 Summary of Recommended Management Actions

Table 12. Summary of management actions for cleared and disturbed areas.

Management Category	Context/Issue	Actions	Priority
Cultural Heritage	Cultural heritage values may occur throughout cleared and degraded areas.	Implement systematic surveys of the cultural heritage values of this habitat. In consultation with the community, give consideration to protecting/managing these values through fencing and culturally appropriate signage.	Immediate
Fauna Surveys	NA	No actions.	-
Plant Surveys	NA	No actions	-
Threatened Species Management	<u>Flora:</u> NA <u>Fauna:</u> NA	<u>Flora:</u> No actions. <u>Fauna:</u> No actions.	- -
Traditional Ecological Knowledge	The recording of TEK may include places, stories, and cultural resources which occur in cleared and degraded areas.	Collect and collate TEK and from interviews with elders on an ongoing basis.	High
Invasive Species Management	<u>Flora:</u> Many weeds are known from within and on the disturbed margins the community.	<u>Flora:</u> Undertake a comprehensive program of weed assessment around the community followed by strategic control and eradication. Monitor success of past and recent control measures on known populations of highly invasive weeds. Foster a close partnership between the DAFF field botanists and the rangers program as an important foundation to protecting the island from highly invasive	Immediate Immediate Immediate

Management Category	Context/Issue	Actions	Priority
	<u>Fauna</u> : Populations of cats, dogs and rats originate from the community area.	weeds. Train rangers in weed identification. <u>Fauna</u> : Train rangers in feral animal monitoring methods. Assess cat and dog activity levels by installation and monitoring of sand pads on nearby tracks, nocturnal spotlighting, and consultation with community members. Implement control where appropriate.	Immediate Immediate
Monitoring	NA	NA	-

8.0 References

- Airy-Shaw, H. K. (1952). *On the distribution of Pisonia grandis R. BR. (Nyctaginaceae), with special reference to Malaysia. Kew Bulletin* 7(1): 87-97.
- Baittinoff, G.N. and Dillewaard, H.A. (1997). *Floristic analysis of the Great Barrier Reef continental islands*. Queensland Herbarium, Department of Environment, Indooroopilly, Qld.
- Barham, A.J., (1999). *The local environmental impact of prehistoric populations on Saibai Island, northern Torres Strait, Australia: enigmatic evidence from Holocene swamp lithostratigraphic records*. Quaternary International 59 (1999) 71-105. Elsevier Science Ltd.
- Barham, A.J., Harris, D.R., (1985). *Relict field systems in the Torres Strait region*. In: Farrington, I.S. (Ed.), *Prehistoric Intensive Agriculture in the Tropics*, British Archaeological Reports, International Series 232 (vol. I). BAR, Oxford, pp. 247-283.
- Barratt, D.G. (1997). Predation by house cats, *Felis catus* (L.), in Canberra, Australia. I. Prey composition and preference. *Wildlife Research*, **24**: 263-277.
- Barrett, G., A. Silcocks, S. Barry, R. Cunningham & R. Poulter (2003). *The new atlas of Australian birds*. Birds Australia, Melbourne.
- Baxter, R. (2010). *Trip report Torres Strait (Boigu-Saibai-Dauan) 16th-23rd Oct 2008*. <http://www.birdingtours.com.au/ts.html>
- Biosecurity Queensland (2007). Fact Sheet PP85, *Invasive Plants and Animals, Leucaena leucocephala*. The State of Queensland (Department of Primary Industries and Fisheries), Brisbane, 2007.
- BirdLife International (2008). *Aquila gurneyi*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4. www.iucnredlist.org. Downloaded on 23 February 2011.
- BirdLife International (2011). *Species factsheet: Apus pacificus*. Downloaded from <http://www.birdlife.org> on 04/01/2011.
- Blakers, M., Davies, S.J.J.F. and Reilly, P.N. (1984). *The atlas of Australian birds*. Melbourne University Press, Melbourne.
- Boland, C.R.J. (2004a). *Breeding biology of rainbow bee-eaters (Merops ornatus): a migratory, colonial, cooperative bird*. *Auk*, **121**: 811-823.
- Boland, C.R.J. (2004b). *Introduced cane toads are active nest predators and competitors of rainbow bee-eaters Merops ornatus: observational and experimental evidence*. *Biological Conservation*, **120**: 53-62.
- Bostock, P.D. and Holland, A.E. (eds.) (2010). *Census of the Queensland Flora*. Queensland Herbarium, Environment Protection Agency, Brisbane.
- Bureau of Meteorology (BOM) (2008a). Rainfall Statistics, Recording Station 027002 – Masig Island. Available at www.bom.gov.au/climate/averages
- Bureau of Meteorology (BOM) (2008b). Rainfall Statistics, Recording Station 027001 – Badu Island. Available at www.bom.gov.au/climate/averages.
- Bureau of Meteorology (BOM) (2008c). Rainfall Statistics, Recording Station 027011 – Dauan Island. Available at www.bom.gov.au/climate/averages.

- Case, T.J., Bolger, D.T. & Petren, K. (1994). *Invasions and competitive displacement among house geckos in the tropical Pacific*. *Ecology*, **75**: 464-477.
- Chantler, P. (1999). 'Apodidae (Swifts),' in *Handbook of the Birds of the World. Vol. 5. Barn-owls to hummingbirds*, eds. J. del Hoyo, A. Elliott & J. Sargatal, Lynx Edicions, Barcelona.
- Christidis, L. & Boles, W.E. 2008. *Systematics and taxonomy of Australian birds*. CSIRO Publishing, Collingwood.
- Clarke, R.H. (2004). *The avifauna of northern Torres Strait: Notes on a wet-season visit*. *Australian Field Ornithology* 21: 49-66.
- Clancy, G.P. (1986). *Observations of nesting beach thick-knees *Burhinus neglectus* at Red Rock, New South Wales*. *Corella*, **10**: 114-118.
- Clarke, R.H. (2006). Papuan spine-tailed swifts *Meamsia novaeguineae* on Boigu Island, Torres Strait, Queensland. *Australian Field Ornithology*, **23**: 125-129.
- Clarke, R.H. (2007). Orange-bellied fruit-dove *Ptilinopus iozonus* on Boigu Island, Torres Strait: The first record for Australian Territory. *Australian Field Ornithology*, **24**: 44-48.
- Clarke, R.H., Gosford, R., Boyle, A., Sisson, L. & Ewens, J.G. (2010). *A specimen record of the little paradise-kingfisher *Tanysiptera hydrocharis* from Torres Strait, Queensland: A new bird for Australian Territory*. *Australian Field Ornithology*, **27**: 165-173.
- Conics (2009). *Masig Sustainable Land Use Plan- Part 2*.
- DAFF (2011, 2012). *Weed lists compiled by Department of Agriculture Fisheries and Forestry's Northern Australia Quarantine Strategy plant health surveillance activities 17/8/2011 and 31/7/2012*.
- Debus, S. (1998). *The birds of prey of Australia: A field guide to Australian raptors*. Oxford University Press, Melbourne.
- Department of Environment and Resource Management (2010). *Torres Strait Natural Resource Management Region Back on Track Biodiversity Planning Tool*, Department of Environment and Resource Management, Brisbane.
- Department of Environment and Resource Management (2010a). *Wildlife Online Extract. Latitude: 9.2622 Longitude: 142.2095 Distance: 6 km*. Department of Environment and Resource Management. Extracted 15 October 2010.
- Department of Environment and Resource Management (2010b). *Wildlife Online Extract. Latitude: 9.5874 Longitude: 143.7703 Distance: 9 km*. Department of Environment and Resource Management. Extracted 18 October 2010.
- Department of Environment and Resource Management (2010e). *Wildlife Online Extract. Latitude: 9.9534 Longitude: 142.1817 Distance: 10 km*. Department of Environment and Resource Management. Extracted 18 October 2010.
- Department of Environment and Resource Management (2010f). *Wildlife Online Extract. Latitude: 10.1846 Longitude: 142.266 Distance: 9 km*. Department of Environment and Resource Management. Extracted 15 October 2010.
- Department of Environment and Resource Management (2010g). *Wildlife Online Extract. Latitude: 10.1149 Longitude: 142.156 Distance: 7 km*. Department of Environment and Resource Management. Extracted 15 October 2010.
- Department of Environment and Resource Management (2011a). *Back on Track species prioritisation framework*. Department of Environment and Resource Management, Brisbane.

http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/back_on_track_species_prioritisation_framework/index.html.

Department of Environment and Resource Management (2011b). *Wildlife and ecosystems: Fawn leaf-nosed bat*. Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/az_of_animals/micro_bats_the_insect_terminators/fawn_leafnosedbat.html. Last updated 1 December 2010.

Department of Environment and Resource Management (2011c). *Herbrecs Data Extract for Torres Strait Region*. Sourced March 2011. Department of Environment and Resource Management, Brisbane.

Department of Sustainability, Environment, Water, Population and Communities (2011). *Advice to the Minister for the Environment, Water, Heritage and the Arts from the Threatened Species Scientific Committee (the Committee) on Amendments to the List of Key Threatening Processes under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. Online @ <http://www.environment.gov.au/index.html>. Accessed 16 Feb 2011.

Diete, R. (2010). *The ecology of exotic rodents and non-target species on Torres Strait islands: implications for exotic rodent eradication*. Unpublished Honours Thesis, BAppSc School of Animal Studies, The University of Queensland.

Draffan, R.D.W., Garnett, S.T. and Malone, G.J. (1983). *Birds of the Torres Strait: An annotated list and biogeographical analysis*. *Emu* 83: 207-234.

Driscoll, P.V. & Ueta, M. (2002). *The migration route and behaviour of eastern curlews Numenius madagascariensis*. *Ibis*, **144**: 119-130.

DSEWPC (2011a). *Apus pacificus* in Species Profile and Threats Database, Department of Sustainability, Environment, Water, Population and Communities, Canberra. Available from: <http://www.environment.gov.au/sprat>.

DSEWPC (2011b). *Ardea ibis* in Species Profile and Threats Database, Department of Sustainability, Environment, Water, Population and Communities, Canberra. Available from: <http://www.environment.gov.au/sprat>.

DSEWPC (2011c). *Ardea modesta* in Species Profile and Threats Database, Department of Sustainability, Environment, Water, Population and Communities, Canberra. Available from: <http://www.environment.gov.au/sprat>.

DSEWPC (2011d). *Australian Faunal Directory*. Department of Sustainability, Environment, Water, Population and Communities, Canberra. <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/index.html>.

DSEWPC (2011f). *Hirundapus caudacutus* in Species Profile and Threats Database, Department of Sustainability, Environment, Water, Population and Communities, Canberra. Available from: <http://www.environment.gov.au/sprat>.

DSEWPC (2011g). *Protected Matters Search Tool*. Department of Sustainability, Environment, Water, Population and Communities. <http://www.environment.gov.au/epbc/pmst/index.html>.

Freeman, A.N.D. (2003). *The distribution of beach stone-curlews and their response to disturbance on far north Queensland's Wet Tropical Coast*. *Emu*, **103**: 369-372.

Fell, D.G. (2009). *Report on the Vegetation and Flora of Pulu Islet*: DG Fell Flora Surveys May 2009. Unpublished report to Arafura Consulting.

Fell, D.G. (2012a). *Report on the Vegetation and Flora of Warul Kara Indigenous Protected Area*: DG Fell Flora Surveys. Unpublished report to Arafura Consulting.

- Fell, D.G. (2012b). *Report on the Vegetation and Flora of the proposed Warabagal Indigenous Protected Area, Central Torres Strait*. DG Fell Flora Surveys. Unpublished report to Arafura Consulting.
- Garnett, S.T. and Crowley, G.M. (2000). *The Action Plan for Australian Birds*. Environment Australia, Canberra.
- Geering, A., Agnew, L. & Harding, S. (2007). *Shorebirds of Australia*. CSIRO Publishing, Collingwood.
- Haddon, A.C. (ed.) (1901-1935). *Reports of the Cambridge Anthropological Expedition to Torres Straits*. 6 Volumes. Cambridge University Press, Cambridge.
- Haddon, A.C. (1912b). Horticulture. In A.C. Haddon (ed.), *Reports of the Cambridge Anthropological Expedition to Torres Straits. Volume 4: Arts and Crafts*, pp. 144-151. Cambridge University Press, Cambridge.
- Hall, L.S. (2008). Large-eared Flying-fox, *Pteropus macrotis*. In: S. Van Dyck and R. Strahan (eds), *The Mammals of Australia*, pp. 441-442. Third Edition. Reed New Holland, Sydney.
- Hart, D and Kench, P (2007). *Carbonate Production of an Emergent Reef Platform, Warraber Island, Torres Strait, Australia*. Coral Reefs, 26; 53 -68.
- Heatwole, H. (1975). *Biogeography of reptiles on some of the islands and cays of eastern Papua-New Guinea*. Atoll Research Bulletin, No. **180**.
- Helgen, K.M. (2004). On the identity of flying-foxes, genus *Pteropus* (Mammalia: Chiroptera), from islands in the Torres Strait, Australia. *Zootaxa* 780: 1-14.
- Hitchcock, G., McNiven, I.J. and the Pulu Indigenous Protected Area (IPA) Committee (2009). Pulu Indigenous Protected Area Plan of Management. Melbourne: Arafura Consulting. June 2009.
- Higgins, P.J. ed. (1999). *Handbook of Australian, New Zealand and Antarctic birds, Vol. 4, Parrots to dollarbird*. Oxford University Press, Melbourne.
- Higgins, P.J. & Davies, S.J.J.F. eds. (1996). *Handbook of Australian, New Zealand and Antarctic birds, Vol. 3, Snipe to pigeons*. Oxford University Press, Melbourne.
- Higgins, P.J, Peter, J.M. & Cowling, S.J eds. 2006a. *Handbook of Australian, New Zealand and Antarctic birds. Vol. 7. Boatbill to starlings. Part A: Boatbill to larks*. Oxford University Press, South Melbourne.
- Higgins, P.J, Peter, J.M. & Cowling, S.J eds. 2006b. *Handbook of Australian, New Zealand and Antarctic birds. Vol. 7. Boatbill to starlings. Part B: Dunnock to starlings*. Oxford University Press, South Melbourne.
- Hoskin, C.J. 2010. *The invasion and potential impact of the Asian house gecko (Hemidactylus frenatus) in Australia*. *Austral Ecology*, DOI: 10.1111/j.1442-9993.2010.02143.x.
- Hyland, B.P.M., Whiffan, T. & Zich F.A. (2010). *Australian Tropical Rainforest Plants. Edition 6*. Online at <http://keys.trin.org.au/key-server/data/0e0f0504-0103-430d-8004-060d07080d04/media/Html/index>. Accessed 13 Aug 2012.
- Ingram, G.J. (2008). *The terrestrial vertebrates of Mua*. In B. David, L. Manas and M. Quinnell (eds), *Gelam's Homeland: Cultural and Natural History on the Island of Mua, Torres Strait*, pp. 619-628. *Memoirs of the Queensland Museum (Cultural Heritage Series)* 4(2).
- Kushlan, J.A. & Hancock, J. (2005). *Hérons*. Oxford University Press, Oxford.
- Lane, B. A. (1987). *Shorebirds in Australia*. Nelson Publishers, Melbourne.

- Lawrie, M. (1970). *Myths and Legends of the Torres Strait*. University of Queensland Press, St Lucia Brisbane.
- Leary, T. & David, J. (1994). *Coconut (Poruma) Island Environment and Resource Management Plan*. Unpublished report compiled for the Island Coordinating Council.
- Long, R.W. (1976). *Biosystematics of Ruellia tuberosa L.* (Acanthaceae). *American Journal of Botany*. 63 (7): 951-959.
- Maddock, M. (2000). 'Hérons in Australasia and Oceania,' in *Heron Conservation*, eds. J.A. Kushlan & H. Hafner, Academic Press, Sydney.
- Marchant, S. & Higgins, P.J. eds. (1990). *Handbook of Australian, New Zealand and Antarctic birds, Vol. 1, Ratites to Ducks, Part B, Australian pelican to ducks*. Oxford University Press, Melbourne.
- Marchant, S. & Higgins, P.J. eds. (1993). *Handbook of Australian, New Zealand and Antarctic birds, Vol. 2, Raptors to lapwings*. Oxford University Press, Melbourne.
- McKilligan, N. (2005). *Hérons, egrets and bitterns: Their biology and conservation in Australia*. CSIRO Publishing, Collingwood.
- McNiven, I.J. and Hitchcock, G. (2004). *Torres Strait Islander marine subsistence specialisation and terrestrial animal translocation*. *Memoirs of the Queensland Museum (Cultural Heritage Series)* 3(1): 105-162.
- McNiven, I.J. & D. Wright (2008). *Ritualised marine midden formation in Western Zenadh Kes (Torres Strait)*. In G. Clark, F. Leach and S. O'Connor (eds), *Islands of Inquiry: Colonisation, Seafaring and the Archaeology of Maritime Landscapes*. *Terra Australis* 29: 133-147.
- National Heritage Trust (2003). *Alert list for Environmental Weeds. Weed Management Guide, Barleria or porcupine flower, Barleria prionitis*. Accessed 17 Jan 2011. Online at <http://www.weeds.gov.au/publications/guidelines/alert/pubs/b-prionitis.pdf>.
- Native Title Research Unit (2012). *Research Resource Page Prescribed Bodies Corporate Profile*. Online at <http://www.aiatsis.gov.au/ntru/docs/rntbc/profiles/Porumalgal.pdf>. Accessed 8 Aug 2012.
- Neldner, V. J., Wilson, B. A., Thompson, E. J. and Dilleward, H. A. (2005). *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 3.1. Updated September 2005. Queensland Herbarium, Environmental Protection Agency, Brisbane.
- Olsen, P. (1998). *Australia's raptors: diurnal birds of prey and owls. Supplement to Wingspan*, 8: I-XVI.
- OZCAM (2011). *BioMaps*. Online Zoological Collections of Australian Museums. <http://www.biomaps.net.au/biomaps2/>. Searched 11-18/2/2011.
- Parr, J. F. and Carter, M. (2003). "Phytolith and starch analysis of sediment samples from two archaeological sites on Dauar Island, Torres Strait." *Vegetation History and Archaeobotany* 12(2): 131-141.
- Parsons, W., and Cuthbertson, E. (1992). *Noxious Weeds of Australia*. Pp. 431–433.
- Pringle, J.D. (1985). *The waterbirds of Australia: The National Photographic Index of Australian wildlife*. Angus and Robertson, North Ryde.
- Pringle, J.D. (1987). *The shorebirds of Australia: The National Photographic Index of Australian wildlife*. Angus and Robertson, North Ryde.

- QPWS (2007). *Distribution and abundance of the estuarine crocodile (Crocodylus porosus Schneider, 1801) in waterways of Queensland's populated east coast*. Report to Hon. Lindy Nelson-Carr MP Minister for the Environment and Multiculturalism. Queensland Parks and Wildlife Service.
- Queensland Government (2011). *Agave sisalana Factsheet, Special edition of Environmental weeds of Australia for Biosecurity Queensland*. Accessed 20 August 2012, Online at http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Agave_sisalana.htm.
- Reid, T. & Park, P. (2003). *Continuing decline of eastern curlew, Numenius madagascariensis*, in Tasmania. *Emu*, **103**: 279-283.
- Ross, E. M. & Halford, D. A. (2007). Aristolochiaceae. *Flora of Australia 2*: 244-258. Australian Government Publishing Service, Canberra.
- RPS (2010a). *Torres Strait Sustainable Land Use Plan – Masig*. Report to Torres Strait Regional Authority.
- RPS (2010b). *Masig Environmental Report: Torres Strait sustainable land use plan habitat and fauna assessment*. Unpublished Report to Torres Strait Regional Authority.
- RPS (2010c). *Torres Strait sustainable land use plan – Poruma*. Report to Torres Strait Regional Authority.
- RPS (2010d). *Poruma (Coconut Island) environmental report: Torres Strait sustainable land use plan habitat and fauna assessment – Poruma (Coconut Island)*. Unpublished Report to Torres Strait Regional Authority.
- Shnukal, A. (2004). *The post-contact created environment in the Torres Strait Central Islands. Memoirs of the Queensland Museum, Cultural Heritage Series 3*(1): 317-346. Brisbane.
- Stanton, D. J, Fell, D. G., and Gooding, D. O. (2009). *Vegetation Communities and Regional Ecosystems of the Torres Strait Islands, Queensland, Australia*. Unpublished report to the Torres Strait Regional Authority, land and Sea Management Unit.
- Tate G.H.H. 1941. *Results of the Archbold Expeditions No. 37: Notes on the Oriental Taphozous and allies*. American Museum Novitates No. 1141, 1–5.
- Thorp, J R, & Lynch, R (2000). *The Determination of Weeds of National Significance*. National Weeds Strategy Executive Committee, Launceston.
- Tidemann, C.R., Yorkston, H.D. & Russack, A.J. (1994). The diet of cats, *Felis catus*, on Christmas Island, Indian Ocean. *Wildlife Research*, **21**: 279-285.
- Tyler, M.J. (1972). 'An analysis of the lower vertebrate faunal relationships of Australia and New Guinea,' in: Bridge and barrier: The natural and cultural history of Torres Strait, ed. D. Walker, Australian National University, Canberra.
- Ueta, M., Antonov, A., Artukhin, Y. & Parilov, M. (2002). *Migration routes of eastern curlews tracked from far east Russia*. *Emu*, **102**: 345-348.
- Walker, T. A. (1991). *Pisonia islands of the Great Barrier Reef. Part I. The Distribution, abundance and dispersal by seabirds of Pisonia grandis*. Atoll Research Bulletin 350: 1-23.
- Walton, C. S. (2003). *Leucaena (Leucaena leucocephala) in Queensland PEST STATUS REVIEW SERIES – LAND PROTECTION*. Department of Natural Resources and Mines, Qld.
- Watson, J. (2012). *Terrestrial vertebrate fauna of the proposed Central Islands Indigenous Protected Area*. Report to Arafura Consulting.

Wells, R.W. (2002). *Taxonomic notes on the genus Cyrtodactylus (Reptilia: Gekkonidae) in Australia*. Australian Biodiversity Record, **2002**: 1-8.

Wilson, S. (2005). *A field guide to reptiles of Queensland*. Reed New Holland, Sydney.

9.0 Glossary

Aeolian: Pertaining to transport by wind, particularly wind-blown sand.

Beach Rock: A hardpan layer formed by cemented coral or shells.

Bioregion: The bioregion forms the primary level of classification for terrestrial biodiversity values on a state and nationwide basis. Thirteen bioregions are classified in Queensland with the Torres Strait Islands being a sub-province of the broader Cape York Peninsula bioregion.

Broad Vegetation Group: The highest level of classification used to describe plant assemblages in the Torres Strait Islands, typically referring to plant habit and structure.

Deciduous: A tree species that undergoes a seasonal shedding of leaves, typically being leafless in the drier seasonal periods (e.g. *Bombax ceiba*).

Edaphic: Pertaining to characteristics of the soil including moisture, drainage and fertility.

Evergreen: A tree or vegetation community that retains foliage on an annual basis i.e. always has leaves.

Holocene: The period of time less than 11 thousand years to present. Less than 5 thousand years old is considered to be 'Late Holocene'.

Igneous Rock: A rock formed by cooling and solidification of molten magma or lava.

Notophyll: A category of leaf size with a leaf blade for 7.5 to 12.5 cm long.

Obligate Seeder: A plant that can only regenerate after fire from a seed or stored seed bank.

Pleistocene: The period of time between 11 thousand and 1.8 million years old.

Quaternary: The period of time between present and 1.8 million years old, which is sub-divided into Pleistocene and Holocene ages.

Regional Ecosystem: The primary unit against which Queensland's Vegetation Management Act (1999) is regulated and as such, the classification specific legislative significance. The classification of regional ecosystems is based on a hierarchical system with a three part code defining bioregion, followed by land zone, and then vegetation.

Savanna: A habitat typified by grasses where trees do not form a closed canopy.

Semi-evergreen: A tree or forest type whose pattern of leaf loss can be related to specific periods of environmental stress. In semi-evergreen vine forest, only portions of the canopy will be subject to leaf loss at a particular time.

Semi-deciduous: A rainforest or vine thicket type in which a component of the forest canopy trees and canopy emergents are seasonally (obligate) deciduous.

Vine Thicket: A vegetation community that is formed by predominantly soft leaf (rainforest) trees and shrubs, typically with dense layers of wiry lianes (vines) growing from ground level and reaching canopy height. Thicket is in reference to canopy height with the predominant canopy forming at < 9m.

Vine Forest: A vegetation community commonly referred to as rainforest, that is formed by predominantly soft leaf (rainforest) trees and shrubs. Dense cover of lianes (vines) and epiphytes are common at all structural levels. Vine forest is differentiated from vine thicket by height, with predominant vine forest canopy being > 9m.

10.0 Appendices

Appendix A. Queensland Govt. Vegetation Structural Classification

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 Form²	Structural Formation Classes (qualified by height)			
Trees > 30m	tall closed-forest (TCF)	tall open-forest (TCF)	tall woodland (TW)	tall open-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)	-

² Growth form of the predominant layer (the ecologically dominant layer).

Appendix B. Flora Species List – Masig, Torres Strait, Queensland.

DG Fell 3D Environmental

- Nomenclature follows Bostock & Holland (2010) 'Census of the Queensland Flora'.
- Habitats refer to broad vegetation groups of Stanton *et al.* (2009).
- *Denotes naturalised or doubtfully naturalised taxa according to Bostock & Holland (2010).
- ^ denotes local - cultural significance.
- # denotes regional significance.
- Unnamed species followed by a collection number (i.e. DGF10153) are pending formal identification at Qld Herbarium.
- Common names of rainforest taxa follow Hyland *et al.* (2010).
- Weed lists compiled by Department of Agriculture Fisheries and Forestry Northern Australia Quarantine Strategy plant health surveillance activities have been incorporated (DAFF 2010).
- Includes selected native non-indigenous plants and naturalised plants found in village areas.

SUMMARY

- 208 species (1 fern, 191 angiosperms)
- 144 native (74%)
- 64 naturalised (26%)
- 85 families (10 wholly naturalised)
- 154 genera (36 wholly naturalised)
- Dominant families (native species): Fabaceae 12, Poaceae 9, Phyllanthaceae 8, Rubiaceae 7, Celastraceae 4, Combretaceae 4, Cyperaceae 4, Malvaceae 4, Moraceae 4, Convolvulaceae 3
- 71 (38%) local/cultural significance (61 native, 10 naturalised)

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
Pteridiophytes & Fern Allies																	
Polypodiaceae	<i>Microsorium grossum</i>	^		kargh kargh	1	1					X			Xv	X		
Angiosperms (Flowering Plants)																	
Acanthaceae	<i>Asystasia australasica</i>				1	1					X	X		X	X		flw
	<i>Asystasia gangetica</i> subsp. <i>gangetica</i>	*	chinese violet								X			X			
	<i>Achyranthes aspera</i>		chaff burr		1	1	1							X			
	<i>Ruellia tuberosa</i>	*											X				
Agavaceae	<i>Agave sisalana</i>	*^	manilla rope								X			X			
	<i>Pleomele angustifolia</i>	^	native draceana	buz	1	1					X	X		X	X	Ft	flw
Aizoaceae	<i>Sesuvium portulacastrum</i>	^	sea purslane	garawad			1							X	X		flw
Amaryllidaceae	<i>Crinum pedunculatum</i>	Cult.	crinum											X			
	<i>Proiphys amboinensis</i>		Christmas lily, Cardwell lily		1	1	1	1						X	X		
Anacardiaceae	<i>Buchanania arborescens</i>	^	little gooseberry tree	sizenai	1	1		1			X			Xv	X	ft	
	<i>Mangifera indica</i>	*^	mango						1				1	X		ft	
	<i>Pleiogynum timorense</i> ³	Cult.	Burdekin plum											X			
Apocynaceae	<i>Gynathera oblonga</i>		harpoon bud	marki issew	1	1								X			
	<i>Catharanthus roseus</i>	*	pink periwinkle			1	1						X	X		flw	
	<i>Nerium oleander</i>	*	yellow oleander						1					X			
Araliaceae	<i>Polyscias macgillivrayi</i>	^	whistle tree	buman (sarhra buman)	1	1					X			Xv	X		
Arecaceae	<i>Cocos nucifera</i>	*^	coconut			1	1	1						X	X		
Aristolochiaceae	<i>Aristolochia chalmersii</i>	#	Chalmers				1							Xv		ft	

³ Planted in village area. Locally valued for edible fruit.

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
			aristolochia														
Asparagaceae	<i>Sansevieria trifasciata</i>	*											X				
Asteraceae	<i>Blainvillea dubia</i>										X						
	<i>Bidens pilosa</i>	*	cobblers pegs								X						
	<i>Cyanthillium cinereum</i>												X				
	<i>Emilia sonchifolia</i> var. <i>sonchifolia</i>	*	purple sow thistle									X	X	X			
	<i>Eleutheranthera ruderalis</i>	*	ogiera						X								
	<i>Praxelis clematidea</i>	*	praxelis						X		X						
	<i>Synedrella nodiflora</i>	*	cinderella weed						X		X	X	X	X			
	<i>Tridax procumbens</i>	*^	tridax daisy, grass medicine				X	X	X				X	X			flw
Bignoniaceae	<i>Tecoma stans</i> var. <i>stans</i>	*Class 3	yellow bells						X				X	X		flw	1
Boraginaceae	<i>Argusia argentea</i>	^	octopus bush				X							X			
	<i>Cordia dichotoma</i>		cordia					X						X			
	<i>Cordia subcordata</i>	^	golden trumpet tree	mukamai	X	X	X	X	X		X			X		flw	
Caesalpiniaceae	<i>Bauhinia monandra</i>	*	bauhinia						X					X			
	<i>Delonix regia</i>	*^	poinciana, christmas tree						X				X	X			flw
	<i>Caesalpinia bonduc</i>		nicker nut				X							X			
	<i>Senna gaudichaudii</i>							X		X							
	<i>Senna occidentalis</i>	*	coffee senna						X	X							
Campanulaceae	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>						X	X	X					X	X		flw
Capparaceae	<i>Capparis lucida</i>		coast caper		X	X		X		X				X			
	<i>Capparis quinifolia</i>				X	X		X						Xv			
	<i>Capparis sepiaria</i>		wild orange		X	X		X	X	X	X			X	X	flw	
Caricaceae	<i>Carica papaya</i>	*	papaya, paw paw						X				X	X			
Casuarinaceae	<i>Casuarina equisetifolia</i> var. <i>incana</i>	^	horsetail oak	gaiboi		X	X							X	X		
Celastraceae	<i>Gymnosporia inermis</i>			pitader	X	X		X		X	X		X	X	ft	flw	

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
	<i>Hippocrea barbata</i>				X	X								X			
	<i>Pleurostyla opposita</i>		pleurostyla		X	X					X			X			
	<i>Salacia chinensis</i>	^	lolly berry, jaffa bush	uru	X	X		X			X			X	X		
Chenopodiaceae	<i>Salsola australis</i>		prickly saltwart				X							Xv			
Cleomaceae	<i>Cleome viscosa</i>	^	tick weed				X	X						X			
Clusiaceae	<i>Calophyllum inophyllum</i>		beach touriga					X	X	X				X			
Colchicaceae	<i>Gloriosa suberosa</i>	*	glory lily						X	X		X	X	X	X		flw
Combretaceae	<i>Terminalia arenicola</i>	^	brown damson	imipa	X	X					X	X		X			
	<i>Terminalia catappa</i>	^	beach almond	merkai	X	X	X		X		X			X			
	<i>Terminalia complanata</i>	^	yellow terminalia (planted)						X					X	X		
	<i>Terminalia muelleri</i>	^	Australian almond	mipa	X	X		X			X			X	X		ft
	<i>Terminalia subacroptera</i>	^		mipa	X	X		X						X			
Commeliniaceae	<i>Commelina diffusa</i>		scurvy weed			X		X	X					X			
Convolvulaceae	<i>Ipomoea pes-capre</i> subsp. <i>brasiliensis</i>	^	goats foot convolvulus	puala			X							X			
	<i>Ipomoea hederifolia</i>	*	scarlet creepr			X							X	X	X		flw
	<i>Ipomoea trilobata</i>	*	pink convolvulus, 3 leaved morning glory						X					X			
	<i>Ipomoea macrantha</i>		coast moon flower		X	X		X						Xv	X		flw
	<i>Ipomoea nil</i>	*											X				
	<i>Jacquemontia paniculata</i>		jacquemontia			X		X		X				X			flw
Crassulaceae	<i>Bryophyllum pinnatum</i>	*	mother of millions						X					X	X		
Cucurbitaceae	<i>Diplocyclos palmatus</i> subsp. <i>palmatus</i>												X				
	<i>Muelleragia timorensis</i>		spitting cucumber		X	1								X			ft
Cyperaceae	<i>Bulbostylis barbata</i>		water grass				X	X						X			

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
	<i>Cyperus pedunculatus</i>		pineapple grass				X	1					X				
	<i>Cyperus sp. (DGF)</i>						X	X					X				
	<i>Fimbristylis cymosa</i>						X	X			X						
Ebenaceae	<i>Diospyros compacta</i>		An Australian ebony	kubi	X	X		X			X	X		Xv	X	flw	
	<i>Diospyros maritima</i>	^	broad leaved ebony	Kubil gim	X	X					X			X	X	ft	
	<i>Diospyros sp. (Mt White P.I.Forster PIF14415)</i>		ebony		X	X					X			X	X	flw	
Euphorbiaceae	<i>Euphorbia cyathophora</i>	*	painted spurge	susupoi		X	X		X		X		X	X	X	flw	
	<i>Euphorbia heterophylla</i>	*	painted spurge										X				
	<i>Euphorbia hirta</i>	*	asthma plant						X					X			
	<i>Euphorbia pallens</i>		beach euphorbia	itmarr			X							Xv			flw
	<i>Euphorbia tannensis var. tannensis</i>		euphorbia				X							X			flw
	<i>Macaranga tanarius</i>	^	macaranga	bibi	X	X					X			X	X		flw
	<i>Pedilanthus tithymaloides</i>	*											X				
	<i>Ricinus communis</i>	^	castor oil bush			X			X		X		X	X	X		
Fabaceae	<i>Abrus precatorius</i> subsp. <i>precatorius</i>	^	gidee gidee, crabs eye		X	1		X			X			X	X		flw
	<i>Canavalia papuana</i>		beach bean				X							Xv			flw
	<i>Clitoria ternatea</i>	*	butterfly pea										X				
	<i>Crotalaria pallida</i> var. <i>obovata</i>	*	streaked rattlepod	shakem				X	X		X		X				
	<i>Dalbergia densa</i> var. <i>australis</i>							X						X			
	<i>Dendrolobium arbuscula</i>		horsebush					X						X			
	<i>Derris trifoliata</i>		three leaf derris				X							X			
	<i>Desmodium scorpiurus</i>	*											X				
	<i>Desmodium tortuosum</i>	*	beggar weed						X		X		X	X			ft
	<i>Desmodium triflorum</i>	*	creeping						X		X		X	X			flw

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
			tickfoil														
	<i>Erythrina variegata</i>	^	coral tree	nawai	X									X		ft	
	<i>Indigofera tinctoria</i>	*	indigo	kupi					X		X		X	X			
	<i>Indigofera</i> sp. (see DGF Poruma collection)								X					X			
	<i>Macroptileum atropurpureum</i>	*	siratro						X				X	X			
	<i>Milletia pinnata</i>		Indian beech, pongamia tree		X	X								X	X		flw
	<i>Mucuna pruriens</i> var. <i>utilis</i>	*	velvet bean						X		X			X			
	<i>Rhynchosia minima</i> var. <i>australis</i>		rynchnosia				X	X	X		X	X		X	X		flw
	<i>Sesbania grandiflora</i>	*											X				
	<i>Sophora tomentosa</i> subsp. <i>australis</i>		silver bush	gabau ras			X				X			X	X		flw
	<i>Stylosanthes hamata</i>	*	secca										X				
	<i>Stylosanthes humilis</i>	*	Townsville stylo, secca						X					X			
	<i>Tephrosia laxa</i>			eebarb			X	X						Xv			flw
	<i>Vigna marina</i>	^	dune bean	Duth			X				X			X			flw
Flacourtiaceae	<i>Scolopia braunii</i>		flintwood	liwar?	X	X					X	X		X	X		
Flagellariaceae	<i>Flagellaria indica</i>	^	whip vine		X	X								X			
Goodeniaceae	<i>Scaevola taccada</i>	^	sea lettuce	dell			X				X			X	X	flw	
Lamiaceae	<i>Anisomeles malabarica</i>		chodhava	kibur				X			X			X			
	<i>Clerodendrum inerme</i>		scrambling clerodendrum				X							X			
	<i>Hyptis suaveolens</i>	*	cockatoo bush								X		X	X			flw
	<i>Premna serratifolia</i>	^	coastal premna	komak	1	1	X	X			X			X	X		ft
Lauraceae	<i>Cassytha filiformis</i>	^	dodder	muzzuru	X	X	X	X			X			X	X		ft
Lecythidaceae	<i>Barringtonia racemosa</i>		mango pine			X								Xv	X		
Lythraceae	<i>Pemphis acidula</i>	^	digging stick tree	mur			X				X			X	X		
Malvaceae	<i>Abutilon albescens</i>		coastal lantern				X	X						X			

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
			flower														
	<i>Hibiscus tiliaceus</i>	^	cotton wood				X	X			X			X			
	<i>Malvastrum coromandelianum</i> subsp. <i>coromandelianum</i>	*											X				
	<i>Sida acuta</i>	*	sida						X		X		X	X			
	<i>Sida pusilla</i>		A sida						X		X	X	X	X			
	<i>Thespesia populneoides</i>	^	Pacific rosewood	wana			X							X	X		
Meliaceae	<i>Aglaia elaeagnoidea</i>	^	coastal boodyara	usarkun	1	X	X				X			X	X		
	<i>Vavaea amicornum</i>		vavaea		X	X								Xv			
	<i>Xylocarpus granatum</i> ⁴		monkey puzzle				X							X			
Menispermaceae	<i>Tinospora smilacina</i>		snake vine		1	X		X						X	X		
Mimosaceae	<i>Leucaena leucocephala</i>	*	leucaena			X		X	X				X	X	X		
Moraceae	<i>Ficus benjamina</i>	Cult.	weeping fig						X					X			
	<i>Ficus fraseri</i>		fig		X									X			
	<i>Ficus opposita</i>	^	sandpaper fig		X	1		X			X			X	X		ft
	<i>Ficus virens</i> var. <i>sublanceolata</i>	^	white fig	darni tree	X				X					X			
Moringaceae	<i>Moringa oleifera</i>	*	miracle tree						X					X	X		
Myrtaceae	<i>Eugenia reinwardtiana</i>	^	Cedar bay cherry	kurad	X	X		X			X			X	X		
	<i>Syzygium aquem</i>	^ Cult.	bell fruit	errow					X					X			
	<i>Syzygium branderhorstii</i>	^ Cult.	Lockerbie satinash	uzu					X		X	X		X		ft	
Nyctaginaceae	<i>Boerhavia mutabilis</i>		tar vine	apai			X	X						X			
	<i>Pisonia grandis</i>	^	bird lime tree	piner		X					X			Xv	X		
Oleaceae	<i>Ximenia americana</i>	^	yellow plum	pitader	X	X		X			X	X		X			
Oleaceae	<i>Chionanthus ramiflorus</i>		native olive		X	X					X			X		ft	
Opiliaceae	<i>Opilia amentacea</i>		opilia	tait pat	X	X		X			X	X		Xv	X		
Orchidaceae	<i>Nervilia holochila</i>		ribbed shield		1						X						

⁴ Shoreline germinant

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
			orchid														
Pandanaceae	<i>Pandanus spirilis</i>	^	pandanus	kowsar			X							X			
Passifloraceae	<i>Passiflora foetida</i>	*^	stinking passion flower			X		X	X		X		X	X	X		
	<i>Passiflora suberosa</i>	*	corky passionfruit			X			X		X		X	X	X		
Pedaliaceae	<i>Josephinia imperatricis</i>		sand burr	puti			X				X			Xv			flw
Phyllanthaceae	<i>Breynia cernua</i>		imer		X	X					X			X	X	flw	
	<i>Breynia oblongifolia</i>		coffee bush	bik or iusi	X	X					X			X			
	<i>Bridelia tomentosa</i>		bridelia		X	X								Xv	X		ft
	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>	^	white current, white fruit	kupi	X			X			X			X			
	<i>Glochidion apodogynum</i>		button wood	peleith	X		X	X						X	X		
	<i>Glochidion disparipes</i>		pin flower tree			X		X			X	X		X			
	<i>Phyllanthus novae-hollandiae</i>		phyllanthus		X	X		X			X			X	X		
	<i>Phyllanthus amarus</i>	*	bahupatra						X				X	X			
	<i>Phyllanthus reticulatus</i>					1		X			X						
Pittosporaceae	<i>Pittosporum ferrugineum</i> subsp. <i>ferrugineum</i>	^	rusty pittosporum		X	X					X			Xv	X	ft	flw
Poaceae	<i>Bothriochloa bladhii</i> var. <i>bladhii</i>		forest blue grass						X					X	X		flw
	<i>Bothriochloa pertusa</i>	*	Indian couch						X					X			flw
	<i>Cenchrus echinatus</i>	*	Mossman river grass				X		X		X		X	X			
	<i>Cenchrus pedicellatus</i> subsp. <i>unispiculus</i>	*	kyasuma grass						X								
	<i>Chloris inflata</i>	*	purple top Rhodes gras										X				
	<i>Cynodon dactylon</i>	*	common couch						X					X			
	<i>Dactyloctenium aegyptium</i>	*	button grass				X		X				X	X			
	<i>Digitaria ciliaris</i>	*	summer grass						X				X	X			
	<i>Eleusine indica</i>	*	crows foot						X				X	X			

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
			grass														
	<i>Eragrostis tenella</i>	*	love grass						X		X	X	X	X			
	<i>Eragrostis</i> sp.		A love grass				X							X			
	<i>Imperata cylindrica</i>	^	blady grass, house grass					X						X			
	<i>Lepturus repens</i>		lepturus				X							X			
	<i>Melinis repens</i> *	*	red natal grass						X				X	X			
	<i>Panicum pygmaeum</i>		pygmy panic, dwarf pannic		X									X			flw
	<i>Spinifex longifolius</i>	^	beach spinifex				X				X			Xv			
	<i>Themeda arguens</i>							X			X			X	X		
	<i>Themeda quadrivalvis</i>	*	grader grass						X		X						
	<i>Thuarea involuta</i>		running grass				X	X			X			Xv			
	<i>Themeda triandra</i>												X				
	<i>Urochloa piligera</i>		hairy armgrass					X									
Putranjivaceae	<i>Drypetes deplanchei</i>	^	yellow boxwood	ak	X	X		X			X			X	X		
Portulacaceae	<i>Portulaca oleracea</i>	*	pig weed						X					X	X		flw
Rhamnaceae	<i>Colubrina asiatica</i>	^	colubrina, beach berry bush	guraigur			X				X			X			
Rhizophoraceae	<i>Rhizophora apiculata</i>	^	tall stilted mangrove							X				Xv	X		
Rubiaceae	<i>Cylcophyllum maritimum</i>	^	coastal canthium		X	X					X			Xv			
	<i>Guettarda speciosa</i>	^	sea randa, beach gardenia	budu	X	X	X				X			X	X		
	<i>Ixora timorensis</i>	^	native ixora		X	X					X	X	X	X	X		
	<i>Morinda citrifolia</i>	^	noni	auboi	X	X			X		X			X	X	ft	flw
	<i>Pavetta brownii</i> var. <i>brownii</i>		pavetta			X								X			ft
	<i>Oldenlandia corymbosa</i>	*											X				
	<i>Psychotria nesophila</i>				X	X					X			Xv	X		
	<i>Psydrax banksii</i>				X	X					X			X			

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
	<i>Scoparia dulcis</i>	*	broomweed, sweet broom						X					X			
	<i>Spermacoce</i> sp. (Lorim Point A.Morton AMX237)	#						X						X			1
Rutaceae	<i>Micromelum minutum</i>	^	lime berry	hapi, gait gait, githgith?	X	X		X			X			X	X	ft	
	<i>Murraya paniculata</i> cv. <i>Exotica</i>	*	murraya										X				
Sapindaceae	<i>Dodonaea viscosa</i> subsp. <i>viscosa</i>	^	hop bush	sapai		X					X	X		X			
Sapotaceae	<i>Manilkara kauki</i>	^	wongai	ubar (dried wongai 'kaiga')	1	X	X	X	X			X		X		ft	
	<i>Planchonella obovata</i>		northern yellow boxwood	ebai	X	X					X			Xv	X		1
Smilacaceae	<i>Smilax australis</i>		barbed wire vine	Guireab gureab?	X	X		X			X			X			1
Solanaceae	<i>Physalis angulata</i>	*^	cape gooseberry						X				X	X			1
Sterculiaceae	<i>Heritiera littoralis</i> (shoreline germinant)		looking glass mangrove				X							X			
Surianaceae	<i>Suriana maritima</i>		bay cedar				X				X	X		X			
Taccaceae	<i>Tacca leontopetaloides</i>	^	native arrowroot	Gasi, argussi	X	X	X	X						X	X		
Thymelaeaceae	<i>Wikstroemia indica</i>		tie bush			X		X			X			X	X		
Ulmaceae	<i>Celtis paniculata</i>		native celtis, silky celtis		X	X					X			X			
	<i>Celtis philipensis</i> var. <i>philipensis</i>		celtis		X	X								X			
Urticaceae	<i>Pipturus argenteus</i>		white nettle, white mulberry	wayli	X	X		1						X	X		flw
Verbenaceae	<i>Lantana camara</i>	*Class 2	lantana				X	X			X	X	X	X	X		flw
	<i>Stachytarpheta</i>	*	snake weed			X		X			X		X	X	X		flw

Family	Botanical Name	Status	Common Name	Central Island Language Name	Deciduous / Semi deciduous vine forest & vine thicket	Casuarina dominant woodland & open forest.	Coastal dune complexes	Anthropogenically altered (secondary) vine forest & thicket	Cleared land, regrowth and exotic species	Intertidal	H'brecc (2012)	ATH (2011)	DAFF (2010, database)	DGF 2012 (v=vouche)	DGF photo	Phenology (Oct 07)	Phenology (June 12)
	<i>jamaicensis</i>																
Vitaceae	<i>Cayratia cardiophylla</i>		large leaf water vine		X	X								X	X		
	<i>Cayratia trifolia</i>		slender water vine		X	X								X			
Zygophyllaceae	<i>Tribulus cistoides</i>		caltrope	puti			X		X		X			X			

Appendix C. Preliminary List of Culturally Significant Plants for Masig

Scientific Name	Language Name	Common Name	Life Form	Broad Use	Part Used	Broad Habitat	Source
<i>Abrus precatorius</i>	TBD	Gidee gidee	Vine	Material	Black and red seeds used for decorative purposes i.e. necklaces and bracelets. Seeds shot through paw paw stems for kids play.	Vine forest & thickets, & shrublands.	Orlando Pearson pers. comm. (May 2012).
<i>Agave sisalana</i> *	TBD	Manilla rope	Succulent shrub	Material	Leaves cut and soaked in water to extract fibre for traditional grass skirts. Spike used for holding leaves in a fence or wind barrier.	Disturbed areas.	Orlando Pearson pers. comm. (May 2012).
<i>Aglaiia eleagnoidea</i>	usarkun	Coastal boodyara	Tree	Material	Strong timber known to be once used for building purposes on other islands.	Vine forests and thickets.	D. Mosby pers. com. (2007)
<i>Anisomeles malabarica</i>	kibur	Chodhava	Herb	TBD	TBD	Dune shrublands.	TBD
<i>Argusia argentea</i>	TBD	Octopus bush	Shrub	TBD	Known as a wind breaker	Dune foreshores.	D. Mosby pers. com. (2007)
<i>Boerhavia mutabilis</i>	ipee, ipi, apai	Tar vine	Herb	Material	Once used as a succulent green feed for pigs.	Dune foreshores.	O. Pearson pers. comm. (May 2012).
<i>Breynia oblongifolia</i>	bik or iusi	Coffee bush	Shrub	TBD	TBD	Vine forests and thickets, dune shrublands.	TBD
<i>Buchanania arborescens</i>	sizenai	Little gooseberry tree	Tree	Food	Small black fruits eaten as a snack when ripe on other islands.	Vine forests & thickets.	D. Mosby pers. com. (2007)
<i>Caesalpinia bonduc</i>	TBD	Nicker nut	Shrub, vine	Material	Seeds known to be used on other islands for playing marbles.	Margins of vine forests near coast.	N. Gibuma pers. com. (Nov. 2011).
<i>Cassytha filiformis</i>	muzurru	Dodder laurel	Vine	Material	Stems used for mats on racks for drying wongai.	Vine forests and thickets, dune shrublands and grasslands.	Shnukal (2004)
<i>Casuarina equisetifolia</i> var. <i>incana</i>	gaiboi	Horsetail oak	Tree	Material	Good timber. Valued as beachfront tree.	Foredunes	D. Mosby pers. com. (2007)
<i>Catharanthus roseus</i> *	binci	Pink periwinkle	Herb	Material, aesthetic	Flowers used as a decoration.	Disturbed foreshores.	D. Mosby pers. com. (2007)
<i>Cocos nucifera</i> *	urub	Coconut	Palm	Food, Material	Kernel	Planted locations.	D. Mosby pers. com. (2007)
<i>Colubrina asiatica</i>	Gurigal, guraigur	Colubrina or beach berry bush	Shrub	Material	Leaves in water to wash hands. Ladies used to dig roots to expose inner skin (bark) and extract put in	Margins of vine forests near coast.	O. Pearson pers. comm. (May 2012).

Scientific Name	Language Name	Common Name	Life Form	Broad Use	Part Used	Broad Habitat	Source
					rag and used as a shampoo to clean hair and make shiny.		
<i>Cordia subcordata</i>	mukamai	Golden trumpet tree	Tree	Material	Young fruits eaten (coconut taste). Timber used for drums on other islands.	Vine forests and thickets.	D. Mosby (Oct 2007).
<i>Crotalaria pallida</i> var. <i>obovata</i> *	shakem	Streaked rattlepod	Shrub	TBD	TBD	Disturbed areas	TBD
<i>Cyclophyllum maritimum</i>	TBD	coastal canthium	Shrub	Material	Timber burns green.	Vine forests and thickets.	F. Nai (May 2012).
<i>Delonix regia</i> *	TBD	Christmas tree, poinciana	Tree	Aesthetic	Red flowers are valed aesthetically and an indicator of Christmas time.	Disturbed areas	D. Mosby (Oct 2007).
<i>Diospyros compacta</i>	kubi	An Australian ebony	Tree	TBD	TBD	Vine forests and thickets.	TBD
<i>Diospyros maritima</i>	kubil gim	Broad leaved ebony	Tree	Indicator	Fruit ripening yellow is a sign for turtle abundance. Sap of leaves and stem and fruit is toxic.	Vine forests and thickets.	D. Mosby (Oct 2007).
<i>Dodonaea polyandra</i> , <i>Dodonaea viscosa</i> subsp. <i>viscosa</i>	Yellapui, sapai	Hop bush	Shrub	TBD	TBD	Dune shrublands	TBD
<i>Drypetes deplanchei</i>	ak	Yellow box wood	Tree	Material	Dried leaves traditionally used for storing wongai plums on Masig and Warraber.	Vine forests and thickets.	D. Mosby (Oct 2007).
<i>Erythrina variegata</i>	nawai	Coral tree	Tree	Material	Glossy seeds used for decorative purposes i.e. necklaces and bracelets. Soft timber easily worked.	Vine forests and thickets.	D. Mosby (Oct 2007).
<i>Eugenia reinwardtiana</i>	kurad	Cedar bay cherry	Shrub	Food	Ripe fruits eaten as a snack.	Vine forests and thickets.	D. Mosby (Oct 2007).
<i>Euphorbia cyathophora</i>	susupoi	Painted spurge	Herb	TBD	TBD	Dune shrublands and disturbed areas.	TBD
<i>Euphorbia pallens</i>	itmarr	Beach euphorbia	Herb	TBD	TBD	Foreshores.	TBD
<i>Exocarpos latifolius</i>	TBD	Broad leaved ballart	Shrub	Food	Small fruit eaten when ripe.	Vine forest & thickets, & shrublands.	E. Nai (May 2012).
<i>Ficus opposita</i>	TBD	Sandpaper fig	Herb	Material, medicinal	Leaves	Vine forests and thickets, dune shrublands.	E. Nai (May 2012).
<i>Ficus virens</i> var. <i>sublanceolata</i>	darni tree	White fig	Tree	TBD	TBD	Community area	TBD
<i>Flagellaria indica</i>	TBD	Whip vine	Vine	Material	Stems for binding.	Vine forests and thickets, dune shrublands.	D. Mosby (Oct 2007).
<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>	kupi	White current, white fruit	Shrub	Food	Small white fruit for eating as a snack.	Vine forests and thickets, dune shrublands.	D. Mosby (Oct 2007).
<i>Glochidion apodogynum</i>	peleith	Button wood	Shrub	Material	TBD	Vine forests and thickets,	TBD

Scientific Name	Language Name	Common Name	Life Form	Broad Use	Part Used	Broad Habitat	Source
						dune shrublands.	
<i>Guettarda speciosa</i>	budu, bodo	Sea randa, beach gardenia	Tree	Material	Leaves for Kup Muri	Vine forests and thickets, dune shrublands.	D. Mosby (Oct 2007).
<i>Gymnanthera oblonga</i>	marki issew	Harpoon bud	Vine	TBD	TBD	Vine forests and thickets, dune shrublands.	TBD
<i>Gymnosporia inermis</i>	pitader	Gymnosporia	Shrub	TBD	TBD	Coastal shrublands and vine thickets.	D. Mosby (Oct 2007).
<i>Hibiscus tiliaceus</i>	TBD	Cottonwood hibiscus	Tree	Material	Light wood for making small racing canoes. Fibrous bark possibly used for fibre.	Dune shrublands.	D. Mosby (Oct 2007).
<i>Imperata cylindrica</i>	TBD	Blady grass, house grass	Grass	Material	Used traditionally for thatching roofs of huts and houses.	Dune shrublands.	D. Mosby (Oct 2007), Snukal (2004).
<i>Indigofera tinctoria*</i>	kupi	Indigo	Low shrub	TBD	Known from other parts of the tropics as a source of true Indigo dye.	Dune shrublands and disturbed areas.	-
<i>Ipomoea pes capre var. brasiliensis</i>	puala	Goats foot convolvulus	Herb/Vine	Material	Stems for tying.	Foreshores.	D. Mosby (Oct 2007).
<i>Ixora timorensis</i>	TBD	Native ixora	Shrub	TBD	TBD	Vine forests and thickets, dune shrublands.	TBD
<i>Josephinia imperatricis</i>	puti	A sand burr	Herb	TBD	TBD	Foreshores.	TBD
<i>Macaranga tanarius</i>	TBD	Macaranga	Shrub, small tree	Material	Leaves cut and used for kup muri. Red sap in broken branches used as an adhesive.	Vine forests and thickets, and dune shrublands.	D. Mosby (Oct 2007).
<i>Mangifera indica</i>	TBD	Mango	Tree	Food	Fruit are eaten.	Disturbed areas and gardens.	-
<i>Manilkara kauki</i>	ubar, (dried wongai 'kaiga')	Wongai	Tree	Food, Material	Fruit are eaten. Strong timber favoured for dugong spears and carving.	Vine forests & thickets.	D. Mosby (Oct 2007), F. Nai (May 2012).
<i>Micromelum minutum</i>	bom, hapi, gait gait, githgith?	Lime berry	Shrub	TBD	TBD	Vine forests and thickets.	TBD
<i>Microsorium grossum</i>	kargh kargh	Ground fern	Fern	TBD	TBD	Vine forests and thickets.	TBD
<i>Milletia pinnata</i>	gub	Pongamia	Tree	Material	Good timber cut down on small islands for fires curing bech de mer.	Vine forests and thickets.	D. Mosby (Oct 2007).
<i>Morinda citrifolia</i>	auboi	Noni plum	Shrub	Medicinal	Fruit. Fruit ripens white. Eaten raw or fruit boiled up and juice drunk for illness. Leaves cut and	Vine forests and thickets. Disturbed areas and gardens.	D. Mosby (Oct 2007), E. Nai (2012)

Scientific Name	Language Name	Common Name	Life Form	Broad Use	Part Used	Broad Habitat	Source
					heated/boiled. Juice mixed with coconut oil and put on sores.		
<i>Opilia amentacea</i>	tait pat	Opilia	Vine	TBD	TBD	Vine forests and thickets.	TBD
<i>Pandanus spirilis</i>	kowsar	Pandanus	Pandanus Palm	Food, Material	Kernel of individual fruit segments hammered out when dry and eaten. Leaves used for fibre making baskets, mats. Used for making paint brushes.	Vine thicket, dune shrublands.	D. Mosby (Oct 2007).
<i>Papaya carica</i>	TBD	Paw paw	Shrub	Food	Fruit. Cultivated past and present.	Gardens	-
<i>Passiflora foetida</i> *	TBD	Stinking or wild passionfruit	Vine	Food	Small fruit eaten as a snack when ripe.	Vine forest & thickets, & shrublands, disturbed areas.	D. Mosby (Oct 2007).
<i>Pemphis acidula</i>	mur	Pemphis, Digging stick tree	Shrub	Material	Strong timber used for firewood.	Coastal margins.	D. Mosby (Oct 2007).
<i>Physalis angulata</i> *	TBD	Cape gooseberry	Herb	Food	Fruit are eaten.	Disturbed areas and gardens.	D. Mosby (Oct 2007).
<i>Pipturus argenteus</i>	wayli	White nettle, white mulberry	Shrub	TBD	TBD	Vine forests and thickets.	TBD
<i>Pisonia grandis</i>	piner	Bird lime tree	Tree	TBD	TBD	Vine forests and thickets.	TBD
<i>Pittosporum ferrugineum</i> subsp. <i>ferrugineum</i>	TBD	Rusty pittosporum	Shrub	TBD	Flowers	Vine forests and thickets.	TBD
<i>Planchonella obovata</i>	ebai	Northern yellow boxwood	Tree	TBD	TBD	Vine forests and thickets.	TBD
<i>Pleomele angustifolia</i>	buz	Native draceana	Shrub	TBD	TBD	Vine forest and thickets.	TBD
<i>Polyscias macgillivraei</i>	buman, sahra buman	Whistle tree	Shrub	Material	Leaves cut and used for kup muri. Leaf stems broken at base and used for toy whistle.	Vine forest and thickets.	L. Naawi (May 2012).
<i>Portulaca oleracea</i>	TBD	Pig weed	Herb	Material	Pig feed.	Dune shrublands.	D. Mosby (Oct 2007).
<i>Premna serratifolia</i>	komak	Premna	Shrub	Food	Fruit edible when pink before turning black.	Vine thicket, dune shrublands.	
<i>Rhizophora apiculata</i>	TBD	Tall stilted mangrove	Tree	Material	Timber	A few plants occur on intertidal areas around Masig.	-
<i>Ricinus communis</i> *	lam	Castor oil bush	Shrub	Medicinal	Leaves crushed and juice mixed with cocunt oil to heal sores. Leaf put on womans stomach to straighten baby. In WW2 seeds reportedly crushed up and put in food to kill Japanese.	Disturbed areas.	Use from Poruma (O. Pearson May 2012).
<i>Salacia chinensis</i>	uru	Jaffa fruit	Shrub	Food	Fruit ripening red is edible. Stems	Vine thicket, dune	L. Naawi (May

Scientific Name	Language Name	Common Name	Life Form	Broad Use	Part Used	Broad Habitat	Source
					twisted in a bundle and fire wood stored inside.	shrublands.	2012).
<i>Scaevola taccada</i>	dell	Sea lettuce	Shrub	Ritual	If leaves or branches are broken tradition has it that the strong wind will blow.	Dune foreshores.	L. Naawi (May 2012).
<i>Scolopia braunii</i>	liwar?	Flintwood	Tree	TBD	TBD	Vine forest and thicket	TBD
<i>Semecarpus australiensis</i>	duha	Tar tree	Tree	Material, food	Leaves used for toy sailing boats. Seeds extracted and roasted in coals. Sap toxic.	Vine forest	Use from Poruma (O. Pearson May 2012).
<i>Sesuvium portulacastrum</i>	gurawad	Sea purslane	Herb	Material	Succulent leaves and stems one fed to pigs to make fat.	Dune foreshores.	L. Naawi (May 2012).
<i>Smilax australis</i>	guireab gureab?	Barbed wire vine	Vine	TBD	TBD	Vine forests and thickets	TBD
<i>Sophora tomentosa</i> subsp. <i>australis</i>	gabau ras	Silver bush	Shrub	TBD	TBD	Dune foreshores.	TBD
<i>Spinifex longifolius</i>	TBD	Beach spinifex	Grass	TBD	TBD	Dune foreshores.	D. Mosby (Oct 2007).
<i>Syzygium aqeum</i>	errow	Bell fruit	Tree	Food	Fruit eaten. It is unlikely that this plant grows in the wild in Torres Strait however is now domesticated and planted in home gardens.	House gardens.	-
<i>Syzygium branderhorstii</i>	uzu	Lockerbie satinash	Shrub/Tree	Food	Fruit eaten. This plant grows in the wild on Mua, Erub, and Dauan. It is now domesticated and planted in home gardens.	House gardens.	-
<i>Tacca leontopetaloides</i>	gasi, argussi	Native arrowroot	Tuber	Food	Tuber dug, prepared and eaten.	Vine forests and thickets, dune shrublands, grasslands.	E. Nai, L. Naawi (May 2012).
<i>Tecoma stans</i> var. <i>stans</i>	TBD	Yellow bells	Shrub	Aesthetic	Valued as a garden plant for attractive yellow flowers.	House gardens, disturbed areas	-
<i>Tephrosia laxa</i>	eebarb	Tephrosia	Herb	TBD	TBD	Dune shrublands	TBD
<i>Terminalia arenicola</i>	imipa	Brown damson	Tree	Food	Outer skin of fruit eaten when ripe. Leaves cut and used for kup muri.	Vine forests and thickets.	E. Nai, L. Naawi (May 2012).
<i>Terminalia catappa</i>	merkai	Sea almond	Tree	Food	Outer skin of fruit eaten when ripe. Inner nut eaten when dry. Leaves cut and used for kup muri.	Community areas.	E. Nai, L. Naawi (May 2012).
<i>Terminalia muelleri</i>	mipa	Australian almond	Shrub or small tree	Food	Fleshy skin of small purplish-black fruit eaten when ripe.	Vine forest & thickets, & shrublands.	E. Nai, L. Naawi (May

Scientific Name	Language Name	Common Name	Life Form	Broad Use	Part Used	Broad Habitat	Source
							2012).
<i>Thespesia populneoides</i>	wana	Pacific rosewood	Shrub/Tree	Material	Round fruit used for toys.	Mangrove margins.	D. Mosby (Oct. 2007).
<i>Tribulus cistoides</i>	puti	Caltrope	Herb	TBD	TBD	Disturbed areas, coastal dunes complex.	TBD
<i>Tridax procumbens</i> *	grass medicine	Tridax daisy, grass medicine	Annual herb	Medicinal, Material	Decoction of leaves used for treating cuts and sores. Flowers weaved into daisy chain for decoration.	Disturbed areas, coastal dunes complex.	E. Nai, L. Naawi (May 2012).
<i>Vigna marina</i>	duth	Dune bean	Vine	TBD	TBD	Coastal dunes complex (foreshore)	TBD
<i>Ximenia americana</i>	pitader	Yellow plum	Shrub	Food	Fleshy fruit ripening yellow.	Vine forests and thickets.	D. Mosby (Oct. 2007).

Appendix D Terrestrial Vertebrates Known¹ or Predicted² to Occur on the Islands of Torres Strait and their Occurrence on Masig.

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
AMPHIBIANS						
Myobatrachidae	<i>Limnodynastes ornatus</i>	Ornate Burrowing Frog		LC		
Myobatrachidae	<i>Uperoleia lithomoda</i>	Stonemason Toadlet		LC		
Myobatrachidae	<i>Uperoleia mimula</i>	Mimic Toadlet		LC		
Hylidae	<i>Litoria bicolor</i>	Northern Dwarf Tree Frog		LC		
Hylidae	<i>Litoria caerulea</i>	Green Tree Frog		LC		Wildnet & Unpublished record
Hylidae	<i>Litoria gracilentia</i>	Dainty Green Tree Frog		LC		
Hylidae	<i>Litoria infrafronata</i>	White-lipped Tree Frog		LC		
Hylidae	<i>Litoria nasuta</i>	Rocket Frog		LC		
Hylidae	<i>Litoria nigrofrenata</i>	Bridle Frog		LC		
Hylidae	<i>Litoria rubella</i>	Red Tree Frog		LC		
Microhylidae	<i>Austrochaperina gracilipes</i>	Slender Frog		LC		
Microhylidae	<i>Cophixalus</i> sp.	No common name				
Ranidae	<i>Rana daemeli</i>	Wood Frog		LC		
Bufonidae	<i>Rhinella marina</i>	Cane Toad		I		
REPTILES						
Crocodylidae	<i>Crocodylus porosus</i>	Salt-water Crocodile	M	V		Predicted by EPBC protected matters search
Gekkonidae	<i>Cyrtodactylus louisianensis</i>	Ring-tailed Gecko		LC		
Gekkonidae	<i>Gehyra baliola</i>	Short-tailed Dtella		LC		
Gekkonidae	<i>Gehyra dubia</i>	Dubious Dtella		LC		Database record
Gekkonidae	<i>Gehyra variegata</i>	Tree Dtella		LC		
Gekkonidae	<i>Hemidactylus frenatus</i>	House Gecko		I		Wildnet & Published records
Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's Gecko		LC		
Gekkonidae	<i>Lepidodactylus lugubris</i>	Mourning Gecko		LC		
Gekkonidae	<i>Lepidodactylus pumilus</i>	Slender Chained Gecko		NT		
Gekkonidae	<i>Nactus eboracensis</i>	no common name		LC		
Gekkonidae	<i>Nactus 'pelagicus'</i>	Pelagic Gecko		LC		
Gekkonidae	<i>Oedura rhombifer</i>	Zigzag Velvet Gecko		LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Gekkonidae	<i>Pseudotothecadactylus australis</i>	Giant Tree Gecko		LC		
Pygopodidae	<i>Lialis burtonis</i>	Burton's Snake-lizard		LC		
Scincidae	<i>Bellatorias frerei</i>	Major Skink		LC		
Scincidae	<i>Carlia coensis</i>	Coen Rainbow-skink		LC		
Scincidae	<i>Carlia longipes</i>	Closed-litter Rainbow-skink		LC		Database record
Scincidae	<i>Carlia Macfarlani</i>	Closed-litter Rainbow-skink		LC		
Scincidae	<i>Carlia quinquecarinata</i>	no common name		LC		
Scincidae	<i>Carlia sexdentata</i>	no common name		LC		
Scincidae	<i>Carlia storri</i>	Brown Bicarinate Rainbow-skink		LC		
Scincidae	<i>Cryptoblepharus litoralis litoralis</i>	Supralittoral Shinning-skink		LC		
Scincidae	<i>Cryptoblepharus virgatus</i>	Cream-striped Shinning-skink		LC		
Scincidae	<i>Ctenotus inornatus</i>	Bar-shouldered Ctenotus		LC		
Scincidae	<i>Ctenotus robustus</i>	Robust Ctenotus		LC		
Scincidae	<i>Ctenotus spaldingi</i>	Straight-browed Ctenotus		LC		
Scincidae	<i>Emoia atrocostata</i>	Littoral Whiptail-skink		NT		
Scincidae	<i>Emoia longicauda</i>	Shrub Whiptail-skink		LC		
Scincidae	<i>Eremiascincus pardalis</i>	Lowlands Bar-lipped Skink		LC		
Scincidae	<i>Eugongylus rufescens</i>	Bar-lipped Sheen-skink		LC		Unconfirmed record (Natural Solutions 2008)
Scincidae	<i>Glaphyromorphus crassicaudus</i>	Cape York Mulch-skink		LC		
Scincidae	<i>Glaphyromorphus nigricaudis</i>	Black-tailed Bar-lipped Skink		LC		
Scincidae	<i>Glaphyromorphus pumilus</i>	Dwarf Mulch-skink		LC		
Scincidae	<i>Lygisaurus macfarlani</i>	Translucent Litter-skink		LC		
Agamidae	<i>Chlamydosaurus kingii</i>	Frilled Lizard		LC		
Agamidae	<i>Diporiphora bilineata</i>	Two-lined Dragon		LC		
Agamidae	<i>Lophognathus temporalis</i>	Swamplands Lashtail		LC		
Varanidae	<i>Varanus gouldii</i>	Gould's Goanna		LC		
Varanidae	<i>Varanus indicus</i>	Mangrove Monitor		LC		
Varanidae	<i>Varanus mertensi</i>	Mertens' Water Monitor		LC		
Varanidae	<i>Varanus panoptes</i>	Yellow-spotted Monitor		LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Varanidae	<i>Varanus prasinus</i>	Emerald Monitor		NT		
Varanidae	<i>Varanus scalaris</i>	Spotted Tree Monitor		LC		
Varanidae	<i>Varanus tristis</i>	Black-tailed Monitor		LC		
Typhlopidae	<i>Ramphotyphlops braminus</i>	Flowerpot Blind Snake		I		
Typhlopidae	<i>Ramphotyphlops leucoproctus</i>	Cape York Blind Snake		LC		
Typhlopidae	<i>Ramphotyphlops polygrammicus</i>	North-eastern Blind Snake		LC		
Boidae	<i>Antaresia cf childreni</i>	Children's Python		LC		
Boidae	<i>Antaresia maculosa</i>	Spotted Python		LC		
Boidae	<i>Liasis fuscus</i>	Water Python		LC		
Boidae	<i>Morelia amethystina</i>	Amethyst Python		LC		
Boidae	<i>Morelia kinghorni</i>	Scrub Python		LC		
Colubridae	<i>Boiga irregularis</i>	Brown Tree Snake		LC		
Colubridae	<i>Cerberus australis</i>	Bockadam		LC		
Colubridae	<i>Dendrelaphis calligastra</i>	Northern Tree Snake		LC		
Colubridae	<i>Dendrelaphis punctulatus</i>	Common Tree Snake		LC		
Colubridae	<i>Stegonotus cucullatus</i>	Slaty-grey Snake		LC		
Colubridae	<i>Stegonotus parvus</i>	Slate-brown Snake		LC		
Elapidae	<i>Acanthophis praelongus</i>	Northern Death Adder		LC		
Elapidae	<i>Demansia papuensis</i>	Papuan Whipsnake		LC		
Elapidae	<i>Demansia vestigiata</i>	Black Whipsnake		LC		
Elapidae	<i>Furina tristis</i>	Brown-headed Snake		LC		
Elapidae	<i>Pseudechis papuanus</i>	Papuan Black Snake		LC		
Elapidae	<i>Oxyuranus scutellatus</i>	Papuan Taipan		LC		
BIRDS						
Megapodiidae	<i>Alectura lathami</i>	Australian Brush-turkey		LC		
Megapodiidae	<i>Megapodius reinwardt duperryii</i>	Orange-Footed Scrubfowl		LC		
Phasianidae	<i>Coturnix ypsilophora</i>	Brown Quail		LC		
Anseranatidae	<i>Anseranas semipalmata</i>	Magpie Goose		LC		
Anatidae	<i>Dendrocygna guttata</i>	Spotted Whistling-Duck		LC		
Anatidae	<i>Dendrocygna eytoni</i>	Plumed Whistling-Duck		LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Anatidae	<i>Dendrocygna arcuata</i>	Wandering Whistling-Duck		LC		
Anatidae	<i>Tadorna radjah</i>	Radjah Shelduck		NT		
Anatidae	<i>Chenonetta jubata</i>	Australian Wood Duck		LC		
Anatidae	<i>Nettapus pulchellus</i>	Green Pygmy-goose		LC		
Anatidae	<i>Anas gracilis</i>	Grey Teal		LC		
Anatidae	<i>Anas superciliosa</i>	Pacific Black Duck		LC		
Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian Grebe		LC		
Columbidae	<i>Columba livia</i>	Rock Dove		I		
Columbidae	<i>Geopelia striata papua</i>	Emerald Dove		LC		
Columbidae	<i>Geopelia striata</i>	Peaceful Dove		LC		
Columbidae	<i>Geopelia humeralis</i>	Bar-shouldered Dove		LC		WildNet & published records.
Columbidae	<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove		LC		
Columbidae	<i>Ptilinopus superbus</i>	Superb Fruit-Dove		LC		Published record
Columbidae	<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove		LC		WildNet & published records.
Columbidae	<i>Ptilinopus iozonus</i>	Orange-Bellied Fruit-Dove		LC		
Columbidae	<i>Ducula mullerii</i>	Collared Imperial-Pigeon		LC		.
Columbidae	<i>Ducula bicolor</i>	Pied Imperial-Pigeon		LC		WildNet & published records.
Columbidae	<i>Lopholaimus antarcticus</i>	Topknot Pigeon		LC		
	<i>Colonectris leucomelus</i>	Streaked Shearwater	M	LC		Predicted by EPBC MNES search
Podargidae	<i>Podargus strigoides</i>	Tawny Frogmouth		LC		
Podargidae	<i>Podargus papuensis</i>	Papuan Frogmouth		LC		
Eurostopodidae	<i>Eurostopodus mystacalis</i>	White-throated Nightjar		LC		
Eurostopodidae	<i>Eurostopodus argus</i>	Spotted Nightjar		LC		
Caprimulgidae	<i>Caprimulgus macrurus</i>	Large-tailed Nightjar		LC		
Apodidae	<i>Collocalia esculenta</i>	Glossy Swiftlet		LC		
Apodidae	<i>Aerodramus terraereginae</i>	Australian Swiftlet		NT		
Apodidae	<i>Aerodramus vanikorensis</i>	Uniform Swiftlet		LC		
Apodidae	<i>Hirundapus caudacutus</i> ⁵	White-throated Needletail	M	LC		
Apodidae	<i>Mearnsia novaeguineae</i>	Papuan Spine-tailed Swift		LC		
Apodidae	<i>Apus pacificus</i>	Fork-tailed Swift	M	LC		
Apodidae	<i>Apus affinis</i>	House Swift		LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian Darter		LC		
Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant		LC		
Phalacrocoracidae	<i>Phalacrocorax carbo</i>	Great Cormorant		LC		
Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant		LC		
Phalacrocoracidae	<i>Phalacrocorax varius</i>	Pied Cormorant		LC		
Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian Pelican		LC		Published records.
Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork		NT		
Ardeidae	<i>Ixobrychus dubius</i>	Australian Little Bittern		LC		
Ardeidae	<i>Ixobrychus flavicollis</i>	Black Bittern		LC		
Ardeidae	<i>Ardea pacifica</i>	White-necked Heron		LC		
Ardeidae	<i>Ardea modesta</i> ⁶	Eastern Great Egret	M	LC		WildNet & published records.
Ardeidae	<i>Ardea intermedia</i>	Intermediate Egret		LC		
Ardeidae	<i>Ardea sumatrana</i>	Great-billed Heron		LC		
Ardeidae	<i>Ardea ibis</i> ⁷	Cattle Egret	M	LC		WildNet & published records.
Ardeidae	<i>Butorides striata</i>	Striated Heron		LC		
Ardeidae	<i>Egretta picata</i>	Pied Heron		LC		
Ardeidae	<i>Egretta novaehollandiae</i>	White-faced Heron		LC		WildNet & published records.
Ardeidae	<i>Egretta garzetta</i>	Little Egret		LC		
Ardeidae	<i>Egretta sacra</i>	Eastern Reef Egret	M	LC		WildNet & published records.
Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen Night-Heron		LC		Published records.
Threskiornithidae	<i>Plegadis falcinellus</i>	Glossy Ibis	M	LC		
Threskiornithidae	<i>Threskiornis molucca</i>	Australian White Ibis		LC		
Threskiornithidae	<i>Threskiornis spinicollis</i>	Straw-necked Ibis		LC		
Threskiornithidae	<i>Platalea regia</i>	Royal Spoonbill		LC		
Accipitridae	<i>Pandion cristatus</i> ⁸	Eastern Osprey	M	LC		WildNet & published records.
Accipitridae	<i>Elanus axillaris</i>	Black-shouldered Kite		LC		
Accipitridae	<i>Hamirostra melanosternon</i>	Black-breasted Buzzard		LC		
Accipitridae	<i>Aviceda subcristata</i>	Pacific Baza		LC		
Accipitridae	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	M	LC		WildNet record
Accipitridae	<i>Haliastur sphenurus</i>	Whistling Kite		LC		
Accipitridae	<i>Haliastur indus</i>	Brahminy Kite		LC		
Accipitridae	<i>Milvus migrans</i>	Black Kite		LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Accipitridae	<i>Accipiter fasciatus</i>	Brown Goshawk		LC		
Accipitridae	<i>Accipiter cirrhocephalus</i>	Collared Sparrowhawk		LC		
Accipitridae	<i>Accipiter novaehollandiae</i>	Grey Goshawk		NT		
Accipitridae	<i>Circus assimilis</i>	Spotted Harrier		LC		
Accipitridae	<i>Circus approximans</i>	Swamp Harrier		LC		
Accipitridae	<i>Erythrotriorchis radiatus</i>	Red Goshawk	V	E	high	
Accipitridae	<i>Aquila gurneyi</i>	Gurney's Eagle		LC		.
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel		LC		Published records.
Falconidae	<i>Falco berigora</i>	Brown Falcon		LC		
Falconidae	<i>Falco longipennis</i>	Australian Hobby		LC		
Falconidae	<i>Falco peregrinus</i>	Peregrine Falcon		LC		
Fregatidae	<i>Fregata ariel</i>	Lesser Frigatebird		LC		Wildnet record
Fregatidae	<i>Fregata minor</i>	Great Frigatebird		LC		Published record
Gruidae	<i>Grus rubicunda</i>	Brolga		LC		
Rallidae	<i>Porphyrio porphyrio</i>	Purple Swamphen		LC		
Rallidae	<i>Eulabeornis castaneoventris</i>	Chestnut Rail		LC		
Rallidae	<i>Rallina tricolor</i>	Red-necked Crake		LC		
Rallidae	<i>Gallirallus philippensis</i>	Buff-banded Rail		LC		
Rallidae	<i>Porzana pusilla</i>	Baillon's Crake		LC		
Rallidae	<i>Porzana fluminea</i>	Australian Spotted Crake		LC		
Rallidae	<i>Porzana tabuensis</i>	Spotless Crake		LC		
Rallidae	<i>Amauornis cinerea</i>	White-browed Crake		LC		
Rallidae	<i>Amauornis moluccana</i>	Pale-vented Bush-hen		LC		
Otididae	<i>Ardeotis australis</i>	Australian Bustard		LC		
Burhinidae	<i>Burhinus grallarius</i>	Bush Stone-curlew		LC		
Burhinidae	<i>Esacus magnirostris</i>	Beach Stone-curlew		V	high	WildNet & published records.
Haematopodidae	<i>Haematopus longirostris</i>	Australian Pied Oystercatcher		LC		Published record
Haematopodidae	<i>Haematopus fuliginosus</i>	Sooty Oystercatcher		NT		
Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged Stilt		LC		
Charadriidae	<i>Pluvialis fulva</i>	Pacific Golden Plover	M	LC		WildNet & published records.
Charadriidae	<i>Pluvialis squatarola</i>	Grey Plover	M	LC		WildNet & published records.
Charadriidae	<i>Charadrius ruficapillus</i>	Red-capped Plover		LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Charadriidae	<i>Charadrius bicinctus</i>	Double-banded Plover	M	LC		
Charadriidae	<i>Charadrius mongolus</i>	Lesser Sand Plover	M	LC		WildNet & published records.
Charadriidae	<i>Charadrius leschenaultii</i>	Greater Sand Plover	M	LC		WildNet & published records.
Charadriidae	<i>Erythrogonys cinctus</i>	Red-kneed Dotterel		LC		
Charadriidae	<i>Vanellus miles</i>	Masked Lapwing		LC		WildNet & published records.
Scolopacidae	<i>Gallinago hardwickii</i>	Latham's Snipe	M	LC		
Scolopacidae	<i>Gallinago megala</i>	Swinhoe's Snipe	M	LC		
Scolopacidae	<i>Limosa limosa</i>	Black-tailed Godwit	M	LC		
Scolopacidae	<i>Limosa lapponica</i>	Bar-tailed Godwit	M	LC		Published record
Scolopacidae	<i>Numenius minutus</i>	Little Curlew	M	LC		
Scolopacidae	<i>Numenius phaeopus</i>	Whimbrel	M	LC		WildNet record
Scolopacidae	<i>Numenius madagascariensis</i>	Eastern Curlew	M	NT		
Scolopacidae	<i>Xenus cinereus</i>	Terek Sandpiper	M	LC		Published record
Scolopacidae	<i>Actitis hypoleucos</i> ⁹	Common Sandpiper	M	LC		
Scolopacidae	<i>Tringa brevipes</i> ¹⁰	Grey-tailed Tattler	M	LC		Published record
Scolopacidae	<i>Tringa incana</i> ¹¹	Wandering Tattler	M	LC		
Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	M	LC		WildNet & published records.
Scolopacidae	<i>Tringa stagnatilis</i>	Marsh Sandpiper	M	LC		
Scolopacidae	<i>Tringa glareola</i>	Wood Sandpiper	M	LC		
Scolopacidae	<i>Arenaria interpres</i>	Ruddy Turnstone	M	LC		WildNet & published records.
Scolopacidae	<i>Calidris tenuirostris</i>	Great Knot	M	LC		WildNet & published records.
Scolopacidae	<i>Calidris canutus</i>	Red Knot	M	LC		
Scolopacidae	<i>Calidris alba</i> ¹²	Sanderling	M	LC		
Scolopacidae	<i>Calidris ruficollis</i>	Red-necked Stint	M	LC		Wildnet & published record
Scolopacidae	<i>Calidris melanotos</i>	Pectoral Sandpiper	M	LC		
Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	M	LC		WildNet & published records.
Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper	M	LC		
Turnicidae	<i>Turnix maculosus</i>	Red-backed Button-quail		LC		
Turnicidae	<i>Turnix pyrrhotorax</i>	Red-chested Button-quail		LC		
Glareolidae	<i>Glareola maldivarum</i>	Oriental Pratincole	M	LC		
Glareolidae	<i>Stiltia isabella</i>	Australian Pratincole		LC		Published record
Laridae	<i>Anous stolidus</i>	Common Noddy	M	LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Laridae	<i>Anous minutus</i>	Black Noddy		LC		
Laridae	<i>Onychoprion anaethetus</i> ¹³	Bridled Tern	M	LC		
Laridae	<i>Onychoprion fuscata</i>	Sooty Tern		LC		
Laridae	<i>Sternula albifrons</i> ¹⁴	Little Tern	M	E	high	Published record
Laridae	<i>Gelochelidon nilotica</i>	Gull-billed Tern		LC		
Laridae	<i>Hydroprogne caspia</i>	Caspian Tern	M	LC		
Laridae	<i>Chlidonias hybrida</i>	Whiskered Tern		LC		
Laridae	<i>Chlidonias leucopterus</i>	White-winged Black Tern	M	LC		
Laridae	<i>Sterna dougallii</i>	Roseate Tern	M	LC		Published record
Laridae	<i>Sterna striata</i>	White-fronted Tern		LC		
Laridae	<i>Sterna sumatrana</i>	Black-naped Tern	M	LC		Published record
Laridae	<i>Sterna hirundo</i>	Common Tern	M	LC		Published record
Laridae	<i>Thalasseus bengalensis</i> ¹⁵	Lesser Crested Tern	M	LC		
Laridae	<i>Thalasseus bergii</i>	Crested Tern		LC		Published records
Laridae	<i>Chroicocephalus novaehollandiae</i>	Silver Gull		LC		Published records
Cacatuidae	<i>Probosciger aterrimus</i>	Palm Cockatoo		NT		.
Cacatuidae	<i>Eolophus roseicapilla</i>	Galah		LC		
Cacatuidae	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo		LC		
Psittacidae	<i>Trichoglossus haematodus caeruleiceps</i>	Rainbow Lorikeet		LC		
Psittacidae	<i>Cyclopsitta</i> species	fig-parrot species				
Psittacidae	<i>Eclectus roratus polychloros</i>	Eclectus Parrot		LC		
Psittacidae	<i>Geoffroyus geoffroyi aruenensis</i>	Red-cheeked Parrot		LC		
Cuculidae	<i>Centropus phasianinus</i>	Pheasant Coucal		LC		
Cuculidae	<i>Eudynamys orientalis</i>	Eastern Koel		LC		
Cuculidae	<i>Eudynamus scolopacea</i>	Common Koel		LC		
Cuculidae	<i>Urodynamys taitensis</i>	Long-tailed Cuckoo		LC		
Cuculidae	<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo		LC		Published record
Cuculidae	<i>Chalcites basalis</i>	Horsfield's Bronze-Cuckoo		LC		
Cuculidae	<i>Chalcites osculans</i>	Black-eared Cuckoo		LC		
Cuculidae	<i>Chalcites lucidus</i>	Shining Bronze-Cuckoo		LC		WildNet & published records.

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Cuculidae	<i>Chalcites minutillus</i>	Little Bronze-Cuckoo		LC		
Cuculidae	<i>Cacomantis pallidus</i>	Pallid Cuckoo		LC		
Cuculidae	<i>Cacomantis castaneiventris</i>	Chestnut-breasted Cuckoo		LC		
Cuculidae	<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo		LC		
Cuculidae	<i>Cacomantis variolosus</i>	Brush Cuckoo		LC		
Cuculidae	<i>Cuculus optatus</i> ¹⁶	Oriental Cuckoo	M	LC		
Strigidae	<i>Ninox connivens</i>	Barking Owl		LC		
Strigidae	<i>Ninox novaeseelandiae</i>	Southern Boobook		LC		
Tytonidae	<i>Tyto longimembris</i>	Eastern Grass Owl		LC		
Alcedinidae	<i>Ceyx azureus</i>	Azure Kingfisher		LC		
Alcedinidae	<i>Ceyx pusilla pusilla</i>	Little Kingfisher		LC		
Halcyonidae	<i>Tanysiptera sylvia</i>	Buff-breasted Paradise-Kingfisher		LC		Published record
Halcyonidae	<i>Tanysiptera galatea</i>	Common Paradise-Kingfisher		LC		
Halcyonidae	<i>Tanysiptera hydrocharis</i>	Little Paradise-Kingfisher				
Halcyonidae	<i>Dacelo leachii</i>	Blue-winged Kookaburra		LC		
Halcyonidae	<i>Syma torotoro</i>	Yellow-billed Kingfisher		LC		
Halcyonidae	<i>Todiramphus macleayii</i>	Forest Kingfisher		LC		
Halcyonidae	<i>Todiramphus sanctus</i>	Sacred Kingfisher		LC		WildNet.
Halcyonidae	<i>Todiramphus chloris</i>	Collared Kingfisher		LC		
Meropidae	<i>Merops ornatus</i>	Rainbow Bee-eater	M	LC		Published record.
Coraciidae	<i>Eurystomus orientalis</i>	Dollarbird		LC		Published record
Pittidae	<i>Pitta erythrogaster</i>	Red-bellied Pitta		LC		
Pittidae	<i>Pitta versicolor</i>	Noisy Pitta		LC		Published record
Ptilonorhynchidae	<i>Ptilonorhynchus nuchalis</i>	Great Bowerbird		LC		
Acanthizidae	<i>Sericornis beccarii</i>	Tropical Scrubwren		LC		
Acanthizidae	<i>Gerygone levigaster</i>	Mangrove Gerygone		LC		
Acanthizidae	<i>Gerygone magnirostris brunneipectus</i>	Large-billed Gerygone		LC		
Acanthizidae	<i>Gerygone palpebrosa</i>	Fairy Gerygone		LC		
Meliphagidae	<i>Meliphaga notata</i>	Yellow-spotted Honeyeater		LC		
Meliphagidae	<i>Meliphaga gracilis</i>	Graceful Honeyeater		LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Meliphagidae	<i>Lichenostomus versicolor</i>	Varied Honeyeater		LC		
Meliphagidae	<i>Manorina melanocephala</i>	Noisy Miner		LC		
Meliphagidae	<i>Ramsayornis modestus</i>	Brown-backed Honeyeater		LC		
Meliphagidae	<i>Conopophila albogularis</i>	Rufous-banded Honeyeater		LC		
Meliphagidae	<i>Myzomela obscura fumata</i>	Dusky Honeyeater		LC		
Meliphagidae	<i>Myzomela erythrocephala infuscata</i>	Red-headed Honeyeater		LC		
Meliphagidae	<i>Cissomela pectoralis</i>	Banded Honeyeater		LC		
Meliphagidae	<i>Lichmera indistincta</i>	Brown Honeyeater		LC		
Meliphagidae	<i>Philemon buceroides</i>	Helmeted Friarbird		LC		
Meliphagidae	<i>Philemon argenteiceps</i>	Silver-crowned Friarbird		LC		
Meliphagidae	<i>Philemon comiculatus</i>	Noisy Friarbird		LC		
Meliphagidae	<i>Philemon citreogularis</i>	Little Friarbird		LC		
Meliphagidae	<i>Xanthotis flaviventer saturator</i>	Tawny-breasted Honeyeater		LC		
Pomatostomidae	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler		LC		
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike		LC		WildNet & published records.
Campephagidae	<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike		LC		
Campephagidae	<i>Coracina lineata</i>	Barred Cuckoo-shrike		LC		
Campephagidae	<i>Coracina tenuirostris melvillensis</i>	(Melville) Cicadabird	M	LC		
Campephagidae	<i>Lalage tricolor</i>	White-winged Triller		LC		Published record
Campephagidae	<i>Lalage leucomela</i>	Varied Triller		LC		
Pachycephalidae	<i>Pachycephala melanura</i>	Mangrove Golden Whistler		LC		Published record.
Pachycephalidae	<i>Pachycephala rufiventris</i>	Rufous Whistler		LC		
Pachycephalidae	<i>Colluricincla megarrhyncha</i>	Little Shrike-thrush		LC		
Oriolidae	<i>Sphecothebes vieilloti</i>	Australasian Figbird		LC		
Oriolidae	<i>Oriolus flavocinctus</i>	Yellow Oriole		LC		
Oriolidae	<i>Oriolus sagittatus</i>	Olive-backed Oriole		LC		
Artamidae	<i>Artamus leucorhynchus</i>	White-breasted Woodswallow		LC		WildNet & published records.
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow		LC		
Artamidae	<i>Artamus minor</i>	Little Woodswallow		LC		
Artamidae	<i>Cracticus quoyi alecto</i>	Black Butcherbird		LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Dicruridae	<i>Dicrurus bracteatus carbonarius</i>	Spangled Drongo		LC		
Rhipiduridae	<i>Rhipidura rufifrons</i>	Rufous Fantail	M	LC		
Rhipiduridae	<i>Rhipidura phasiana</i>	Mangrove Grey Fantail		LC		
Rhipiduridae	<i>Rhipidura rufiventris gularis</i>	Northern Fantail		LC		
Rhipiduridae	<i>Rhipidura leucophrys melaleuca</i>	Willie Wagtail		LC		
Corvidae	<i>Corvus orru orru</i>	Torresian Crow		LC		
Monarchidae	<i>Myiagra ruficollis</i>	Broad-billed Flycatcher		LC		
Monarchidae	<i>Myiagra rubecula</i>	Leaden Flycatcher		LC		
Monarchidae	<i>Myiagra cyanoleuca</i>	Satin Flycatcher	M	LC		
Monarchidae	<i>Myiagra alecto</i>	Shining Flycatcher		LC		
Monarchidae	<i>Myiagra inquieta</i>	Restless Flycatcher		LC		
Monarchidae	<i>Monarcha melanopsis</i>	Black-faced Monarch	M	LC		Published records.
Monarchidae	<i>Monarcha frater</i>	Black-winged Monarch	M	LC		
Monarchidae	<i>Symposiarchus trivirgatus</i> ¹⁷	Spectacled Monarch	M	LC		
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark		LC		
Monarchidae	<i>Arses telescopthalmus</i>	Frilled Monarch		LC		
Paradisaeidae	<i>Phonygammus keraudrenii</i>	Trumpet Manucode		LC		
Paradisaeidae	<i>Ptiloris magnificus</i>	Magnificent Riflebird		LC		
Petroicidae	<i>Microeca flavigaster</i>	Lemon-bellied Flycatcher		LC		
Petroicidae	<i>Peneoanthe pulverulenta</i>	Mangrove Robin		LC		
Petroicidae	<i>Drymodes superciliaris</i>	Northern Scrub-robin		LC		
Cisticolidae	<i>Cisticola exilis</i>	Golden-headed Cisticola		LC		Published record.
Acrocephalidae	<i>Acrocephalus australis</i> ¹⁸	Australian Reed-Warbler	M	LC		
Megaluridae	<i>Megalurus timoriensis</i>	Tawny Grassbird		LC		
Megaluridae	<i>Megalurus gramineus</i>	Little Grassbird		LC		
Timaliidae	<i>Zosterops citrinella</i>	Pale White-eye		LC		Wildnet & published record.
Timaliidae	<i>Zosterops lateralis</i>	Silvereye		LC		
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow	M	LC		
Hirundinidae	<i>Hirundo neoxena</i>	Welcome Swallow		LC		
Hirundinidae	<i>Petrochelidon ariel</i>	Fairy Martin		LC		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Hirundinidae	<i>Petrochelidon nigricans</i>	Tree Martin		LC		
Hirundinidae	<i>Cecropis daurica</i> ¹⁹	Red-rumped Swallow	M	LC		
Turdidae	<i>Zoothera</i> sp.	thrush species		LC		
Sturnidae	<i>Aplornis cantoroides</i>	Singing Starling		LC		
Sturnidae	<i>Aplornis metallica</i>	Metallic Starling		LC		WildNet & published records.
Sturnidae	<i>Sturnus tristis</i>	Common Myna		I		
Nectariniidae	<i>Dicaeum geelvinkianum</i>	Red-capped Flowerpecker		LC		
Nectariniidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird		LC		
Nectariniidae	<i>Nectarinia jugularis</i>	Olive-backed Sunbird		LC		WildNet record
Estrildidae	<i>Poephila personata</i>	Masked Finch		LC		
Estrildidae	<i>Lonchura punctulata</i>	Nutmeg Mannikin		I		
Estrildidae	<i>Lonchura castaneothorax</i>	Chestnut-breasted Mannikin		LC		WildNet record.
Passeridae	<i>Passer domesticus</i>	House Sparrow		I		Published records.
Motacillidae	<i>Motacilla</i> sp.	Yellow Wagtail species	M	LC		
MAMMALS						
Tachyglossidae	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna		LC		
Peramelidae	<i>Isoodon macrourus</i>	Northern Brown Bandicoot		LC		
Peramelidae	<i>Isoodon obesulus</i>	Southern Brown Bandicoot		LC		
Macropodidae	<i>Macropus agilis</i>	Agile Wallaby		LC		
Pteropodidae	<i>Dobsonia magna</i>	Bare-backed Fruit-bat		NT		
Pteropodidae	<i>Macroglossus minimus</i>	Northern Blossom-bat		LC		
Pteropodidae	<i>Syconycteris australis</i>	Common Blossom-bat		LC		
Pteropodidae	<i>Nyctimene cephalotes</i>	Torresian Tube-nosed Bat		NT		
Pteropodidae	<i>Nyctimene robinsoni</i>	Eastern Tube-nosed Bat		LC		
Pteropodidae	<i>Pteropus alecto</i>	Black Flying-fox		LC		Wildnet record
Pteropodidae	<i>Pteropus conspicillatus</i>	Spectacled Flying-fox	V	LC	high	Predicted by the EPBC Protected Matters Search Tool
Pteropodidae	<i>Pteropus macrotis</i>	Large-eared Flying-fox		LC		
Pteropodidae	<i>Pteropus scapulatus</i>	Little Red Flying-fox		LC		
Pteropodidae	<i>Pteropus banakrisi</i>	Torresian Flying-fox		LC		
Rhinolophidae	<i>Rhinolophus philippinensis</i> (large form)	Greater Large-eared Horseshoe Bat	E	E	high	

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Hipposideridae	<i>Hipposideros ater aruensis</i>	(eastern) Dusky Leaf-nosed Bat		LC		
Hipposideridae	<i>Hipposideros cervinus</i>	Fawn Leaf-nosed Bat		V	high	
Hipposideridae	<i>Hipposideros diadema</i>	Diadem Leaf-nosed Bat		LC		
Emballonuridae	<i>Saccolaimus saccolaimus nudicluniatus</i>	Bare-rumped Sheath-tail-bat	CE	E	high	
Emballonuridae	<i>Saccolaimus mixtus</i>	Papuan Sheath-tail Bat		NT		
Emballonuridae	<i>Taphozous australis</i>	Coastal Sheath-tail Bat		V	high	
Molossidae	<i>Chaerephon jobensis</i>	Northern Freetail-bat		LC		
Molossidae	<i>Mormopterus beccarii</i>	Beccari's Freetail-bat		LC		
Vespertilionidae	<i>Chalinolobus nigrogriseus</i>	Hoary Wattled Bat		LC		
Vespertilionidae	<i>Miniopterus australis</i>	Little Bent-wing Bat		LC		
Vespertilionidae	<i>Miniopterus schreibersii</i>	Eastern Bent-wing Bat		LC		
Vespertilionidae	<i>Myotis macropus</i>	Large-footed Myotis		LC		
Vespertilionidae	<i>Nyctophilus bifax</i>	Eastern Long-eared Bat		LC		
Vespertilionidae	<i>Pipistrellus</i> sp.	Pipistrelle species		LC		
Vespertilionidae	<i>Pipistrellus adamsii</i>	Forest Pipistrelle bat		LC		
Vespertilionidae	<i>Pipistrellus weaustalis</i>	Northern Pipistrelle bat		LC		
Muridae	<i>Conilurus penicillatus</i>	Brush-tailed Tree-rat	V	LC		
Muridae	<i>Hydromys chrysogaster</i>	Water-rat		LC		
Muridae	<i>Melomys burtoni</i>	Grassland Melomys		LC		
Muridae	<i>Melomys capensis</i>	Cape York Melomys		LC		
Muridae	<i>Melomys rubicola</i>	Bramble Cay Melomys	E	E	high	
Muridae	<i>Mus musculus</i>	House Mouse		I		
Muridae	<i>Pseudomys delicatulus</i>	Delicate Mouse		LC		
Muridae	<i>Rattus exulans</i>	Pacific Rat		I		
Muridae	<i>Rattus norvegicus</i>	Brown Rat		I		
Muridae	<i>Rattus rattus</i>	Black Rat		I		
Muridae	<i>Xeromys myoides</i>	Water Mouse	V	V	high	
Canidae	<i>Canis familiaris</i>	Domestic Dog		I		Reported (Natural Solutions 2008)
Felidae	<i>Felis catus</i>	Cat		I		Reported (Natural Solutions 2008)
Equidae	<i>Equus caballus</i>	Horse, Brumby		I		

Family	Scientific Name ³	Common Name	Status ⁴			Masig
			EPBC Act	NC Act	BoT	
Suidae	<i>Sus scrofa</i>	Pig		I		
Bovidae	<i>Capra hircus</i>	Goat		I		
Cervidae	<i>Cervus timorensis</i>	Rusa Deer		I		

8 Known from Museum records, published literature (eg Tyler 1972; Draffan *et al.* 1983; Whittier & Moeller 1993; Clarke 2004a, b; 2005, 2006; Wilson 2005; Ingram 2008), WildNet database and/or reports and other grey literature (e.g. Borsboom 2007; RPS 2010a, b, c; Schaffer 2010). These sources are not necessarily mutually exclusive and many records are un-confirmed. Some appear unreliable. WildNet database searches were conducted for Boigu, Saibai, Bramble Cay, Erub (Darnley), Mer, Mabuiag, Iama (Yam), Mua, Badu, Possession, Thursday, Wednesday, Horn, Hammond and Prince of Wales Islands.

9 Predicted by the EPBC Protected Matters Search Tool maintained by the Department of Sustainability, Environment, Water, Population and Communities, Canberra (DSEWPC) <http://www.environment.gov.au/erin/ert/epbc/index.html>. Only noted if not recorded from another source.

10 Nomenclature follows the Australian Faunal Directory maintained by DSEWPC. <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/index.html>

11 Status: CE = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near-Threatened, M = Migratory, LC = Least Concern (Common), I = Introduced (Exotic) under the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) and/or *Nature Conservation Act* 1992 (NC Act). BoT = species listed as critical or high priority under the Back on Track species prioritisation framework. Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/back_on_track_species_prioritisation_framework/index.html.

12 Also listed under the EPBC Act as *Chaetura caudacuta* (ROKAMBA).

13 Listed under the EPBC Act as Great Egret *Ardea alba* (CAMBA, JAMBA). Australian birds elevated to full species level as *A. modesta* (Kushlan & Hancock 2005; Christidis & Boles 2008).

14 Listed under CAMBA as *Ardeola ibis*, listed under JAMBA as *Bubulcus ibis*.

15 Listed under the Bonn Convention as Osprey *Pandion haliaetus*. Australian birds have been elevated to species level as *P. cristatus* (Wink *et al.* 2004; Christidis & Boles 2008).

16 Also listed under CAMBA and ROKAMBA as *Tringa hypoleucos*.

17 Also listed under the Bonn Convention and JAMBA as *Heteroscelus brevipes*.

18 Also listed under the Bonn Convention and JAMBA as *Heteroscelus incanus*.

19 Also listed under ROKAMBA as *Crocethia alba*.

20 Listed under the EPBC Act as *Sterna anaethetus* (CAMBA, JAMBA).

21 Listed under the EPBC Act as *Sterna albifrons* (Bonn Convention, CAMBA, JAMBA, ROKAMBA).

22 Listed under the EPBC Act as *Sterna bengalensis* (CAMBA).

23 Listed under the EPBC Act as *Cuculus saturatus* (CAMBA, JAMBA, ROKAMBA). Australian birds elevated to full species level as *A. optatus* (Christidis & Boles 2008).

24 Listed under the EPBC Act as *Monarcha trivirgatus* (Bonn Convention).

25 Listed under the EPBC Act as Clamorous Reed-warbler *Acrocephalus stentoreus* (Bonn Convention). Australian birds elevated to full species level as *A. australis* (Higgins *et al.* 2006b).

26 Listed under the EPBC Act as *Hirundo daurica* (ROKAMBA).

Appendix E. Profiles of Migratory Fauna Species Potentially occurring on Masig Island and Surrounding Islets

Waders

Life history: Waders listed as Migratory under the EPBC Act that have been recorded in the Torres Strait include plovers, sandpipers and Oriental Pratincole. Sandpipers are known by a number of common names including snipe, godwit, curlew, tattler, knot and stint. The majority of the waders recorded occur in coastal areas, particularly in the intertidal zone, on mudflats, sandflats, beaches, saltmarsh, coastal lagoons and mangroves. Some also forage and/or roost on rocky shores. Many of these species are also found on freshwater and artificial waterbodies such as rivers, streams, swamps, dams and sewage ponds. Two species are unlikely to be found in the intertidal zone, Oriental Pratincole and Wood Sandpiper. Oriental Pratincole is largely restricted to grasslands and other open areas and Wood Sandpiper occurs on freshwater waterbodies (Pringle 1987). None of these wader species breed in Australia but individuals of some species, especially large sandpipers such as Eastern Curlew and Bar-tailed Godwit, may be present year-round.

Flat tidal shores with extensive muddy intertidal areas support the most species and individuals, though some waders feed in mangroves forests at low tide (Lane 1987). The coastal species have a life cycle driven largely by the tidal cycle, roosting in mixed species flocks above the high water mark at high tide and moving to feeding areas as the tide recedes. Most of these species are gregarious, wary and fly strongly and swiftly (Pringle 1987; Geering *et al.* 2007). Smaller species, such as Red-necked Stint and Curlew Sandpiper, feed for longer each tide cycle than do larger species and may continue to feed in non-tidal areas during high tide (Lane 1987).

Other than Double-banded Plover (*Charadrius bicinctus*), which breeds in New Zealand, all the Migratory waders breed in the northern hemisphere during the Australian winter. Migration to Australia after breeding starts in mid-July and finishes by December. Birds begin returning to breeding grounds as early as mid-February, though most birds leave in mid-March (Lane 1987).

Threats: Although none of the species breed in Australia they are susceptible to loss of foraging and roosting habitat and to disturbance when foraging or roosting by human activities and feral and domestic animals. Such disturbance may limit their ability to undertake long migration flights through depletion of their energy reserves. Pollution may also affect the intertidal invertebrate species on which so many Migratory waders depend (Lane 1987). Masig Island provides some habitat for waders but threats appear limited to disturbance on mudflats, beaches and around mangroves. This will be most relevant prior to return passage in autumn.

Terns

Life history: Six Migratory tern species have been recorded from Masig Island, though other species are also expected to occur. Many tern species are cosmopolitan, with very large distributions. Most species are coastal, found in a variety of habitats, including open beaches, lagoons, estuaries, river mouths, lakes, bays, harbours and inlets. Some species do also occur on inland freshwater habitats

and others are largely restricted to pelagic waters. Fish is the major food item but crustaceans and insects are also taken by some and those species that feed in freshwater may also eat reptiles, frogs and small mammals. Most terns are gregarious when feeding and are colonial nesters, with most of the species that breed in Australia simply laying their eggs in shallow depressions, though noddies will nest in trees (Pringle 1987; Higgins & Davies 1996).

Threats: Ground-nesting makes many species susceptible to loss of eggs and chicks through native and feral predators and adverse weather conditions. Colonies can be threatened by human disturbance and birds are affected by degradation of feeding areas, pesticide residues in fish, and oil-fouling, both of birds and beaches. Birds occasionally are tangled in fishing nets (Blakers *et al.* 1984; Higgins & Davies 1996; Garnett & Crowley 2000). There is likely to be little, if any, breeding by terns on Masig Island. Threats appear to be minimal.

Herons and egrets

Life history: The family Ardeidae includes herons, egrets and bitterns and all species are characterised by long necks and legs and long sharp bills. Although there is variation, most species forage in shallow water and eat fish, crustaceans, frogs, insects and other small animals (McKilligan 2005). Three species listed as Migratory occur in the Torres Strait; Eastern Great Egret, Cattle Egret and Eastern Reef Egret.

Eastern Great Egrets are generally associated with shallow water, both freshwater and saline, but also occur in dry habitats. The species occurs on coastal and inland habitats, including rivers, estuaries, tidal mudflats, swamps, man-made dams and ponds, sewage farms and wet pasture. Eastern Great Egrets eat mainly fish but also small vertebrates such as frogs and aquatic insects (Pringle 1985; Marchant & Higgins 1990; McKilligan 2005). The Cattle Egret inhabits grasslands, wetlands and wooded lands, often foraging away from water in grassland, pasture and crops. The species is strongly associated with grazing animals in Australia, but also forages at garbage tips, follows machinery, and feeds independently. Cattle Egrets feed on invertebrates, especially grasshoppers, and small vertebrates such as frogs, reptiles and mammals (Pringle 1985; Marchant & Higgins 1990). Eastern Reef Egret is found on coastlines, foraging on rocky and muddy shores. The species eats mostly fish, but also crustaceans, molluscs, bird chicks and turtle hatchlings (McKilligan 2005).

Eastern Great Egret is common and widespread in Australia even in some arid areas. The Cattle Egret occurs in all Australian states and mainland territories. Eastern Reef Egret occurs along most of the Australian coastline. All three species extend through the Torres Strait into south-east Asia. The Cattle Egret has a limited distribution in the Torres Strait but has been undergoing a global expansion of range (Pringle 1985; Marchant & Higgins 1990; McKilligan 2005). It may become more widespread and common in the Torres Strait if there are changes to land use which favour the species.

Threats: The Eastern Great Egret is threatened by destruction and modification of freshwater habitats by drainage and groundwater extraction, clearing, livestock, burning, increased salinity and

weed invasions (Marchant & Higgins 1990). The most important issue is the allocation of water from regulated rivers in sufficient quantity and with appropriate timing to maintain suitable wetland conditions (Maddock 2000). The Cattle Egret is also threatened by loss of breeding habitat through drainage of wetlands and river regulation and water harvesting that prevent or limit flooding of temporary wetlands. Nestlings may be susceptible to predation by cats (DSEWPC 2011b). Eastern Reef Egrets can be disturbed by human activity near nest sites and are threatened by reclamation of tidal areas and deepening of channels. However, the species often tolerates human presence and roosts, and sometimes breeds, on artificial structures (Marchant & Higgins 1990).

Neither Eastern Great nor Cattle Egret is likely to breed on Masig Island and threats appear minimal. Eastern Reef Egret may breed and would be susceptible to disturbance at its nest. The level of threat is likely to be minor.

Swifts

Life history: In Australia the White-throated Needletail and Fork-tailed Swift are almost completely aerial species, possibly even sleeping on the wing. These species are sometimes found roosting in trees and may on rare occasions rest in trees and on the ground during the day. They are found over a wide variety of habitat, including forest, open areas, modified land and the ocean. Foraging for aerial invertebrates occurs at heights from less than one metre up to more than 1000 metres (Higgins 1999).

Both species breed in Asia and arrive in Australia in September/October and leave by April. Some birds may over-winter. White-throated Needletail is widespread in eastern and south-eastern Australia and Fork-tailed Swift is widespread throughout Australia (Higgins 1999). The total population of White-throated Needletail is unknown but it is described as abundant in some regions of Australia (Chantler 1999). A comparison of Birds Australia atlas data between 1977–81 and 1998–2002 indicates that the species has undergone a decline in both its area of occupancy and extent of occurrence in Australia (Blakers *et al.* 1984; Barrett *et al.* 2003). Worldwide the Fork-tailed Swift is thought to have a stable population with no evidence for any declines or substantial threats (BirdLife International 2011).

Threats: Both species are occasionally killed by collision with man-made structures, and Fork-tailed Swifts are occasionally killed by Cats (Higgins 1999), but there is no apparent major threat to either species overall, either in Australia or elsewhere (DSEWPC 2011a, f). A potential threat is a reduction in prey due to loss of habitat (Low 1995; DSEWPC 2011a). Neither species would be subject to any significant level of threat on Masig Island.

Raptors

Life history: The family Accipitridae includes a very large number of species with an enormous variety of body sizes, prey species and habitat use. The two Migratory raptors, Eastern Osprey and White-bellied Sea-Eagle, are, however, very similar in much of their life history. Both species occur

along the entire Australian coastline and extend far inland, typically along major rivers or on large lakes and reservoirs. Eastern Osprey feeds on fish but the White-bellied Sea-Eagle also eats mammals, birds, reptiles and carrion. Both species will nest on cliffs and in large trees but Eastern Osprey also nest on artificial structures such as power poles and towers (Debus 1998; NSW NPWS 2002). Established breeding pairs are mostly sedentary although there is evidence that territorial adults move long distances. Inland territorial birds are probably more dispersive than those on the coast and may move as waters disappear (Debus 1998).

Threats: The Eastern Osprey population in Australia has decreased since European settlement but has been recovering in recent years (Olsen 1998). They are threatened by loss of existing and suitable replacement breeding trees, disturbance at the nest site, reduction in quality and quantity of fish stocks, collision with or electrocution by power lines, and the use of pesticides (NSW NPWS 2002). The White-bellied Sea-Eagle is threatened by clearing of forests and the consequent loss of optimal breeding sites (Marchant & Higgins 1993) and disturbance at nest sites (Debus 1998). Neither species is likely to be threatened by current land use practices on Masig Island.

Oriental Cuckoo (*Cuculus optatus*)

Listed under the EPBC Act (CAMBA, JAMBA, ROKAMBA) as *Cuculus saturatus*. Australian birds elevated to full species level as *A. optatus* (Christidis & Boles 2008).

The Oriental Cuckoo breeds in northern Asia with birds spending the non-breeding season in south-east Asia, New Guinea, the Solomons and Australia. The species mostly occurs on the northern and eastern coasts of Australia, between September and April. Most birds do not arrive in Australia until December. Oriental Cuckoos occur in rainforest, vine thicket and open forest and woodland. The species is sometimes found in mangroves and is often recorded in gardens and plantations. It feeds on invertebrates, particularly caterpillars (Blakers *et al.* 1984; Higgins 1999).

Threats: The species is sometimes killed by cats and by collisions with windows and lighthouses (Higgins 1999). Draffan *et al.* (1983) state that it occurs in wooded areas, including mangroves. Oriental Cuckoo is likely to be a regular visitor to Masig Island, occurring in almost any habitat other than grasslands. Threats would be minimal.

Rainbow Bee-eater (*Merops ornatus*)

The Rainbow Bee-eater occurs in almost any habitat. The species eats insects, preferring bees and wasps, which are mostly caught in the air, and will also take food from the ground or vegetation and occasionally water. It is widespread in Australia, New Guinea, Indonesia and Micronesia. In northern Australia populations are present in coastal or sub-coastal areas where they breed in the riparian areas and move into more open habitat after the breeding season. Breeding may take place individually or in colonies, nesting in burrows in soft sand or soil (Higgins 1999; Boland 2004a).

Threats: The species appears little threatened, although Cane Toads have been found to prey on the eggs and nestlings (Boland 2004b). Draffan *et al.* (1983) describe Rainbow Bee-eater as an abundant

passage migrant in Torres Strait and the species could occur in, or over, all habitats on Masig Island. Cane Toads are not reported for the island and threats to Rainbow Bee-eater would be minimal.

Passerines

Ten species of Migratory passerine are known from the Torres Strait. These species may be split into two broad groups, species that occur mostly in wooded habitats and those that occur mostly in open habitats. Members of these pairings may not be particularly closely related.

Wooded habitat species

Life history: Six of the Migratory passerine species that occur in Torres Strait occur mostly in wooded habitats. All of these birds, (Melville) Cicadabird (subspecies *melvillensis*), Rufous Fantail, Satin Flycatcher, Black-faced, Black-winged and Spectacled Monarchs, occur in rainforest, melaleuca woodlands, mangroves and occasionally open forests, except for Satin Flycatcher, which typically avoids closed forest. All the species are insectivorous, though the Cicadabird may also eat some fruit and seeds. All breed in Australia and, except for Black-winged Monarch; all are at least partly resident in Australia. Some individuals of Black-winged Monarch may also be present year-round (Higgins *et al.* 2006a).

Threats: Threats include the loss and fragmentation of habitat, especially along the migratory routes, and predation of eggs and young by the Black Rat (*Rattus rattus*) (Higgins *et al.* 2006a). All six species do or could occur on Masig Island and would use any wooded areas

Open habitat species

Life history: Four of the Migratory passerine species that occur in Torres Strait occur mostly in open habitats.

Reed-Warblers in Australia were previously thought to be a subspecies of the migratory Clamorous Reed-Warbler (*Acrocephalus stentoreus*). They are now considered a full species, Australian Reed-Warbler (*A. australis*), and all movements are thought to occur within Australia. Australian Reed-Warblers typically occur in reeds and other dense vegetation in and adjacent to a variety of wetland types. They feed on insects and spiders. The species is not known to breed in the Torres Strait (Higgins *et al.* 2006b).

Barn and Red-rumped Swallows are both widespread species, particularly in the northern hemisphere, and neither breeds in Australia. Barn Swallow is an annual visitor to northern Australia in small numbers but Red-rumped Swallow may not be present every year. Both species feed in open areas, particularly over wetlands, cane fields and sporting fields and often perch on overhead wires.

Yellow Wagtail is listed under the EPBC Act as *Motacilla flava* s. lat. The birds that occur in Australia are now treated as full species, Eastern Yellow Wagtail (*M. tschutschensis*) and Green-headed Yellow Wagtail (*M. taiwana*) (Christidis & Boles 2008). They were previously regarded as subspecies

of *M. flava*, which is no longer considered to occur in Australia. The occurrence of Yellow Wagtails in the Torres Strait appears unconfirmed but Yellow Wagtails have been reported for Boigu, Thursday and Horn Islands (Baxter 2010) and are likely to occur as irregular visitors on many of the Torres Strait Islands.

Yellow Wagtails occur in open areas with low vegetation, especially in cultivation and on lawns, sporting fields and air fields. They are often recorded near water. Yellow Wagtails are probably regular wet season non-breeding visitors to north Queensland. Diet consists mainly of invertebrates, taken mostly from the ground and occasionally from the air (Higgins *et al.* 2006b).

Threats: The major threat to Australian Reed-Warbler is loss of habitat due to coastal development in natural habitat areas (Higgins *et al.* 2006b). Barn and Red-rumped Swallows appear to be increasing in numbers in Australia, though this may be due to an increase in observers. Neither species appears subject to any particular threat in Australia. Threats to Yellow Wagtail in Australia are unknown.

Australian Reed-Warbler is not known from Masig Island and is not expected to occur. Draffan *et al.* (1983) report the species only from south-western islands in Torres Strait. Barn and Red-rumped Swallows are known from Boigu Island but their status there, as for Yellow Wagtail, is unknown. Increased clearing of wooded areas would actually benefit these species and threats appear minimal.

