



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

January 2013

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



Australian Government



TSRA
www.tsra.gov.au

3D Environmental
vegetation analysis and mapping specialists

Cover image: 3D Environmental (2013)

EXECUTIVE SUMMARY

Ugar (Stephens) Island is a small and remote island that occupies a total area of 36 hectares located 160 kilometers north east of Thursday Island. The island is formed on a platform of massively bedded basalt, up to 30m high, that is the result of Pleistocene age volcanic activity, and is part of the Eastern Group of Torres Strait Islands which includes Mer (Murray) and Erub (Darnley) and a number of small uninhabited islands and sand cays. It is fringed by coral reef with its shoreline surrounded by numerous fish traps constructed using basalt rock boulders.

The vegetation on Ugar is simple and dominated by a unique vine forest association, which has been impacted by generations of human land use and more recent clearing for infrastructure. Intact vine forest forms approximately 30% of the islands' vegetation cover, persisting on sheltered slopes and escarpments that have escaped clearing. Other vegetation types include mangrove forest on the island margins and extensive areas of altered forest habitat. Two natural broad vegetation groups comprising two vegetation communities and two regional ecosystems exist on the island. Whilst limited in distribution, the vine thicket habitat is endemic to the Torres Strait Eastern Island Group, and has no representation elsewhere in Queensland.

The total known flora of 195 species comprises 116 native species and 79 naturalised species. The latter accounts for 41 % of the islands flora which is the highest of any of the inhabited islands surveyed in the Torres Strait region and testament to the level of disturbance. The native bamboo (*Neololeba atra*) is the only species of conservation significance recorded on the island and is listed as Near-Threatened under the *Nature Conservation Act (1992)*. Of the nine plants which are regionally significant, two are possible new records for Australia and another, *Cycas scrathchleyana*, is a highly disjunct occurrence that is associated with neighbouring Papua New Guinea.

As for the majority of Torres Strait Islands there is a considerable lack of systematic survey of fauna habitats on the island. Studies by RPS (2010), undertaken over a five-day window, provide the most comprehensive ecological survey undertaken to date. A desktop review identified 45 fauna species that have been reported for Ugar including one frog, 11 reptiles, 32 birds and one mammal species. Of these, one reptile and one bird are introduced. Four species of conservation significance are reported or predicted to occur on the island being little tern, littoral whiptail skink, saltwater crocodile and spectacled flying fox. A further four conservation significant fauna species possibly occur on the island based on known distribution and habitat preferences.

Within the three 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 include:

- Control of a number of invasive weeds which are threatening biodiversity values on the island.
- Continued collection of floristic information, specifically those plants that have biodiversity and cultural importance.
- Further fauna survey, both as a means of monitoring for the impacts of exotic species, as well as toward further defining the occurrence and ecology of a number of significant fauna species.
- Further survey and documentation of the complex and diverse cultural landscape on the island.

It is important that any future surveys on Ugar be collaborative with the Ugaram Rangers and include study of traditional ecological knowledge and ethno-taxonomy. This is also relevant to recommended land management practices which must be implemented in consultation with the island PBC in a culturally acceptable manner.

ACKNOWLEDGEMENTS

The project has been funded by through the Land and Sea Management Unit of the Torres Strait Regional Authority. Our thanks are extended for the support and guidance of Tony O'Keefe of TSRA who administered the project and provided valuable input throughout. 3d Environmental also wish to acknowledge and thank the Ugaram Le Traditional Land and Sea Owners (Torres Strait Islanders) Corporation for granting access to the land. Appreciation is also given to Ugar Island Ranger Noel Baker, TSRA Ranger Supervisor Karl Goetze, and Karen Evans and George Saveka of the Land Team Management Unit for assistance in the field and logistic support.

Initial fauna information and text provided by Terry Reis was adapted for the purpose of this report. It should be noted that Terry was not involved in the compilation of this document other than provision of raw data and preparation of species profiles. 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 Stephen McKenna of the Department of Agriculture, Forestry and Fisheries provided valuable information on the occurrence and distribution of weeds.

Table of Contents

EXECUTIVE SUMMARY	ii
ACKNOWLEDGEMENTS	iv
1.0 Introduction.....	7
1.1 Cultural Setting	7
1.2 Geographic Setting	7
1.3 Geological Context	7
2.0 Methods.....	8
3.0 Aims and Objectives	8
4.0 Legislative and Policy Considerations	9
5.0 Vegetation and Flora.....	12
5.1 Vegetation Groups and Mapping	12
5.2 Flora Species	14
5.2.1 Flora Species with Conservation Significance	14
5.2.2 Flora with Cultural Significance	16
5.2.3 Introduced Plants	17
6.0 Fauna (Animals)	22
6.1 Culturally Important Fauna Species	23
6.2 Fauna Habitat Values	23
6.3 Fauna Species with Conservation Significance	24
6.3.1 Critically Endangered, Endangered, Vulnerable and Near-Threatened Species.....	24
6.3.2 Profiles of Significant Known from or Possibly Occurring on Ugar Island	25
6.3.3 Migratory Animal Species.....	31
6.3.4 Additional possible Migratory species	32
6.3.5 Species of Regional Significance.....	32
6.4 Pest Fauna Species.....	33
6.5 Threats to Fauna and Habitat	34
6.6 Future Priorities	34
7.0 Management Profiles for Ugar Island Habitats	35
7.1 Deciduous / Semi Deciduous Vine Forest and Thicket	35
7.1.1 Status of Ecological Knowledge.....	35
7.1.2 Ecological / Cultural Considerations	36
7.1.3 Management Implications	37
7.1.4 Summary of Recommended Management Actions	37
7.2 Mangrove Forest, Woodland and Shrubland Complex	39
7.2.1 Status of Ecological Knowledge.....	39
7.2.2 Ecological / Cultural Considerations	39

7.2.3	Management Implications	40
7.2.4	Summary of Recommended Management Actions	41
7.3	Exotic Vegetation, Regrowth Vegetation and Cleared Areas	42
8.0	References and Bibliography.....	44
9.0	Glossary	51
Appendices		52
Appendix A.	Queensland Government Vegetation Structural Classification	53
Appendix B.	Preliminary Flora Species List – Ugar Island, Torres Strait, Queensland.	54
Appendix C.	Fauna of Ugar Island, Torres Strait, Qld.....	61
Appendix D.	Information on Migratory Fauna Species Potentially Occurring on Ugar Island and Surrounding Islets	74

List of Figures

Figure 1.	Location of Ugar (Stephens) Island	8
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).	13
Figure 3.	Distribution of semi-deciduous and deciduous vine forest and thicket on Ugar Island (place names after Lawrie, 1970).	36
Figure 4.	Distribution of mangrove forest habitats (place names after Lawrie 1970).	39
Figure 5.	The location of vegetation dominated by exotic species.	43
Figure 6.	The location of regrowth vine forest and thicket.	43

List of Tables

Table 1.	Broad vegetation groups and relative contributions to island vegetation on Ugar Island ...	13
Table 2.	Descriptions of component vegetation communities and association with regional ecosystems currently recognised on Ugar Island (from Stanton <i>et al.</i> 2009).	13
Table 3.	Summary of Flora with Regional Biodiversity Significance on Ugar Island.....	15
Table 4.	Environmental weeds on Ugar Island – High and Moderate Threat.	18
Table 5.	Major weed threats	21
Table 6.	Endangered, Vulnerable and Near-Threatened fauna species ¹ reported or predicted ² to occur on Ugar Island.	25
Table 7.	Migratory ¹ species reported or predicted to occur on Ugar Island.	32
Table 8.	Summary of management actions for semi-deciduous vine forest and thicket.....	37
Table 9.	Summary of management actions for mangrove habitats.....	41

1.0 Introduction

Ugar, also known as Stephens Island represents one of six islands selected for a supplementary stage of funding for development of a biodiversity management profile. The document aims to identify the biodiversity features, landscape processes, and cultural values (from both a landscape and site specific perspective) that are intrinsic to the island and identify management actions to assist preservation of these features. It also aims to identify management issues and recommends actions to conserve natural and cultural values into the future.

1.1 Cultural Setting

Ugar is the smallest community in the Torres Strait with a population that varies between 70 – 80 people (TSIRC 2012). Land tenure is DOGIT (deed of grant in trust) with Native Title determined on 09/12/2004. The Registered Native Title Body Corporate¹ (RNTBC or PBC in shortened form) is the Ugaram Le Traditional Land and Sea Owners (Torres Strait Islanders) Corporation who hold the title of the land on behalf of the traditional owners. The Ugaram Le speak Miriam Mir, the dialect of Eastern Torres Strait Island Group which includes the neighbouring islands of Mer (Murray) and Erub (Darnley).

1.2 Geographic Setting

Ugar is located 180 km north-east of Thursday Island (shown in **Figure 1**). The island is remote having no airstrip and is accessible only by boat and helicopter. Ugar, Mer and Erub and a number of smaller uninhabited islands and sand cays including Bramble and Nepean, comprise the Eastern Island Group. Ugar is the smallest inhabited island with an area of 36 ha, rising to 23 m AHD at its highest point. There are no available rainfall records for Ugar although it is expected to be comparable to Erub which has a mean annual rainfall of 1 287mm (BOM 2008a).

1.3 Geological Context

The Eastern Island Group including the islands of Ugar, Erub and Mer are the result of Pleistocene age (<1.8Ma) volcanic activity. Unlike Mer where the volcanic cone is well defined, the source of the Ugar basalt has been eroded to leave a relatively low lying, small plateau of basalt of about 30m high (Wilmott 1972). The resultant soil, produced from the weathering of basalt, is highly fertile, which has resulted in a blanket of dense vegetation. The flow basalt is exposed on the margins of the Island as a series of low scarps and, talus slopes with eroded basalt boulder strewn along the rocky coastline.

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

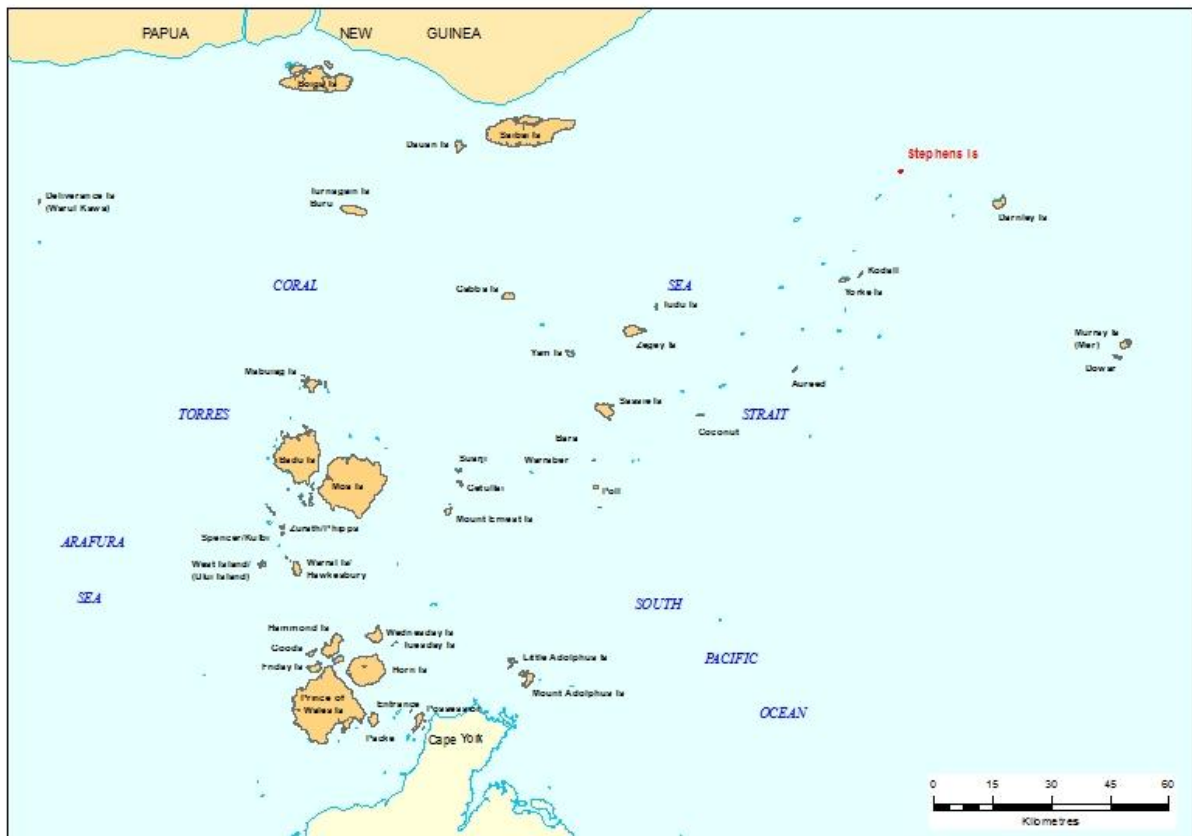


Figure 1. Location of Ugar (Stephens) Island

2.0 Methods

This document provides a compendium of information from a range of sources, supplemented with information gathered from consultation with both technical experts and traditional landowners on Ugar. In summary, the process undertaken to complete this biodiversity assessment includes review of the following:

- 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.
- Land Use Management Plan for Ugar (RPS 2010), and
- Various technical papers relating to both flora and fauna (see references section).

3.0 Aims and Objectives

The aim of this document is to compile and annotate existing information relating to island scale ecological process, introduce cultural interactions with these processes, and establish a framework of

actions which can be drawn on by island rangers and managers to effectively manage the islands specific ecological and cultural values. Specifically the aims are as follows:

1. Identify the extent, values and condition of island habitats and the plants and animals which occur on them.
2. Describe the island-scale ecological processes, that is, the environmental and human factors which are influencing habitats, plants and animals.
3. Introduce the cultural interactions with these processes, that is, the ways that Ugar people interact with the natural environment including identification of values.
4. Establish a list of management actions to be used by island rangers and managers to assist in updating Land and Sea Ranger work plans aimed to increase the effectiveness of island's ecological and cultural value management.

Owing to the long term occupancy of the islands (> 4 000 years), 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 is the safest management option. Habitat maintenance has therefore been a primary consideration during the compilation of this document although on Ugar Island, as on Mer and Erub Islands, a number of problematic land management issues became apparent. These are documented for further consideration in this report. The specific actions that are ultimately adopted and direction of island scale ecological management will however be ultimately up to the discretion of island rangers and traditional owners with support of the TSRA land and Sea Management Unit.

4.0 Legislative and Policy Considerations

Biodiversity is regulated at state and national levels by a range of legislative mechanisms which classify fauna species, flora species and habitats according to their rarity (at a range of scales), population size, distribution and threats. The legislative classification is generally used as a surrogate for assigning significance to a particular species or ecological value. Relevant components of the major legislative mechanisms that require consideration are described briefly below.

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). The *Nature Conservation (Wildlife) Regulation 2006* is sub-ordinate to the NC Act and defines seven classes that are:

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

These classes collectively relate to native species and 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) are assigned on a consistent state-wide basis. 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. 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 Ugar (e.g. vine thicket ecosystems classified under RE3.8.5) 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 Ugar provides accurate information on the legislative significance of vegetation on the island offering an information planning resource for the community, the Torres Strait Island Regional Council (TSIRC) and the TSRA. For example, if a facility tower was proposed for a specific area which supported a regional ecosystem (vegetation type) that was 'Endangered' or 'Of Concern', then clearing of this vegetation without authorisation is in breach of the VMA. Liaison with regulators (EHP) should be undertaken 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 exotic species 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 threat are declared within 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 ecologically sensitive area.

For example, if a Class 2 weed such as Gamba grass (*Andropogon gayanus*) was found on Ugar, there is a requirement under the act for landowners to take reasonable steps to control and manage the weed. In addition, the draft TSIRC Pest Management Plan forms a policy document to guide field and administrative staff and communities toward cooperative involvement of an integrated and coordinated approach to pest management across the island. The Commonwealth also provides an inaugural list of 'Weeds of National Significance (WONS)' based their perceived threat to a range of environmental, social and cultural values at a national level.

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 five priority levels for action to remediate declining Queensland wildlife being 'Critical Priority (CR)', 'High Priority (H)', 'Medium Priority (M)' and 'Low Priority (L)'. The information within this document will be valuable in future reassessments of BoT in the Torres Strait.

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 regulator (Australian Government) who are likely to provide conditions under which the interference can take place. Interference (such as removal of the protected plant species) without authorisation is in breach of the EPBC Act.

5.0 Vegetation and Flora

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. Ugar), island groups (Eastern 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 which considers the dominant life form (tree or grass), height of the tallest strata, and canopy closure. 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 5.1** comprise a group of vegetation communities, although unlike BVGs, consider regional distribution and geology within their classification. REs must be considered due to their legislative implications although in this document, BVGs have been used as a principle unit to define habitat management groupings.

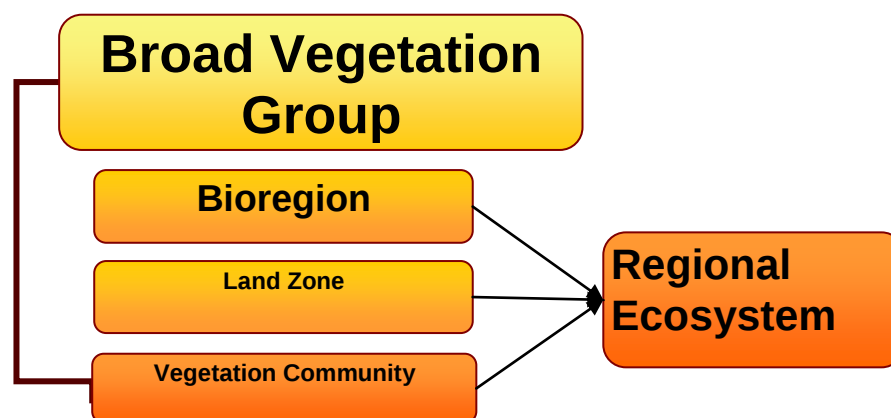


Figure 2. Diagrammatic illustration of the hierarchy and relationship between components of the vegetation classification system used in the Torres Strait Island vegetation mapping study (Stanton *et al.* 2009).

Vegetation Classification on Ugar Island: For management purposes, the island's vegetation is classified into 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. Due to the small size of the island and its geological uniformity, only two natural vegetation habitats have been recognised.

Table 1. Broad vegetation groups and relative contributions to island vegetation on Ugar Island

Broad Vegetation Group/ Habitat**	Component Vegetation Communities**	Area (ha)	Contribution %
Deciduous / Semi deciduous vine forest and vine thicket	2k	10.5	29.2
Mangrove forest, woodland and shrubland complexes	24a	1.2	3.4
Regrowth	RE	5.7	15.9
Exotics	Ex, Bamboo	3.6	10.2
Cleared Areas	CI	15.0	41.3
Total		36	100

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

Vegetation Community	Description	Geological Association	Regional Ecosystem	VMS ¹	BDS ²
2k	Deciduous vine forest + <i>Gyrocarpus americanus</i> + <i>Bombax ceiba</i> var. <i>leiocarpum</i> + <i>Antiaris</i> <i>toxicaria</i> var. <i>macrophylla</i> + <i>Canarium australianum</i> + <i>Cathormion umbellatum</i> subsp. <i>monoliforme</i> + <i>Garuga floribunda</i> var. <i>floribunda</i> +/- <i>Adenanthera</i>	Sheltered gullies in basalt	3.8.5b	OC	OC

Vegetation Community	Description	Geological Association	Regional Ecosystem	VMS ¹	BDS ²
	<i>pavonina</i> +/- <i>Maranthes corymbosa</i> .				
24a	Mangrove closed and open forest, woodland and shrubland complexes (24d/24c – 80/20).	Estuarine muds (periodically inundated)	3.1.1/ 3.1.2	LC	NCAP/OC
CI	Cleared areas	Basalt	Non-remnant	Non-remnant	Non-remnant
RE	Regrowth Vine Forest	Basalt	Non-remnant	Non-remnant	Non-remnant
Exotics	Exotic species and bamboo	Basalt	Non-remnant	Non-remnant	Non-remnant

1. Vegetation Management Status and per the *Vegetation Management Act, 1999*.

2. Biodiversity Status as designated by DERM.

OC= Of Concern regional ecosystem

LC= Least Concern regional ecosystem

NCAP = No Concern at Present – Biodiversity Status

5.2 Flora Species

Prior to the June 2012 field survey, the composition of the Ugar flora which was compiled from analysis of Queensland Herbarium data (Herbrechts 2011) stood at 83 species. Incorporation of survey results together with weed data provided by DAFF (2012) has determined a currently known flora of 195 species of which 79 (41 %) are naturalised. There are 193 angiosperms with a single exotic fern species and one cycad.

One species, a native bamboo (*Neolebra atra*) is threatened at state level and a further nine are considered to have significance at a regional level. The identity of two species within the family Clusiaceae that were collected on the island have not been confirmed and are potentially new records for Australia. Another species, a cycad (*Cycas sratchlyeana*), represents a highly disjunct occurrence of a Papua New Guinea species previously known in Australian territory from two individuals on Mer and a single plant on Naghir. The cycad is listed under the International Union for the Conservation of Nature (IUCN) as Near-Threatened.

There are 68 plant families recorded on the island of which 11 are wholly exotic. Dominant families (native species) are Fabaceae (11 species), Poaceae (7 species), plus Euphorbiaceae, Moraceae, and Myrtaceae (4 species). Of the 174 genera, there are 63 which are wholly naturalised.

An indication of the disturbed nature of the islands vegetation is indicated by a high number of introduced species. Additional systematic surveys in vine thickets, and mangroves, are likely to increase the list of species known for the island.

5.2.1 Flora Species with Conservation Significance

An assessment of significant flora species draws on the limited data sources identified above. Further surveys are necessary to adequately inform an analysis of the islands significant flora. Species have been broadly categorised into significance categories (i.e. national, state, regional and cultural) based

on criteria which include legislative status, keystone/focal, threatened or sensitive, restricted, otherwise noteworthy or of cultural interest value. Culturally significant species are assessed separately.

National Significance

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

State Significance

One species is listed on the Amended Regulations of the Queensland NC Act.

Near-Threatened

Native Bamboo - *Neolebra atra* (Poaceae): A native bamboo known from Torres Strait, Cape York Peninsula and north eastern Queensland in the understorey of rainforest habitats. Also occurs in New Guinea, the Moluccas, northern Sulawesi and the Philippines. On Ugar it is typically associated with vine forests on basalt. It is known also from Mua (1i, 2o, 3d), Badu (4a), Mer (2j), Iama, Erub, and Naghir (Fell pers. obs.).



Photograph 3. The native bamboo *Neolebra atra*

Regional Significance

The classification of regionally significant species 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. The eight species recognised for the island are summarised in **Table 3** below.

Table 3. Summary of flora with regional conservation significance on Ugar Island.

Species	Regionally Significant	BVG	VC	RE
<i>Amorphophallus paeoniifolius</i>	Disjunct; regionally restricted habitat.	Deciduous vine forest	2k	3.8.5b
<i>Cycas scratchlyeana</i>	Highly disjunct;	Deciduous vine forest.	2k	3.8.5b

Species	Regionally Significant	BVG	VC	RE
	IUCN listed species otherwise known from PNG. Rare on the island with two plants known.			
Clusiaceae 1 (Shoreline DGF+ June 12)	Possible new record for Australia; Locally rare with on one plant known on the island.	Deciduous vine forest	2k	3.8.5b
Clusiaceae 2 (Milky sap DGF+ June 12)	Possible new record for Australia; Locally rare with on one plant known on the island.	Deciduous vine forest	2k	3.8.5b
<i>Euphorbia plumerioides</i> var. <i>plumerioides</i>	Disjunct; locally rare.	Deciduous vine forest	2k	3.8.5b
<i>Flacourtia</i> sp. (Shiptons Flat L.W. Jessup)	Undescribed species; disjunct at the northern limit of distribution.	Deciduous vine forest	2k	3.8.5b
<i>Tephrosia</i> sp. (Muddy Bay P.I.Forster+ PIF15313)	Undescribed species which is disjunct and at the northern limit of distribution.	Deciduous vine forest	2k	3.8.5b
<i>Uvaria rufa</i>	Disjunct; regionally restricted habitat; Butterfly food plant.	Deciduous vine forest	2k	3.8.5b

5.2.2 Flora with Cultural Significance

Information on useful plants of Ugar Island is currently held within the community. More detailed ethnobotanical studies are required to derive baseline information of useful plants and the local language names. This should include information on uses, seasonality, habitat, and distribution.

Based on information recorded on other islands in the Eastern Group of islands, there are a number of plants that are likely to have recorded usage on Ugar (refer **Appendix B**). These include naturalised species such as stinking passionflower (*Passiflora foetida*), bamboo (*Bambusa* spp.), mango (*Mangifera indica*), Manila rope (*Agave* sp.), paw paw (*Carica papaya*), banana (*Musa* sp.), coconut (*Cocos nucifera*), yam or lewer kar (*Dioscorea esculenta*), weskepu (*Pueraria montana* var. *lobata*) which may occur within and on the margins of remnant vegetation, often in vicinity of old settlement and garden sites. Others such as cassava (*Manihot esculenta*), and tridax daisy (*Tridax procumbens*) may be abundant in community areas. Uzu or sorbi in the eastern tongue (*Syzygium branderhorstii*) and bell fruit (*Syzygium aqeum*) are favoured native bush fruit trees which are often planted in house gardens. Plants that are likely to be used for food include eneu (wongai is western tongue) (*Manilkara kauki*), merkai (*Terminalia catappa*), meker (or mipa) (*T. muelleri*), garuga (*Garuga floribunda* var. *floribunda*), kurath (*Eugenia reinwardtiana*), and lady apple (*Syzygium suborbiculare*). Material uses include products made from timber (e.g. *Acacia polystachya*, *Manilkara kauki*),

decoration (*Abrus precatorius*, and *Entada* spp.), and for rope or binding (*Hibiscus tiliaceus*, *Ipomaea pes-caprae* subsp. *brasiliensis*, and *Flagellaria indica*). Documentation of medicinal uses is currently limited and requires additional investigation at the community level.

5.2.3 Introduced Plants

Information on weeds has been sourced from Queensland Herbarium voucher data (DERM 2011c), the land use planning report of RPS (2010), field data of Barbara Waterhouse and Stephen McKenna (DAFF 2012), and field surveys by 3D Environmental in June 2012.

Ugar has been subject to generations of occupation and land use which, together with the fertile basalt derived soils, tropical climate and high seasonal rainfall, provides ideal conditions for the establishment of many plants which are not native to the island. These introduced plants are referred to as 'environmental weeds' or 'naturalised plants'. Most have been brought to the island as garden plants although others may have been imported by natural means for example by birds, wind and tides. Others may have been brought in by people, boats and barges within freight items, and in soil, gravel and machinery. As for the majority of the inhabited islands, the developed and disturbed areas are a major dispersal point for weeds.

While many of them pose no real problem to the natural environment, others can spread into bush areas and have serious impacts if not controlled. A number of these plants are however valued by local people on the basis of their various uses. For example the food plants yams (*Dioscorea esculenta*), coconut (*Cocos nucifera*), cassava (*Manihot esculenta*), tropical kudzu (*Pueraria montana* var. *lobata*) and wild passionfruit (*Passiflora foetida*); plants used for material and medicinal uses such as Manilla rope (*Agave sisalana*), and tridax daisy (*Tridax procumbens*); and those with aesthetic values such as poinciana or Christmas tree (*Delonix regia*).

With reference to the flora list (**Appendix B**), there are 74 naturalised species currently known to occur on the island (38% of the total island flora). Those species considered a current threat to biodiversity on the island and requiring management action are summarized below. Further surveys are required to determine the extent of impact and threats of individual weeds to the islands ecology.

Declared Weeds

Two species declared on the LP Act are currently known to occur on Ugar Island.

Lantana - *Lantana camara* (Class 3): Lantana is a Class 3 Declared Weed and listed as WONS species. Advice from Barbara Waterhouse indicates that the plant is not prolific with a record from somewhere between Rosie Stephen and Tom Stephen's house (on the right hand side of the track). It is currently widespread on Mer, Erub and poses a potential threat to Ugar. Ongoing monitoring and prompt control of any infestations is recommended.



Photograph 2. Lantana growing at the Erub Airport (April, 2011).

Singapore Daisy - *Sphagneticola trilobata* (Class 3): Singapore daisy is a vigorous creeping ground cover that is known to occur on Ugar (Waterhouse pers. com. May 2012). The plant will out-compete native species and is a significant threat to habitats across the island. Information on the extent of its occurrence on the island is required.

Environmental Weeds

The distribution of introduced plants on the island is concentrated within disturbed areas. The limited area of remnant vegetation is however increasingly susceptible to impacts from a number of invasive weeds. Weeds which are not currently declared under state legislation are categorized 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 they are likely to infest.

Table 4 below summarises weeds considered to be of high and moderate threat.

Table 4. Environmental weeds on Ugar Island – high and moderate threat.

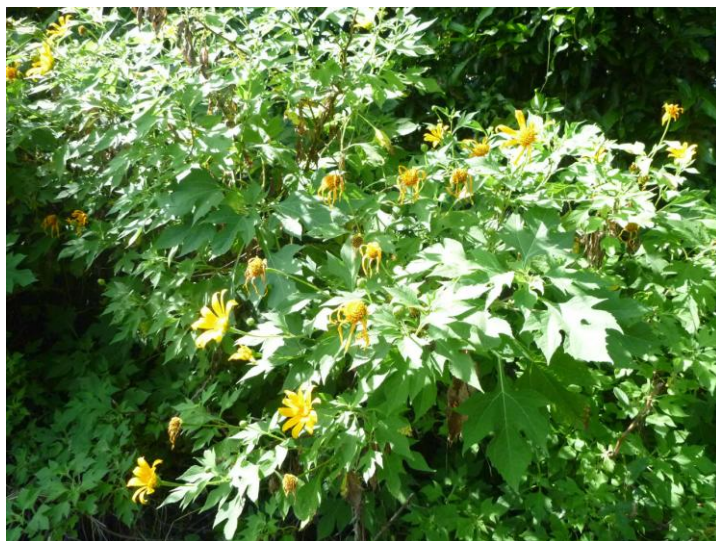
Species	Life Form	Comments
HIGH		
Leucaena (<i>Leucaena leucocephala</i>)	Shrub	Leucaena is the most pressing weed threat to island with the potential to severely impact and transform the remaining natural ecosystems. It is a small tree up to about six metres tall with

Species	Life Form	Comments
		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 Ugar are not known although it is likely to have been brought in from other islands as an ornamental. The occurrence and infestations on Ugar requires investigation. On the other basalt islands of Mer and Erub, leucaena has become established in and around the margins of the community and poses a significant threat to the islands cultural and natural values.
Japanese or Mexican sunflower (<i>Tithonia diversifolia</i>)	Perennial Herb/Shrub	Originally from Mexico this robust shrub to 5m with an attractive yellow flower is naturalised in eastern Australia from north eastern New South Wales to northern Queensland. It produces many small seeds which are held in the seed head until the plant dries in the late dry season. The seeds are easily dispersed by wind, water, people and vehicles particularly along disturbed areas such as roadsides. It is able to resprout from its roots and therefore reappears after slashing. It is best controlled by application of herbicide. The weed is widespread on Ugar and likely to continue to spread if not controlled.
Tropical kudzu (<i>Pueraria montana</i> var. <i>lobata</i>)	Vine	Tropical kudzu is a robust and aggressive tropical legume with large hairy trifoliate leaves and a large edible underground tuber. Kudzu is originally from Asia, and is naturalised in Papua New Guinea (PNG), other parts of Malesia and the Pacific Islands where it is utilised as a forage crop, a food resource, and for medicinal purposes. It is now naturalised in Cape York Peninsula (CYP), north eastern Queensland and southwards as far as north-eastern New South Wales usually growing on disturbed sites and agricultural land, and sometimes on rain forest margins. On mainland Queensland the vine is a Class 2 declared weed and is listed as noxious in NSW. The IUCN has listed kudzu among the world's 100 worst invasive species (IUCN Global Invasive Species Database 2002) and it is a severe problem in the USA and Japan. Kudzu has been present in Queensland since at least 1941 and its origin is unclear. The Torres Strait recorded occurrences are from Dauan, Mua, Mer, Erub and Hammond Islands (Herbrechts Data 2011). Torres Strait Islanders consider it to be native and there is evidence that it has a long history of use and transportation as a source of food, possibly originating in Asia but then taken south through Indonesia and across the Pacific (Csurhes 2008). On Mer the tuber is a traditional food resource known as 'Weskepu'. Robust infestations of kudzu were observed in October 2012 on the margins of the Ugar community on the margins of disturbed and remnant vine forest vegetation. Evidence from field observations on Mer, and Ugar and Dauan (D. Fell pers. obs. March 2011, Oct 2012), indicates that kudzu impacts native vegetation by climbing and smothering forest edges. It has also been observed on Dauan to form dense sprawling mats which smother native grassland vegetation. Further observations are required to determine the extent of kudzu on Ugar and its impact on native vegetation.
Brazilian joyweed (<i>Alternanthera brasiliana</i>)	Herb	This is a purple leaved perennial ground herb often planted as a hardy ornamental in tropical areas. This herb has the ability to grow in full sun and low light conditions spreading along the ground by adventitious roots. It is considered a threat to rainforest habitats where it may gradually displace native groundcovers and prevent germination of native trees, shrubs and vines. Infestations were observed on the margins of the village. The extent of this species occurrence on the island requires further investigation.
Giant panic (<i>Megathyrsus maximus</i> var. <i>maximus</i>)	Grass	A robust tussock grass growing on the margins of the village and access tracks. Has a high potential to continue to invade rainforest margins.
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 on 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.

Species	Life Form	Comments
		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). Its occurrence on the margins of vine thicket habitat was confirmed during the October 2012 field survey.
Mother of millions (<i>Bryophyllum pinnatum</i>)	Succulent herb	While a number of other species of the genus <i>Bryophyllum</i> are declared in Qld, <i>B. pinnatum</i> is regarded as a problematic succulent herb that spreads easily and is difficult to control. It is an erect, smooth, fleshy, plant growing to 1 m or more in height with has flower spikes and clusters of orange-red bell-shaped flowers. It is able to reproduce from small plantlets, which arise from the leaf edges. Small infestations were observed on Ugar.
MODERATE		
Scarlet flower (<i>Ipomoea hederifolia</i>)	Vine	A slender vine originally from tropical America, now naturalised in CYP, north eastern Queensland and southwards to north-eastern New South Wales. Recorded on disturbed margins of the community invading vine thicket margins. There is a high potential for its further proliferation.
Star of Bethlehem (<i>Ipomoea quamoclit</i>)	Vine	A slender vine with milky sap, fine pinnate leaves and small deep red flowers is originally from India, and now naturalised in CYP, north eastern Queensland and southwards to north-eastern New South Wales. Recorded on disturbed margins of the community invading vine thicket margins. There is a high potential for its further proliferation.
Snake weed (<i>Stachytarpheta jamaicensis</i>)	Herb	This low erect perennial herb is common on the island. Its leaves are opposite with toothed margins and blue flowers borne on stiff spikes. It is also naturalised throughout Queensland where it typically invades roadsides, creek lines and vine forests where soil has been disturbed.
Butterfly pea (<i>Clitoria ternatea</i>)	Vine	A vigorous, herbaceous perennial leguminous vine. Leaves are pinnate with 5-7 leaflets. Flowers are axillary, single or paired ranging in colour from white, mauve through to light and dark blue. Occurs in and around disturbed community areas on a number of Torres Strait Islands.
Centro (<i>Centrosema molle</i>)	Vine	This vigorous sprawling vine is one of a number of leguminous vines and herbs which occur throughout the disturbed parts of the island. It is a tropical perennial legume adapted to a range of soils and climates in northern (tropical and subtropical) Australia. Current infestations are restricted to disturbed areas however it has the potential to invade native vegetation. Seeds are likely to be dispersed by vectors such as machinery, and water. Ongoing monitoring and prompt control of any infestations outside the community area is recommended.
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, 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.



Photograph 3. A typical infestation of *leucaena* on Ugar Island.



Photograph 4. Infestation of Japanese sunflower on Ugar Island.

Weed Threats

Those weeds currently not recorded on Ugar yet which are capable of causing long-term changes to the island's vegetation are as follows.

Table 5. Major weed threats

Species	Comments	Photograph
Gamba Grass (<i>Andropogon gayanus</i>)	Gamba grass is a Class 2 Declared Weed that has not yet been recorded in Torres Strait however, it is considered a serious potential threat. Together with Annual Mission Grass it is listed as a Key Threatening Processes under the EPBC Act. It is widespread in the Bamaga district of northern CYP (Fell <i>et al.</i> 2009). The grass is an aggressive colonist which develops a standing biomass of 5-7 times that of native species resulting in extremely intense fires (Rossiter <i>et al.</i> 2003).	 Gamba grass near Injinoo (DGFell April 09).
Annual Mission Grass (<i>Pennisetum pedicellatum</i> subsp. <i>unispiculum</i>)	An aggressive robust annual grass capable of inducing habitat change through altering fire behaviour. Known from Mua (St Pauls), Mabuiag, Masig, Poruma and Horn. 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 (DSEWPC 2011).	 (source NT Govt.) http://www.nt.gov.au/nreta/natres/weeds/find/missiongrass.html)

Species	Comments	Photograph
Barliera or porcupine flower (<i>Barliera prioritis</i>)	This plant is considered an emerging environmental weed which is recognized as one of 28 weeds on the Alert List for Environmental Weeds (NHT 2010). Porcupine Flower is a low compact shrub also known to occur around townships in the Northern Territory and Queensland (Townsville) and in the Kimberley Region (NHT 2010). It was introduced to Boigu as a garden plant where it was reported by Barbara Waterhouse in 1993 and had since spread on the edges of the town through natural seed dispersal by birds and improper disposal of garden clippings. Ongoing monitoring for the species is important given that the shrub has the potential to form dense thickets, which may displace native vegetation.	
Praxelis (<i>Praxelis clematidea</i>)	A highly invasive erect, branched, unpleasant smelling herb with hairy stems and foliage. This species has been observed in native grassland habitats on Erub and is considered a threat. Known also from Badu, Mua, and Mabuiag.	 Praxelis recorded on Erub

6.0 Fauna (Animals)

As for the majority of Torres Strait Islands, there is a considerable lack of systematic survey of fauna habitats on the island. Avifauna (birds) have been the most comprehensively studied component of Torres Strait's terrestrial fauna. Other records are incidental, or part of broader regional surveys targeted towards particular groups (e.g. Draffan *et al.* 1983, Clarke 2004, Garnet *et al.* 2000, Hall 2008, Helgen 2004). Recent surveys on Ugar (RPS 2010) while limited, represent the most comprehensive data available for the island. In addition, there is little available information on the cultural significance of terrestrial fauna species. Some data on this topic can be found in the *Reports of the Cambridge Anthropological Expedition to Torres Straits* (Haddon 1901-1935). Systematic collecting across the range of habitats is however likely to greatly increase the number of known species and further contribute to the identification and development of management strategies. It is therefore recommended that surveys become an identified ranger work activity, supported by relevant specialists.

The desktop review identified 45 fauna species that have been reported for Ugar Island (**Appendix C**) including one frog, 11 reptile, 32 bird and one mammal species. Of these, one reptile and one bird are introduced. This can be compared with the 384 terrestrial fauna species that have been reported for the broader Torres Strait Island group. An additional two species have been identified by the Protected Matters Search Tool as possibly occurring.

6.1 Culturally Important Fauna Species

The current available information on important terrestrial animals of Ugar Island is scant. Whilst insufficient to provide any detailed account, the familiarity of Torres Strait Islanders' with the natural world was noted over 100 years ago by the English anthropologist Alfred Cort Haddon (1912:230):

'[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 clan totems. The calls of some birds are recognized 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 (*Casuaris casuaris* – obtained from Papua New Guinea traders) continue to be used for traditional head-dresses.

Further fieldwork by the Land and Sea Rangers coupled with review of literature is required, with all information incorporated into an appropriate Traditional Ecological Knowledge (TEK) system. This includes information on uses, habitat, distribution, abundance, and most importantly the relationships to story and culture. The fauna species list provided in **Appendix C** of this report provides a foundation to incorporate language names and habitats.

6.2 Fauna Habitat Values

There has been very limited fauna work conducted on Ugar with few documented records of even common species (e.g. DERM 2010b) and the faunal values of the island remain poorly known. RPS (2010) report that the Ugar coastline has 'exceptionally high' habitat value based on its pristine condition, its value as a habitat for threatened and migratory bird species, and value as a habitat for the littoral whiptail skink (*Emoia atrocostata*) which is a Near-Threatened species under the NC Act. Other high value habitats identified include intact areas of semi-deciduous vine forest and the restricted areas of mangrove forest that fringe the island. The island possesses no permanent watercourses and its lack of habitat diversity, in comparison to the larger volcanic islands of Mer and Erub, limits the likely suite of specialist fauna species.

The reptile assemblage, 11 species, is large in terms of the overall terrestrial vertebrate assemblage of 45 species. Whilst the small size and location of Ugar Island suggest that few unrecorded species of reptile should be expected to be found, additional systematic surveys within mangrove and vine forest habitats have the potential to record additional reptile species.

Most of the bird species recorded in the Torres Strait are highly mobile and many are migratory, including numerous species that are not listed as Migratory under the EPBC Act. It is likely that any additional species reported for Ugar Island will be highly mobile species.

Thirty-four native mammal species are reported or predicted for the Torres Strait (**Appendix C**), though it is doubtful that some of these species actually occur and the identification of other species is questionable. Regardless, the native mammal fauna of the Torres Strait Islands is dominated by bats, with 20 reported species. Seven rodents are reported, though only one, grassland melomys, is widespread. At this stage the only native mammal reported from Ugar Island is grassland melomys (RPS 2010) and other native ground-dwelling mammals are not considered likely to occur. RPS did not record any species of bat though they were advised by community members that flying-foxes were present on a nearby island. It is likely that both micro-bats and mega-bats will be recorded on Ugar Island during future field work.

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 EPBC Act.
- Species listed under Endangered, Vulnerable or Near-Threatened under Queensland's NC Act.
- Species listed as Migratory under the EPBC Act due to their inclusion under one of more of the following:
 - 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)
- Species considered of 'Critical' or 'High' priority under the Back on Track framework (DERM 2011).

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 Critically Endangered, Endangered, Vulnerable and Near-Threatened Species

The following section provides an overview of those species that are known to occur, or potentially occur on Ugar Island. Twenty-five of the 384 species reported or predicted for the Torres Strait are listed as Critically Endangered, Endangered, Vulnerable or Near-Threatened under the EPBC Act and/or NC Act. Of these, four species of conservation significance are reported from or predicted to occur on Ugar Island including two reptiles, one bird and one mammal as identified in **Table 6**. Given that there are no confirmed records of spectacled flying fox in the Torres Strait Islands, this species is

considered unlikely to occur despite its predicted occurrence by the EPBC Protected Matters search tool.

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

occur on Ogar Island.

Scientific Name ³	Common Name	Status ⁴			Comments ⁶
		EPBC Act	NC Act	BoT ⁵	
SPECIES REPORTED					
<i>Emoia atrocostata</i>	Littoral whiptail skink	-	NT	-	Published record (RPS, 2010)
<i>Sternula albifrons</i> ⁷	Little tern	M	E	high	WildNet database and published records
SPECIES PREDICTED					
<i>Pteropus conspicillatus</i>	Spectacled flying-fox	V	LC	high	Predicted by the EPBC Protected Matters Search Tool – occurrence considered unlikely.
<i>Crocodylus porosus</i>	Salt water crocodile	-	V	-	Predicted by the EPBC Protected Matters Search Tool – Occurrence considered likely

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 2011).
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: 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 Storr 1973; Draffan *et al.* 1983), WildNet database and/or reports and other grey literature (eg Smith & Smith 2006; Natural Solutions 2008a). These sources are not necessarily mutually exclusive.
7. Listed under the EPBC Act as *Sterna albifrons* (Bonn Convention, CAMBA, JAMBA, ROKAMBA).

Additional possible EVNT species

It is also possible that slender chained gecko, emerald monitor and coastal sheath-tail bat will occur on Ugar Island. Spectacled flying-fox is predicted to occur by the EPBC Protected Matters Search Tool but a lack of actual database or published records in Torres Strait for such a readily identifiable species makes its occurrence unlikely, particularly given Ugar's size and comparative isolation. There is no record of a flying-fox for the island. RPS (2010) also notes the likely occurrence of eastern curlew on the island, although the species has not been recorded during field survey. Given that beach-stone curlew has been identified on Erub, it is possible that the species occurs on Ugar. The suitability of habitat on Ugar for the emerald monitor presents the possibility that the species will occur although it is not reported by the occupants of Ugar and as such, if it occurs, is not common. Species profiles for those EVNT species known or expected to occur are provided in **Section 6.3.2**.

6.3.2 Profiles of Significant Known from or Possibly Occurring on Ugar Island

Little tern (*Sternula albifrons*)

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

NC Act: Endangered

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 in 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). Draffan *et al.* (1983) reports the species from 13 islands, and describes it as an uncommon summer visitor throughout the Torres Strait.

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). On Ugar it is likely to be threatened only if breeding occurs.

Littoral whiptail-skink (*Emoia atrocostata*)

NC Act: Near-Threatened

The littoral whiptail-skink is found on rocky shores and in foreshore vegetation, including mangrove forests. It shelters in rock recesses and crevices, in tree root crevices and in logs. It readily swims in tidal pools and can remain submerged for short periods (Heatwole 1975; Ehmann 1992). Cogger (2000) states that the species also occurs in lowland forests, coastal scrubs and grasslands near beaches but Hediger (1933-34 in Heatwole 1975) states that it is never found more than 100 m from the sea.

The littoral whiptail-skink is widespread from Japan, through south-east Asia and into the south-west Pacific. It is found on the tip of Cape York Peninsula and islands of the Torres Strait (Ehmann 1992, Wilson 2005). Cogger (2000) considers its distribution poorly known and despite references to its occurrence on Torres Strait Islands there is no available record for any island except Boigu Island (Wilson 2005, Schaffer 2010). Ingram (2008) refers to a WildNet record from Mua but the species was not returned by a search of the database in 2010 (DERM 2010f) and the validity of the record is

uncertain. Species of the genus *Emoia* are efficient rafters and colonise islands on floating debris (Wilson 2005).

Ehmann (1992) states the littoral whiptail-skink is abundant and secure. It is a common mangrove species in some areas and is especially abundant on rocky foreshores (Cogger 2000). Threats are unknown, however small reptiles, including littoral whiptail-skink, are eaten by cats (*Felis catus*) on Christmas Island. However, the species made up a very small percentage of known prey (Tidemann *et al.* 1994), possibly due to cats spending little time foraging in foreshore habitats. On Ugar the littoral whiptail-skink would be threatened by cats, any loss of mangroves due to clearing, or storm damage.



Photograph 5. Littoral whiptail skink on Ugar (Photograph by D. Stanton).

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 Boigu, Mua, Badu, Mer and Erub. There is a single WildNet record from Mabuiag (DERM 2010e), 4 WildNet records from Dauan and a published record from Iama (Conics 2008b). 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 250 m of approach (Higgins & Davies 1996). Pollution may have also reduced food availability (Higgins & Davies 1996). The species is most likely to be threatened by disturbance when foraging and such a threat is likely to be significant only during passage to northern hemisphere breeding grounds.

Emerald monitor (*Varanus prasinus*)

NC Act: Near-Threatened

The emerald monitor is an arboreal species, living in the upper canopy of rainforest and monsoon forest (Wilson 2005), in palm forest, mangroves (Greene 1986; Cogger 2000), cocoa plantations (Greene 1986), vine thickets (Schaffer 2010) and around lagoons (Cogger 2000). The species uses its prehensile tail to forage among slender branches and outer foliage (Wilson & Swan 2010) and eats mainly katydids and other small arthropods and occasionally rodents (Greene 1986). Emerald monitors lay eggs in termite mounds in trees (Greene 1986; Ehmann 1992).

The emerald monitor is widespread in New Guinea. In Australia it is restricted to several islands in the Torres Strait, south to Mua Island, where it is known as Wyniss (Wilson & Swan 2010). The species is known from Boigu (Clarke 2004a; Schaffer 2010, Stanton & Fell pers. obs. 2010); Mua (Whittier & Moeller 1993; Wilson 2005; Ingram 2008; DERM 2010f), Badu (Borsboom 2007 in Conics 2009a) and Mer Islands (DERM 2010d; OZCAM 2011).

The emerald monitor is one of the most poorly known monitors (Greene 1986) and threats to the species in Australia are unknown. However, in Papua New Guinea the species is targeted by the pet trade, though the threat is considered low (Allison 2006). The emerald monitor is highly desired by reptile keepers and illegal collecting could become a threat in the Torres Strait. The species would be threatened by habitat clearance. Given its known diet the emerald monitor does not appear susceptible to mortality through attempted ingestion of cane toads (*Rhinella marina*) as per many other species of varanid (e.g. Shine 2010). On Ugar, if the species is found in future survey effort, it is probably most at threat from loss and degradation of vine thicket habitat.

Salt-water crocodile (*Crocodylus porosus*)

EPBC Act: Migratory (Bonn Convention)

NC Act: Vulnerable

Listed as estuarine crocodile under the Queensland *Nature Conservation (Wildlife) Regulation* 2006.

The salt-water crocodile occurs in tidal rivers, coastal floodplains and swamps, extending hundreds of kilometres inland along major drainage systems, but is also seen regularly in the open ocean (Webb *et al.* 1983, Read *et al.* 2004, Wilson & Swan 2010). The species is found from India through south-east Asia to the western Pacific and northern Australia (Wilson & Swan 2010). In Australia the species is most common in large areas of productive wetlands and estuaries (Fukuda *et al.* 2007). In Queensland, salt-water crocodiles are mainly found in coastal areas north of the Fitzroy River, with only infrequent sightings to the south (QPWS 2007). The highest densities in Queensland are found in north-west Cape York Peninsula (Read *et al.* 2004, EPA 2007). Salt-water crocodile is known from Mabuiag (Watson 2009), Saibai, Thursday (OZCAM 2011), Boigu (Schaffer 2010) and Mua islands (Terry Reis *pers. obs.*). The species is likely to occur throughout the Torres Strait, including Mer Island.

The salt-water crocodile is still threatened by drowning in fishing nets (Ehmann 1992) with juveniles more likely to become entangled. This does not appear to pose a major threat to the species (EPA 2007). A lack of suitable nesting habitat appears to be the most significant limiting factor for the recovery of the species in Queensland (Read *et al.* 2004). On Ugar, the salt-water crocodile may be threatened by entanglement in fishing nets and by direct human persecution but currently such threats are likely to be minor.

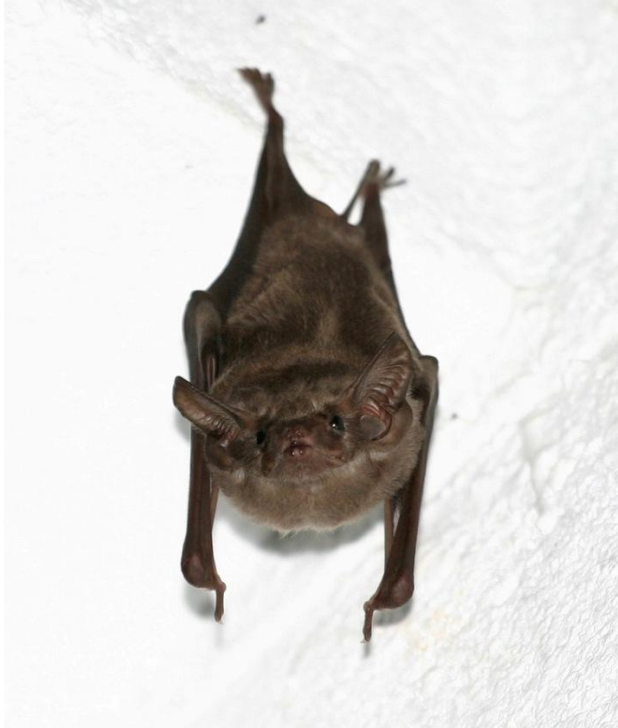
Coastal sheath-tail bat (*Taphozous australis*)

NC Act: Vulnerable

The coastal sheath-tail bat is also considered of 'High' priority under the Back on Track species prioritisation framework (DERM 2011). It is seldom found more than a few kilometres from the ocean, where it roosts in sea caves, rock fissures, boulder piles and, occasionally, in buildings (Churchill 2008, Richards 2008). Colonies are usually of two to 25 individuals, though up to 100 have been recorded. The species is often found on islands and will forage on nearby mainland (Churchill 2008). Foraging occurs in a wide range of habitats, including open eucalypt forest, coastal heathlands, grasslands, sand dune scrub, monsoon forests and mangroves (Duncan *et al.* 1999, Churchill 2008). Little is known of its breeding biology but most births probably occur from September to November (Churchill 2008, Richards 2008).

The coastal sheath-tail bat occurs from Shoalwater Bay on the central Queensland coast north to Torres Strait and extra-limitally in New Guinea (Duncan *et al.* 1999, Churchill 2008). In the Torres Strait there are 15 Australian Museum specimens from Possession Island (OZCAM 2011), two WildNet records (DERM 2010f) and Queensland Museum specimen (reported in Conics 2008b) from Mua Island, and observations and Anabat recordings from Pulu (Watson 2009). Conics (2009d) recorded no micro-bats of any species during their survey of Ugar although the species may occur within roosts formed on rocky escarpments, and also within buildings. Major threats to the species probably include loss of foraging habitat from coastal development and roost disturbance, particularly

in the southern part of their range (Duncan *et al.* 1999). On Ugar, the coastal sheath-tail bat would be threatened by disturbance to any roosts and maternity sites and by loss of foraging habitat.



Photograph 6. Coastal sheath-tail bat roosting in the St Pauls Church (photograph by T. Reis).

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.

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). If found on Ugar, beach stone-curlew may be threatened by feral animals and disturbance by humans. The species is most threatened when nesting.

Slender Chained Gecko (*Lepidodactylus pumilis*)

NC Act: Near-Threatened

The slender chained gecko is found in southern New Guinea, the Torres Strait and the tip of Cape York (Covacevich *et al.* 1982; Ehmann 1992). In the Torres Strait there is a WildNet database record from Mer Island (DERM 2010d), and a Queensland Museum specimen (reported in Conics 2008c) and a record by Ingram (2008) from Mua Island. There are also Australian Museum specimens from Saibai, Masig, Mer, Hammond and Prince of Wales Islands (OZCAM 2011) and it is likely the species occurs more widely through the region than is yet documented. It is expected to occur on Saibai Island in habitats other than wetlands, treeless areas and on coastal dunes.

The species is arboreal and occurs in open and closed forests and coastal habitats (Ehmann 1992; Wilson & Swan 2010) and in human dwellings (Wilson 2005). The female lays two eggs per clutch under bark or within closed-in vegetation. Nesting is often communal and takes place during the warmer wet months (Ehmann 1992).

Threats to the species are unknown. Ehmann (1992) states the species is common and secure. However, the species is not known from any national park or other reserve affording protection (Covacevich *et al.* 1982). The slender chained gecko may be threatened by loss of habitat due to clearing and/or rising sea levels and storm surges as a result of climate change and by competition with house gecko (*Hemidactylus frenatus*), in both natural habitats and on buildings (Case *et al.* 1994; Buden 2007; Hoskin 2010). House gecko is present on Ugar Island but is unlikely to pose a threat to any possible population of slender chained gecko unless the introduced species spreads into natural habitats.

6.3.3 Migratory Fauna Species

Fifty-seven bird species listed as Migratory under the EPBC Act are known to occur in Torres Strait (**Appendix C**). The Vulnerable (NC Act) salt-water crocodile is also listed as Migratory under the EPBC Act and is expected to occur on Ugar Island. 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. Further discussion of these species within groups based on behavioural traits, habitat use and threats is provided in **Appendix D**. A list of 16 migratory species known from or predicted to occur on Ugar Island is provided in **Table 7**. It should be noted that the limited number of known Migratory species is possibly due to the restricted nature of fauna surveys undertaken on the island.

Table 7. Migratory¹ species reported or predicted to occur on Ugar Island.

Scientific Name ²	Common Name	Comments ³
SPECIES REPORTED		
<i>Crocodylus porosus</i>	salt-water crocodile	Predicted to occur – EPBC Protected Matters
<i>Egretta sacra</i>	eastern reef egret	Database & published records.
<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle	Database & published records.
<i>Pluvialis fulva</i>	pacific golden plover	Database & published records.
<i>Fregata ariel</i>	lesser frigatebird	Published record
<i>Charadrius mongolus</i>	lesser sand plover	Database & published records.
<i>Charadrius leschenaultii</i>	greater sand plover	Database & published records.
<i>Limosa lapponica</i>	bar-tailed godwit	Database & published records.
<i>Tringa brevipes</i> ⁴	grey-tailed tattler	Database & published records.
<i>Tringa nebularia</i>	common greenshank	Database & published records.
<i>Calidris ruficollis</i>	red-necked stint	Database & published records.
<i>Sternula albifrons</i> ⁵	little tern	Database records.
<i>Sula leucogaster</i>	brown booby	Database records.
<i>Thalasseus bengalensis</i> ⁶	lesser crested tern	Database & published records.
<i>Monarcha melanopsis</i>	black-faced monarch	Database & published records.
<i>Symposiachrus trivirgatus</i> ⁷	spectacled monarch	Database & published 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
4. Also listed under the Bonn Convention and JAMBA as *Heteroscelus brevipes*.
5. Listed under the EPBC Act (Bonn Convention, CAMBA, JAMBA, ROKAMBA) as *Sterna albifrons*. Listed under the NC Act as Endangered.
6. Listed under the EPBC Act (CAMBA) as *Sterna bengalensis*.
7. Listed under the EPBC Act (Bonn Convention) as *Monarcha trivirgatus*.

6.3.4 Additional Possible Migratory Species

Of the other 31 species of Migratory bird known from the Torres Strait (**Appendix C**), black-tailed godwit (*Limosa limosa*), marsh sandpiper (*Tringa stagnatilis*), caspian tern (*Hydroprogne caspia*) and rufous fantail (*Rhipidura rufifrons*) are expected to occur on Ugar Island on a regular basis. The remaining 18 species are all possible as sporadic (not annual) visitors except for double-banded plover (*Charadrius bicinctus*), which is considered very unlikely based on known movements, and glossy ibis (*Plegadis falcinellus*), for which there is no suitable habitat.

6.3.5 Species of Regional Significance

Carlia quinquecarinata is a recently described skink which is currently known only from Erub Island, though the species possibly occurs on Mer and Papua New Guinea (Donnellan *et al.* 2009). If found on Ugar, the species should be considered regionally significant.



Photograph 7. Photograph of *Carlia quinquencarinata* taken on Erub island in notophyll vine forest (photo D. Stanton 2007).

6.4 Pest Fauna Species

Exotic (introduced) fauna species reported for Ugar Island are house gecko and house sparrow (*Passer domesticus*). RPS (2010) also reports dog and cat as occurring on the island.

House gecko is considered a threat to native geckos through competition in both natural habitats and on buildings (Case *et al.* 1994, Hoskin 2010). There are records of native arboreal geckoes on nearby Erub Island, *Gehyra baliola*, and slender chained gecko may also occur. House gecko is unlikely to prove a threat to native species unless it moves into natural habitats. Any future reptile survey work should include assessments of habitat use by the species.

House sparrow was reported from all habitat types (RPS 2010). However, house sparrow is unlikely to pose any threat to native species on Ugar Island and no action is required for the species.

RPS (2010) notes that dogs are particularly abundant on the island and pose a considerable risk to public and environmental health. Dogs are a threat to ground nesting birds such as eastern curlew and are a disturbance factor for waders and terns. Cats are significant predators of native animals and have been implicated in the extinction of native species both on islands (Bloomer and Bester 1992) and on mainland Australia (Dickman *et al.* 1993). It is not just feral cats that kill native animals. 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. Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. Therefore, should house cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997). RPS (2011) reported the native rodent grassland melomys (*Melomys burtonii*) as occurring in vine forest and disturbed habitats. If cat numbers are not controlled there could be significant future impacts on melomys and other native fauna.

Introduced rodents have not been recorded on Ugar.

6.5 Threats to Fauna and Habitat

The major threats to fauna in any location are loss, degradation and fragmentation of habitat. These processes may be due to deliberate clearing, damage by feral and domestic herbivores, storm damage and weed invasion. Weed invasion may not simply alter the plant species assemblage but can also choke out ground cover, reducing suitability for ground-dwelling species. Weeds, particularly lantana may be a substantial long-term threat to the fauna of Ugar if spread is not effectively controlled. It is unfortunate on Ugar that weed invasion is well advanced throughout a large portion of the island and few intact habitats remain.

Exotic predators, such as dogs and cats, pose a threat to native fauna, either directly through predation or by disturbance. At this stage the most significant potential threats to native fauna on Ugar are the possible introduction of the exotic cane toad and rats (*Rattus* species). Cane toads would have dramatic impacts on varanids (goanna) and, given the small size of the island, could lead to local extinctions. Pacific and black rats are an even greater potential threat given their agility and generalist diet. Should exotic rats be found to be present an extermination, or control project is recommended.

6.6 Future Priorities

It is important that the faunal values of Ugar Island be more comprehensively identified so that the most important conservation elements are managed appropriately. In addition to general systematic survey methods for the compilation of the fauna species assemblage for the island, the following actions are recommended.

High Priority

- Extensive ecological monitoring and assessment is required to assess the presence and populations of exotic rodents and to develop the appropriate strategies for eradication from Ugar Island (see Diete 2010).

Medium Priority

- Verification of the presence of eastern-curlew and beach stone curlew.
- Micro-bat surveys.
- Mega-bat surveys.
- Identification of any breeding areas for terns.
- Identification of the most important foraging and high roost sites for waders.
- Reptile survey, with particular emphasis on determining the presence of the regionally significant species *Carlia quinquecarinata*.

7.0 Management Profiles for Ugar Island Habitats

7.1 Deciduous / Semi Deciduous Vine Forest and Thicket

7.1.1 Status of Ecological Knowledge

A structurally variable habitat that has been heavily fragmented through land clearing and development activities, the most extensive being a failed attempt at airstrip construction in the early 1990's. Field investigation is required to more comprehensively define the floristic composition and structural characteristics of this habitat.

Only a few structurally intact remnants of this forest remain on Ugar with the best development occurring on the south end of the island where it is relatively undisturbed. The canopy of this habitat ranges from 25m to 35m and has an open feel due to the deciduous canopy although measured crown cover is typically > 80%. The dominant canopy species (in order of decreasing dominance) are *Bombax ceiba* var. *leiocarpum*, *Gyrocarpus americanus* subsp. *americanus*, *Garuga floribunda* var. *floribunda*, *Antiaris toxicaria* var. *macrophylla*, *Mimusops elengi*, and *Diospyros hebecarpa*. The sub-canopy is relatively open with 30 – 50% cover.

With reference to **Figure 3**, the best development of deciduous vine forest is located on the eastern and southern side of the island. The canopy in this community ranges from 12-25m, with dominants including *Bombax ceiba* var. *leiocarpum* and *Garuga floribunda* var. *floribunda* with *Gyrocarpus americanus* subsp. *americanus* and *Diospyros maritima*.



Photograph 8. The maximum development of vine forest on Ugar at the south end of the island.

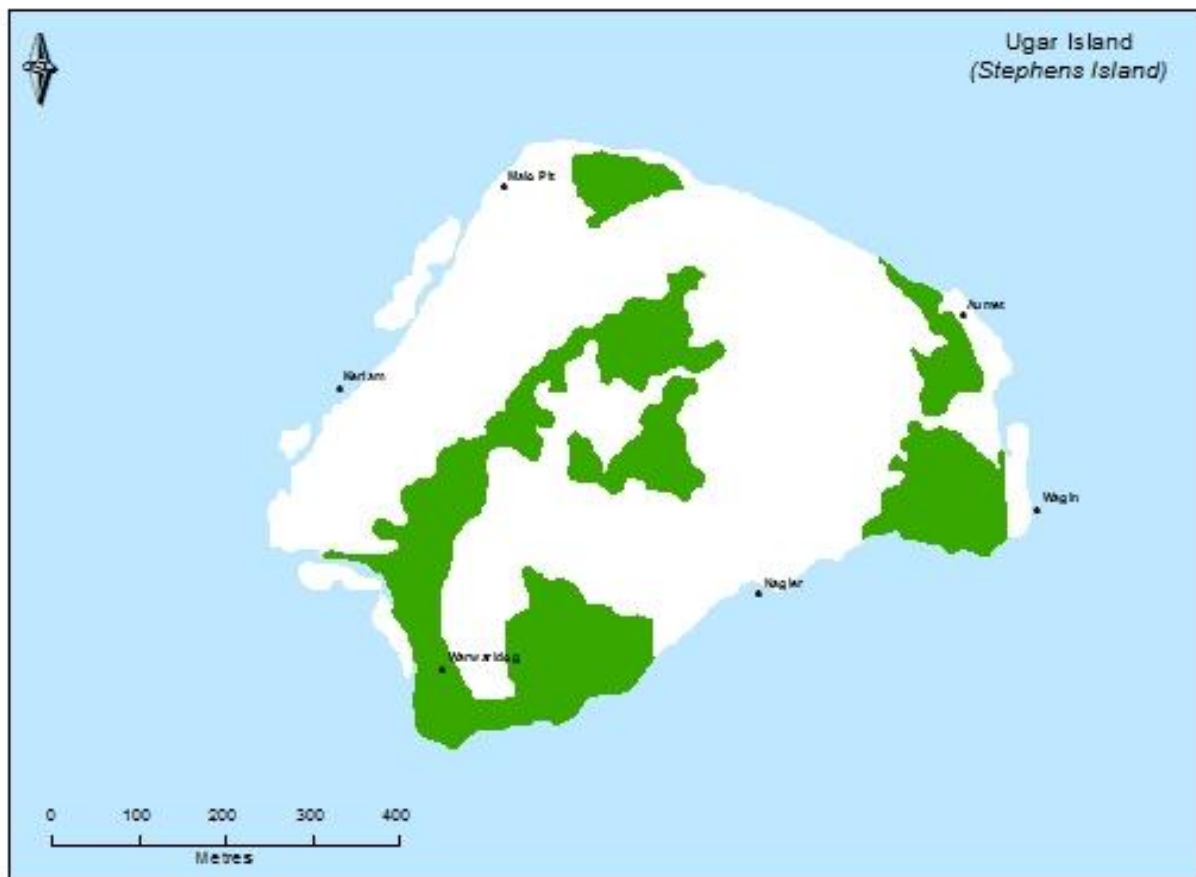


Figure 3. Distribution of semi-deciduous and deciduous vine forest and thicket on Ugar Island (place names after Lawrie, 1970).

7.1.2 Ecological / Cultural Considerations

Habitat Condition: Large areas of vine thicket have been altered both naturally and through anthropogenic disturbance. Copses of bamboo (*Bambusa* spp.) are scattered throughout the habitat and other non-native species including poinciana (*Delonix regia*) and mango (*Mangifera indica*) dominate the canopy in some places, although these areas have been mapped as separate entities wherever possible. Other invasive species which are impacting margins are tropical kudzu, leucaena and Japanese sunflower. Large areas of vine forest regrowth occur on the island and the development of these requires further investigation.

Fauna: The fauna known to utilise this habitat most extensively are ground dwelling reptiles as well as frugivorous birds. Vine forest may provide habitat for the endemic skink species, *Carlia quinquecarinata*. It also provides the most likely habitat for the Near-Threatened species slender-chained gecko and emerald monitor.

Flora: The native bamboo (*Noeloleba atra*) (Near-Threatened NC Act) has been reported in this habitat. Rapid field surveys of June 2012 did not record *Alectryon repandodentatus* (Endangered EPBC, NC Act) or the Near-Threatened vine *Operculina brownii*, however these should be considered potential occurrences given the suitability of the habitat. Regionally significant species that may occur

on this island include *Flacourtia* sp. (Shiptons Flat), *Uvaria rufa*, *Amorphophallus paeoniifolius*, *Euphorbia plumerioides* var. *plumerioides*, *Tephrosia* sp. (Muddy Bay P.I.Forster+ PIF15313), Clusiaceae 1 (Shoreline DGF+ June 12) and Clusiaceae 2 (Milky sap DGF+ June 12). *Cycas scratchlyeana*, a species restricted to a few locations in the Torres Strait has been recorded in this habitat.

Cultural Perspectives: The habitat, including highly disturbed and altered occurrences, hosts numerous plant resources. The full extent of resource utilisation within this habitat requires further consideration and study.

7.1.3 Management Implications

This habitat is currently self-maintaining although it is threatened by continued attrition, due both to clearing for development and invasion by exotic weeds. Vine forest margins are particularly susceptible to weed invasion and areas of vine forest regeneration may be compromised by recruitment of exotic species. Whilst further investigation is required to detail these impacts in full, the primary focus should be toward preserving the integrity of the best developed and intact examples of vine forest remaining on the island. Selected areas of regrowth vine thicket with the capacity to enhance remnant areas should be earmarked for rehabilitation. The requirement for vine forest restoration and rehabilitation needs to be developed in association within a weed management plan for the island.

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 Ugar Island Working on Country Plan.

Table 8. Summary of management actions for semi-deciduous vine forest and thicket.

Management Category	Context/Issue	Actions	Priority
Fauna Surveys	Fauna composition within this habitat is poorly documented.	Design and implement a structured fauna survey and trapping program based on priority recommendations contained in Section 6.6 . Particular focus should be given to identifying potentially occurring species including reptiles and bird species. Maintain focus on ethnotaxonomy to feed into TEK.	High
Plant Surveys	Flora composition is poorly documented and limited to rapid surveys.	Carry out additional flora field surveys with focus on significant species, new records for the island and important cultural resource species. Collect leaf specimens and/or photograph plants with known uses/values and that may have been used in the past.	Moderate
Traditional Ecological Knowledge	TEK of flora within this habitat is poorly known and/ or documented. Plant and animal lists provided in the Appendices provide a good	Collect and collate TEK knowledge within this habitat gained through fauna and flora survey actions on an ongoing basis.	High

Management Category	Context/Issue	Actions	Priority
	foundation for increasing TEK and ethnotaxonomy.		
Fire Management	The fire regimes on Ugar are not known and require further investigation.	A fire management plan may be required dependent on interviews with knowledgeable members on the Ugar community.	Moderate
Threatened Species Management	<u>Flora</u>: The composition of threatened flora within this habitat is not known. The habitat may suffer continued degradation through edge effects associated with hot fire, and weed infestation. <u>Fauna</u>: Composition of fauna within this habitat is poorly documented.	<u>Flora</u>: Undertake detailed floristic survey to determine the constituent threatened flora species within this habitat. The long-term impacts of weed infestation is a possible threat to the threatened species. Species potentially impacted are and <i>Neolebra atra</i> and a number of regionally significant species. Investigate the identity of the two unidentified Clusiaceae species and determine and assess distribution and ecology (flowering, seeding, germination). Determine the location, health and population of <i>Cycas scratchlyeana</i> on the island. <u>Fauna</u>: Further baseline survey information is required in regard to habitat usage by threatened species, particularly 'possibly occurring' species including the emerald monitor, slender-chained gecko and coastal-sheathail bat.	Moderate Moderate
Invasive Species Management	<u>Flora</u>: Leucaena, Japanese sunflower, lantana, tropical kudzu, Brazilian joyweed, Singapore daisy, poinciana and a range of smothering vines and herbs may impact the recruitment of native vine forest species in areas of vine thicket regeneration. <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>: A critical habitat management requirement is to control and eradicate weeds impacting within and on the margins of the remnant vine forest, with the aim to preserve the integrity of the best developed forests. A secondary focus is to identify adjoining areas of vine thicket regeneration, which can be rehabilitated over time. These works need to be carried out within the framework of a weed management plan. <u>Fauna</u>: Further survey into the usage of this habitat by feral (and domestic) cats and dogs is required. This will be informed by results of fauna survey. Management protocols can be devised when more baseline information is acquired.	High High
Monitoring	The success of any weed control efforts in promoting natural species recruitment and regeneration requires documentation. Methods to be identified within the weed management plan.	This success of eliminating exotic species within remnant and regrowth vine forest vegetation requires a strategic approach where successes can be demonstrated over time. Selected monitoring points should be placed within remnant and regrowth areas targeted for rehabilitation. Permanent photographic monitoring sites should be erected supplemented by notes in regard to the observed response in canopy and species recruitment.	High

Fauna: Mangrove ecosystems provide habitat and foraging values for a range of avifauna, reptiles and mammals including the littoral whiptail skink (*Emoia atrocostata*) and saltwater crocodile (*Crocodylus porosus*), and potentially present Near-Threatened species including the emerald monitor and coastal sheathail bat. A number of the significant migratory bird species listed in **Table 7** are associated with estuarine habitats.

Flora: These habitats have been subject to limited floristic survey although indications are that floristic diversity is limited in comparison to other islands where estuarine habitat is more extensive. There is a potential for the mangrove trumpet tree (*Dolichandrone spathacea*) (Near-Threatened NC Act) to occur. Further survey is warranted to fully describe the floristic composition and zonation within these habitats.

Cultural Perspectives: Mangrove communities provide an important cultural resource for hunting grounds and material resources such as timber firewood and construction. Little information is currently available on the cultural uses of mangroves and mangrove forests on Ugar and this warrants additional investigation.



Photograph 9. Mangroves on Ugar.

7.2.3 Management Implications

The extent of impact of feral cats and rats in the habitat is unknown. Recommendations for management and monitoring of mangrove ecosystems are identified in Burrows (2010) who indicates that a thorough knowledge of plants and animals of mangrove ecosystems is essential for understanding and monitoring changes expected with climate change and other human pressures. Further biological surveys are therefore warranted.

7.2.4 Summary of Recommended Management Actions

Table 9. Summary of management actions for mangrove habitats.

Management Category	Context/Issue	Actions	Priority
Fauna Surveys	Not subject to previous fauna survey.	Design and implement a structured fauna survey and trapping program supported by specialists. Maintain focus on culturally significant species and ethnotaxonomy to feed into TEK.	High
Plant Surveys	Information on flora composition is incomplete.	Carry out additional flora field surveys. Collect leaf specimens and photograph plants with known uses/values and that may have been used in the past, and catalogue.	Moderate
Threatened Species Management	<u>Flora</u> : No threatened species are currently known to occur within this habitat.	<u>Flora</u> : Undertake additional floristic survey to fully describe the floristic composition.	Moderate
	<u>Fauna</u> : Numerous migratory birds and a number of EVNT fauna species are known to utilise this habitat.	<u>Fauna</u> : Further baseline information required (see fauna surveys) before discrete management actions can be defined.	High
Traditional Ecological Knowledge	TEK within this habitat is poorly known and/ or documented. Plant and animal lists provided in the Appendices provide a good foundation for increasing TEK and ethnotaxonomy.	Collect and collate TEK through fauna and flora survey actions, and from interviews with elders on an ongoing basis.	High
Fire Management	No issues evident.	No actions.	No Action Required.
Invasive Species Management	<u>Flora</u> : Pond apple, which has been recorded on Horn Island, poses a low level threat to this habitat.	<u>Flora</u> : Undertake monitoring for invasive species on mangrove margins as well as on margins of intact forest patches. Monitoring on littoral margins should be undertaken in conjunction with general ranger (and rubbish clean up) duties.	Moderate
	<u>Fauna</u> : There is significant potential for impacts on fauna by feral cats and dogs.	<u>Fauna</u> : Composition of invasive fauna to be derived from ongoing fauna survey results. Assess cat and dog activity levels nocturnal spotlighting, and consultation with community members. Implement control where appropriate.	High
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 management responses formulated.	No formal monitoring of mangrove habitats is currently required and is considered low priority. General monitoring of habitat condition should be undertaken as a component of ranger activities.	Moderate
Other	Ghost Nests may occur on the margins of mangrove vegetation.	Carry out ongoing surveys for Ghost Nets along the coastline of Ugar.	Immediate
	Rubbish accumulation may be occurring on the landward margins of mangroves due to tidal action.	Undertake routine rubbish collection duties within these habitats.	Ongoing

7.3 Exotic Vegetation, Regrowth Vegetation and Cleared Areas

Bamboo, mango and a range of ornamental species are common on the island. These habitats mosaic with adjacent vine forest communities, either spreading from former traditional garden areas on margins, or as discrete groves within the forest. The spatial distribution of these exotic forest copses is provided in **Figure 5**. The historical record as reviewed by McNiven (2008) reveals the existence of bamboo groves throughout the Torres Strait, more specifically in the eastern islands in 1793, the western islands in 1845, and on Kirriri (Hammond) in 1867, with indications that groves continued to be established in the late nineteenth century. *Bambusa vulgaris* is the most likely bamboo to form the communities mapped in this exercise although a number of species are recorded for the region (see McNiven 2008). The native bamboo (*Neololeba atra* - listed as Near-Threatened under the NC Act) occurs in the Wet Tropics, Iron Range-McIlwraith and Lockerbie areas of north-eastern Queensland and also in Papua New Guinea and New Britain (Hyland *et al.* 2003). It is also known from other islands in Torres Strait such as Erub Mer, Naghir, Ugar and Iama, and from Badu and Mua Islands (Fell pers. obs.). The species is generally restricted to the understory and rainforest margins and does not form mappable communities.

Degraded habitats also host a considerable number of exotic weed species which have potential to spread to less disturbed habitats on Ugar. The majority of the 74 introduced species currently recorded on the island occur in degraded areas. The more problematic of these have been previously discussed in **Section 5.2.2**. A structured program of weed management planning, community awareness, and strategic control within the community areas is required to control the spread of these species throughout the island landscape.

There is a considerable quantity of regrowth vegetation that is mapped on Ugar. The composition of this vegetation, particularly in regard to threatened species, as well as exotic species, requires further investigation before discrete management actions can be defined. Although warranting further investigation, the general distribution of regrowth vine forest on Ugar is shown in **Figure 6**.

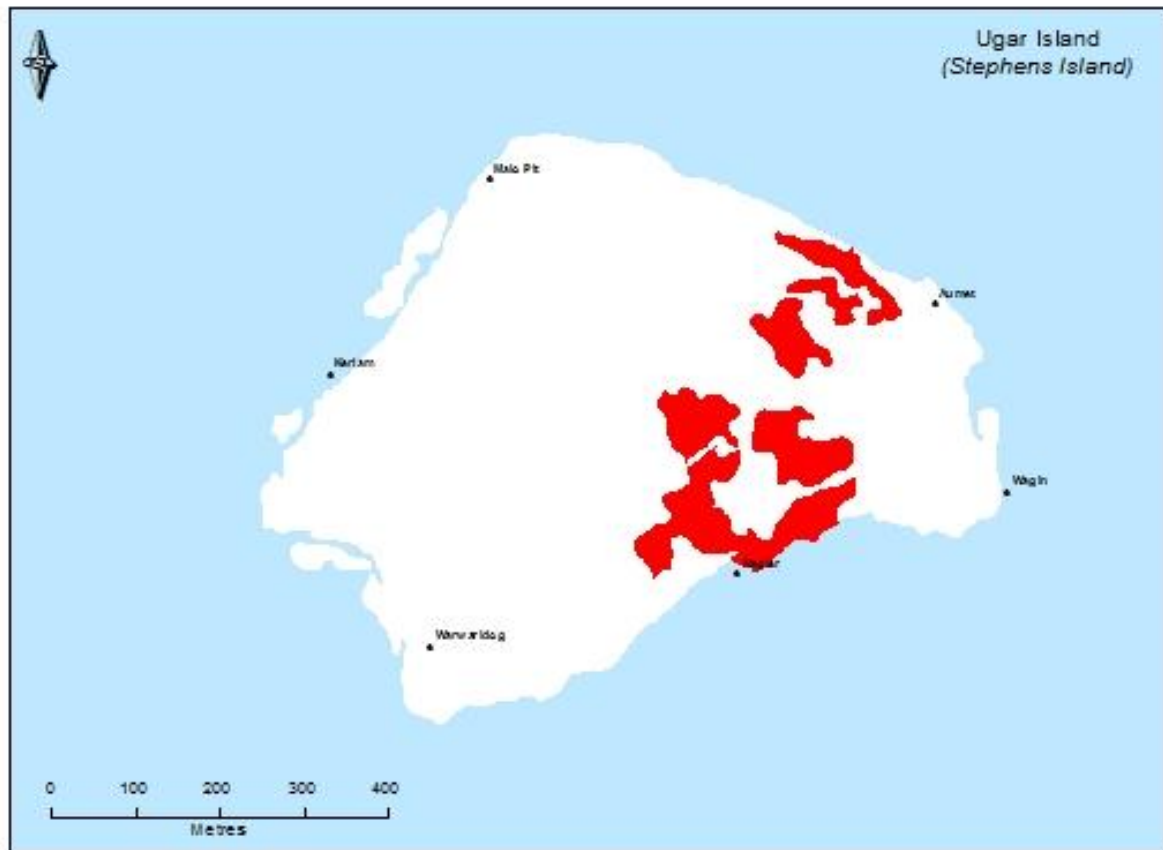


Figure 5. The location of bamboo thickets and other vegetation dominated by exotic species.

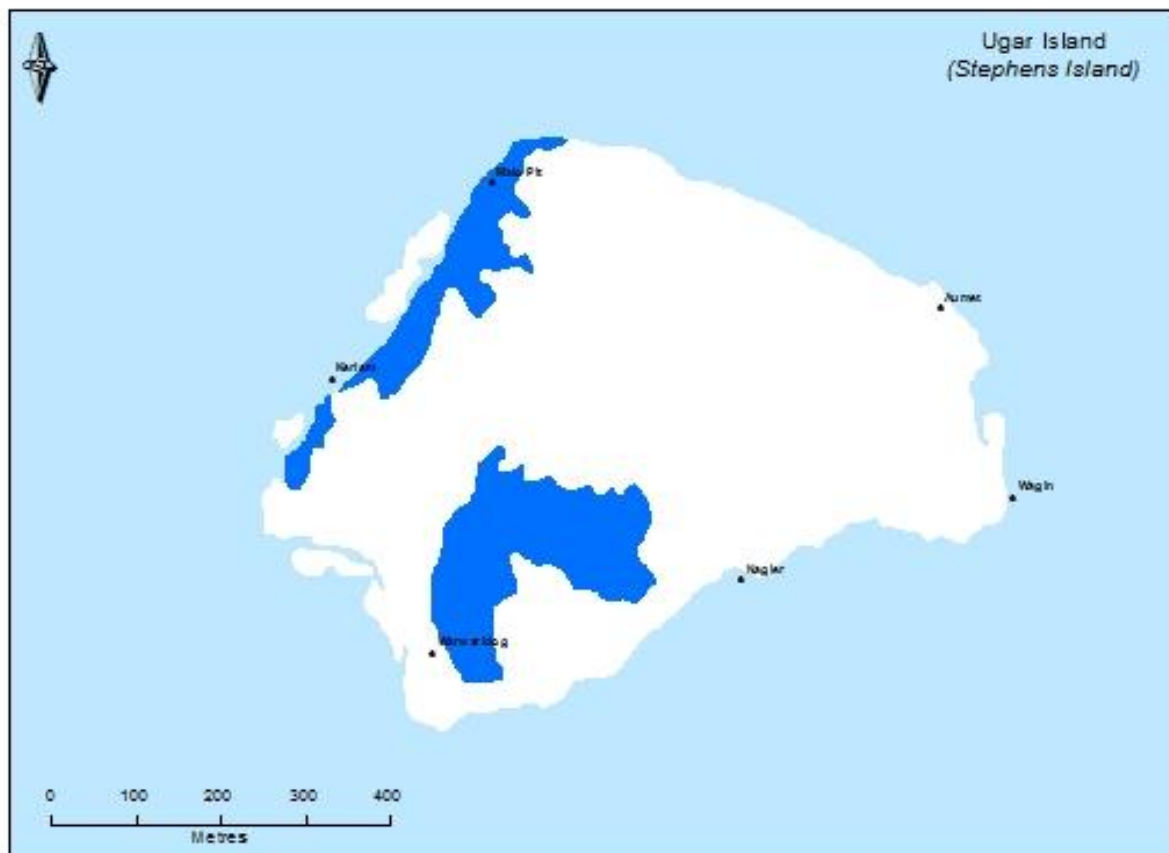


Figure 6. The location of regrowth vine forest and thicket.

8.0 References and Bibliography

- 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 (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.
- Borsboom, A. (2007). Nomination to re-classify the 'rare' *Varanus prasinus* to 'Near-Threatened' under the Nature Conservation Act 1992. *Biodiversity Sciences Environmental Sciences Division, Environmental Protection Agency*.
- Bostock, P.D. and Holland, A.E. (eds.) (2010). Census of the Queensland Flora 2010. *Queensland Herbarium, Department of Environment and Resource Management, Brisbane*.
- Bureau of Meteorology (BOM) (2008a). Rainfall Statistics, Recording Station 027008 – Erub 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*.
- Churchill, S. (2008). Australian bats. Second Edition. *Allen & Unwin, Crows Nest*.
- 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. (2004a). A record of the emerald monitor *Varanus prasinus* from Boigu Island, Torres Strait, Australia. *Herpetofauna*, **34**: 70-71.

- Clarke, R.H. (2004b). The avifauna of northern Torres Strait: Notes on a wet-season visit. *Australian Field Ornithology*, **21**: 49-66.
- 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
- Cogger, H.G. (2000). Reptiles & amphibians of Australia. *Reed New Holland, Sydney*.
- Conics 2008a. *Kubin environmental report: Torres Strait sustainable land use plan habitat and fauna assessment – Kubin Community, Moa Island*. Unpublished Report to Torres Strait Regional Authority.
- Conics 2008b. *St Pauls environmental report: Torres Strait sustainable land use plan habitat and fauna assessment – St Pauls Community, Moa Island*. Unpublished Report to Torres Strait Regional Authority.
- Conics 2008c. *Torres Strait Sustainable Land Use Plan Part 2 Boigu*. Unpublished Report to Torres Strait Regional Authority.
- Conics 2009a. *Badu environmental report: Torres Strait sustainable land use plan habitat and fauna assessment – Badu*. Unpublished Report to Torres Strait Regional Authority.
- Conics 2009b. *Erub Sustainable Land Use Plan: Part 2*. Unpublished Report to Torres Strait Regional Authority.
- Conics 2009c. *Iama Sustainable Land Use Plan: Part 2*. Unpublished Report to Torres Strait Regional Authority.
- Conics 2009d. *Mabuyag (Mabuiag Island) environmental report: Torres Strait sustainable land use plan habitat and fauna assessment – Mabuyag (Mabuiag Island)*. Unpublished Report to Torres Strait Regional Authority.
- Csurhes, S. (2008). Pest plant risk assessment Kudzu *Pueraria montana* var. *lobata*. Biosecurity Queensland, Department of Primary Industries and Fisheries, Brisbane, Queensland.
- 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*.
- DERM (2010a). Wildlife Online Extract. Latitude: 9.2622 Longitude: 142.2095 Distance: 6 km. *Department of Environment and Resource Management. Extracted 2 May 2012*.
- DERM (2010b). Wildlife Online Extract. Latitude: 9.5874 Longitude: 143.7703 Distance: 9 km. *Department of Environment and Resource Management. Extracted 18 October 2010*.
- DERM (2010c). Wildlife Online Extract. Latitude: 9.8999 Longitude: 142.7747 Distance: 12 km. *Department of Environment and Resource Management. Extracted 15 October 2010*.
- DERM (2010d). Wildlife Online Extract. Latitude: 9.9149 Longitude: 144.052 Distance: 25 km. *Department of Environment and Resource Management. Extracted 15 October 2010*.

- DERM (2010e). Wildlife Online Extract. Latitude: 9.9534 Longitude: 142.1817 Distance: 10 km. Department of Environment and Resource Management. Extracted 18 October 2010.
- DERM (2010f). Wildlife Online Extract. Latitude: 10.1846 Longitude: 142.266 Distance: 9 km. Department of Environment and Resource Management. Extracted 15 October 2010.
- DERM (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.
- DERM (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 Sustainability, Environment, Water, Population and Communities (DSEWPC) (2011). *Draft Threat Abatement Plan to Reduce Impacts on Northern Australia's Biodiversity by Five Listed Grasses*. Australian Government.
- Dickman, C.R., Pressey, C.L., Lim, L. & Parnaby, H.E. 1993. Mammals of particular conservation concern in the Western Division of New South Wales. *Biological Conservation*, **65**: 219-248.
- 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.
- Donnellan, S.C., Couper, P.J., Saint, K.M. & Wheaton, L. 2009. Systematics of the *Carlia 'fusca'* complex (Reptilia: Scincidae) from northern Australia. *Zootaxa*, **2227**: 1-31.
- 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>.
- Duncan, A., Barker, G.B. & Montgomery, N. (1999). The action plan for Australian bats. Environment Australia, Canberra.

- Ehmann, H. (1992). Encyclopedia of Australian animals: Reptiles. *Angus and Robertson, Sydney*.
- EPA (2007). *Nature conservation (Estuarine Crocodile) plan 2007 and management program 2007-2017*. Environmental Protection Agency, Queensland.
- 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., Lifu M., McIntyre-Tamwoy S., Roberts C., Leung L., Lynch A.J.J., Charlie B. and Lifu T. (2009). *Significant Species and Habitats of Greater Lockerbie Scrub, Cape York Peninsula, Queensland*. Unpublished report to the Queensland Government Department of Environment and Resource Management, Brisbane.
- 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.
- Fukuda, Y., Whitehead, P. & Boggs, G. (2007). Broad-scale environmental influences on the abundance of saltwater crocodiles (*Crocodylus porosus*) in Australia. *Wildlife Research*, **34**: 167-176.
- 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*.
- Greene, H.W. 1986. Diet and arboreality in the emerald monitor, *Varanus prasinus*, with comments on the study of adaptation. *FIELDIANA Zoology NEW SERIES*, No. **31**. Publication 1370.
- Haddon, A.C. (ed.) (1901-1935). *Reports of the Cambridge Anthropological Expedition to Torres Straits*. 6 Volumes. *Cambridge University Press, Cambridge*.
- Haddon, A.C. (1908). Religion. Pp. 241-280. In Haddon, A.C. (ed.) *Reports of the Cambridge Anthropological Expedition to Torres Straits. Volume 6: Sociology, Magic and Religion of the Eastern Islanders*. Cambridge: Cambridge University Press.
- Haddon, A.C. (1912a). Food and its preparation and narcotics. In A.C. Haddon (ed.), *Reports of the Cambridge Anthropological Expedition to Torres Straits. Volume 4: Arts and Crafts*, pp. 130-143. 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.
- Haddon, A.C. (1912c). Science. Pp. 218-237. In Haddon, A.C. (ed.) *Reports of the Cambridge Anthropological Expedition to Torres Straits. Volume 4: Arts and Crafts*. Cambridge: Cambridge University Press.
- Haddon, A.C. & Rivers, W.H.R. (1904). Totemism. Pp. 153-193. In Haddon, A.C. (ed.) *Reports of the Cambridge Anthropological Expedition to Torres Straits. Volume 5: Sociology, Magic and Religion of the Western Islanders*. Cambridge: Cambridge University Press.
- Heatwole, H. (1975). Biogeography of reptiles on some of the islands and cays of eastern Papua-New Guinea. *Atoll Research Bulletin*, No. **180**.
- Hediger, H. (1933-34). Beitrag zur herpetologie und zoogeographie neu Britanniens und einiger umliegender Gebiete. *Jahrbücher*, **65**: 441-582.
- 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*.
- 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*.
- 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.
- Ingram, G.J. (2008). The terrestrial vertebrates of Mua, western Torres Strait. *Memoirs of the Queensland Museum, Cultural Heritage Series*, 4: 619-628.
- IUCN (2012), *Global Invasive Species Database – Leucaena*. Available at: <http://www.issg.org/database>.
- Kushlan, J.A. & Hancock, J. (2005). Herons. *Oxford University Press, Oxford*.
- Landsberg, J. and Clarkson, J. R. (2004). Threatened Plants of Cape York Peninsula. Queensland Parks and Wildlife Service, Environmental protection Agency, Cairns.
- 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*.
- Maddock, M. (2000). 'Herons 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). *Herons, egrets and bitterns: Their biology and conservation in Australia*. CSIRO Publishing, Collingwood.
- Menkhorst, P.W. & Knight, F. (2004). *A field guide to the mammals of Australia*. *Oxford University Press, Melbourne*.
- NRMCANZ - Natural Resource Ministerial Council of Australia and New Zealand (2011). Weeds of National Significance WONS Lantana (*Lantana camara*) Strategic Plan. *Australian Weeds Committee, Launceston*.
- 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>.

- Natural Solutions 2008a. *Torres Strait Sustainable Land Use Plan Habitat and Fauna Assessment – Erub (Darnley) Island*. Natural Solutions Environmental Consultants Pty Ltd. Report prepared for the Torres Strait Regional Authority.
- Natural Solutions 2008b. *Torres Strait Sustainable Land Use Plan Habitat and Fauna Assessment – Iama Island*. Natural Solutions Environmental Consultants Pty Ltd. Report prepared for the Torres Strait Regional Authority.
- Neldner, V.J. and Clarkson, J.R. (1995). *Vegetation Survey Mapping of Cape York Peninsula*. In: *Cape York Peninsula Land Use Strategy*. Office of the Co-ordinator General and Department of Environment and Heritage, Government of Queensland, Brisbane.
- 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.
- 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.
- Queensland Government (2012). *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.
- Read, M.A., Miller, J.D., Bell, I.P. & Felton, A. (2004). *The distribution and abundance of the estuarine crocodile, Crocodylus porosus, in Queensland*. *Wildlife Research*, **31**: 527-534.
- Reid, T. & Park, P. (2003). *Continuing decline of eastern curlew, Numenius madagascariensis, in Tasmania*. *Emu*, **103**: 279-283.
- Richards, G.C. (2008). 'Coastal Sheath-tailed Bat *Taphozous australis*,' in *The mammals of Australia*, Third Edition. eds. S. Van Dyck, & R. Strahan, Reed New Holland, Sydney.
- Rossiter N. A., Setterfield. S. A., Douglas, M.M. and Hutley, L. B. (2003). *Testing the fire grass cycle: alien grass invasion in the tropical savannas of northern Australia*. *Diversity and Distributions* **9**, 169-176.
- RPS, 2010. *Ugar environmental report: Torres Strait sustainable land use plan habitat and fauna assessment – Badu*. Unpublished Report to Torres Strait Regional Authority.
- Shine, R. 2010. *The ecological impact of invasive cane toads (Bufo marinus) in Australia*. *Quarterly Review of Biology*, **85**: 253-291.
- 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.
- Storr, G.M. (1973). List of Queensland birds. *Western Australian Museum Special Publication No. 5*.
- Taylor, I.R. & Bester, A. (1999). The response of foraging waders to human recreation disturbance at Rhyll, Phillip Island, Victoria. *Stilt*, **35**: 67.

- 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.
- Warham, J. (1962). *Bird islands within the Barrier Reef and Torres Strait. Emu*, **62**: 99-111.
- Watson, J.J. (2009). *Terrestrial vertebrate fauna of the Pulu Indigenous Protected Area, Torres Strait. Report to Arafura Consulting.*
- Watson, J.J. & Hitchcock, G. in prep: *The terrestrial vertebrate fauna of Mabuyag*. Memoirs of the Queensland Museum, Cultural Heritage Series.
- Webb, G.J.W., Sack, G.C., Buckworth, R. & Manolis, S.C. (1983). *An examination of Crocodylus porosus nests in two Northern Australian freshwater swamps, with an analysis of embryo mortality. Australian Wildlife Research*, **10**: 571-605.
- Whittier, J.M. & Moeller, D.R. (1993). *Varanus prasinus (the emerald goanna) on Moa Island, Torres Strait, Australia. Memoirs of the Queensland Museum*, **34**: 130.
- Wilson, S. (2005). *A field guide to reptiles of Queensland*. Reed New Holland, Sydney.
- Wilson, S. & Swan, G. (2010). *A complete guide to reptiles of Australia*. Third Edition. New Holland Publishers, Sydney.
- Wink, M., Sauer-Gürth, H. & Witt, H.-H. (2004). 'Phylogenetic differentiation of the osprey *Pandion haliaetus* inferred from nucleotide sequences of the mitochondrial cytochrome b gene.' in *Raptors Worldwide*, eds. R.D. Chancellor & B., U. Meyberg, WWGBP/MME, Budapest.

9.0 Glossary

Alluvium/ Alluvial: Sediments deposited by the action of flowing water, generally derived from the action of rivers or from wash of hillslopes.

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. Cotton Tree *Bombax ceiba*).

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

Endemic: A plant or animal that has at least 75% of its known range within a bioregion or which has a total range of 100,000 square km or less (Commonwealth of Australia 1995).

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

Holocene: The current geological epoch, which began approximately 11 thousand years ago. Between five thousand years ago and the present 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 the Pleistocene and Holocene epochs.

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.

Appendices

Appendix A. Queensland Government 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. Preliminary Flora Species List – Ugar Island, Torres Strait, Queensland.

DG Fell 3D Environmental

- Nomenclature follows Bostock & Holland (2010) 'Census of the Queensland Flora' (N denotes naturalised and C denotes common species).
- 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.
- Sources: BRI (Qld Herbarium extract 2011); ATH (Australian Tropical Herbarium extract 2012); DAFF (Stephen McKenna 2012); 3DE (DGFell June 2012).
- 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 2012).
- Includes selected native non-indigenous plants and naturalised plants found in village areas.

SUMMARY

- 195 species (1 ferns, 1 cycad, 193 angiosperms).
- 116 native (59%).
- 79 naturalised (41%).
- 68 families (11 wholly naturalised).
- 174 genera (63 wholly naturalised).
- 1 species threatened at state level (NC Act).
- 8 species regionally significant.
- Dominant families (native species): Fabaceae (11 species); Poaceae (7 species); Euphorbiaceae, Moraceae, Myrtaceae (4 species).
- Local/cultural significance 45 (22%).

Family	Botanical Name	Status	Decid Vine forest	Mangrove	Strand margins	Non-R	BRI (2011)	ATH (2011)	DAFF (2012)	3DE (June 2012)	DGF Photo June 12	Phenology June 12	Uses
Pteridophytes (Ferns & Fern Allies)													
Adiantaceae	<i>Pityrogramma calomelanos*</i>	N				1			1				
Cycadaceae	<i>Cycas scrathchleyana</i>	C^	1							1			belief
Angiosperms (Flowering Plants)													
Acanthaceae	<i>Achyranthes aspera</i>	C	1			1				1		Ft	
	<i>Asystasia australasica</i>	C	1			1				1			
	<i>Asystasia gangetica</i> subsp. <i>gangetica*</i>	N				1				1		Flw	
	<i>Pseuderanthemum variabile</i>	C	1			1				1		Flw	
	<i>Ruellia tuberosa*</i>	N				1			1	1			
Agavaceae	<i>Agave sislana*</i>	N^	1			1				1	1		material
	<i>Pleomele angustifolia</i>	C	1			1				1		Flw	
Amaranthaceae	<i>Alternanthera brasiliana*</i>	N				1			1	1	1	Flw	
	<i>Amaranthus viridis*</i>	N				1			1				
	<i>Celosia argentea*</i>	N				1			1	1		Flw	
Amaryllidaceae	<i>Crinum pedunculatum</i>	C				1				1			
Anacardiaceae	<i>Mangifera indica*</i>	N^				1				1			Food
	<i>Semecarpus australiensis</i>	C	1							1			
Annonaceae	<i>Uvaria rufa</i>	C^	1							1			Food
Apocynaceae	<i>Catharanthus roseus*</i>	N				1			1	1		Flw	
	<i>Cynanchum leptolepis</i>	C	1							1			
	<i>Marsdenia velutina</i>	C								1v	1		
	<i>Wrightia versicolor</i>	C	1										
Araceae	<i>Amorphophallus paeoniifolius</i>	C#	1			1				1	1	Ft	
	<i>Priophys amboinensis</i>	C	1							1	1		
Araliaceae	<i>Polyscias macgillivraei</i>	C^	1			1				1	1	Flw	Material
Arecaceae	<i>Cocos nucifera*</i>	N^			1	1				1	1		Food, Material
Asteraceae	<i>Blainvillea dubia</i>	C				1							
	<i>Cosmos caudatus*</i>	N				1				1		Ft	
	<i>Cyanthileum cinereum*</i>	N				1			1	1		Flw	
	<i>Eleutheranthera ruderalis*</i>	N				1			1	1		Flw	
	<i>Emilia sonchifolia*</i>	N				1			1	1			
	<i>Sphagneticola trilobata*</i>	Class 3				1				1			
	<i>Synedrella nodiflora*</i>	N				1			1	1		Flw	
Asteraceae	<i>Tithonia diversifolia*</i>	N				1			1	1	1	Flw	
	<i>Tridax procumbens*</i>	N^				1			1	1		Flw	Medicinal, decorative
	<i>Wallastonia biflora</i>	C			1	1				1			
Avicenniaceae	<i>Avicennia marina</i> var. <i>australasica</i>	C^		1						1			Material

Family	Botanical Name	Status	Decid Vine forest	Mangrove	Strand margins	Non-R	BRI (2011)	ATH (2011)	DAFF (2012)	3DE (June 2012)	DGF Photo June 12	Phenology June 12	Uses
Bombacaceae	<i>Bombax ceiba</i> var. <i>leiocarpum</i>	C^	1							1	1		Material
Boraginaceae	<i>Argusia argentea</i>	C			1					1	1	Buds	
	<i>Cordia dichotoma</i>	C^	1										Material
	<i>Cordia myxa</i> *	N				1				1v			
	<i>Cordia subcordata</i>	C	1		1	1				1		Flw, ft	Material
Burseraceae	<i>Canarium australianum</i>	C	1							1			
	<i>Garuga floribunda</i> var. <i>floribunda</i>	C^	1										Food - fruit
Caesalpiniaceae	<i>Caesalpinia bonduc</i>	C	1		1					1		Ft	
	<i>Delonix regia</i> *	N^	1			1			1	1			Aesthetic, decorative
	<i>Lysiphyllum binatum</i>	C	1		1					1	1		
	<i>Senna tora</i> *	N				1							
Capparaceae	<i>Capparis lucida</i>	C	1			1				1			
	<i>Capparis quiniflora</i>	C	1							1			
	<i>Capparis sepiaria</i>	C	1			1				1			
Caricaceae	<i>Carica papaya</i> *	N^				1				1			Food
Clusiaceae	<i>Calophyllum inophyllum</i>	C	1		1	1				1			
	Cluisaceae 1 (DGF June 12, milky sap)	C	1							1v	1	Flw	
	Clusiaceae 2 (DGF June 12, shoreline)	C	1		1					1v	1	Flw	
Combretaceae	<i>Quisqualis indica</i> *	N				1			1	1			
	<i>Terminalia cattapa</i>	C^	1		1	1				1			Food
	<i>Terminalia muelleri</i>	C^	1							1		Flw	Food
Commeliniaceae	<i>Commelina bengalensis</i> *	N	1			1			1	1	1	Flw	
Convolvulaceae	<i>Ipomoea hederifolia</i> *	N				1			1	1	1	Flw	
	<i>Ipomoea macrantha</i>	C	1			1				1			
	<i>Ipomoea pers-capre</i> subsp. <i>brasiliensis</i>	C^			1	1				1		Flw	Material
	<i>Ipomoea quamoclit</i> *	N				1			1				
	<i>Xenostegia tridentata</i>	C				1				1			
Crassulaceae	<i>Bryophyllum pinnatum</i> * (cultivated)	N				1							
Cucurbitaceae	Cucurbitaceae (DGF June 12)	C^	1			1				1		Ft	food
Cyperaceae	<i>Cyperus compressus</i>	C				1							
	<i>Cyperus rotundus</i> *	N				1			1	1			
	<i>Fimbristylis littoralis</i>	C				1							
Dioscoreaceae	<i>Dioscorea esculenta</i> *	N^	1			1				1			Food
Ebenaceae	<i>Diospyros compacta</i>	C	1							1			
	<i>Diospyros hebecarpa</i>	C	1							1			
	<i>Diospyros maritima</i>	C	1							1			
Euphorbiaceae	<i>Acalypha lanceolata</i>	C				1							
	<i>Chamaesyce hirta</i> *	N				1			1	1			
	<i>Chamaesyce prostrata</i> *	N				1			1				
	<i>Euphorbia heterophylla</i> *	N	1			1			1	1			

Family	Botanical Name	Status	Decid Vine forest	Mangrove	Strand margins	Non-R	BRI (2011)	ATH (2011)	DAFF (2012)	3DE (June 2012)	DGF Photo June 12	Phenology June 12	Uses
	<i>Euphorbia plumerioides</i> var. <i>plumerioides</i>	C#	1		1					1v	1	Flw	
	<i>Macaranga tanarius</i>	C^	1			1				1			Material
	<i>Mallotus philippinensis</i>	C	1							1			
	<i>Manihot esculenta</i> *	N^				1				1			Food
Fabaceae	<i>Abrus precatorius</i>	C^	1			1				1			Material
	<i>Alysicarpus vaginalis</i> *	N				1			1	1			
	<i>Canavalia papuana</i>	C	1			1				1		Flw	
	<i>Centosema molle</i> *	N				1				1		Flw	
	<i>Clitoria ternatea</i> *	N				1			1	1		Flw	
	<i>Desmodium scorpiurus</i> *	N				1			1	1		Ft	
	<i>Desmodium tortuosum</i> *	N				1			1	1		Ft	
	<i>Desmodium triflorum</i>	C				1			1				
	<i>Entada rheedii</i>	C^	1							1	1		Material
	<i>Indigofera tinctoria</i> *	N				1			1	1			
	<i>Leucas decemdentata</i>	C				1							
	<i>Milletia pinnata</i>	C	1		1	1				1	1		
	<i>Mucuna gigantea</i>	C	1							1		Flw	
	<i>Mucuna pruriens</i> var. <i>utilis</i> *	N				1				1			
	<i>Pueraria montana</i> var. <i>lobata</i> *	N^				1			1	1	1		Food
	<i>Rynchosia</i> sp. (yellow flw. DGF June 12)	C	1			1				1v		flw	
	<i>Sesbania cannabina</i>	C				1				1		Ft	
	<i>Stylosanthes hamata</i> *	N				1			1	1			
	<i>Stylosanthes humilis</i> *	N				1			1	1			
	<i>Tephrosia</i> sp. (Muddy Bay P.I.Forster+ PIF15313)	C#				1							
	<i>Teramnus labialis</i> *	N				1							
	<i>Vigna radiata</i> var. <i>sublobata</i>	C			1	1					1	flw	
Flacourtiaceae	<i>Flacourtia</i> sp. (Shiptons Flat L.W.Jessup+ GJD3200)	C#	1							1v	1		
Flagellariaceae	<i>Flagellaria indica</i>	C^	1							1			Material
Goodeniaceae	<i>Scaevola taccada</i>	C^			1					1			Beleif
Hernandiaceae	<i>Gyrocarpus americanus</i> var. <i>americanus</i>	C	1							1	1		
Lamiaceae	<i>Anisomeles malabrica</i>	C				1				1		Flw	
	<i>Clerodendrum floribundum</i>	C	1										
	<i>Clerodendrum longiflorum</i> var. <i>glabrum</i>	C	1							1v	1	Flw	
	<i>Hyptis suaveolens</i> *	N				1			1	1			
Lauraceae	<i>Litsea glutinosa</i>	C	1							1			
Lecythidaceae	<i>Barringtonia asiatica</i>	C			1					1			
	<i>Barringtonia calyptata</i>	C	1			1				1			
Malvaceae	<i>Abutilon albescens</i>	C			1								

Family	Botanical Name	Status	Decid Vine forest	Mangrove	Strand margins	Non-R	BRI (2011)	ATH (2011)	DAFF (2012)	3DE (June 2012)	DGF Photo June 12	Phenology June 12	Uses
	<i>Gossypium australe</i> *	N^				1				1			Material
	<i>Hibiscus tiliaceus</i>	C^			1					1	1	Flw	Material
	<i>Malvastrum coromandelianum</i> subsp. <i>coromandelianum</i> *	N				1			1	1		Flw	
	<i>Sida acuta</i> *	N				1			1	1			
	<i>Sida rhombifolia</i> *	N				1			1	1			
	<i>Thespesia populneoides</i>	C^			1					1	1		Material
Meliaceae	<i>Aglaia eleagnoidea</i>	C	1							1		Buds	
Meliaceae	<i>Xylocarpus moluccensis</i>	C		1	1					1	1v	Flw, ft	
Menispermaceae	<i>Tinospora smilacina</i>	C	1							1	1		
Mimosaceae	<i>Acacia polystachya</i>	C^				1				1		Flw	Material
	<i>Albizia lebbek</i>	C				1							
	<i>Cathormion umbellatum</i> subsp. <i>moniliforme</i>	C			1					1		Ft	
	<i>Leucaena leucocephala</i> subsp. <i>leucocephala</i> *	N				1			1	1	1	Flw, ft	
Moraceae	<i>Antiaris toxicaria</i> var. <i>macrophylla</i>	C	1							1	1		
	<i>Ficus opposita</i>	C^	1							1	1		Material
	<i>Ficus virens</i> subsp. <i>sublanceolata</i>	C	1			1				1			
	<i>Trophis scandens</i> subsp. <i>scandens</i>	C	1							1			
Musaceae	<i>Musa</i> sp.*	N^				1				1	1		Food
Myristicaceae	<i>Myristica insipida</i> var. <i>insipida</i>	C	1							1			
Myrtaceae	<i>Eugenia reinwardtiana</i>	C^	1							1	1		Food
	<i>Syzygium aquem</i>	Cult.^				1							Food
	<i>Syzygium branderhorstii</i>	Cult.^	1			1				1			Food
	<i>Syzygium suborbiculare</i>	C^				1				1			Food
Nyctaginaceae	<i>Boerhavia mutabilis</i>	C			1	1							
Olcaceae	<i>Ximenia amerciana</i>	C^			1					1			Food
Passifloraceae	<i>Passiflora foetida</i> *	N^	1			1			1	1			Food
	<i>Passiflora suberosa</i> *	N	1			1			1	1	1	Ft	
Phyllanthaceae	<i>Breynia cernua</i>	C	1			1				1	1		
	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>	C^	1			1				1			Food
	<i>Phyllanthus amarus</i> *	N				1			1	1			
	<i>Phyllanthus novae-hollandaei</i>	C	1							1			
Phytolocaceae	<i>Rivina humilis</i> *	N	1			1			1	1	1	Ft	
Poaceae	<i>Axonopus compressus</i> *	N				1			1	1			
	<i>Bambusa</i> sp.*	N^				1				1	1		Material
	<i>Bothriochloa bladhii</i>	C				1				1		Flw	
	<i>Bothriochloa pertusa</i> *	N				1				1		Flw	
	<i>Cenchrus brownii</i> *	N				1							
	<i>Cenchrus echinatus</i> *	N				1			1	1			
	<i>Chloris inflata</i> *	N				1			1	1		Flw	

Family	Botanical Name	Status	Decid Vine forest	Mangrove	Strand margins	Non-R	BRI (2011)	ATH (2011)	DAFF (2012)	3DE (June 2012)	DGF Photo June 12	Phenology June 12	Uses
	<i>Chrysopogon aciculatus</i> *	N				1			1	1			
	<i>Dactyloctenium aegyptium</i> *	N				1			1	1		Flw	
	<i>Digitaria bicornis</i>	C				1						Flw	
	<i>Digitaria ciliaris</i> *	N				1			1	1		Flw	
	<i>Echinochloa colona</i> *	N				1			1	1			
	<i>Eleusine indicus</i> *	N				1			1	1			
	<i>Eragrostis tenella</i> *	N				1			1	1			
	<i>Heteropogon contortus</i>	C				1				1			
	<i>Imperata cylindrica</i>	C^				1				1			Material
	<i>Megathyrsus maximus</i> var. <i>maximus</i> *	N				1			1	1	1	Flw	
	<i>Melinis repens</i> *	N				1				1		Flw	
	<i>Neololeba atra</i> (Near-Threatened)	NT^	1							1			Material
	<i>Oplismenus</i> sp.	C	1							1		Flw	
	<i>Rottboellia cochinchinensis</i> *	N				1				1			
	<i>Sporobolus virginicus</i>	C			1					1			
	<i>Urochloa mutica</i> *	N		1									
Portulacaceae	<i>Portulaca oleracea</i> *	N		1					1				
	<i>Portulaca pilosa</i> *	N		1					1				
	<i>Trianthema portulacastrum</i> *	N		1									
Putrangivaceae	<i>Drypetes deplanchei</i>	C	1							1			
Rhamnaceae	<i>Colubrina asiatica</i>	C			1					1		Buds	
Rhizophoraceae	<i>Rhizophora apiculata</i>	C^		1						1	1	Flw	Material
Rubiaceae	<i>Guettarda speciosa</i>	C^			1					1	1	Ft	Material
	<i>Morinda citrifolia</i>	C^	1			1				1		Ft	Medicinal
	<i>Oldenlandia corymbosa</i> var. <i>corymbosa</i> *	N				1			1	1			
	<i>Psychotria nesophila</i>	C	1							1		Ft	
Rutaceae	<i>Allophylus cobbe</i>	C	1										
	<i>Glycosmis trifoliata</i>	C	1							1v		Flw	
	<i>Micromelum minutum</i>	C	1							1	1		
Sapindaceae	<i>Cupaniopsis anacardioides</i>	C	1							1			
Sapotaceae	<i>Manilkara kauki</i>	C^	1			1				1	1	Ft	Food, material
	<i>Mimusops elengii</i>	C	1							1			
Simaroubiaceae	<i>Harrisonia brownie</i>	C	1							1			
Smilacaceae	<i>Smilax australis</i>	C	11							1			
Solanaceae	<i>Capsicum annuum</i> var. <i>glabriuscula</i> *	N^				1			1				Food
	<i>Physalis angulata</i> *	N^				1			1	1			Food
	<i>Solanum nodiflorum</i> *	N				1			1				
Sparrmanniaceae	<i>Corchorus aestuans</i>	C				1				1		Flw	
Surianaceae	<i>Suriana maritima</i>	C								1	1		
Ulmaceae	<i>Celtis philippinensis</i>	C	1							1			

Family	Botanical Name	Status	Decid Vine forest	Mangrove	Strand margins	Non-R	BRI (2011)	ATH (2011)	DAFF (2012)	3DE (June 2012)	DGF Photo June 12	Phenology June 12	Uses
Verbenaceae	<i>Lantana camara</i> *	Decl. Class 3				1			1	1		Flw	
	<i>Stachytarpheta jamaicensis</i> *	N				1			1	1		Flw	
Vitaceae	<i>Cissus</i> sp. (simple leaf DGF June 12)	C	1							1v			

Appendix C. Fauna of Ugar Island, Torres Strait, Qld.

Species list compiled by Terry Reis (Natural Resource Assessments, Cairns).

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			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 & published record (RPS, 2010).
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		LC		
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 EPBC Protected Matters Search Tool
Gekkonidae	<i>Cyrtodactylus lousiadensis</i>	ring-tailed gecko		LC		
Gekkonidae	<i>Gehyra baliola</i>	short-tailed dtella		LC		
Gekkonidae	<i>Gehyra dubia</i>	dubious dtella		LC		Published record (RPS, 2010)
Gekkonidae	<i>Gehyra variegata</i>	tree dtella		LC		
Gekkonidae	<i>Hemidactylus frenatus</i>	house gecko		I		Published record (RPS, 2010)
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			Ugar
			EPBC Act	NC Act	BoT	
Gekkonidae	<i>Pseudothecadactylus 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		Published record (RPS, 2010)
Scincidae	<i>Carlia Macfarlani</i>	closed-litter rainbow-skink		LC		Published record (RPS, 2010)
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		Published record (RPS, 2010)
Scincidae	<i>Cryptoblepharus virgatus</i>	cream-striped shinning-skink		LC		Published record (RPS, 2010)
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		Published record (RPS, 2010)
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		Published record (RPS, 2010)
Scincidae	<i>Glaphyromorphus crassicaudus</i>	cape york mulch-skink		LC		Published record (RPS, 2010)
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		Published record (RPS, 2010)
Varanidae	<i>Varanus mertensi</i>	Mertens' water monitor		LC		
Varanidae	<i>Varanus panoptes</i>	yellow-spotted monitor		LC		
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		

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
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 lathamii</i>	Australian brush-turkey		LC		
Megapodiidae	<i>Megapodius reinwardt duperryi</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		
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</i>	Australasian grebe		LC		

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
	<i>novaehollandiae</i>					
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 record
Columbidae	<i>Ptilinopus magnificus</i>	wompoo fruit-dove		LC		
Columbidae	<i>Ptilinopus superbus</i>	superb fruit-dove		LC		
Columbidae	<i>Ptilinopus regina</i>	rose-crowned fruit-dove		LC		WildNet & published records (RPS, 2010).
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		
Columbidae	<i>Lopholaimus antarcticus</i>	topknot pigeon		LC		
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		
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		
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		
Ardeidae	<i>Ardea intermedia</i>	intermediate egret		LC		WildNet & published record (RPS, 2010)

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
Ardeidae	<i>Ardea sumatrana</i>	great-billed heron		LC		
Ardeidae	<i>Ardea ibis</i> ⁷	cattle egret	M	LC		
Ardeidae	<i>Butorides striata</i>	striated heron		LC		WildNet & published record (RPS, 2010)
Ardeidae	<i>Egretta picata</i>	pied heron		LC		
Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		LC		
Ardeidae	<i>Egretta garzetta</i>	little egret		LC		
Ardeidae	<i>Egretta sacra</i>	eastern reef egret	M	LC		WildNet & published record (RPS, 2010)
Ardeidae	<i>Nycticorax caledonicus</i>	nankeen night-heron		LC		
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		
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 & RPS 2010.
Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		LC		
Accipitridae	<i>Haliastur indus</i>	brahmyn kite		LC		
Accipitridae	<i>Milvus migrans</i>	black kite		LC		
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		
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 & published record (RPS, 2010)
Gruidae	<i>Grus rubicunda</i>	brilga		LC		.
Rallidae	<i>Porphyrio porphyrio</i>	purple swamphen		LC		
Rallidae	<i>Eulabeornis castaneiventris</i>	chestnut rail		LC		
Rallidae	<i>Rallina tricolor</i>	red-necked crake		LC		

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
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>Amaurornis cinerea</i>	white-browed crake		LC		
Rallidae	<i>Amaurornis moluccana</i>	pale-vented bush-hen		LC		
Rallidae	<i>Amaurornis olivaceus</i>	bush-hen		LC		Published record (RPS, 2010)
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	
Haematopodidae	<i>Haematopus longirostris</i>	Australian pied oystercatcher		LC		
Haematopodidae	<i>Haematopus fuliginosus</i>	sooty oystercatcher		NT		
Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt		LC		Published record (RPS, 2010)
Charadriidae	<i>Pluvialis fulva</i>	pacific golden plover	M	LC		Published record (RPS, 2010)
Charadriidae	<i>Pluvialis squatarola</i>	grey plover	M	LC		
Charadriidae	<i>Charadrius ruficapillus</i>	red-capped plover		LC		
Charadriidae	<i>Charadrius bicinctus</i>	double-banded plover	M	LC		
Charadriidae	<i>Charadrius mongolus</i>	lesser sand plover	M	LC		WildNet & published records (RPS, 2010)
Charadriidae	<i>Charadrius leschenaultii</i>	greater sand plover	M	LC		WildNet & published records (RPS, 2010)
Charadriidae	<i>Erythronyx cinctus</i>	red-kneed dotterel		LC		
Charadriidae	<i>Vanellus miles</i>	masked lapwing		LC		WildNet & published records (RPS, 2010)
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 (RPS, 2010)
Scolopacidae	<i>Numenius minutus</i>	little curlew	M	LC		
Scolopacidae	<i>Numenius phaeopus</i>	whimbrel	M	LC		
Scolopacidae	<i>Numenius madagascariensis</i>	eastern curlew	M	NT		
Scolopacidae	<i>Xenus cinereus</i>	terek sandpiper	M	LC		
Scolopacidae	<i>Actitis hypoleucos</i> ⁹	common sandpiper	M	LC		.
Scolopacidae	<i>Tringa brevipes</i> ¹⁰	grey-tailed tattler	M	LC		Published record (RPS, 2010)
Scolopacidae	<i>Tringa incana</i> ¹¹	wandering tattler	M	LC		
Scolopacidae	<i>Tringa nebularia</i>	common greenshank	M	LC		Published record (RPS, 2010)
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		

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
Scolopacidae	<i>Calidris tenuirostris</i>	great knot	M	LC		
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		Published records (RPS, 2010)
Scolopacidae	<i>Calidris melanotos</i>	pectoral sandpiper	M	LC		
Scolopacidae	<i>Calidris acuminata</i>	sharp-tailed sandpiper	M	LC		
Scolopacidae	<i>Calidris ferruginea</i>	curlew sandpiper	M	LC		
Sulidae	<i>Sula leucogaster</i>	brown booby	M	LC		WildNet
Turnicidae	<i>Turnix maculosus</i>	red-backed button-quail		LC		
Turnicidae	<i>Turnix pyrrhorostris</i>	red-chested button-quail		LC		
Glareolidae	<i>Glareola maldivarum</i>	oriental pratincole	M	LC		
Glareolidae	<i>Stiltia isabella</i>	Australian pratincole		LC		
Laridae	<i>Anous stolidus</i>	common noddy	M	LC		
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	WildNet 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		
Laridae	<i>Sterna striata</i>	white-fronted tern		LC		
Laridae	<i>Sterna sumatrana</i>	black-naped tern	M	LC		
Laridae	<i>Sterna hirundo</i>	common tern	M	LC		
Laridae	<i>Thalasseus bengalensis</i> ¹⁵	lesser crested tern	M	LC		WildNet record
Laridae	<i>Thalasseus bergii</i>	crested tern		LC		WildNet & published record (RPS, 2010)
Laridae	<i>Chroicocephalus novaehollandiae</i>	silver gull		LC		
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 species</i>	fig-parrot species				
Psittacidae	<i>Eclectus roratus polychloros</i>	eclectus parrot		LC		

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
Psittacidae	<i>Geoffroyus geoffroyi aruenesis</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		
Cuculidae	<i>Chalcites basalus</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 (RPS, 2010)
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		
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 & published records (RPS, 2010)
Halcyonidae	<i>Todiramphus chloris</i>	collared kingfisher		LC		
Meropidae	<i>Merops ornatus</i>	rainbow bee-eater	M	LC		
Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		LC		
Pittidae	<i>Pitta erythrogaster</i>	red-bellied pitta		LC		
Pittidae	<i>Pitta versicolor</i>	noisy pitta		LC		
Ptilonorhynchidae	<i>Ptilonorhynchus nuchalis</i>	great bowerbird		LC		
Acanthizidae	<i>Sericornis beccarii</i>	tropical scrubwren		LC		
Acanthizidae	<i>Gerygone levigaster</i>	mangrove gerygone		LC		

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
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		
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 argenticeps</i>	silver-crowned friarbird		LC		
Meliphagidae	<i>Philemon corniculatus</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 (RPS, 2010)
Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		LC		WildNet & published records (RPS, 2010)
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		
Campephagidae	<i>Lalage leucomela</i>	varied triller		LC		
Pachycephalidae	<i>Pachycephala melanura</i>	mangrove golden whistler		LC		WildNet & published records (RPS, 2010)
Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		LC		
Pachycephalidae	<i>Colluricincla megarhyncha</i>	little shrike-thrush		LC		
Oriolidae	<i>Sphecotheres 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		
Artamidae	<i>Artamus cinereus</i>	black-faced woodswallow		LC		
Artamidae	<i>Artamus minor</i>	little woodswallow		LC		

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
Artamidae	<i>Cracticus quoyi alecto</i>	black butcherbird		LC		
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		WildNet & published record (RPS, 2010).
Monarchidae	<i>Monarcha frater</i>	black-winged monarch	M	LC		
Monarchidae	<i>Symposiachrus trivirgatus</i> ¹⁷	spectacled monarch	M	LC		WildNet & published record (RPS, 2010)
Monarchidae	<i>Grallina cyanoleuca</i>	maggie-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>Peneoenanthe 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 (RPS, 2010).
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		Published record (RPS, 2010)
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		
Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		LC		WildNet & published record (RPS, 2010)
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		

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
Sturnidae	<i>Aplornis metallica</i>	metallic starling		LC		.
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 & published record (RPS, 2010)
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		
Passeridae	<i>Passer domesticus</i>	house sparrow		I		WildNet & published records.
Motacillidae	<i>Motacilla</i> sp.	yellow wagtail species	M	LC		
MAMMALS						
Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		LC		
Peramelidae	<i>Isodon macrourus</i>	northern brown bandicoot		LC		
Peramelidae	<i>Isodon 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		
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	
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 nudiclunatus</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		

Family	Scientific Name ³	Common name	Status ⁴			Ugar
			EPBC Act	NC Act	BoT	
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>Pipestrellus adamsii</i>	forest pipistrelle bat		LC		
Vespertilionidae	<i>Pipestrellus weastralis</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		Published record (RPS, 2010)
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		
Felidae	<i>Felis catus</i>	cat		I		
Equidae	<i>Equus caballus</i>	horse, brumby		I		
Suidae	<i>Sus scrofa</i>	pig		I		
Bovidae	<i>Capra hircus</i>	goat		I		
Cervidae	<i>Cervus timorensis</i>	rusa deer		I		

- 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 (eg Smith & Smith 2006; Borsboom 2007; Conics 2008a, b, c; 2009a, b; Schaffer 2010). These sources are not necessarily mutually exclusive and many records are unconfirmed. 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.
- 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.
- Nomenclature follows the Australian Faunal Directory maintained by DSEWPC. <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/index.html>
- 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.
- Also listed under the EPBC Act as *Chaetura caudacuta* (ROKAMBA).

6. 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).
7. Listed under CAMBA as *Ardeola ibis*, listed under JAMBA as *Bubulcus ibis*.
8. 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).
9. Also listed under CAMBA and ROKAMBA as *Tringa hypoleucos*.
10. Also listed under the Bonn Convention and JAMBA as *Heteroscelus brevipes*.
11. Also listed under the Bonn Convention and JAMBA as *Heteroscelus incanus*.
12. Also listed under ROKAMBA as *Crocethia alba*.
13. Listed under the EPBC Act as *Sterna anaethetus* (CAMBA, JAMBA).
14. Listed under the EPBC Act as *Sterna albifrons* (Bonn Convention, CAMBA, JAMBA, ROKAMBA).
15. Listed under the EPBC Act as *Sterna bengalensis* (CAMBA).
16. Listed under the EPBC Act as *Cuculus saturatus* (CAMBA, JAMBA, ROKAMBA). Australian birds elevated to full species level as *A. optatus* (Christidis & Boles 2008).
17. Listed under the EPBC Act as *Monarcha trivirgatus* (Bonn Convention).
18. 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).
19. Listed under the EPBC Act as *Hirundo daurica* (ROKAMBA).

Appendix D. Information on Migratory Fauna Species Potentially Occurring on Ugar 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 (*Glareola maldivarum*). 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 (*Tringa glareola*). 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, 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). On Ugar Island, threats to waders appear limited to disturbance on beaches and rocky shores. This will be most relevant prior to return passage in autumn.

Terns

Life history

Terns, with gulls, belong to the family Laridae. The terns include the noddies, a group of largely tropical pelagic species. Eight Migratory tern species have been recorded from Ugar Island and the caspian tern is 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). Threats appear to be minimal except for any species that may breed on Ugar Island.

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). Eastern great and cattle egrets are not likely to breed on Ugar Island and threats appear minor. 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 Ugar 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 Ugar Island.

Oriental Cuckoo (*Cuculus optatus*)

The oriental cuckoo breeds in northern Asia with birds spending the non-breeding season in south-east Asia, New Guinea, the Solomon's 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). Oriental cuckoo is possibly an annual visitor to Ugar Island, and could occur 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). Rainbow bee-eater could occur in, or over, all habitats on Ugar 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 (*Myiagra cyanoleuca*), spectacled, black-faced and black-winged monarchs (*Monarcha frater*), 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 may occur on Ugar Island and would use a majority of the wooded habitats present. Breeding by any species would be limited, if any breeding occurs. Black rat is not known to occur on Ugar Island.

However, these bird species are more threatened by habitat loss should land use practices change and by the spread of cats into natural habitats.

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. taivana*) (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, possibly including Ugar Island. 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.

None of these species are known from Ugar Island. Neither species appears subject to any particular threat in Australia. Threats to yellow wagtail in Australia are unknown.

