

Restoration of Reef Islands Project

Phase 1: Island Threat Assessment

Ecological assessment for Bajigal (Stephens Island)

August 2024



We acknowledge the Mandubarra people, the Traditional Owners of the Sea Country this project was conducted on and recognise their continuing connection to lands, waters and community.

We pay our respects to their Elders, past, present and emerging.

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Version control

Version	Title	Prepared by	Reviewed by	Date prepared
v0.1	Draft ecological assessment report – Bajigal (Stephens Island)	David Fell and Mark Geyle	Andrew Palmer-Brodie	11/5/2024
v0.2	Draft ecological assessment report – Bajigal (Stephens Island)	Andrew Palmer-Brodie	Naomi Maxwell	14/5/2024
v0.3	Draft ecological assessment report – Bajigal (Stephens Island)	Andrew Palmer-Brodie	Dr Colette Thomas, David Fell and Mark Geyle	06/06/2024
v0.4	Draft ecological assessment report – Bajigal (Stephens Island)	Andrew Palmer-Brodie	Naomi Maxwell	20/06/2024
v0.5	Draft ecological assessment report – Bajigal (Stephens Island)	Andrew Palmer-Brodie	Mandubarra Aboriginal Land and Sea Incorporated Queensland Parks and Wildlife Service	11/07/2024
v0.6	Final draft ecological assessment report – Bajigal (Stephens Island)	Isabelle Onley	Andrew Palmer-Brodie, Dr Colette Thomas	15/07/2024
v1.0	Final ecological assessment report – Bajigal (Stephens Island)	Andrew Palmer-Brodie	Naomi Maxwell	02/08/2024

Acknowledgement and citation

This report was prepared as part of Phase 1 of the Restoration of Reef Islands Project delivered by the Reef Joint Field Management Program (Great Barrier Reef Marine Park Authority) and sponsored by Reef Trust (Australian Department of Climate Change, Energy, the Environment, and Water).

We acknowledge the Traditional Owners of Bajigal (Stephens Island), the Mandubarra people, and appreciate the advice and support provided by the Mandubarra Aboriginal Land and Sea Incorporated (MALSI) in undertaking the field surveys and finalising this report.

Dr Colette Thomas for Project support and reviews of this report.

Dr Eda Addicott and Shannon Hudson Qld Herbarium for discussions on Regional Ecosystem classification.

Australian Tropical Herbarium for use of a plant dryer.

Stuart Worboys for input into plant identification.

Dr Melissa Bruton for identification of reptile images.

Mr Brian Venables for identification of recorded bird calls.

The report should be cited as follows:

Fell D, Geyle M, Palmer-Brodie A, 2024, *Ecological assessment report – Bajigal (Stephens Island)*, Prepared by Aestra Pty Ltd for the Great Barrier Reef Marine Park Authority, Commonwealth of Australia, Canberra.

Executive Summary

The Restoration of Reef Islands Project (the Project) aims to facilitate the rehabilitation or enhancement of habitat values and support resilient island ecosystems in the Great Barrier Reef World Heritage Area. This report outlines the findings of field surveys completed under Phase 1 of the Project for Bajigal (Stephens Island) (hereafter “Bajigal”) located on Mandubarra Country.

The field surveys of Bajigal were intended to provide a rapid biodiversity and threat assessment of the island to inform the development of management options that could be implemented to improve habitat, and complement work already undertaken on the island by Queensland Parks and Wildlife Service (QPWS). The surveys were conducted in April 2024 in partnership with the Mandubarra Aboriginal Land and Sea Incorporated (MALSI) Rangers.

The field surveys recorded a diversity of values and features which range from intact areas of high conservation significance to highly disturbed ecosystems dominated by exotic species. There are several factors influencing the island, including threatening processes and environmental drivers, which affect the distribution and condition of its ecological values.

Location

Bajigal is located 6.7 km northeast of Kurrimine Beach, which is approximately half-way between Cairns and Townsville, in north Queensland. It is part of the Barnard Island Group National Park in the Wet Tropics bioregion.

Vegetation and flora

The vegetation on Bajigal is ecologically unique. The rainforest ecosystem on basalt represents the most eastern expression of this ecosystem type in the bioregion, and is likely the only example of the community on an island in the bioregion. The rainforest vegetation is consistent with two Threatened Ecological Communities (TECs) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act): the endangered *Lowland tropical rainforest of the Wet Tropics* and the critically endangered *Littoral rainforest and coastal vine thickets of eastern Australia*.

Across Bajigal, the structure and floristic composition of vegetation communities can be variable. The variation is driven by a combination of disturbance history and topographic position. A total of 184 flora species have been recorded on Bajigal which includes 161 native species and 23 naturalised non-indigenous species. Of the flora species recorded during the field surveys, 83 species were new records for the island. This included a record of grand devil's claw (*Pisonia grandis*), which represents a new record for the Barnard Island Group and an extension of the known distribution of the species.

The surveys also identified an extensive population of the vulnerable Australian arenga palm (*Arenga australasica*) in littoral rainforest, lowland rainforest, and low closed forest communities. The population size is estimated at 1,000 individuals.

Similarly, a new record of *Coleus batianoffii* on Bajigal represents a significant range extension for an island endemic species and a new record for the Wet Tropics Bioregion. This species was previously only known from a couple of highly localised areas around Lizard Island in the Cape York Bioregion.

While Bajigal supports several areas of conservation significance, a number of ecosystem transforming weeds have become established on the island, likely as a result of disturbance from tropical cyclones. Those which are having the most impact on the ecological values of the island include:

- Guinea grass (*Megathyrsus maximus*),
- Purple morning glory (*Ipomoea purpurea*),
- Coastal morning glory (*Ip. cairica*), and
- Coral berry (*Rivina humilis*).

Additional species of ecosystem transforming weeds recorded in small population/s, but which still pose a future threat include:

- Devil's fig (*Solanum torvum*),
- Lantana (*Lantana camara*),
- Singapore daisy (*Sphagneticola trilobata*), and
- Mossman river grass (*Cenchrus echinatus*).

Fauna

The Key Value recognised for Bajigal is its seabird breeding habitat, which supports a regionally significant breeding population of bridled terns (*Onychoprion anaethetus*) as well as other seabirds. This Key Value will be an important focus of management options planning. To inform management options planning, the field surveys focused on the identification of threats to the island's ecosystems, with consideration for bridled tern nesting habitat. Surveys targeted the late wet season for weed mapping and to avoid unnecessary disturbance to breeding seabirds. As a result, the diversity of bird species recorded during the field survey was relatively low and there was no discernible evidence of seabird nesting activity. While no evidence of nesting was observed during the field surveys, recent survey efforts for the species involving MALSI Rangers and QPWS over the past two breeding seasons was able to be leveraged to provide insight into the locations where higher density of nest sites have previously been recorded.

The surveys identified factors that may be limiting utilisation of potential nest sites on the island, including the presence of native and exotic vine towers over the canopy, particularly on the northern side of the island, and areas of dense Guinea grass infestation. However, the effect that these factors are having on nest site selection by bridled terns is not clear from this survey and would require further targeted investigation during breeding season to understand further.

Two species of threatened shorebirds were recorded incidentally during the survey, the critically endangered eastern curlew (*Numenius madagascarensis*) and the beach stone-curlew (*Esacus magnirostris*), which is listed as vulnerable under the Queensland *Nature Conservation Act 1992* (NC Act). A further six species of seabirds and eighteen species of forest birds were recorded during the survey. One new forest bird species, the eastern koel (*Eudynamys orientalis*), was also recorded.

There was no evidence of native or invasive mammals during the survey. The surveys did not identify any evidence of the presence of black rats (*Rattus rattus*) which indicates that QPWS eradication activities have been successful. While no mammals were recorded, four species of reptiles were confirmed to occur, of which three species were new records for the island, namely:

- Striped snake-eyed skink (*Cryptoblepharus virgatus*),
- Red-throated rainbow-skink (*Carlia rubrigularis*), and
- Slaty-grey snake (*Stegonotus cucullatus*).

The surveys also recorded the presence of two juvenile cane toads (*Rhinella marina*) which confirms that the species remains present on the island and has established a breeding population.

The condition of vegetation varied from 'good with some concern' through to 'critical'. The island remains highly vulnerable to ongoing impacts from the spread of existing weeds and the introduction of new and previously eradicated invasive species, including rodents.

1 Introduction

The Restoration of Reef Islands Project (the Project) aims to facilitate the rehabilitation or enhancement of habitat values for selected islands in the Great Barrier Reef World Heritage Area. The Project has a staged delivery approach: Phase 1 involves assessing island threats and values, formulating management and intervention activities and identifying priority management and intervention treatments for implementation.

The Project provides a proof of concept for the delivery of assessment and planning of on-ground management and intervention actions in partnership with Traditional Owners, the Queensland Parks and Wildlife Service (QPWS) through the Reef Joint Field Management Program (the Program) and industry.

This report relates to the delivery of field surveys to support the identification of management activities under Phase 1 of the Project for Bajigal (Stephens Island) located on Mandubarra Country. The field surveys of Bajigal were intended to provide a rapid biodiversity and threat assessment of the island with a focus on weed threats to bridled tern nesting habitat, and were conducted in April 2024 in partnership with the Mandubarra Aboriginal Land and Sea Incorporated (MALSI) Rangers.

This report provides a summary of the western science ecological information gathered during the survey to assist future preservation of these values and inform the management options planning process. Traditional Ecological Knowledge will be incorporated into management options planning through workshops with MALSI.

1.1 Aims and objectives

The field surveys of Bajigal are intended to provide a rapid assessment of biodiversity values and threats with a focus on weed threats to bridled tern nesting habitat, to support management options planning. The surveys are intended to complement work by QPWS and MALSI.

Breeding seabirds are an important feature of Bajigal for both Traditional Owners, QPWS, and the Australian Government. QPWS and MALSI have partnerships in place, including through the Program, to look at the utilisation of the island by seabirds. Surveys for this project were conducted in April, which is outside of the breeding season for seabirds. This survey was designed to focus on the identification of threats to the island's ecosystems, with consideration for bridled tern nesting habitat.

The aim of this document is to compile information resulting from the field surveys in relation to:

- western science interpretation of the extent, value and condition of island habitats and the plants and animals which occur in them.
- island-scale ecological threats which are influencing Bajigal's habitats.

2 Location and physical setting

Bajigal is situated on the wet tropical coast of north Queensland within the Wet Tropics bioregion. It is located 6.7 km northeast of Kurrimine Beach, which is approximately half-way between Cairns and Townsville (Figure 1).

The 10.6 ha island lies within the Sea Country of the Mandubarra people. It is part of the Barnard Island Group National Park which is managed by QPWS. Bimi (Sisters Island) which is located 0.7 km south of Bajigal was not included in the scope of this survey. Both islands are located within the Marine National Park (Green) Zone (Commonwealth of Australia (GBRMPA) 2016).

Access to Bajigal is restricted to private/chartered vessels for camping and recreation. The number of visitors to the island at any one time is capped, and seasonal access restrictions apply to parts of the island to limit impacts to nesting seabirds (QPWS, 2023).

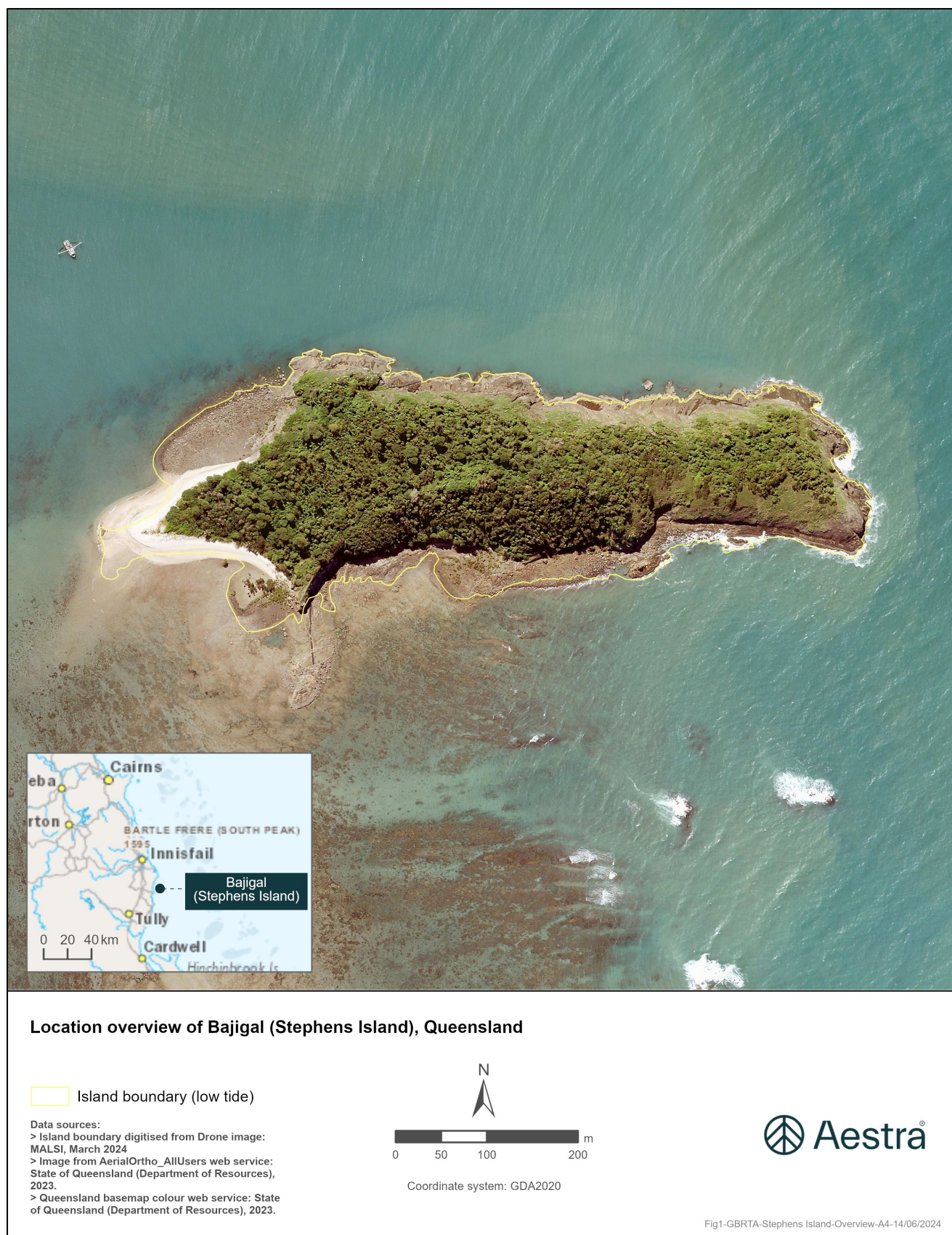


Figure 1: Location overview of Bajigal (Stephens Island), Queensland



Plate 1: View of Bajigal, looking east (Source: © Mandubarra Aboriginal Land and Sea Incorporated)

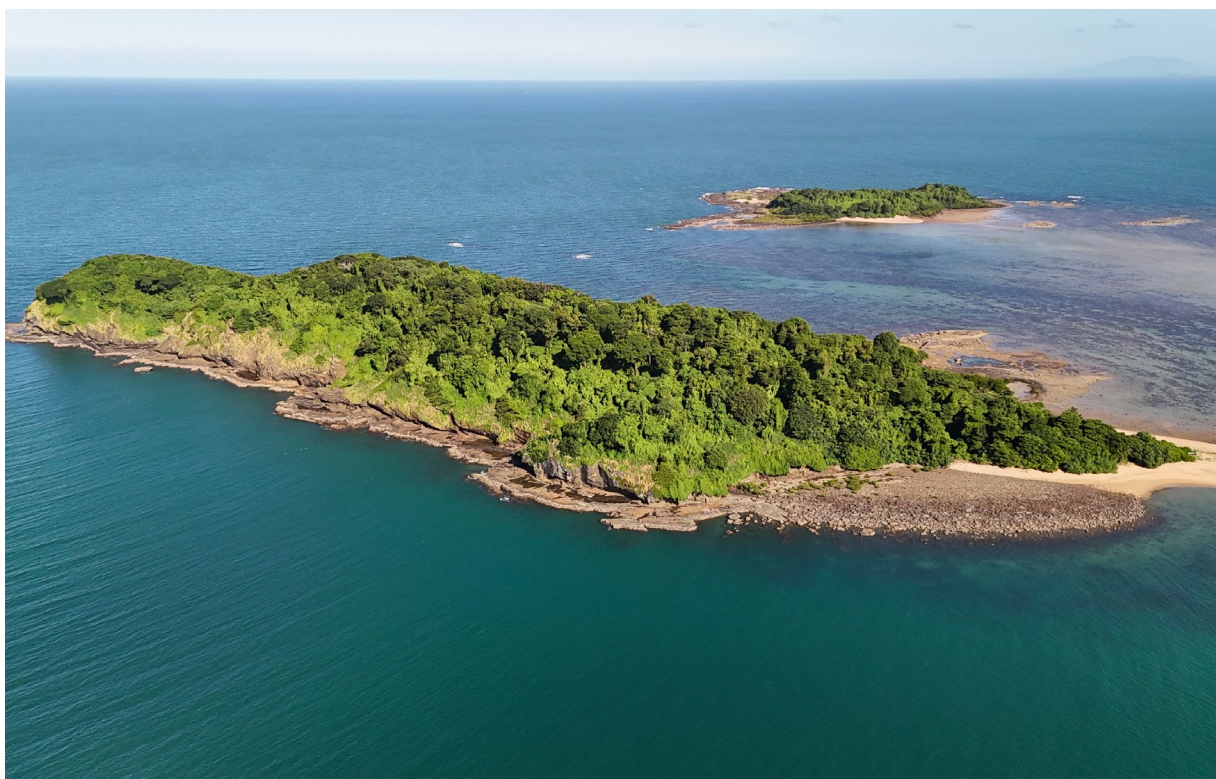


Plate 2: View of Bajigal (foreground) and Bimi (background), looking south, (Source: © Mandubarra Aboriginal Land and Sea Incorporated)

2.1 Physical Setting

Bajigal is a volcanic continental island rising to 45 m above sea level and featuring a spectacular island landscape of steep cliffs and dense rainforest vegetation. The cliffs expose the volcanic tuff deposits laid down in the Cainozoic era and developed through layering of volcanic ash. An olivine basalt ridge runs north-south and is exposed along the south-western shoreline (QPWS, 2023).

Limited quaternary dune deposits occur in the east forming a sand spit, a low foredune and swale, and a restricted area of sand flat. Intertidal rock pavements occur along much of the coastline below steep cliffs. Steep basalt slopes fall to the south and north off the prominent ridge with very small areas of plateau.

2.2 Cultural setting and values

Bajigal and Bimi form part of Mandubarra Sea Country. The Mandubarra Traditional Owners (also known as Wabubarra people) are a clan group of the Mamu speaking people of north-eastern Australia. The Mamu people are the recognised native title holders through the 2013 Mamu People native title determination (MALSI, 2020). Bajigal and Bimi are identified as places of special cultural significance (Figure 2).

Identified cultural features on Bajigal include a fish trap and a cultural place in the central part of the island (MALSI, 2020). On Bimi, there is an identified Mandubarra story place (MALSI, 2020). The Mandubarra Traditional Use of Marine Resources Agreement (TUMRA) was agreed in 2018 (MALSI, 2020) and is shown in Figure 3. Animals of special cultural significance within the Mandubarra Sea Country estate, include:

- green sea turtle (*Chelonia mydas*)
- eels
- dugong (*Dugong dugon*)
- traditional marine resources include:
 - mangrove jack (*Lutjanus argentimaculatus*),
 - barramundi (*Lates calcarifer*),
 - coral trout (*Plectropomus* spp.),
 - mullet (various species) and
 - seabirds such as silver gulls (seagulls; *Choroicocephalus novaehollandiae*), terns, and Torres Strait imperial pigeon (*Dacula bicolor*).

Bajigal also once supported a bêche-de-mer fishing station which was destroyed by a cyclone in the 1890s (QPWS, 2023).

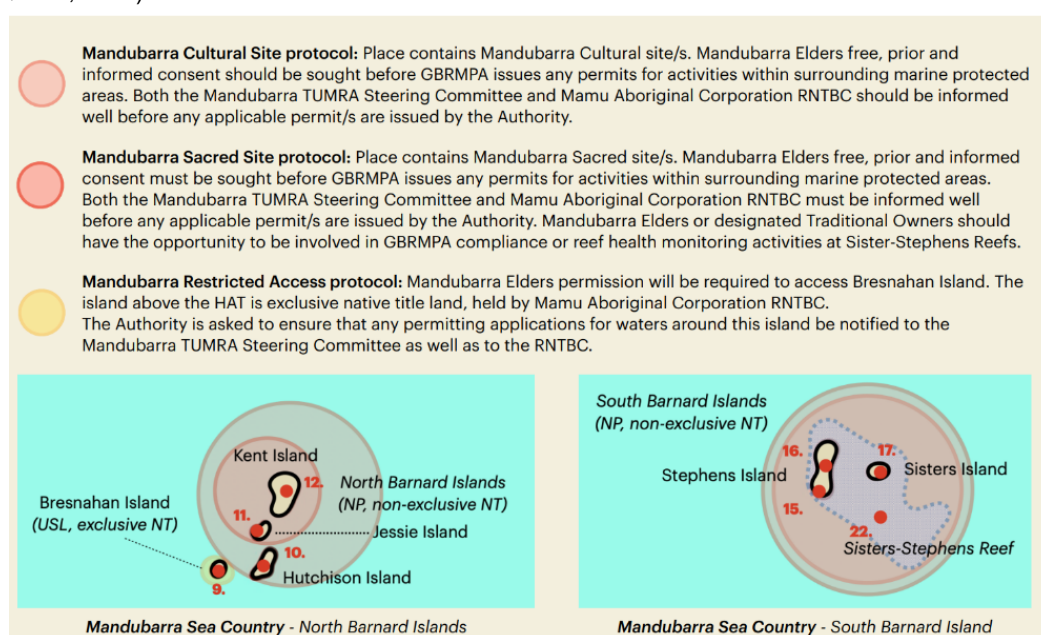


Figure 2: Mandubarra Sea Country access protocols (MALSI, 2020).

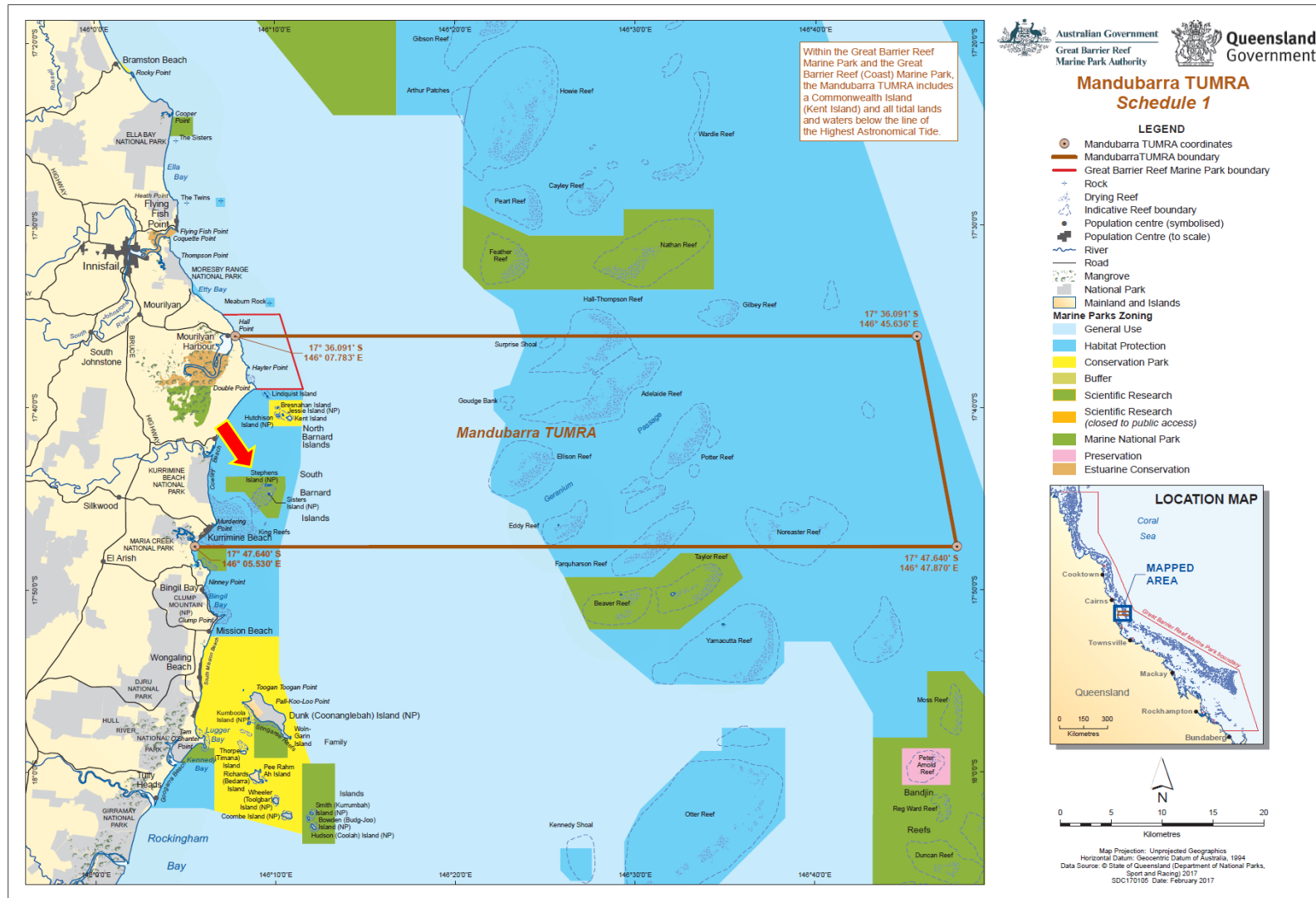


Figure 3: Mandubarra TUMRA map (Great Barrier Reef Marine Park Authority, 2017)

3 Desktop Assessment

A desktop assessment of the information available for Bajigal was completed in March 2024 to inform the field survey design. A summary of the results of the desktop assessment are presented below.

3.1 Vegetation

The vegetation of Bajigal has been previously assessed by Pollock *et al.* (2019) as part of the Great Barrier Reef Priority Islands 1:25,000 Scale Regional Ecosystem Mapping Project. The report described four Regional Ecosystems (REs) as follows, which were mapped by Queensland Department of Environment and Science (DES) within four broad vegetation groups (Table 1). They are:

- A small area of RE 7.2.1c, on coral/pumice and sand-derived soils with basaltic-enrichment, of mesophyll vine forest of *Canarium vitiense*, *Terminalia arenicola* (brown damson), *Planchonella obovata* (yellow boxwood), and *Chisocheton longistipitatus* (cream mahogany).
- A rare variant of complex mesophyll vine forest RE 7.8.1d with *Planchonella obovata* (yellow boxwood), *Myristica insipida* (Australian nutmeg), *Kopsia arborea*, and *Melia azedarach* (white cedar).
- Significant areas of windswept tussock grasslands on Tertiary basalt (RE 7.8.7b), probably previously dominated by *Themeda triandra* (kangaroo grass), now predominantly Guinea grass (*Megathyrsus maximus*).
- An extensive stand of mangroves, especially *Avicennia marina* and also some areas of *Rhizophora stylosa* (RE 7.1.1) on low flat rock platforms subject to regular tidal influence.

Table 1: Broad vegetation groups and Regional Ecosystems known for Bajigal (Pollock *et al.* 2019)

Broad Vegetation Group	Regional Ecosystem	Short Description	Conservation Status (Qld VM Act)	Biodiversity Status (Qld)	Other Values (Regional) (source: DES)
1a	RE 7.8.1d	Simple mesophyll vine forest with <i>Castanospermum australe</i> , <i>Dysoxylum pettigrewianus</i> , <i>Dysoxylum alliaceum</i> , <i>Ficus variegata</i> , <i>Chisocheton longistipitatus</i> , <i>Ailanthus integrifolia</i> , <i>Aleurites rockinghamensis</i> , <i>Wrightia laevis</i> , <i>Lindera queenslandica</i> and <i>Alstonia scholaris</i> . Lowlands on krasnozems soils derived from basalts and basic volcanic parent material.	Least Concern	Endangered	Habitat for threatened plant species including: <i>Carronia pedicellata</i> , <i>Chingia australis</i> , <i>Plesioneuron tuberculatum</i> , <i>Endiandra globosa</i> , <i>Salacistis ochroleuca</i> , <i>Pneumatopteris costata</i> and <i>Didymoglossum mindorense</i> .
3a	RE 7.2.1c	Notophyll to microphyll vine forest (closed forest) with <i>Calophyllum inophyllum</i> , <i>Terminalia arenicola</i> , <i>Dillenia alata</i> , <i>Myristica insipida</i> , <i>Planchonella obovata</i> , <i>Millettia pinnata</i> , and <i>Hibiscus tiliaceus</i> . Occurs on beach ridge deposits adjacent to the foredune.	Endangered	Endangered	Important fruit source for birds, and very significant for many migratory species. Habitat for threatened species including <i>Arenga australasica</i> . High scenic value. A Littoral Rainforest TEC.
32b	RE 7.8.7b	<i>Themeda triandra</i> tussock grassland. Basalt uplands and highlands, and minor areas on coastal headlands.	Of Concern	Endangered	Occurs on more exposed eastern portions and associated with breeding sites for seabird species.

Broad Vegetation Group	Regional Ecosystem	Short Description	Conservation Status (Qld VM Act)	Biodiversity Status (Qld)	Other Values (Regional) (source: DES)
35a	RE 7.1.1	Mangrove closed scrub to open forest. Sheltered coastlines, estuaries, and deep swales between dunes, on fine anaerobic silts, inundated with saline water at high tide. Intertidal.	Least Concern	No concern	Important fish nursery areas. Potential threatened species include: <i>Myrmecodia beccarii</i> (ant plant) and <i>Hypochrysops apollo</i> (apollo jewel butterfly).

Qld VM Act – Queensland Vegetation Management Act 1999.

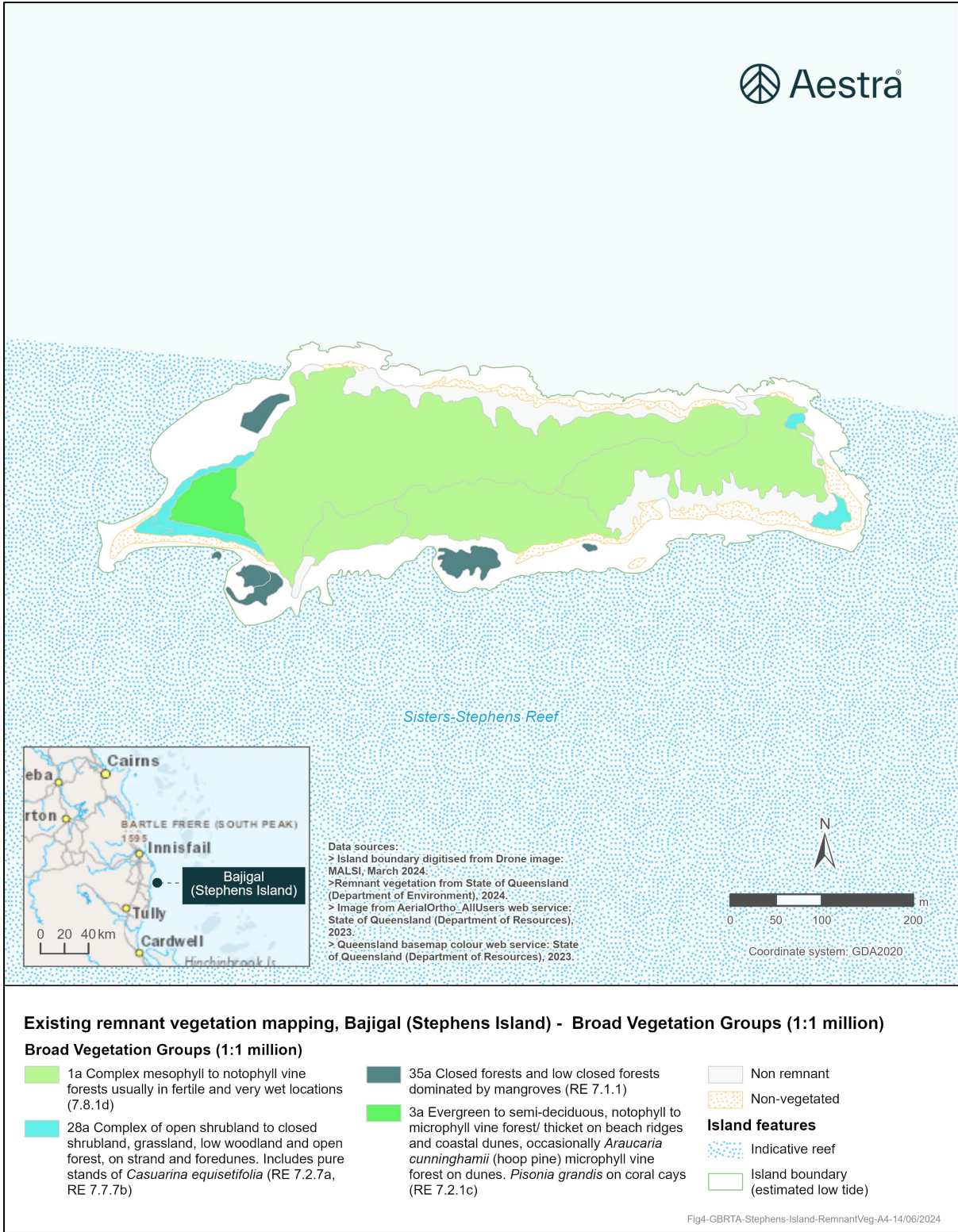


Figure 4: Existing remnant vegetation – broad vegetation groups, Bajigal (Stephens Island)

3.1.1 Significant ecological disturbance events

The vegetation on Bajigal and along the adjacent wet tropical coast has been heavily impacted by tropical cyclone events in 1986 (Tropical Cyclone Winifred (TC Winifred)), 2006 (Severe Tropical Cyclone Larry (STC Larry)) and 2011 (Severe Tropical Cyclone Yasi (STC Yasi)).

TC Winifred crossed the coast as a Category 2 system at Cowley Beach just south of Innisfail on 1 February 1986, with gales extending over 160 km between Cairns to Cardwell and estimated winds between 130 and 150 km/h (BoM 2024). In 2006, STC Larry crossed the coast approximately 15 km to the north of Bajigal at Etty Bay. Photos of Bajigal taken after STC Larry illustrate the defoliated canopy and uprooted or snapped large trees and Pandanus (Plate 3 and Plate 4).

STC Larry was followed five years later in 2011 by STC Yasi. STC Yasi was one of the most powerful cyclones to have affected Queensland since records commenced. Significant wind damage was reported between Innisfail and Townsville where the destructive core of the cyclone crossed the coast. Tully and Cardwell suffered major damage to structures and vegetation with the eye of the cyclone passing over Dunk Island and Tully around midnight on 2 February 2011 (BoM, 2024).

Notes from QPWS management logs indicate that STC Larry increased openings in the canopy and provided conditions for the establishment and spread of invasive weed species. A similar scenario most likely occurred after TC Winifred in 1986 and STC Yasi in 2011.



Plate 3 and Plate 4: Catastrophic damage to vegetation following STC Larry (image QPWS)

3.1.2 Flora

The desktop review conducted for this study identified 100 vascular flora species (88 native, 12 introduced), with one threatened flora species, the Australian arenga palm (*Arenga australasica*), which is listed as vulnerable under the NC Act. These are listed in the annotated species list provided in Appendix B - Flora species list for Bajigal.

The existing knowledge of the plant diversity of Bajigal draws on WildNet data and specimen-backed records of the Queensland Herbarium in Brisbane and the Australian Tropical Herbarium in Cairns.

- Queensland Government's WildNet (*Wildlife Online*) database (Queensland Government, 2023a).
- Australian Department of Climate Change, Energy, the Environment and Water's *Species Profile and Threats Database* (DCCEEW, 2023).
- *Atlas of Living Australia*, a web-based search tool that is a partnership between CSIRO, Australian museums, herbaria and other biological collections, and the Australian Government (ALA, 2023).
- Specimen-backed records at the Queensland Herbarium, Brisbane.
- Specimen-backed records at the Australian Tropical Herbarium, Cairns.

3.1.3 Fauna

Fauna records held in publicly available databases and a range of Australia-wide resources¹ provide insight into species that have been observed on Bajigal, even if only seasonally or sporadically. These include:

- Queensland Government's WildNet (*Wildlife Online*) database (Queensland Government, 2023a).
- Australian Department of Climate Change, Energy, the Environment and Water's *Species Profile and Threats Database* (DCCEEW, 2023).
- *Atlas of Living Australia*, a web-based search tool that is a partnership between CSIRO, Australian museums, herbaria and other biological collections, and the Australian Government (ALA, 2023).
- *eBird* (available at: <https://ebird.org/australia/explore>).
- *Birdlife Australia (Birds Australia) database* (available at: <https://birddata.birdlife.org.au/>).
- *Online Zoological Collections of Australian Museums* (OZCAM, 2023).
- *Species profile search* (Queensland Government, 2023b).
- Reef Joint Field Management Plan documents including:
 - 20101004 – Stephens Island species CSIRO.xls
 - 20180525 – Stephens Island total species.xls
 - 20191119 – Stephens Island breeding.xls
 - 20080527 – Stephens Island Coastal Bird Atlas records
 - Various QPWS management activity reports.

The desktop review conducted prior to this survey identified 56 species that have been historically observed on Bajigal (two mammals, two reptiles, 52 birds). Those species identified are provided in an annotated checklist in Appendix D - Fauna species list for Bajigal. In some instances, the source material follows a different taxonomy to this document and both scientific and common names may vary. Previous records for species on Bajigal are shown in Figure 5.

The Barnard Islands National Park Management Plan identifies Bajigal and Bimi as regionally significant nesting sites for several seabird species including the bridled tern (*Onychoprion anaethetus*) (particularly at Bajigal), lesser crested tern (*Thalasseus bengalensis*) and black-naped tern (*Sterna sumatrana*) (QPWS, 2023). The breeding area for seabirds is identified as a Key Value for Bajigal (Table 2). Estimated breeding populations for key seabird species across Bajigal and Bimi are (QPWS, 2023):

- bridled tern – estimated nesting population of 10,000 (Australian population estimated at 20-60,000)
- lesser crested tern – estimated nesting population of 2,000 (Australian population estimated at 4-8,000)
- black-naped tern – estimated nesting population of 2,000 (Australian population estimates unknown).

Table 2: Breeding seabird information summary (source: Commonwealth of Australia, 2020)

Species	Nesting period	Notes
Bridled tern		Typically lays 1-2 eggs in small scrapes or depressions created in sand or shingle. Nest sites may be re-used over multiple years. The eggs are incubated for 28-30 days and young fledge between 58-63 days.
Lesser crested tern	Varies across range (September to March at Bajigal)	Typically lays 1-2 eggs which are incubated in a scrape, ridge, or bare areas between vegetation for approximately 28 days. Young fledge between 32-35 days.
Black-naped tern		Typically lays 1-3 eggs in a scrape. Eggs are incubated for 21-23 days with young fledging between 21-28 days.

¹ Anstis (2013), Hoskin *et al.* (2015), Sanders (2021) (frogs), Cogger (2014) (herpetofauna), Wilson & Swan (2021) (reptiles), the seven-volume series *Handbook of Australian, New Zealand and Antarctic birds* (various editions 1990-2001), Garnett & Baker (2021) (birds) and Baker & Gynther (2023) (mammals). There are also state-based (Qld) information sources such as Vanderduys (2012) (frogs), Wilson (2022) (reptiles) and Storr (1973) (birds).

In addition to large populations of nesting seabirds, other species of conservation interest have also been previously recorded at Bajigal. These are outlined in Table 3.

Table 3: Other species of conservation interest for Bajigal

Taxa	Scientific name	Common Name	NCA Listing	EPBC Act listing		
				Listed status	Migratory	Marine
Bird	<i>Arenaria interpres</i>	Ruddy turnstone	SL	V	Yes	Yes
Bird	<i>Esacus magnirostris</i>	Beach stone-curlew	V			Yes
Bird	<i>Numenius madagascariensis</i>	Eastern curlew	E	CE	Yes	Yes

NC Act listing – C – Least Concern, SL – Special Least Concern, V – Vulnerable, E – Endangered, CE – Critically Endangered, PE – Presumed Extinct. EPBC Act – V – Vulnerable, E – Endangered, CE – Critically Endangered.

A roost for the spectacled flying-fox (*Pteropus conspicillatus*) is reported to have established on Bajigal over the past few years (QPWS, 2023) (Figure 5). The spectacled flying-fox is a frugivore species which occurs along the eastern edge of far north Queensland and through the Torres Strait into Papua New Guinea. The species is listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Conservation Advice for the species notes that it dispersed widely after STC Larry and occupied many new sites (TSSC, 2019). This may explain the reported presence of the species on Bajigal. Individuals with young have previously been recorded and observed anecdotally at Bajigal. Breeding for the species is seasonal and synchronised with females producing one pup per year between October and December (TSSC, 2019).

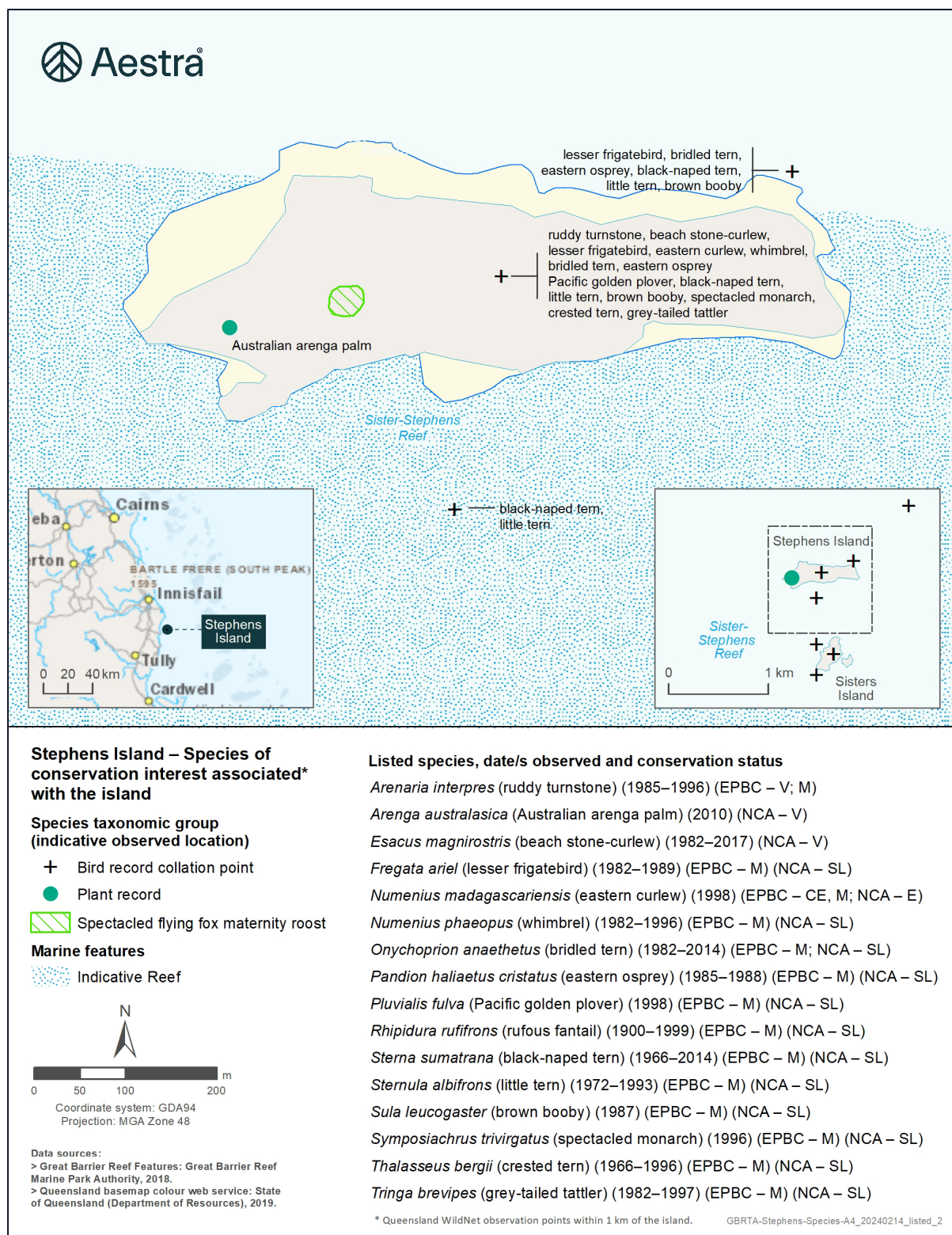


Figure 5: Species of conservation interest associated with Bajigal (Stephens Island)

3.1.4 Review of existing values, threats, and management

Values

Bajigal is part of the QPWS national parks estate for the protection and persistence of its Key Value. The Key Value and Level of Service Assessment Report (QPWS, 2018) identifies seabird breeding habitat as the Key Value for Bajigal. Based on the QPWS assessment report, the current condition of the Key Value is 'good with some concern' and the trend is stable.

The current condition of the Key Value aligns with the desired condition of the value stated in the assessment report. Bajigal and Bimi are also nominated as key seabird nesting sites for the Great Barrier Reef Marine Park and are listed in the Reef 2050 Long Term Sustainability Plan (On-ground action BA11; Commonwealth of Australia 2023).

Documentation prepared by QPWS (QPWS, 2018 and 2022) note that pests on Bajigal will require ongoing management to ensure the condition of the natural values are maintained. QPWS undertake an annual program of works on Bajigal which includes weed and pest monitoring. The key management documents which are relevant to the management of Bajigal are:

- Barnard Island Group National Park Management Plan (1998) (updated with minor changes in 2023) (QPWS, 2023)
- Barnard Island Group Pest Strategy (expiry June 2027) (QPWS, 2022)
- Key Value and Level of Service Assessment Report (latest version available, May 2018) (QPWS, 2018).

Threats

The primary threatening process affecting Bajigal and its Key Value is the introduction of novel biota and their impact on biodiversity. Based on the information reviewed for the desktop assessment, it appears that since 2008 several weed species have successfully spread from the mainland or adjacent islands and established on Bajigal including morning glory vines (*Ipomoea* spp.), lantana (*Lantana camara*), Guinea grass (*Megathyrsus maximus*), Singapore daisy (*Sphagneticola trilobata*), coral berry (*Rivina humilis*), and devil's fig (*Solanum torvum*). There is potential for additional weed species to be introduced from the mainland and adjacent islands by vectors such as cyclones, floods, wildlife, and human visitation (e.g., campers). High risk weeds known to occur on nearby Bimi that pose a potential threat to Bajigal include:

- Billygoat weed (*Ageratum conyzoides*)
- Dark blue snake weed (*Stachytarpheta cayennensis*)
- Guava (*Psidium guajava*)
- Hyptis (*Mesosphaerum suaveolens*)
- Mackie's pest (*Chrysopogon aciculatus*)
- Rattlepod (*Crotalaria pallida*)
- Red natal grass (*Melinis repens*)
- Thickhead (*Crassocephalum crepidioides*)
- Winged yam (*Dioscorea alata*).

Bajigal has also historically been infested with black rats (*Rattus rattus*), however, following a successful eradication campaign in 2001 appears to have been rat-free since. QPWS undertake annual and opportunistic monitoring for this species. The island has also previously recorded low numbers of cane toads (*Rhinella marinus*).

The island does not have any previous records of tramp (exotic) ant species. The ability of these species to raft on vegetation and spread during flood events poses an ongoing threat to the island.

Fire has also been identified as a potential threat to island ecology especially during dry winter conditions. The primary ignition source is likely to be accidental ignition from campfires. This risk is managed by campground rules which prohibit all fires other than fuel stoves.

Potential EPBC Act-listed littoral rainforest and seabird nesting habitat on Bajigal may also be impacted by environmental factors associated with climate change, such as sea level rise, storm surges, and associated erosion (Murphy *et al.* 2016).

4 Methods

A rapid assessment of Bajigal was undertaken in accordance with the agreed approach to the collection of field data for Phase 1 of the Project. The approach to Phase 1 field surveys has been reviewed and agreed by the Project Steering Committee which includes representatives from the Reef Authority and QPWS.

Field surveys of Bajigal were carried out over a non-consecutive three-day period between 22 to 26 April 2024. Adverse weather conditions meant that following day two, further survey had to be postponed until conditions became more suitable.

Access to the island was achieved by a charter vessel which departed Kurrimine Beach and transported the survey team and equipment to and from the island each day. Transit time was approximately 30 minutes.

The field survey was coordinated by Aestra in partnership with Melissa Epong and Rohann Sultana (MALSI). On-ground leadership was carried out by Senior Ranger James Epong and Ranger Naomi Epong (MALSI) and Project Team Leader, Botanist David Fell.

The Mandubarra Rangers were supported by two specialist ecologists (David Fell – flora, and Mark Geyle - fauna), and Reef Authority Project Manager Dr Colette Thomas.

A full list of field survey participants is found in Table 4.

Table 4: Field survey participants

Name	Position
James Epong	MALSI Senior Ranger
Naomi Epong	MALSI Ranger
Sean Kyle	MALSI Ranger Trainee
Sharon Casey	MALSI Ranger Trainee
Larrence O'Donnell	MALSI Ranger Trainee
Dylan Daugherty	MALSI Ranger Trainee
Jahrone Johnson	MALSI Ranger Trainee
Caylin Epong	MALSI Junior Ranger
Rohann Sultana	MALSI Program and Logistics Coordinator
Dr Colette Thomas	Reef Authority Restoration of Reef Islands Project Manager
David Fell	Aestra Field Team Leader and Botanist
Mark Geyle	Aestra Fauna Ecologist
Michael Acheson	Boat Skipper

Prior to departure from the Kurrimine Beach boat ramp, the team carried out a safety induction as required by the Safe Work Method Statement (SWMS) and were made aware of cultural protocols and vessel safety. On arrival to the island, a day base camp was established with a gazebo shelter, food, water, UHF radios, and a first aid station. A Welcome to Country by James Epong introduced visitors to the islands and identified cultural protocols and safety. Flora and fauna field teams visited different parts of the island to carry out survey activities and communications by UHF and mobile phones were scheduled.

Rainfall on Tuesday 22 and Wednesday 23 April (9 mm and 74 mm respectively) created slippery areas of steep terrain which were unsuitable for some team members, which delayed the project by two days. The first two days of the survey were fine and approximately 8 mm of rain fell on Friday 26 April. The temperature during the survey period was warm and humid, ranging from a minimum of 23°C to 28°C. Winds were generally from the WSW to SE ranging from 5 to 17 knots.

The conservation significance of plants and animals identified during the field surveys has been determined with reference to the following and based on the methods outlined further below:

- Nationally significant: species listed on the Commonwealth's EPBC Act as critically endangered, endangered, or vulnerable.
- State significant: species listed on the NC Act as critically endangered, endangered, vulnerable, near threatened, or special least concern.
- Migratory species are those listed as migratory under the EPBC Act due to their inclusion under one or 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).

4.1 Vegetation methods

Field data on vegetation structure and floristics was collected in a format consistent with Queensland Herbarium quaternary sites (Nelder *et al.* 2023). Additional field notes were recorded into field notebooks and a QuickCapture digital field application. This included point-based information on landform, geology, vegetation structure, and disturbance features, together with dominant species, and locations of threatened species and weeds. Incidental flora records were also noted during field traverses. Estimates of vegetation height were made using visual estimates to the nearest metre.

The small size of the island enabled access to the full range of habitats present, with opportunity to interpret variations in vegetation structure on the ground. Vegetation mapping was carried out at a scale of 1:10,000 using interpretation of available aerial photography, drone imagery, and field sampling.

The classification of vegetation utilised the identification of vegetation 'units' which are differentiated based on the vegetation's structural characteristics (e.g. height) and dominant or characteristic floristics (e.g. commonly occurring or dominant species). Vegetation unit descriptions were developed to provide summary information of the species composition for each structural layer, as well as abundance and cover.

In Queensland, DES publish mapping of Regional Ecosystems (REs) which are a coded classification system for vegetation communities across the state. REs are described based on three characteristics which are each given a number to create a three part sequence as follows:

- The first number describes the bioregion which the vegetation unit occurs in.
- The second number refers to the land zone that the vegetation occurs on which is a simplified geological classification.
- The third number describes the strata of vegetation that contributes the most above-ground biomass (usually the dominant species although variations are included to encompass differences in locally dominant species).

For example, RE 7.2.1 would be Bioregion 7 (Wet tropics), Land Zone 2 (coastal dunes), 1 (mesophyll vine forest).

For the surveys on Bajigal, a 'best fit' regional ecosystem is noted for each vegetation unit mapped where possible. In some circumstances, it is not possible to attribute a vegetation unit to an existing regional ecosystem on the basis of the structure, floristics, landform or bioregion present on the island. In these instances, an explanatory note is made to this effect.

Natural Values Health Checks (Melzer, 2019) were also carried out within three major REs; Lowland rainforest on basalt slopes (RE 7.8.1c), Littoral rainforest on sand (RE 7.2.1b), and Grassland on basalt cliffs (RE 7.8.5b).

4.2 Flora methods

The selection of flora survey sites utilised existing Regional Ecosystem (RE) mapping, available Queensland Globe aerial imagery of the island, and drone imagery provided by MALSI.

A key aim of the survey was to assess the vegetation communities present and determine the level of threat the invasive weeds may be causing to these habitats, with a particular focus on bridled tern nesting habitat. The flora survey team was made up of MALSI Rangers and a flora ecologist (see Table 5 below).

Table 5: Flora survey team participants

Participants	Monday 22 April	Thursday 25 April	Friday 26 April
David Fell	X	X	X
James Epong			X
Naomi Epong	X	X	
Sharon Casey	X		
Dr Colette Thomas	X	X	X
Michael Acheson	X		

Flora species lists were recorded for all plants, together with attributes such as family, status, life form, habitat, abundance, and phenology (stage of plant's lifecycle during time of survey). Each plant taxon was given a status of 'native to the mainland', 'exotic' and 'native to islands only'. A list of all vascular plant taxa was compiled and a Braun-Blanquet cover score (Watson *et al.* 2021) of each plant taxa was approximated as either 'very common' (>50% cover), 'common' (25-50%), 'occasional' (5-25%), 'uncommon' (1-5%) or 'rare' (<1%).

Flora species unable to be identified in the field were collected and pressed on site and were dried at the Australian Tropical Herbarium in Cairns. Taxa that were challenging to identify in the field will be identified in the laboratory with assistance from the Queensland Herbarium. Vouchers of 48 species are scheduled for lodgement with the Queensland Herbarium with duplicates provided to the Australian Tropical Herbarium and the MALSI Herbarium.

For flora, the terms 'species' include species, subspecies, varieties, forms, and any undescribed taxa recognised by the Queensland Flora Census (Bean, 2024).

4.3 Fauna methods

Selection of fauna survey sites drew upon local Manduburra knowledge, available aerial imagery collected by MALSI, and existing RE mapping to select suitable sites within the different vegetation habitats.

The core focus of the fauna survey was to identify likely areas that may support invasive animals such as rats (*Rattus* spp.), cane toads (*Rhinella marinus*) and feral cats (*Felis catus*). Remote camera traps, chew cards, and scat, track, and sign searching were used to determine the presence of native and invasive fauna.

In addition, targeted bird surveys and opportunistic records were made throughout the survey period to identify additional native avifauna that are utilising the island. Apart from camera trapping, the field surveys were limited to diurnal surveys as the survey team was constrained to daylight transits each day. Due to the time of arrival and departure of the survey team on the island, peak times of animal activity such as early morning and dusk were not surveyed. Variation in habitat type and logistical constraints meant that survey effort was not standardised across sites.

The fauna survey team was made up of MALSI Rangers and a fauna ecologist. Boat skipper Michael Acheson also participated on the last day of the survey (see Table 6 below).

Vertebrate fauna targeted as part of the field surveys included amphibious species such as crocodiles, frogs, reptiles, and birds including aerial species such as swifts. The report does not include fish, marine turtles, sea snakes, and marine mammals.

Table 6: Fauna team survey participants

Participants	Monday 22 April	Thursday 25 April	Friday 26 April
Mark Geyle	X	X	X
James Epong	X		
Dylan Daugherty	X	X	X
Jahrone Johnson	X	X	X
Caylin Epong	X	X	
Larrence O'Donnell	X		
Michael Acheson			X

4.3.1 Bridled tern habitat assessment

The Key Value identified for both Bajigal and adjacent Bimi is breeding habitat for seabirds (QPWS, 2023). During the breeding season, Bajigal is home to a significant proportion of the Australian bridled tern (*Onychoprion anaethetus*) breeding population. Rocky outcropping off Bimi also supports breeding colonies of the black-naped tern (*Sterna sumatrana*) and the lesser crested tern (*Thalasseus bengalensis*). One aspect of the survey was to assess the nesting habitats for seabirds and determine the level of threat invasive weeds and/or animals may be causing to these habitats.

Bridled tern habitat assessment included collaboration with the MALSI Rangers to identify the extent and features of breeding habitat, and the type and extent of threats to the habitat. In addition, fauna survey techniques such as camera traps, sign searches, chew cards, incidental fauna observations, and bird and weed surveys were all used to help identify any signs of bridled tern activity and potential threats to their nesting habitat.

Areas of bridled tern nesting habitat were recorded on a printed aerial image based on yarning with MALSI Rangers. Mapping was also informed by QPWS Rangers. It is noted that the areas of bridled tern nesting habitat identified in this study are not based on a comprehensive assessment of the distribution of potential habitat across the island. Additional areas of bridled tern nesting habitat may occur in other areas of the island (particularly the eastern end) where access is limited.

4.3.2 Camera traps

Ten remote motion sensing cameras were deployed across the island to detect the presence of both native and invasive vertebrate fauna. Six of the cameras were White Flash Garde Pro A5WF Trail Cameras (hired by Aestra). In addition, MALSI provided four motion detection cameras, two were Gerber IR 40 Trail Cameras and two were Reconnyx HF2X Hyperfire cameras.

Cameras were set to take a picture burst of three photos when triggered by motion, followed by a 10-second delay. The Garde Pros also had a five-second video following the photo burst. Lure attractants used with cameras included sardines as the meat-based lure, and peanut butter, honey and rolled oats as a general lure. Four meat-based lures and six peanut butter-based lures were used with the cameras.

Baits were housed in stainless-steel mesh tea infusers secured to a stake or tree using plastic zip ties or rocks. The ten cameras were all deployed over four trap nights from Monday 22 April and Friday 26 April. Camera trap site locations are illustrated in Figure 6.



Plate 5: Fauna ecologist Mark Geyle and Ranger Trainee Jarone Johnson setting up a motion camera in eastern section of island.



Plate 6: MALSI Senior Ranger James Epong setting up camera trap at top of spring, western end of island.

4.3.3 Shorebird surveys

Three diurnal shorebird surveys were carried out on the sand beach and intertidal rock platform on the western end of the island to record the presence of shorebirds (Plate 7 and Plate 8)

Surveys were conducted between half-tide and low tide to maximise the area of suitable shorebird foraging habitat surveyed. Any birds observed over a 20-minute period, either on the beach or foraging on the intertidal rock platform, were recorded. Birds were identified using Steiner 10 x 42 binoculars, and field guides. A Canon R7 camera with 100-400 mm telephoto lens was used to assist with shorebird identification wherever possible. Shorebird survey locations are outlined in Figure 6.

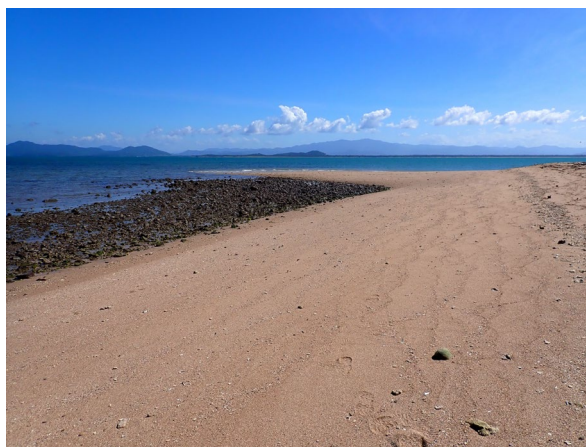


Plate 7 and Plate 8: Shorebird survey sites on sand beach and intertidal rock platform western end of island (photo: Mark Geyle, April 2024).

4.3.4 Forest bird surveys

Three 20-minute diurnal forest bird surveys were conducted during the survey to determine bird species present on the island. Three 100 m x 100 m area survey sites were selected in different habitat locations (Figure 6). Birds were identified through visual observation and heard calls. Unidentified calls were recorded for later analysis and identification. All three of the surveys were conducted during mid-to-late morning. Logistical constraints prevented bird surveys being conducted in the early morning.

4.3.5 Scat, track, and sign searches

One targeted survey was conducted along the sand beach (refer Figure 6) on the morning of 25 April 2024 to look for any sign of fresh prints, scats, and sign such as seed caches and animal carcasses which may indicate the presence of animals such as invasive rats and feral cats. The entire beach area between the tidal zone up to the vegetation line on the foredune was walked.

Incidental searches for scats, tracks, signs, and live animals were also made during the survey in likely areas such as bridled tern nesting habitat, the base of large, buttressed trees and banyan figs, and around the campground area. These incidental searches were undertaken opportunistically by both fauna and flora survey teams.

4.3.6 eDNA soil sampling

Three sites were chosen for eDNA soil sampling (refer Figure 6). Soil samples were collected from areas with suitable habitat to support invasive animals including black rats and cane toads.

Soil samples were collected at each site by laying out a 50 tape then measuring out 50 cm every 2.5 m on alternate sides of the tape and scraping off the leaf litter. A small, sterilised garden trowel was used to collect a total of 20 sub-samples along the tape and these were placed in a large Ziplock bag and mixed thoroughly. Two x 50 ml sample tubes were used to collect soil from the bag and each tube was labelled with replicate numbers. Nitrile gloves were used throughout the sample collections and tools used were sterilised using a bleach solution then rinsed with fresh water.

Location data and site characteristics were recorded on the tubes and collection bags. Once collected the samples were placed in the shade, taken off the island at the end of the day, and stored in the fridge until they were transported to the lab. Soil samples were sent to the DNA laboratory in Melbourne for analysis via Express Post on Monday 29 April with samples received by the laboratory on 1 May 2024.

With reference to Figure 6, the sites chosen for eDNA collection were:

- Campground and littoral rainforest at western end of island on beach sand
- Top of the natural spring on the northwest end of the island on basalt soils
- Bridled tern nesting habitat area along a rocky ridgeline in the middle of the island on basalt soils.

It is worth noting that the soil sample collected at the beach campground included a subsample that was taken directly below where a cane toad had been collected the previous day. Rainfall of up to 8 mm did fall during the day of sample collection which may impact the results.



Plate 9 and Plate 10: Junior Ranger Caylin Epong and Trainee Rangers Jahrone Johnson and Dylan Daugherty collect soil samples for eDNA analysis at the top of the natural spring on Bajigal (photo: Mark Geyle, April 2024)

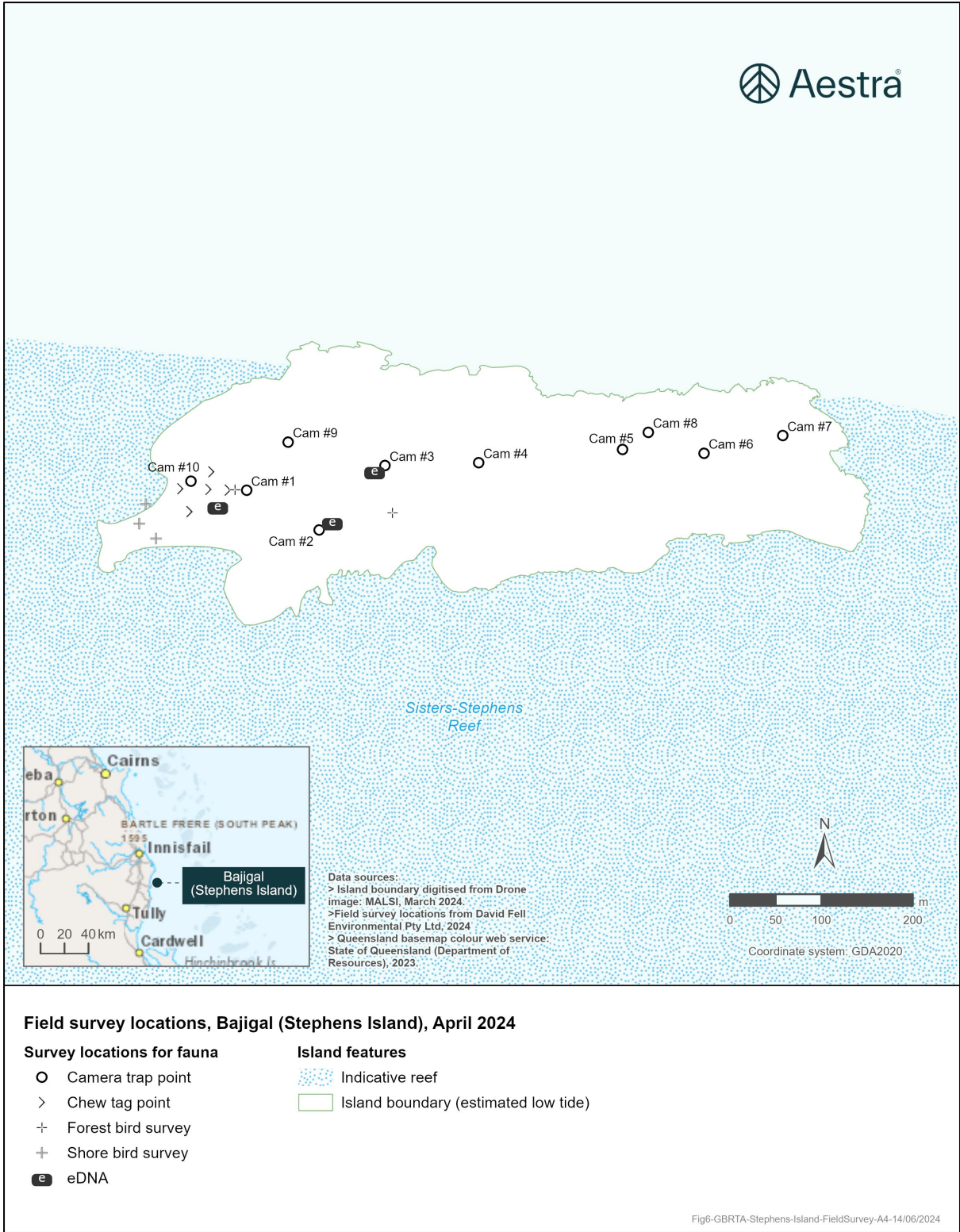


Figure 6: Field survey locations, Bajigal (Stephens Island), April 2024

4.3.7 Flying-fox colony assessment

Collecting data on the spectacled flying-fox (*Pteropus conspicillatus*) colony reported to be resident on the island was to be undertaken by employing the following techniques:

- Record details of location, date, time, observers, and weather.
- Obtain close-up photos using telephoto zoom of the faces of each species of bat present.
- Take GPS waypoints at N, NE, E, SE, S, SW, W, NW compass points around the camp and describe camp distribution.
- If time allows count bats using the tree count method. This involves selecting ten random roost trees and count the bats in each of these trees. Then count/ estimate the number of trees occupied in the camp and use the average of bats present in the ten selected trees to extrapolate (by number of trees) to give a camp estimate.
- Collet scats by laying out ten A3 sheets of paper under areas with lots of bats in the early morning and collect them after 3 pm that same day. Fold collected sheets and place into labelled clip seal bags.
- Ensure any of the team involved in work around the colony wore appropriate PPE, use hand sanitiser following any material collection and no staff were to handle any bats due to potential presence of Australian Bat Lyssavirus.

No flying-foxes were present on the island at the time of survey. As a result, this method was not utilised.

4.3.8 Incidental fauna sightings

Throughout the survey, records were made of visually observed or heard fauna across the island. This included observations from both fauna and flora teams. Data collected for any incidental sightings include date, GPS location, species, number of individuals, observation type, microhabitat, and vegetation type. Audio recordings of non-identified bird calls were made using an iPhone and later identified through collaboration with ornithologist Brian Venables. Photographs of skinks and a snake were sent to herpetologist Dr Melissa Bruton for identification.

4.3.9 Chew cards

The presence of several chew cards nailed to the bottom of trees in the littoral rainforest on the western end of the island provided evidence of ongoing monitoring for feral rats by QPWS. These chew cards consisted of small rectangular corflute cards that had been loaded with peanut butter when they were last set. At the time of survey, the cards were in good (unchewed) condition but had no bait inside the corflute. On the 25 April, the fauna team located and rebaited five of these cards by scraping peanut butter along the edge of the card to force peanut butter into the corflute interior. These cards were then checked and analysed the following day (26 April).



Plate 11: Junior Ranger Caylin Epong and Trainee Rangers Jahrone Johnson and Dylan Daugherty and Boat skipper Michael Acheson bait up and record location of chew cards with peanut butter in the Littoral rainforest area on the island (photo: Mark Geyle, April 2024).

4.3.10 Data collection

Data was collected by various methods throughout the survey. The ArcGIS® QuickCapture application was developed for collection of a range of field survey data on tablets or phones. Field data was also recorded in field notebooks to be later transcribed onto paper-based and electronic data sheets.

5 Results

5.1 Vegetation

The vegetation of Bajigal is dominated by rainforest which occurs in a number of different forms. To identify and describe the spatial variation in the rainforest vegetation on the island, ten vegetation units have been described in this report (Table 7, and Figure 7). The vegetation units each describe a vegetation type based on their species composition and their structure (e.g. height). The units have been aligned with REs and Commonwealth listed Threatened Ecological Communities. Conservation status identified within Queensland and Commonwealth legislation was used to identify alignments with the state classification system. Detailed technical profiles of the vegetation communities are provided in Appendix A - Vegetation Community Profiles. The 21 field survey sites used to describe these units are listed in Table 7.

The most widespread vegetation cover is closed forest/rainforest which occurs on basalt slopes and littoral sands. Limited areas of coastal scrub/shrubland and herbland occur on frontal dunes. Exotic grassland intergrading with vineland occurs on steep and exposed basalt cliffs. A very small area of native herbland/grassland occurs on a basalt headland. Four small stands of mangroves occur on intertidal rock shelves. Each vegetation community is described in further detail below.

Vegetation condition across the island was variable with some areas in relatively good condition but with some weeds present, through to vegetation in critical condition.

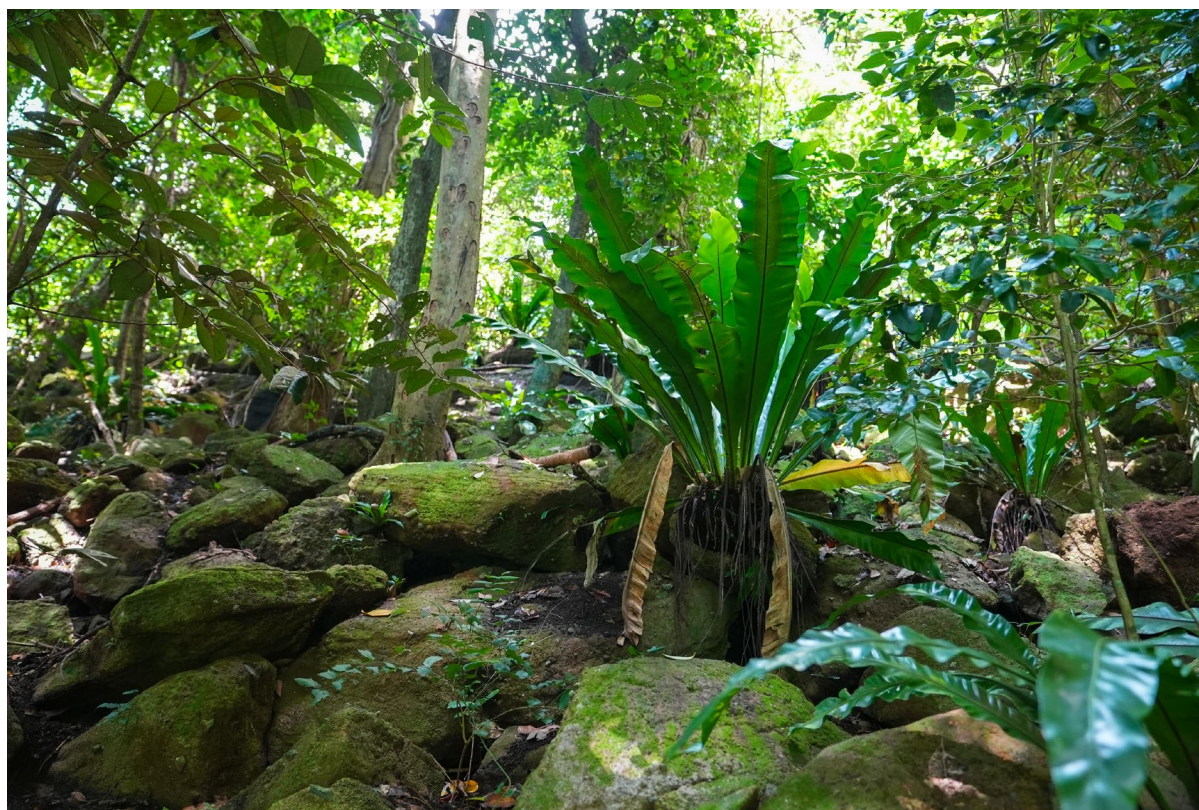


Plate 12: Closed canopy forests supporting birds nest fern- *Asplenium nidus* (Source: © Mandubarra Aboriginal Land and Sea Incorporated)

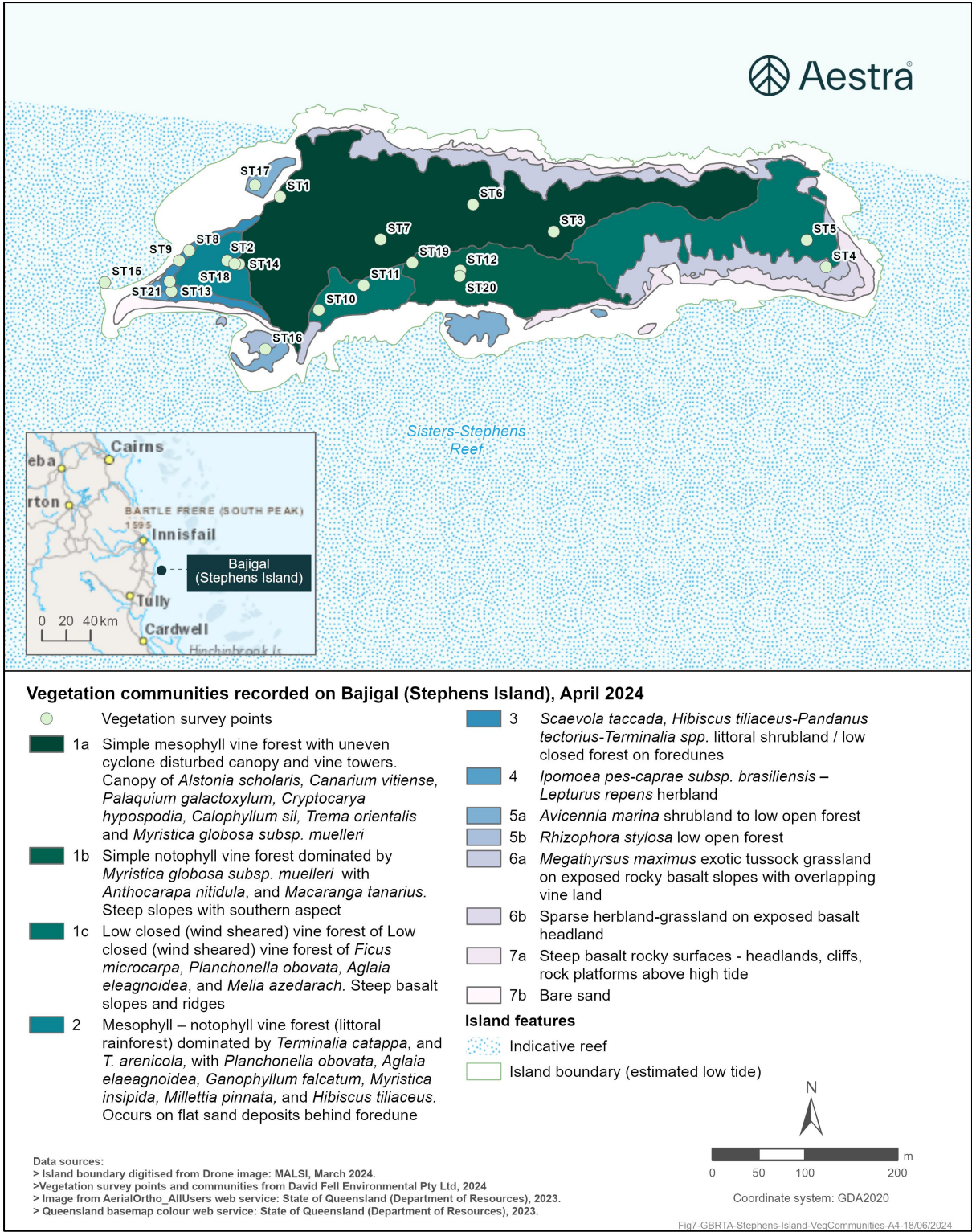


Figure 7: Vegetation communities recorded on Bajigal (Stephens Island), April 2024

5.1.1 Rainforests

Rainforest vegetation on the island has been separated into four distinct rainforest vegetation types (Unit 1A, 1B, 1C and 2).

The largest unit (vegetation Unit 1A, Table 8) comprises a heavily disturbed mesophyll vine forest characterised by an even canopy surface, numerous canopy gaps, and vine towers probably caused by repetitive historic catastrophic wind disturbance. It occurs on north-facing basalt slopes and is dominated by *Alstonia scholaris* and a simple assemblage of other canopy species such as *Cryptocarya hypospodia*, *Canarium vitiense*, *Palaquium galactoxylon*, *Calophyllum sil*, and *Terminalia sericocarpa*. The structure and floristics of this forest are simple with a lack of *Syzygium* spp., other Myrtaceae, and rare Lauraceae species. This vegetation type is deemed consistent with RE 7.8.1d although it lacks some of the more complex structural elements of the RE. Unit 1A is heavily disturbed with *Ipomoea purpurea* forming dense towers completely smothering tree crowns and gaps and intergrading with exotic grassland on the steep cliffs. Common native vines which also form vine towers include *Calamus australis*, *Mucuna gigantea*, *Tetrastigma nitens*, *Tetrastigma thorsborneorum*, *Cissus hastata*, and *Entada phaseoloides*, and ephemeral vines such as *Diplocyclos palmatus* var. *affinis* and *Luffa aegyptiaca* also proliferate.

The presence of secondary species such as *Trema orientalis*, *Melia azedarach*, and *Macaranga tanarius* in the canopy provide evidence of post-cyclone successional processes where fast-growing secondary species fill spaces made by windfall. Other species such as *Gomphandra australiana*, *Pisonia umbellifera*, and *Myristica insipida* are also present in the canopy having grown up from the understory and subcanopy following repeated destruction of the canopy.

Unit 1B is another expression of closed rainforest on basalt and is separated from Unit 1A rainforest based on its canopy structure and floristics. Unit 1B is referred to by MALSI Rangers as 'Nutmeg Forest'. It is a simple notophyll vine forest situated on the steep southern side of the basalt slopes. In contrast to Unit 1A, it has an even canopy surface dominated by notophyll rather than mesophyll species. It lacks the canopy gaps and vine towers characteristic of Unit 1A, which suggests that the southern aspect has been less affected by catastrophic wind disturbance. The canopy is dominated by *Myristica globosa* subsp. *muelleri* with associated trees of *Anthocarapa nitidula*, *Macaranga tanarius*, *Mangifera indica*, *Ficus microcarpa*, *Ficus drupacea*, *Calophyllum sil*, and *Semecarpus australiensis*. There is a conspicuous subcanopy of palms including *Ptychosperma elegans* and *Arenga australasica*.

The shrub layer in Unit 1B is very sparse, and the groundcover is dominated by leaf litter, seedlings of *Myristica* spp., and scattered herbs of the perennial herb *Pseuderanthemum variable*. Steep rocky areas feature occasional *Asplenium nidus* and *Alocasia brisbanensis*. Epiphytes are limited to rare *Asplenium nidus* and *Platynerium hillii* with climbing aroids of *Epipremnum pinnatum* and trailing vines of *Piper hederaceum* var. *hederaceum*. This forest is in good condition with weed incursion limited to scattered coral berry (*Rivina humilis*) seedlings. The presence of dense patches of coral berry, Guinea grass (*Megathyrsus maximus*) and *Ipomoea* spp. on the margins together with rare occurrences of lantana (*Lantana camara*) and devil's fig (*Solanum torvum*) pose a significant future threat. This forest type has not been previously mapped for the island and it does not fit neatly into existing REs within the bioregion. For convenience and best fit it is placed within 7.8.1d, however consideration for recognition as a subunit in the RE framework is recommended.

Low closed rainforest (Unit 1C) has been mapped on steep upper basalt slopes of the island. This rainforest community is a simple notophyll vine thicket typically 4-9 m in height with an even wind sheared canopy. The floristics are simple with consistent canopy dominants of *Ficus microcarpa*, *Planchonella obovata*, *Aglaia elaeagnoidea*, and *Melia azedarach*. Like Unit 1B, this forest type has not been mapped previously for the island and there is no RE available for it to be adequately placed. For convenience it has also been placed within 7.8.1d, and similarly consideration should be given for recognition of this community as a subunit in the RE framework.

In comparison to Units 1A-1C which occur on the basalt geology of the island, rainforest on coastal sand deposits has been mapped as Unit 2. This vegetation unit occurs in a small area of sand at the eastern end of the island only. This vegetation unit is characterised by a simple mesophyll – notophyll vine forest and currently mapped by the Department of Environment, Science and Innovation (DESI) as RE 7.2.1.

The understorey of Unit 2 is open and easy to walk through with scattered arenga palms. The ground cover features a very dense cover of seedlings thought to be deposited by droppings of pied imperial-pigeons (*Ducula bicolor*) and other frugivores. The seedling layer is dominated *Calamus australis*. The dense canopy cover and low light conditions offer minimal opportunities for weed establishment in the littoral rainforest. Nevertheless, seedlings and scattered individuals of the shade tolerant coral berry occur, and dense infestations of mature plants and seedlings were noted on margins in higher-light canopy gaps. Trailing vine stems of the invasive

morning glory vine (*Ipomoea purpurea*) were noted under the dense canopy cover. The presence of these weeds on margins and likely also in the soil seed bank poses a significant threat to the health of this rainforest. Any future wind disturbance event causing tree fall and further canopy gaps will likely be rapidly invaded by weeds from the soil seed bank.

5.1.2 Exotic grasslands

The steep basalt headlands and cliff lines that surround the island are subject to wind and salt exposure with minimal soil development. They are mapped here as exotic grasslands within Unit 6A and are completely dominated by Guinea grass. Prior to invasion by Guinea grass, it is possible that these were native grasslands of kangaroo grass (*Themeda triandra*) as mapped by DESI within RE 7.8.7.

The only evidence of what may have been the natural vegetation on these basalt surfaces was found on the extreme eastern headland of the island. A small polygon of Unit 6B is recognised as a rock pavement community supporting a sparse cover of native and exotic grasses and herbs rooted in cracks and crevices with minimal soil development. While no *Themeda* was recorded, other native grasses such as *Lepturus repens*, *Cymbopogon refractus*, and *Cynodon dactylon* occurred with native herbs such as *Coleus batianoffii* (refer Section 5.1.5), *Pouzolzia zeylanica*, *Evolvulus alsinoides*, and ferns of *Cheilanthes* sp. Low windswept native shrubs of *Myoporum montanum*, *Ficus opposita* and *Ficus microcarpa* occur on the margins. This headland has escaped total invasion by Guinea grass because of the minimal soil development. Guinea grass was however present, together with exotic grasses including *Eleusine indica* and herbs of *Sida cordifolia*.

5.1.3 Coastal shrublands

Vegetation fringing the exposed foredunes at the eastern end of the island has been mapped as Unit 3. This is shrubland to low closed forest with dense band of *Scaevola taccada* interspersed with straggling stems of typical strand species such as *Colubrina asiatica*, *Cassytha filiformis*, *Guilandina bonduc*, and *Premna serratifolia*. Larger trees such as *Hibiscus tiliaceus*, *Pandanus tectorius*, *Terminalia catappa*, *Ter. Arenicola*, and *Thespesia populnea* are common. Less common species which extend into a narrow band of low closed forest or thicket behind the *Scaevola* edge include *Barringtonia asiatica*, *Hernandia nymphaeifolia*, *Ximenia americana*, *Ochrosia elliptica*, *Huberantha nitidissima*, and *Aglaia elaeagnoidea*. A rare stand of *Pisonia grandis* occurs just behind the shoreline on the edge of this community and littoral rainforest. This unit together with *Ipomoea pes-caprae* subsp. *brasiliensis* dominated herbland on the western sand spit is consistent with RE 7.2.7a.

5.1.4 Mangroves

Mangroves occur in four locations on the intertidal rocky platforms surrounding the island. Two sub-units are recognized at the mapping scale. The more common is shrubland dominated by *Avicennia marina* with a few scattered shrubs of *Aegiceras corniculatum*, *Lumnitzera littorea*, and *Aegialitis annulata*. The other unit is a small patch of *Rhizophora stylosa* dominated low closed forest.

Table 7: Flora survey sites

Site #	Location	Site Type	Habitat type	Notes	Vegetation Unit	Applicable Regional Ecosystem
ST1	17°44'14.60"S 146°9'26.49"E	Quaternary	Mangrove	Mangrove shrubland dominated by <i>Aegiceras corniculatum</i> shrubs 1-2 m with <i>Avicennia marina</i>	5A	7.1.1
ST2	17°44'17.29"S 146°9'25.49"E	Health check	Littoral rainforest	Closed littoral mesophyll-notophyll rainforest dominated by <i>Terminalia catappa</i> with <i>Ter. Arenicola</i> , <i>Ganophyllum falcatum</i> , <i>Aglaia elaeagnoidea</i> , <i>Planchonella obovata</i> , <i>Trema orientalis</i> , <i>Cryptocarya hypospodia</i> <i>Canarium vitiense</i> , and <i>Macaranga tanarius</i> .	2	7.2.1c
ST3	17°44'16.28"S 146°9'36.91"E	Quaternary	Lowland rainforest	Well-developed canopy on ridge top <i>Melia azedarach</i> abundant in canopy with <i>Aglaia elaeagnoidea</i> , <i>Planchonella obovata</i>	1C	7.8.1
ST4	17°44'17.51"S 146°9'46.42"E	Quaternary	Low closed forest	Edge of steep cliffs with low closed microphyll-notophyll forest of <i>Ficus microcarpa</i> , <i>Aglaia elaeagnoidea</i> , and <i>Planchonella obovata</i>	1C	7.8.1
ST5	17°44'16.57"S 146°9'45.73"E	Quaternary	Low closed forest	Low closed rainforest 5-7 m with wind sheared canopy dominated by <i>Aglaia elaeagnoidea</i> and <i>Planchonella obovata</i> .	1C	7.8.1
ST6	17°44'15.33"S 146°9'34.08"E	Quaternary	Lowland rainforest	Well-developed lowland rainforest on upper basaltic slopes	1A	7.8.1d
ST7	17°44'16.55"S 146°9'30.85"E	Quaternary	Lowland rainforest	Uneven canopy dense cover upper slope	1A	7.8.1d
ST8	17°44'16.93"S 146°9'24.17"E	Quaternary	Strand	Low closed forest of <i>Hibiscus tiliaceus</i> on frontal dune margins with <i>Premna serratifolia</i> , <i>Sophora tomentosa</i> , <i>Thespesia populnea</i> , and <i>Terminalia catappa</i> .	3	7.2.7
ST9	17°44'17.29"S 146°9'23.81"E	Quaternary	Strand	Low closed forest of <i>Hibiscus tiliaceus</i> on frontal dune margins with <i>Premna serratifolia</i> , <i>Sophora tomentosa</i> , <i>Thespesia populnea</i> , <i>Milletia pinnata</i> and <i>Terminalia catappa</i> .	3	7.2.7
ST10	17°44'19.02"S 146°9'28.70"E	Quaternary	Low closed wind sheared rainforest	Low closed wind sheared rainforest on steep upper slopes with <i>Ficus microcarpa</i> , <i>Aglaia elaeagnoidea</i> , <i>Planchonella obovata</i> , and <i>Melia azedarach</i> .	1C	7.8.1b
ST11	17°44'18.15"S 146°9'30.26"E	Quaternary	Lowland rainforest	Closed forest dominated by <i>Myristica globosa</i> subsp. <i>muelleri</i> with <i>Semecarpus australiensis</i> , <i>Macaranga tanarius</i> , on steep south aspect basalt slope with open understorey	1B	7.8.1b

Site #	Location	Site Type	Habitat type	Notes	Vegetation Unit	Applicable Regional Ecosystem
ST12	17°44'17.64"S 146°9'33.63"E	Health check	Lowland rainforest	Well-developed lowland rainforest on steep southern aspect. Canopy dominated by <i>Myristica globosa</i> subsp. <i>muelleri</i> with <i>Semecarpus australiensis</i> , <i>Macaranga tanarius</i> , <i>Anthocarapa nitidula</i> , <i>Calophyllum sil</i> , <i>Ficus virens</i> , <i>Ficus drupacea</i> .	1B	7.8.1b
ST13	17°44'18.36"S 146°9'23.55"E	Quaternary	Strand	Closed shrubland dominated by <i>Scaevola taccada</i> on frontal dune (strand) with <i>Colubrina asiatica</i> , <i>Hibiscus tiliaceus</i> , <i>Cassytha filiformis</i> , <i>Guilandina bonduc</i> , <i>Cocos nucifera</i> , <i>Barringtonia asiatica</i> , <i>Hernandia nymphaeifolia</i> , <i>Terminalia catappa</i> , <i>Canavalia rosea</i> , and <i>Ipomoea violacea</i> .	3A	7.2.7
ST14	-17.73816946 S; 146.1571988 E	Quaternary	Littoral rainforest	Closed forest of <i>Terminalia catappa</i> , <i>Ter. arenicola</i> , <i>Planchonella obovata</i> , <i>Ganophyllum falcatum</i>	2	7.2.1
ST15	-17.7383474 S 146.1558933 E	Quaternary	Herbland	Herbland-grassland on sand spit dune. <i>Ipomoea pes-caprae</i> dominant 40% cover rare <i>Barringtonia asiatica</i> and patch of <i>Lepturus repens</i> and <i>Cassytha filiformis</i> on edge	4	7.2.7
ST16	-17.73899397S 146.1574528 E	Quaternary	Mangrove shrubland	<i>Avicennia marina</i> and <i>Rhizophora stylosa</i> only on outer edges	5A	7.1.1
ST17	-17.737403 S; 146.1573521 E	Quaternary	Mangrove	<i>Aegiceras corniculatum</i> mainly with <i>Avicennia marina</i>	5A	7.1.1
ST18	-17.738165 S; 146.157154 E	Health Check	Littoral rainforest	<i>Arenga australasica</i> seedlings abundant	2	7.2.1
ST19	-17.73815558 S; 146.1588776 E	Quaternary	Lowland rainforest	Complex meso-notophyll vine forest with <i>Ficus virens</i>	1A	7.8.1
ST20	17.7382871 S; 146.1593365 E	Health Check	Lowland rainforest	Complex meso-notophyll vine forest	1A	7.8.1
ST21	17.73833926 S; 146.1565221 E	Quaternary	Coastal shrubland	Closes shrubland of <i>Scaevola taccada</i> with rare <i>Hernandia nymphaeifolia</i>	3	7.2.7

5.1.5 Vegetation of biodiversity significance

Two Threatened Ecological Communities (TECs) are confirmed as present on Bajigal (refer Figure 8) they are:

- *Lowland Tropical Rainforest of the Wet Tropics threatened ecological community* (lowland rainforest) which is listed as endangered under the EPBC Act (Unit 1A)
- *Littoral Rainforest and Coastal Vine Thickets of Eastern Australia* threatened ecological community (littoral rainforest) which is listed as critically endangered under the EPBC Act (Units 1B, 1C and 2).

On Bajigal, the vegetation described as lowland rainforest is characterised by an uneven canopy with larger emergent mesophyll species such as *Alstonia scholaris* and a canopy dominated by species such as *Canarium vitiense*, *Terminalia sericocarpa*, and *Palaquium galactoxylum*, many of which have buttressed roots. The expression of this vegetation community on Bajigal is not typical of other lowland rainforest communities as it has key elements such as *Syzygium* spp. absent. While this could potentially be described as part of the littoral rainforest community due to its island location, the vegetation height, canopy structure, and difference in species composition is used to support its classification as lowland rainforest. The field surveys for this project did not use the required survey methodology outlined in the Conservation Advice to calculate species richness (100x50 m plot after Eyre *et al.* 2015), however based on the diversity and cover of native species present and patch size it would most likely be considered to align to Class B1 in the Conservation Advice which indicates that it would be a high-quality occurrence of the community.

In contrast to the vegetation described as lowland rainforest, the vegetation identified as littoral rainforest is characterised by a lower closed canopy of even height and dominated by a different suite of species (e.g., *Myristica globosa* subsp. *muelleri* in Unit 1B). The vegetation within the littoral rainforest communities meets the threshold criteria for maritime influence (including factors such as wind shear) as well as species composition requirements (including >25 % of the component species for the TEC, and >30 % cover of the component species).

In addition to the presence of the two TECs, it is noted that mangroves and shoreline vegetation on Bajigal are protected as marine plants under the *Fisheries Act 1994* (Qld). The condition of vegetation is detailed in Figure 9.

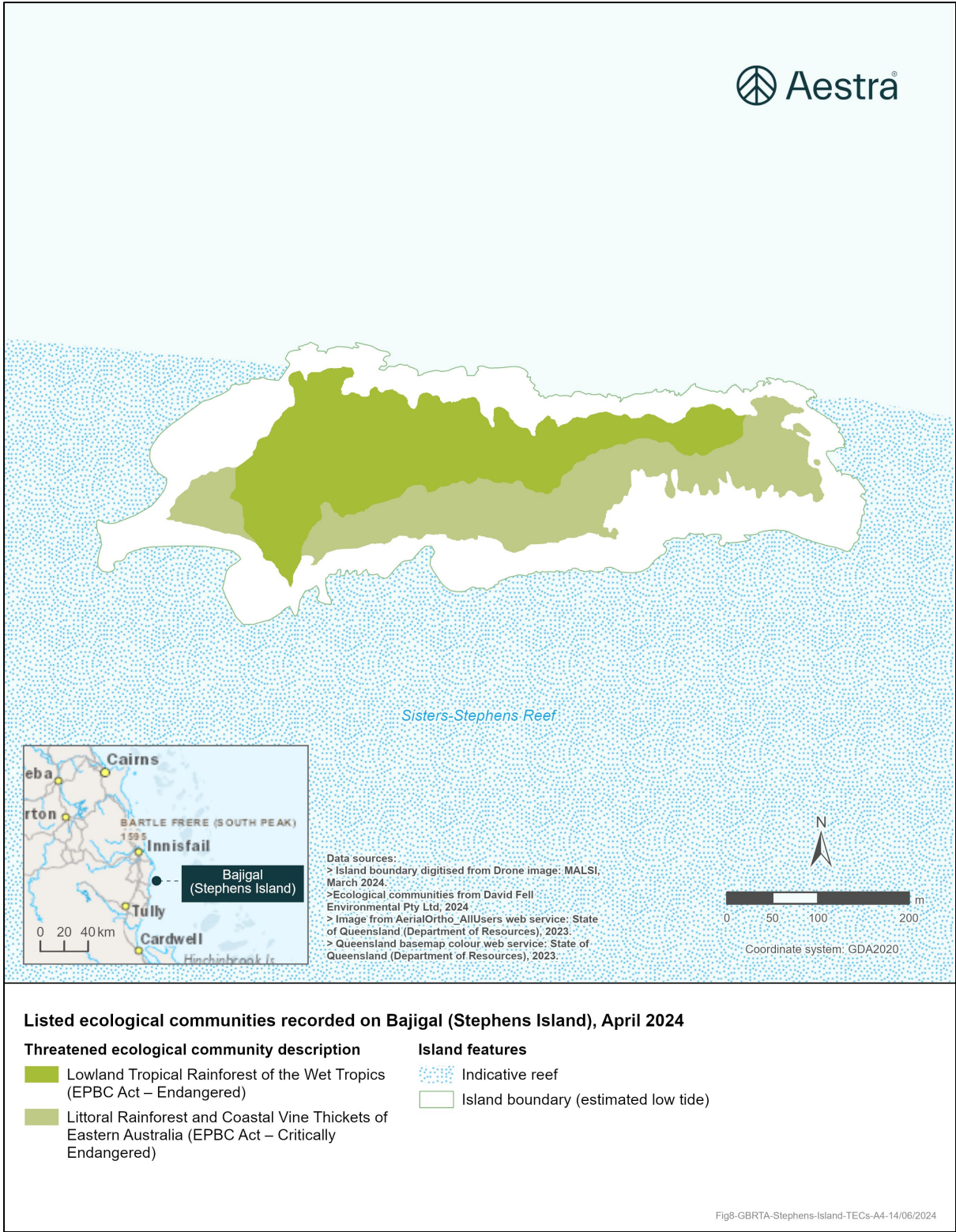


Figure 8: Listed ecological communities recorded on Bajigal (Stephens Island), April 2024

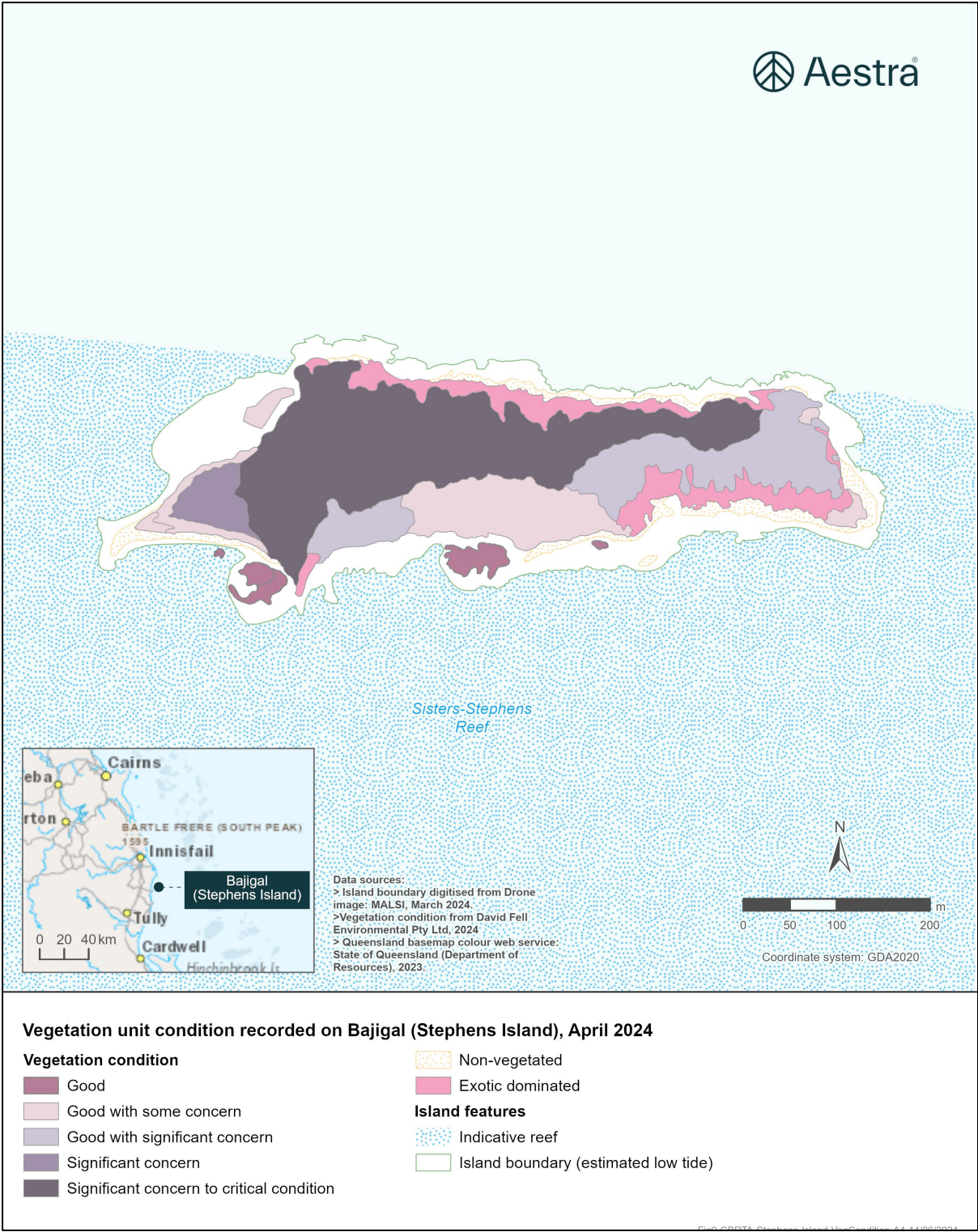


Figure 9: Vegetation unit condition recorded on Bajigal (Stephens Island), April 2024

5.2 Flora

5.2.1 Composition of the flora

The vascular flora of Bajigal contains 184 species within 72 families and 149 genera comprising species observed during this project as well as records identified in the desktop assessment from WildNet. This field survey recorded 168 species which are outlined in Appendix B - Flora species list for Bajigal.

The dominant plant life forms on Bajigal are trees (38%), shrubs (17%), vines (16%) and herbs (11%). The indigenous flora is comprised of 161 species (87%). Native families with more than five native species per family are:

- Leguminosae (ten species),
- Moraceae (eight),
- Poaceae (eight),
- Apocynaceae (seven),
- Lamiaceae (seven),
- Meliaceae (seven), and
- Rubiaceae (five).

The naturalised flora (exotic species) has 23 species (13%).

New records for Bajigal

The April 2024 survey added significantly to the known flora of the island with 83 new species recorded. These species are annotated in Appendix B - Flora species list for Bajigal. Significant flora species are discussed further below.

5.2.2 Flora of biodiversity significance

Three species of significance were recorded during the survey period (Figure 10). These are:

- Australian arenga palm (*Arenga australasica*), and
- Grand devil's-claw (*Pisonia grandis*).
- *Coleus batianoffii*

The arenga palm is a large, dense, wide, clumping palm often with multiple light grey trunks to 30 cm in diameter and many suckers. The divided leaves are glossy dark green above and pale greyish-white beneath and are 2-3.5 m long with a leaf stalk up to 1.6 m long.

The leaves are widely spaced along trunk to show a smooth stem with leaf scars. Flowers are yellow, about 1 cm and fruits are round, red, purple, or brown to about 2 cm diameter. Large (1-2 m) flower stalks first occur next to topmost leaves and then progressively down the trunk. Only one mature trunk flowers at a time and later dies after fruiting. Germination and growth are slow (0.5 – 2 years).

Arenga palms occur in north-east Queensland within the Wet Tropics and Cape York Peninsula bioregions including some Torres Strait islands and possibly north-eastern Northern Territory (Fell and Amall, 2019). The preferred habitat is partial shade in littoral and near-coastal rainforests, especially stony creek beds on sandy soils, on coral cays, and continental islands at altitudes of 0 – 300 m.

The field surveys have shown that Bajigal provides important island habitat for the arenga palm and supports a large population of the species. The population on the island has been estimated at 1,000 individuals based on the field survey and appears robust and healthy. There is clear evidence of regeneration of seedlings rainforest habitats on both sand and basalt (refer Plate , Plate 14). The primary threat to the population of the species on Bajigal is from weed invasion, however, future weed management should be carefully managed to avoid spraying or cutting seedlings or mature individuals.



Plate 13: Seedlings of arenga palm were abundant in the groundcover of littoral rainforest. (photo: David Fell, April 2024)



Plate 14: Mature arenga palm located on margin of forest on eastern end of island with surrounding infestations of coral berry (photo: David Fell, April 2024).

The field surveys recorded the presence of *Pisonia grandis* on the western end of the island. Known variously as bird lime-tree, birdcatcher tree, cabbage tree, lettuce tree, and grand devil's-claw, it is a broad-leaved woody shrub or tree that bears clusters of green flowers that mature into sticky barbed seeds.

The trunk is buttressed on larger trees and the outer bark is smooth and pale. It can reach a mature height of approximately 20 – 30 m. Its wood is relatively weak and soft, and decays rapidly or vigorously resprouts (both basally and from fallen limbs) when the trees fall.

Globally, *Pisonia grandis* occurs on islands in the Indian Ocean including Christmas Island (Clausen, 2005), in South-East Asia, Malesia, and the Pacific Islands (Airy-Shaw, 1952). It occurs as far east at the Tuamotu Archipelago in the Pacific, and as far west as the Mascarene Islands and Seychelles in the Indian Ocean (Walker, 1991). Within Australia, it is best known from the Great Barrier Reef where it covers at least 160 ha (over 44 islands, 94% of the southern coral cays; Walker, 1991). It also occurs at the top end of the Northern Territory, eastern Cape York Peninsula, North-east Queensland, and southwards to coastal central Queensland.

Previous records of *Pisonia grandis* in this area are limited to North Brook and Eva islands. This record represents an important extension of distribution for the species in the Wet Tropics bioregion.



Plate 15: Grand devil's-claws (*Pisonia grandis*) recorded on Bajigal (Photo: Dr Colette Thomas, 2024)

In addition, to the two larger species identified one small herb species of conservation significance was also identified. *Coleus batianoffii* was recorded during the surveys on the extreme eastern headland of the island, growing in crevices of bare basaltic rock. The species is considered to be of conservation significance as it has a highly localised and disjunct distribution.

The species was first collected in 1967 on Lizard Island, however it was first described by Forster in 2008. The species is an island endemic herb which grows to 30cm and was only known previously from the Cape York bioregion. The species occurs in the Cape York Bioregion in three populations on Lizard, Palfrey and Flinders Islands. The habitat on these islands is described as granite outcrops and pavements or occasionally boulder strewn grasslands (Forster 2008).

On Bajigal Island, the population is considered to comprise less than 10 individuals and is restricted to the eastern headland of the island (vegetation Unit 6B). Large areas of potential habitat for the species on the basalt slopes of the island have been invaded by Guinea Grass. The occurrence on Bajigal represents a significant range extension of approximately 350 km and is a new record for the Wet Tropics bioregion. When describing the species, Forster recommended that the species be listed as threatened under Commonwealth and State environment legislation, however, to date the species has not been listed.

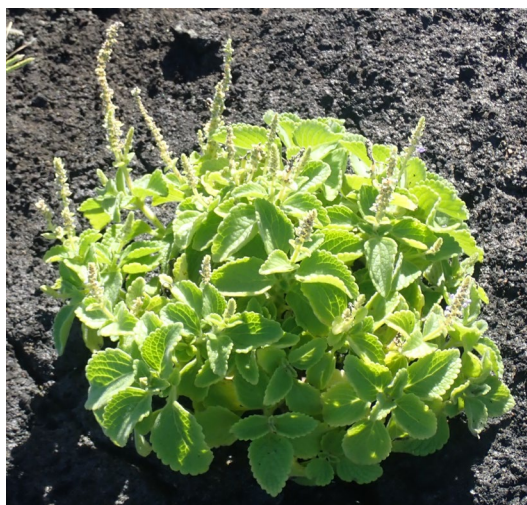


Plate 16 *Coleus batianoffii* (Image: David Fell)



Plate 17 *Coleus batianoffii* leaves (Image: David Fell)

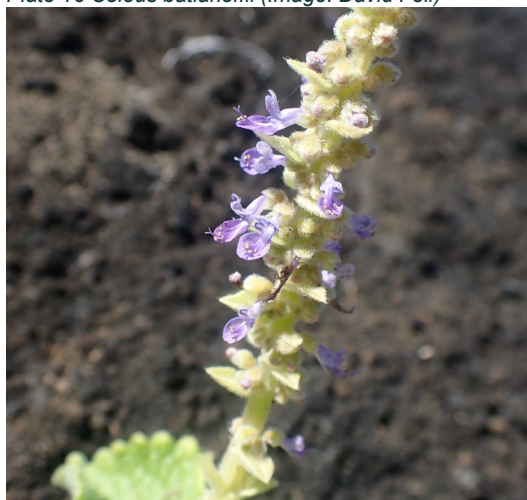


Plate 18 *Coleus batianoffii* flowers (Image: David Fell)



Plate 19 Habitat for *Coleus batianoffii* on Bajigal (Vegetation unit 6B) (Image: David Fell)

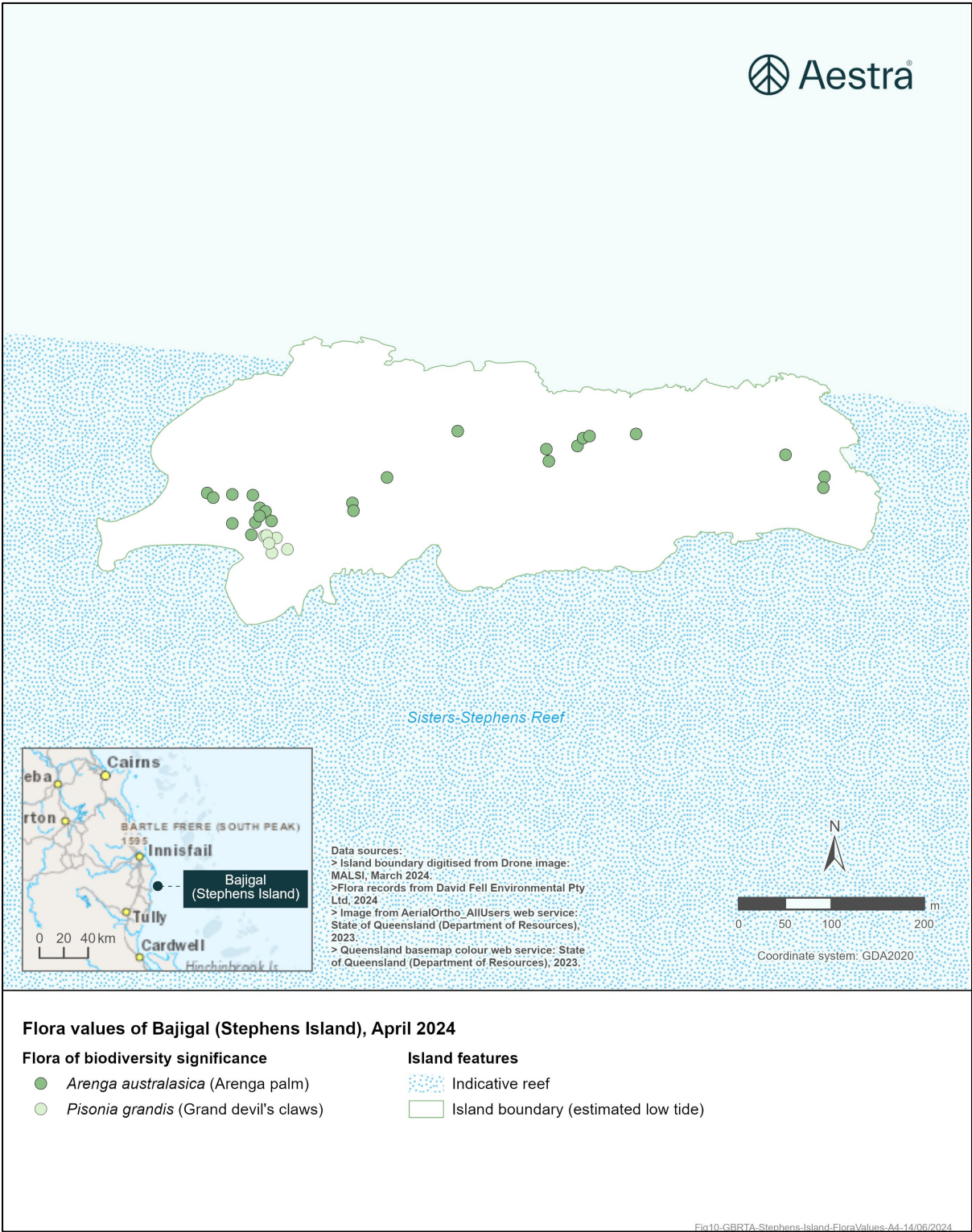


Figure 10: Flora values of Bajigal (Stephens Island), April 2024

5.2.3 Introduced flora (weeds)

Field surveys to date have recorded a total of 23 introduced species. This is 13% of the total flora of the island. The habitat preferences of the main environmental weeds are summarised according to broad habitats in Table 8. Survey weed records are shown in Figure 11.

Table 8: Summary of weed species, distribution and impacts on Bajigal

Species recorded	Vegetation unit	Regional Ecosystem	Summary of infestation
Ecosystem transforming weeds			
Purple morning glory <i>Ipomoea purpurea</i>	1A, 1B, 1C, 2, 6A	7.8.1d 7.2.1b 7.8.7	The heaviest infestations of <i>Ipomoea purpurea</i> occur in vegetation Unit 1A lowland rainforest where forest structure has been devastated by past cyclones. The vine forms dense vine towers which completely shroud native trees and prohibits recruitment in groundcover. In some areas cover is 100%. Vine towers overlap onto cliff lines and intergrade with dense Guinea grass on the northern side of the island. Minor infestations of <i>Ipomoea purpurea</i> occur in the nutmeg forest and low closed forest and mainly on margins in Units 1B and 1C. Unit 2 littoral rainforest has some dense patches in canopy gaps on the margins of the coastline and intergrading with basalt slopes. Patches of trailing vines occur within closed canopy of littoral rainforest. Unit 6A has dense vine swathes overlapping onto the upper slopes of exotic Guinea grasslands
Blue morning glory <i>Ipomoea indica</i>	1A, 1B, 1C, 2, 6A	7.8.1d 7.2.1b 7.8.7	Note that field identification between <i>I. purpurea</i> and <i>I. indica</i> was difficult given lack of fertile material. It is assumed that impacts are the same as for <i>I. purpurea</i> .
Coastal morning glory <i>Ipomoea cairica</i>	1A, 1B, 1C, 2, 6A	7.8.1d 7.2.1b 7.8.7	<i>Ipomoea cairica</i> was commonly observed at a number of locations in canopy gaps and on forest margins.
Coral berry <i>Rivina humilis</i>	1A, 1B, 1C, 2, 3, 6A	7.8.1d 7.2.1b 7.8.7	<i>Rivina humilis</i> formed dense clumps in canopy gaps and extending into low light situations as seedlings and scattered individuals in the groundcover. Dense infestations were recorded in all rainforest types.
Guinea grass <i>Megathyrsus maximus</i>	1A, 1B, 1C, 2, 3, 6A, 6B	7.8.1d 7.2.1b 7.8.7	<i>Megathyrsus maximus</i> formed dense clumps in canopy gaps within the rainforest and on margins.
Devil's fig <i>Solanum torvum</i>	2, 3, 6A	7.2.1, 7.2.7	Only few scattered plants were observed on the margins of cliffs and behind the shoreline. Plants were mature and in juvenile fruit at the time of survey.
Lantana <i>Lantana camara</i>	6A	7.8.7	Only a single clump of lantana was observed on a step cliff line above the mangroves near the fish trap area.
Singapore daisy <i>Sphagneticola trilobata</i>	3	7.2.7	A single infestation of approximately 16 m ² was recorded in coastal shrubland vegetation on the edge of the foredune. The plants were mature and starting to flower. This plant has the potential to infest large areas of coastal vegetation.
Mossman river grass <i>Cenchrus echinatus</i>	4	7.2.7	A single plant was recorded on the edge of <i>Ipomoea pes caprae</i> herbland and scaevola shrubland near the National Park sign.
Other less aggressive weeds			
Blue top <i>Ageratum conyzoides</i>	6A, 6B, 7	7.8.7	Occasional herb on exposed basalt cliffs and headlands.
Paw paw <i>Carica papaya</i>	1A, 1B, 1C, 2	7.8.1d 7.2.1b 7.8.7	Common and scattered plants found in canopy gaps throughout lowland and littoral rainforests.
Rhodes grass	6A, 6B, 7	7.8.7	Rare occurrences on exposed basalt cliffs and headlands.

Species recorded	Vegetation unit	Regional Ecosystem	Summary of infestation
<i>Chloris gayana</i>			
Crows foot grass <i>Eleusine indica</i>	6B	7.8.7	Common in rock crevices on exposed basalt headland at eastern end of the island.
Stinking passionflower <i>Passiflora foetida</i> var. <i>foetida</i>		7.8.1d 7.2.1b 7.8.7	Uncommon vine in coastal shrublands and on margins of littoral and low closed forests.
Cape gooseberry <i>Physalis peruviana</i>		7.8.1d 7.2.1b 7.8.7	Occasional herb on exposed basalt cliffs and headlands.
Flannel weed <i>Sida cordifolia</i>		7.8.7	Patchy but dense infestations limited to margins of exposed basalt headland in east.
Black nightshade <i>Solanum nigrum</i>		7.8.1d 7.2.1b 7.8.7	Occasional herb on exposed basalt cliffs and headlands and on edges of canopy gaps in rainforest.
Cinderella weed <i>Synedrella nodiflora</i>	1C, 6A, 6B	7.8.7	Occasional herb on exposed basalt cliffs and headlands and on edges of canopy gaps in rainforest.
Tridax daisy <i>Tridax procumbens</i>	4	7.8.7	Occasional herb on exposed basalt cliffs and headlands. May also colonise sand spit.
Weeds on species list but not recorded during April 2024 survey			
<i>Triumfetta rhomboidea</i>	Not recorded	NR	Not observed during the April 24 survey but may inhabit exposed basalt cliffs, headlands, and canopy gaps in rainforest. Previously recorded as present on Bajigal.
Yam <i>Dioscorea sp.</i>	Not recorded	NR	Robust vine not recorded in survey. Previous records from Bimi.
Corky passionflower <i>Passiflora suberosa</i>	Not recorded	NR	Slender vine previously listed but not recorded. Potential habitat on exposed margins of littoral forest. Previously recorded as present on Bajigal.

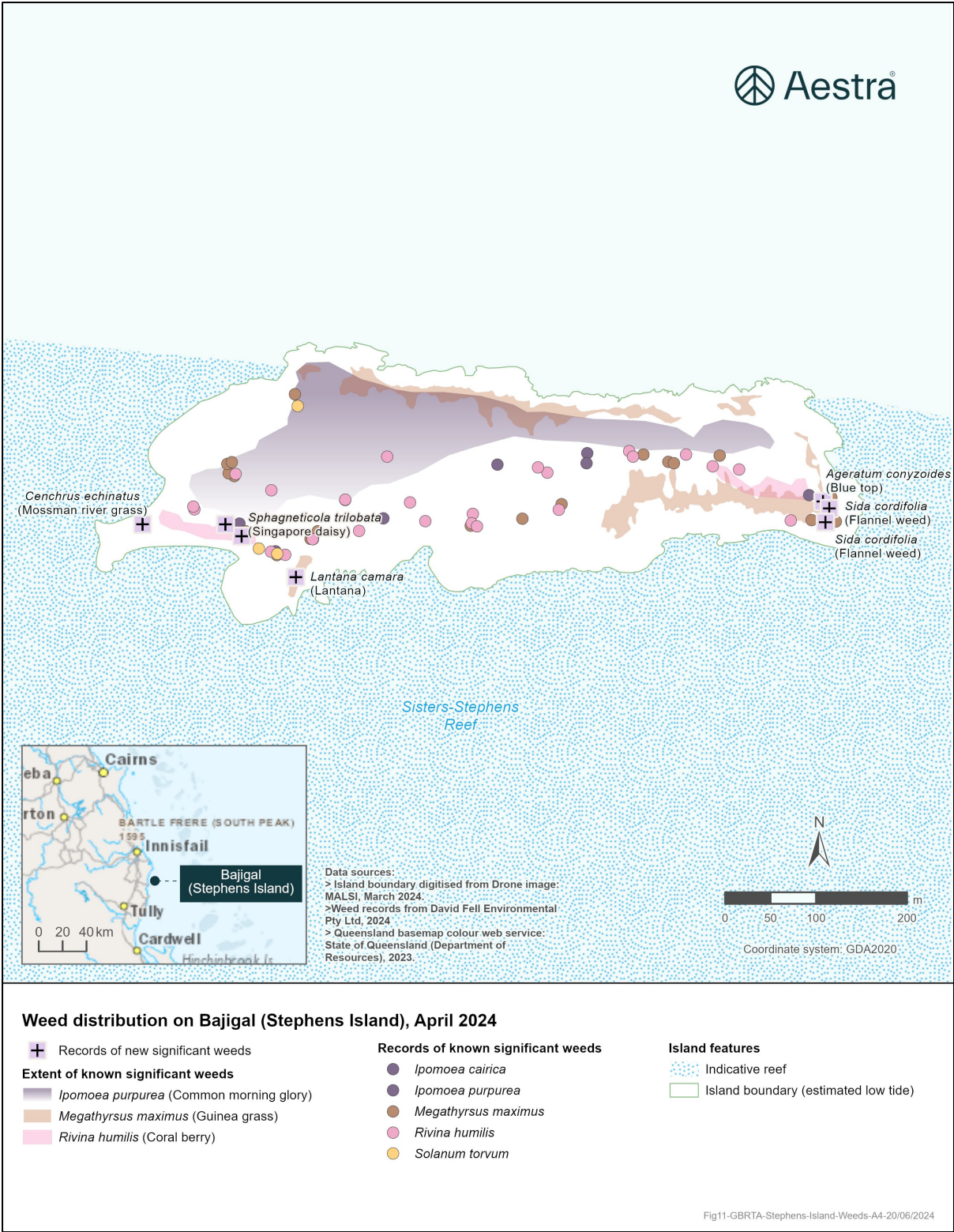


Figure 11: Weed distribution on Bajigal (Stephens Island), April 2024

5.3 Fauna

The survey recorded 31 species of vertebrate, comprising 26 bird, four reptile, and one invasive toad (Appendix D - Fauna species list for Bajigal). Three reptile and one bird species had not been previously recorded on the island, bringing the total number of fauna species recorded for Bajigal to 73 species.

The three new reptile species recorded were the slaty-grey snake (*Stegonotus cucullatus*) – one individual, striped snake-eyed skink (*Cryptoblepharus virgatus*) – four individuals, red-throated rainbow skink (*Carlia rubrigularis*) – two individuals. The only new bird species recorded was the eastern koel (*Eudynamys orientalis*).

Appendix D - Fauna species list for Bajigal includes a list of fauna species recorded during the survey.



Plate 20: The striped snake-eyed skink is a new record for Bajigal (photo: David Fell, 2024)



Plate 21: The slaty-grey snake is a new record for Bajigal (Photo: David Fell, 2024).

Camera trap results indicated no sign of invasive animals and provide supporting evidence of the successful eradication of black rats (*Rattus rattus*). Animals that frequently appeared in the camera traps included orange-footed scrubfowl (*Megapodius reinwardt*), bar-shouldered dove (*Geopelia humeralis*), Pacific emerald dove (*Chalcophaps longirostris*), and major skink (*Bellatorias freerii*).

Appendix D - Fauna species list for Bajigal and Appendix E - Field images outline further results of camera traps.



Plate 22: Pacific emerald dove (Camera 5, north side of ridge, 2024)



Plate 23: Orange-footed scrubfowl (Camera 5, north side of ridge, 2024)

Forest bird surveys revealed a low diversity of avian fauna with only seven species recorded during the three survey periods. The dominant species were varied honeyeater (*Gavicalis versicolor*), bar-shouldered dove, orange-footed scrubfowl, and silvereye (*Zosterops lateralis*). The lack of diversity may have been due to the prolonged wet season (experienced prior to and during the survey) with a lack of fruiting and flowering plants present on the island at the time of the survey. **Appendix D2. Shorebird and forest bird survey results** outline the results of the forest bird survey. Pied imperial-pigeons (*Ducula bicolor*) are known to nest on Bajigal

during summer, and approximately 2,000 individuals were observed returning to the island at dusk during a survey in November 2022. The timing of the forest bird surveys may explain the species' absence.

Scat, track, and sign searches were limited due to presence of high tides in the morning and wet weather. However, no sign of seed caching, scats, or tracks of invasive animals were recorded during targeted and incidental surveys. Appendix D3. Results of scat, track, and sign searches outlines the results of the conducted searches.

Existing chew cards installed by QPWS were inspected for evidence of invasive rodents and re-baited.



Plate 24: MALSI Rangers Dylan Daugherty and Jehrone Johnson inspect chew cards for rat sign 26/04/24 (Photo: Mark Geyle, 2024)



Plate 25: Rat chew card (Photo: Mark Geyle, 2024)

5.3.1 Fauna species of biodiversity significance

No shorebirds were observed during the three targeted shorebird surveys, however, incidental sightings of the eastern curlew (*Numenius madagascariensis*), the beach stone-curlew (*Esacus magnirostris*), and crested terns (*Thalassidroma bergii*) were recorded.

The eastern curlew is listed as critically endangered, and endangered, under the EPBC Act and NC Act respectively. The beach stone-curlew is listed as vulnerable under the NC Act.

Given the timing of the field surveys, most of the migratory shorebird species previously recorded on Bajigal would have departed to their staging areas in preparation for their migration flights to their summer breeding grounds in the Arctic Tundra. However, large numbers (100+) of crested tern adults and juveniles were observed around the two fishing trawlers that were anchored just off the island during the survey as well as on the shoreline on morning of 26 April 2024.



Plate 26: Crested terns with adults and juveniles on Bajigal western sand spit (Photo: Mark Geyle, 2024)

Bridled tern habitat

Bajigal is known to support large numbers of bridled terns (*Onychoprion anaethetus*) during the breeding season and this seabird breeding habitat is the Key Value identified for Bajigal by QPWS. The timing of the field surveys did not coincide with the nesting period for this species and the 2023/2024 bridled tern nesting season had finished before this survey occurred. No nesting activity was observed, and only a few individuals were seen flying over water on the first day.

Information on the location of key nesting habitat from the previous two breeding seasons was provided by MALSI Senior Ranger James Epong and QPWS Senior Project Officer Johanna Karam. Without direct observation of where and how the terns were accessing the island it is difficult to determine the extent of impacts that invasive flora species may be having on terns' access to nesting habitat.



Plate 27: and Plate 28: Myristica forest on northern aspect steep rocky slopes side provides many rock crevices known for nesting bridled terns (Photo: Mark Geyle, 2024)

Based on the information and advice provided by Mr Epong and Ms Karam, a map of favourable nesting habitat known to be used by bridled terns was developed, including a summary of environmental factors that may be inhibiting access to more nesting habitat on the island (refer Figure 12 and Figure 14, and Figure 13 respectively). Both Mr Epong and Ms Karam have indicated that bridled terns appear to favour both the southern and central areas of the island for nesting. They also noted that there are more openings in the forest edge and canopy on the south side of the island which may allow better access for the birds flying into their nest sites. By contrast, there are very few openings in the forests facing to the north, mainly due to thick vine growth over the canopy (MALSI Senior Ranger James Epong and QPWS Senior Project Officer Johanna Karam *pers. comm.*, April 2024). It is noted that the eastern half of the island has been surveyed less frequently and may therefore contain unmapped significant breeding areas.

Spectacled flying-fox

A colony of spectacled flying-fox (*Pteropus conspicillatus*) was previously recorded on Bajigal. The camp was last observed on Bajigal on 28 February 2024 (MALSI Senior Ranger James Epong *pers. comm.*, April 2024). Observations in November 2023 and February 2024 included young, and in November 2022 approximately 6,000 flying-foxes were counted leaving the island at dusk (MALSI Senior Ranger James Epong *pers. comm.*, April 2024). However, no flying-foxes were present on Bajigal during the time of the survey. Advice from Dr Andrew Dennis, Project Lead for Biodiversity at TerrainNRM was that the species tend to remain resident in their bigger camps (like Bajigal) until the end of March and that movements in April were occurring in other locations this year as well. It appears that there was a melaleuca flowering in some of the coastal swamps this year which may have precipitated the movement now that young are largely independent (Dr Andrew Dennis *pers. comm.*, April 2024).

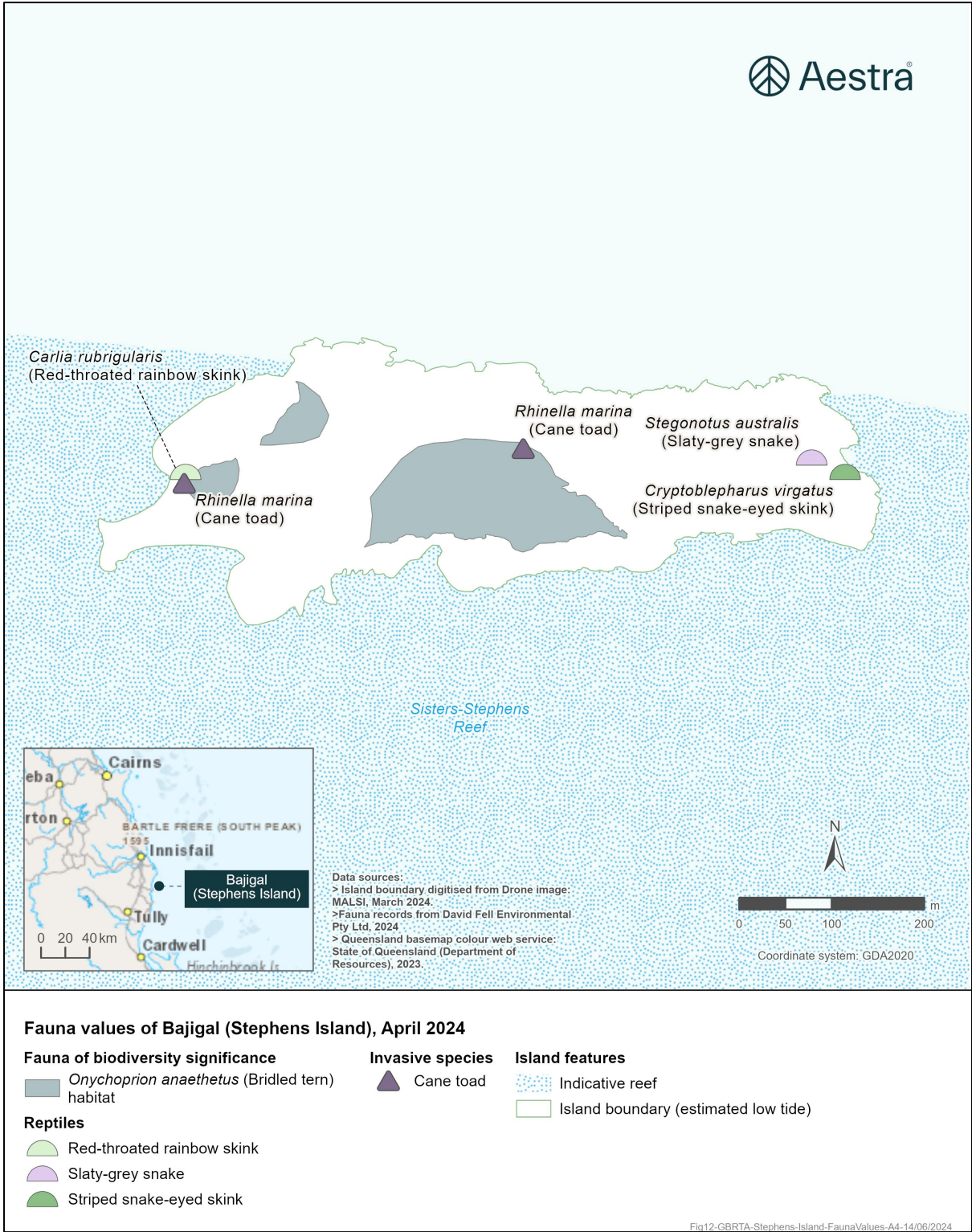


Figure 12: Fauna values of Bajigal (Stephens Island), April 2024

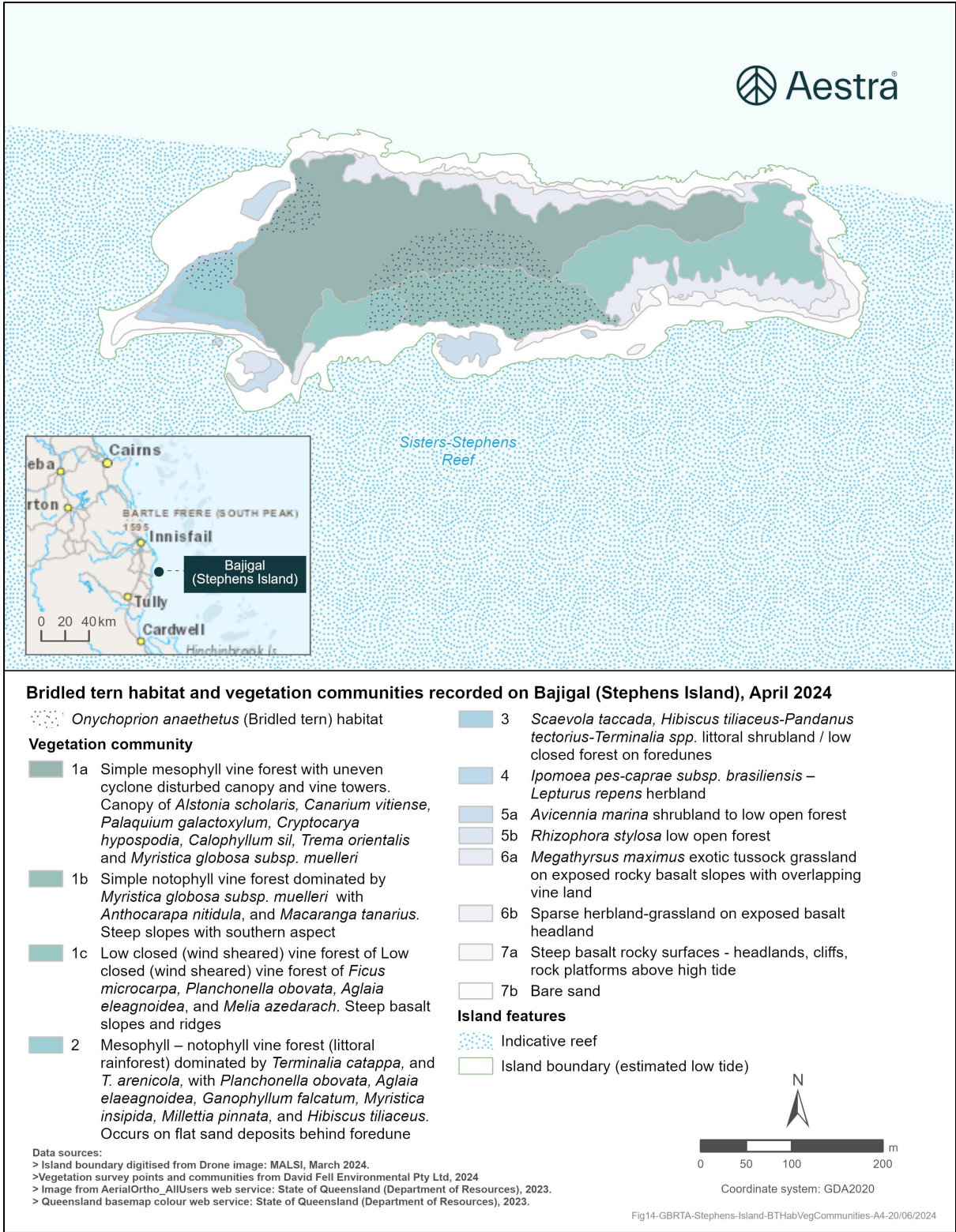


Figure 13: Comparison between bridled tern nesting habitat and vegetation unit distribution on Bajigal (Stephens Island), April 2024

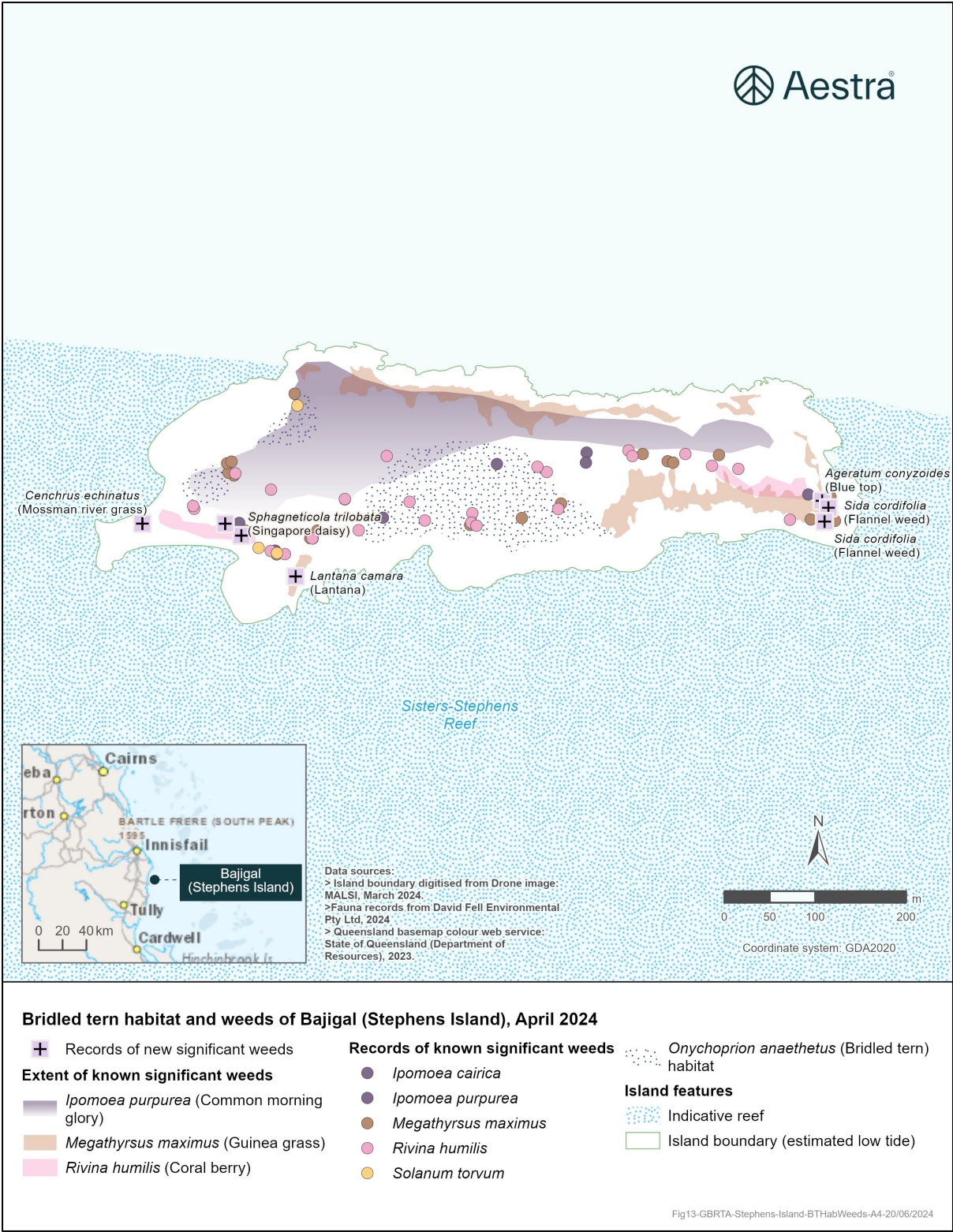


Figure 14: Comparison between bridled tern nesting habitat and weed distribution on Bajigal (Stephens Island), April 2024

5.3.2 Invasive fauna species

Only one species of invasive animal was observed during the surveys. Two juvenile male cane toads were collected and euthanised, which suggests that breeding is occurring on the island.



Plate 29: Juvenile cane toad collected at beach campground (Photo: Mark Geyle, 2024)

No signs of chew marks were observed on the five rebaited chew cards present in the littoral rainforest area and in close proximity to the public campground in the western section of the island. Based on this and the lack of evidence from other searches indicates that no invasive rats are currently present on the island following QPWS eradication efforts in 2001.

Invertebrate species

During the surveys, MALSI Rangers collected samples of ant species as part of a broader monitoring program in collaboration with Queensland Department of Agriculture and Fisheries Research centre. The monitoring forms part of the *Biosecurity Queensland National Electric Ant Eradication Program* and the *Wet Tropics Management Authority's Yellow Crazy Ant Eradication Program*, and is designed to support early detection of invasive ant species.

MALSI Rangers collected 12 samples during the survey period of which nine were confirmed to contain the invasive African big-headed ant (*Pheidole megacephala*).

6 Discussion

Bajigal has a diversity of values and features which range from areas of seabird breeding habitat and intact areas of high conservation significance to highly disturbed ecosystems dominated by exotic species. There are several threats acting upon the island which influence the distribution and condition of its vegetation and floristic values including anthropogenic impacts and environmental drivers. Impacts to the islands vegetation communities result in flow-on impacts to fauna values which utilise the island for habitat. Understanding the values and threats of the island is an important component of developing and applying fit for purpose management activities.

6.1 Rarity of vegetation communities

Bajigal supports rare and uncommon floristic assemblages which is in part due to its underlying basalt geology. The Atherton Basalt group which forms the basal geology for the island is mostly associated with inland regions where it primarily extends from the west of Innisfail up to the Atherton Tablelands. Few expressions of the formation occur within 10 km of the coast, however, there is an expression of the Atherton Basalt group at Clump Point, north of Mission Beach (State of Queensland, 2024). Other islands within the local region (e.g., the Barnards Group, Hinchinbrook and Dunk islands) are not associated with basaltic geology, which makes the vegetation present on Bajigal unique in an island context.

The complex mesophyll vine forest on basalt (Unit 1A) is a rare rainforest type in the wet tropical lowlands that is consistent with the definition of the lowland rainforest TEC. The occurrence of this vegetation type on basalt is possibly the only representation of this rainforest ecosystem type on an island in the Wet Tropics bioregion. This vegetation community is considered rare within the broader region where it is known from only three localities on the Clump Point 1:50 000 map sheet – two significant remnants occur in the coastal section of the Clump Mountain National Park and in the nearby Public Purposes Reserve 995 (Stanton and Stanton 2005a)².

Similarly, littoral rainforest in the wet tropical lowlands is also relatively rare with only a few very small occurrences remaining on sandy soils adjacent to Kurrimine township within the Clump Point region, all of which having been heavily impacted by cyclonic wind disturbance followed by weed incursions (Stanton and Stanton, 2005a). The impact of repetitive cyclones has been a highly significant factor in the disturbance of rainforest canopy across the Wet Tropics and has resulted in the proliferation of vines (native and exotic) with many areas not recovering (Turton and Dale, 2007; Stanton and Stanton 2005b). Encouragingly, on Bajigal the small area of littoral rainforest on sandy soils (Unit 2, 0.39 ha) appears to have recovered well from past cyclone events. Occurrence of large *Terminalia catappa* and *Ter. arenicola* trees throughout the canopy suggests some resilience to wind disturbance, and the presence of secondary species such as *Macaranga tanarius* and *Trema orientalis* in the canopy indicate advanced succession of pioneer species into the canopy following disturbance.

The recognition of rainforest vegetation Units 1B and 1C posed a slight dilemma for classification purposes. The vegetation is consistent with the littoral rainforest TEC; however, the structure and floristics of these units do not conform to any suitable RE descriptions in the bioregion. Discussions with Queensland DESI Bioregional Coordinator Dr Eda Addicott noted the issue of scale and the inherent rarity of these rainforests on basalt in the bioregion. It appears that these units are not present on the mainland. It is recommended that a note be added to the description of RE 7.8.1 to recognise the presence of the Bajigal units given that these areas of rainforest on basalt represent an important ecological value for the island and the Great Barrier Reef World Heritage Area more broadly.

The areas of conservation significance on Bajigal have a history of disturbance from tropical cyclones. The weeds within the more highly disturbed areas now present a threat to more intact areas of vegetation on the island as they are a source of weed propagules. Canopy gaps and edges of the lowland and littoral rainforest communities are under threat from dense patches of Guinea grass in adjacent areas, shade tolerant species such as coral berry are creeping into forest margins, and towers of morning glory vines are putting pressure on canopy trees. Coral berry's capacity to readily set seed and germinate in low light conditions is a particular issue for closed-canopy forest ecosystems.

² Offshore islands were not mapped in the Wet Tropics vegetation mapping project.

In addition to the widespread exotic species which were already known to occur on the island, the project also confirmed the presence of additional species which have the potential to be ecosystem transformers. These species currently occur in small populations and include:

- Devil's fig (*Solanum torvum*) – two occurrences
- Lantana (*Lantana camara*) – a single recorded patch
- Singapore daisy (*Sphagneticola trilobata*) – a single patch approximately 16 m²
- Mossman river grass (*Cenchrus echinatus*) – single individual

6.2 Threats to fauna breeding habitat

Seabird breeding habitat is the Key Value for which Bajigal is managed under the QPWS Values Based Management Framework. The seabird breeding habitat on the island is ecologically significant in the context of islands within the Great Barrier Reef. Based on the findings of the field survey, weed invasion on Bajigal is the primary threat affecting seabird breeding habitat and the ecological integrity of the island more broadly in the near-term. Within areas of seabird breeding habitat, weed invasion has the potential to impact the composition and structure of vegetation, which in turn can reduce habitat quality for resident native fauna species.

During the field survey, Mr Epong spoke of how the older-growth Guinea grass limits access for nesting seabirds to the grassland areas of the island. During the growing season, Guinea grass is a vigorous tall grass that collapses in the dry season, which tangles with subsequent regrowth, forming a dense barrier for nesting birds. Mr Epong indicated that seabirds were observed accessing and nesting in the younger-age patches of Guinea grass on the island, but mature patches were not utilised.

It is possible that extensive areas of old growth Guinea grass and as well as extensive areas of vine towers have over time limited access for seabirds seeking suitable nest locations resulting in a reduced area of the island being utilised by seabird species. For example, breeding habitat for the bridled tern (Figure 14 and Figure 13) is currently most frequently focussed within Unit 1B rainforest (Nutmeg Forest) on the southern slopes and in adjoining low closed rainforest (Unit 1C), and littoral rainforest (Unit 2) (MALSI Senior Ranger James Epong and QPWS Senior Project Officer Johanna Karam *pers. comm.*, April 2024).

The areas identified as bridled tern habitat are less impacted by Guinea grass or morning glory than other areas of the island that may also provide habitat and this may indicate that the species is preferentially utilising areas that are less impacted. However, historical nesting distribution data was not available to support the preparation of this report so it is unclear based on the information collected through this study alone what the historical distribution of seabird breeding was on Bajigal and how this may have been impacted to date by weed invasion. Additional studies targeted at investigating the specific factors that may be impacting habitat utilisation across the island would be required to provide certainty on how existing threats may be impacting on nesting habitat utilisation in this species. Notwithstanding, the impact of invasive flora species is considered likely to be the primary threat to the ecological integrity of the island in the near-term, and addressing this issue will likely have flow-on effects to a broad range of fauna species utilising the island.

The spectacled flying-fox is also known to utilise Bajigal from time to time. Similarly to nesting seabirds, based on the field survey it is unclear what processes (if any) may be impacting the suitability of habitat on the island for flying-fox species. Advice from Dr Andrew Dennis was that vine towers do not necessarily restrict the access of bats to areas of habitat and that further survey and information would be needed to determine whether weeds are impacting habitat suitability. TerrainNRM are undertaking surveys of flying-fox species across the Wet Tropics, which will include drone surveys of known camp sites using infra-red sensors to provide camp population estimates (Dr Andrew Dennis. *pers. comm.*, April 2024). It is recommended that any future flying-fox surveys are coordinated with broader survey programs across the Wet Tropics.

6.3 Presence of invasive fauna species

The surveys also identified the presence of juvenile cane toads, which indicates that cane toads are breeding successfully on island. There is an abundance of rock and tree crevices on the island which provide ideal habitat for cane toads. Small bodies of water sitting in tree root hollows provide plenty of opportunity for egg laying and hatching. The presence of cane toads may be a threat to some species on the island such as the slaty-grey snake.

Interestingly, the eDNA samples did not detect the presence of cane toads and only detected two bird species known to be present at the time of sampling. This project trialled the testing of soil for eDNA as an innovative, low impact tool which could be used to identify the presence of species of concern on islands. The trial on Bajigal has indicated that currently there are limitations to the use of soil eDNA which may make it unsuitable for the identification of threats as part of a rapid assessment process. The laboratory team noted that for a soil sample to positively record the presence of a species, the species must have very close or direct contact with the soil surface sampled. This means the likelihood that eDNA will detect a species is strongly dependent on the density of the target species in the landscape. The trial at Bajigal has shown that rapid soil eDNA technology may not yet be mature enough, and rapid assessment by trained ecologists is likely to be a more reliable method of detecting species of concern.

Encouragingly, the results of camera traps, sign searching, and rebaited chew cards indicate that *Rattus rattus* is not present on the island and has been successfully eradicated by QPWS. As such, the presence of rats is not a current cause for concern for nesting seabirds on the island. Similarly, there was also no sign of the presence of feral cats or other invasive vertebrates during the survey which could pose a threat to the island's Key Value. Further information on the findings of the field survey is contained within the appendices of this report.

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Appendices

Appendix A - Vegetation Community Profiles

Unit 1A. Disturbed mesophyll vine forest with uneven canopy and vine towers.



Plate 30: Margins of mesophyll rainforest on steep northern basalt slopes
(Photo: David Fell, 2024)

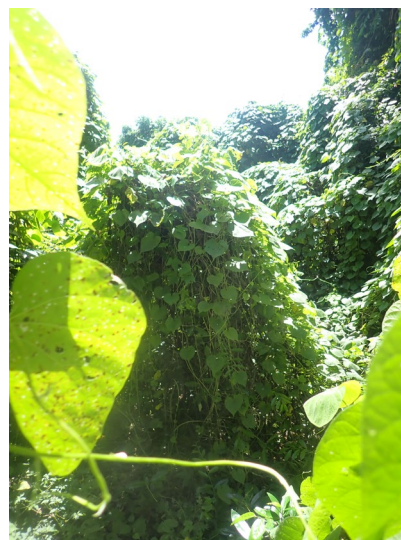


Plate 31: Large canopy gap with dense infestations of *Ipomoea purpurea* (Photo: David Fell, 2024)

Classification: RE 7.8.1d-Complex mesophyll to mesophyll vine forest on well-drained basalt lowlands and foothills

Vegetation Management Status: Of concern; **Biodiversity Status:** Endangered

Reference Sites: ST6, 7, 19, 20

Description. Notophyll vine forest on north facing slopes on krasnozems derived from basalt. Dominated by scattered emergents of *Alstonia scholaris*, with an uneven broken canopy of *Canarium vitiense*, *Terminalia sericocarpa*, *Palaquium galactoxylum*, *Cryptocarya hypospodia*, *Calophyllum* sp., *Trema orientalis*, *Dysoxylum mollissimum* subsp. *molle*., *Myristica globosa* subsp. *muelleri*, *Ganophyllum falcatum*, *Ficus fraseri*, *Carallia brachiata*, and *Chisocheton longistipitatus*. Native and exotic vines occur in the numerous gaps created by past cyclone disturbance. Common native vines include *Cissus hastata*, *Tetrastigma nitens*, *Tetrastigma thorsborneorum*, *Luffa aegyptiaca*, *Diplocyclos palmatus* var. *affinis*, and *Calamus australis*. The dominant exotic vine is *Ipomoea purpurea* with more minor patches of *Ip. indica* and *Ip. cairica*. Canopy gaps also have been invaded by dense patches of Guinea grass and coral berry.

Distribution and Variability: Occurs on north-facing basalt slopes with rock outcrop above cliff lines. Intergrades with littoral rainforest on the sandy flat in the east, and with low closed notophyll rainforest on exposed upper slopes and ridges.

Although classified within RE 7.8.1d, the expression of rainforest on Bajigal differs from that described in the RE description. For example, it is a notophyll dominant type with a lack of some complex structural features such as conspicuous epiphytes. The canopy associates described for the RE i.e., *Castanospermum australe*, *Dysoxylum peltigrewianum*, *Dysoxylum alliaceum*, *Ficus variegata*, *Ailanthus integrifolia*, *Aleurites rockinghamensis*, and *Wrightia laevis*, are absent, as are the characteristic lower stratum trees such as *Acmenosperma claviflorum*, *Synima cordierorum*, *Brombya platynema*, and *Wilkiea longipes*. In fact, the only species in common with the RE description are *Alstonia scholaris* (common), *Chisocheton longistipitatus* (occasional), *Lindera queenslandica* (rare), *Myristica globosa* var. *muelleri* (very common), *Gomphandra australiana* (very common), *Calamus australis* (common), *Arenga australasica* (common), *Ptychosperma elegans* (occasional), and *Archontophoenix alexandrae* (uncommon).

Values and Condition: RE 7.8.1 is consistent with the EPBC listed 'lowland rainforest of the wet tropical lowlands TEC'. However, its occurrence on Bajigal could potentially be considered as littoral rainforest given the maritime influence, and that it meets the species assemblage and cover thresholds identified in the

determination. However, the canopy structure and species composition have been used to differentiate it as lowland rainforest rather than littoral rainforest in this instance.

Unit 1A provides habitat for robust populations of the vulnerable listed arenga palm, *Arenga australasica*, as well as a closed forest nesting habitat of bridled tern and possibly spectacled flying-fox. The floristic assemblage supports a high percentage of fleshy-fruited species which provide food resources and habitat for frugivorous bird species more commonly, rose-crowned dove, superb fruit dove, emerald dove, pied imperial-pigeon, and bar-shouldered dove.

Habitat condition is 'significant concern' to 'critical' based on the impacts of past cyclones. Repeated wind disturbance has created canopy gaps, with native and exotic vine towers dominated by *Ipomoea* spp. and scattered patches of climbing coastal morning glory. The vine towers shroud the outer margin of the forest and may be limiting bridled tern access into the forest during breeding, although native vines also play a crucial role in strengthening the edges of the forest framework against cyclone damage. Canopy gaps and outer edges are further infested by dense patches of Guinea grass and patches of coral berry in the groundcover. No infestations of devil's fig or lantana were recorded in this unit.



Plate 32: The large tree Cairns pencil cedar *Palaquium galactoxylon* is an occasional canopy associated in lowland rainforest on basalt (Photo: David Fell, 2024)



Plate 33: *Canarium vitiense* is a common canopy tree in lowland rainforest on basalt (Photo: David Fell, 2024)

Unit 1B. Nutmeg Forest. Simple notophyll vine forest dominated by *Myristica globosa* subsp. *muelleri* with *Anthocarapa nitidula*, and *Macaranga tanarius*. Steep slopes with southern aspect.



Plate 34: Typical open understorey of *Myristica* dominated rainforest on steep southern slopes (Photo: David Fell, 2024).



Plate 35: Even aged canopy with well-spaced trees of similar diameters and a general lack of large canopy trees (Photo: David Fell, 2024).

Classification: RE 7.8.1d - Complex mesophyll to mesophyll vine forest on well-drained basalt lowlands and foothills

VM Status: Of Concern; **Biodiversity Status:** Endangered

Reference Sites: ST11, 12

Description. This is a simple notophyll vine forest with a closed and even canopy to 16 m dominated by the native nutmeg tree *Myristica globosa* subsp. *muelleri*. Canopy associates are *Anthocarapa nitidula*, *Macaranga tanarius*, *Mangifera indica*, *Ficus microcarpa*, *Ficus drupacea*, *Calophyllum sil*, *Semecarpus australiensis*, and *Ptychosperma elegans* with rare *Alstonia scholaris*. It occurs on steep basalt slopes with a southern aspect. The shrub layer is very sparse and the groundcover is dominated by leaf litter, seedlings of myristica, and scattered herbs of the perennial herb *Pseuderanthemum variabile*. Steep rocky areas feature occasional *Asplenium nidus* and *Alocasia brisbanensis*. Epiphytes are limited to rare *Asplenium* and *Platyserium hillii* with climbing aroids of *Epipremnum pinnatum* and vines of *Piper* sp.

Distribution and Variability: The rainforest occurs on the steep southern slopes of Bajigal. It is differentiated from Unit 1A (uneven canopy, canopy gaps, vine towers) because of its simple structure (even canopy) and floristic composition (dominated by *Myristica*). Whilst there is no doubt this forest has also been affected by past cyclone disturbance, the impacts to structure are markedly different to 1A rainforests.

Values and Condition: This unit is placed within RE 7.8.1 due to lack of other suitable options. It is consistent with the EPBC listed TEC '*littoral rainforests and coastal vine thickets of eastern Australia*' despite RE 7.8.1 not being listed as a component RE of that community. The vegetation in Unit 1B meets the key diagnostic criteria for the littoral rainforest TEC including the maritime influence, species diversity, patch size, and cover criteria. It also provides habitat for the vulnerable arenga palm (*Arenga australasica*), as well as a closed-forest nesting habitat of bridled tern and spectacled flying-fox. The floristic assemblage also supports a high percentage of fleshy-fruited species which provide food resources and habitat for frugivorous bird species.

In comparison to the Unit 1A rainforest, the *Myristica*-dominated forest is in good condition, although the presence of coral berry and other weeds on margins necessitate a 'good with some concern' health status. The presence of these species on the margins poses a risk to the community and would no doubt invade in any canopy gaps created by natural tree fall or future cyclone events.



Plate 36: Open understorey notophyll rainforest (Photo: David Fell, 2024).

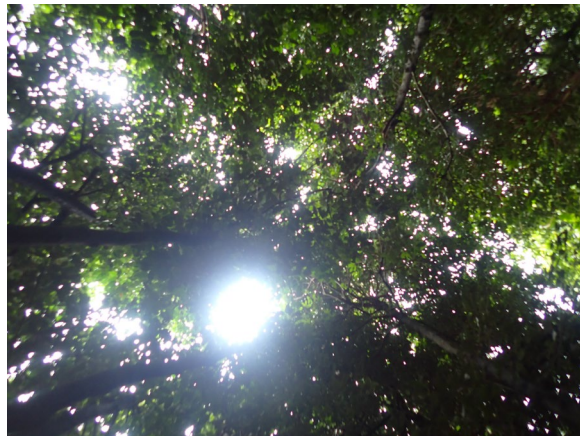


Plate 37: Closed even canopy of notophyll rainforest (Photo: David Fell, 2024)

Unit 1C. Low closed (wind sheared) vine forest of *Ficus microcarpa*, *Planchonella obovata*, *Aglaia elaeagnoidea*, and *Melia azedarach*. Steep basalt slopes and ridges.



Plate 38: Low closed forest on upper hillslope (Photo: David Fell, 2024).



Plate 39: Typical wind sheared low closed forest on exposed upper slopes (Photo: David Fell, 2024).

Classification: RE 7.8.1 – Complex mesophyll to mesophyll vine forest on well-drained basalt lowlands and foothills

VM Status: Of concern; **Biodiversity Status:** Endangered

Reference Sites: ST3, 4, 5, 10

Description: A simple, even canopy is dominated by *Ficus microcarpa*, *Planchonella obovata*, *Aglaia elaeagnoidea*, *Ficus benjamina*, and *Melia azedarach*.

Distribution and Variability: This is a closed canopy microphyll-notophyll rainforest unit that occurs on the steep basalt slopes and ridges towards the eastern end of the island. The low and even canopy height is due to wind shearing from exposure to prevailing south-east winds.

Values and Condition: This unit is consistent with the EPBC listed TEC '*littoral rainforests and coastal vine thickets of eastern Australia*'. The vegetation in Unit 1C meets the key diagnostic criteria for the littoral rainforest TEC including the maritime influence, species diversity, patch size, and cover criteria. Exposed margins are subject to invasion of Guinea grass and coral berry, which indicates health status is 'good with significant concern'.



Plate 40: Edge of exposed cliff lines supporting low wind sheared forest (Photo: David Fell, 2024).



Plate 41: Boulders of volcanic tuff fallen from sheltered cliffs upslope (Photo: David Fell, 2024).

Unit 2. Mesophyll – notophyll vine forest (littoral rainforest) dominated by *Terminalia catappa*, and *Ter. arenicola*, with *Planchonella obovata*, *Aglaia elaeagnoidea*. *Ganophyllum falcatum*, *Myristica insipida*, *Millettia pinnata*, and *Hibiscus tiliaceus*. Occurs on flat sand deposits behind foredune.



Plate 42: Buttressed trunk of *Terminalia catappa* which dominates the small area of littoral rainforest (Photo: David Fell, 2024).



Plate 43: Open understory with dense seedling layer (Photo: David Fell, 2024).

Classification: RE 7.2.1c Mesophyll vine forest on beach ridges and sand plains of beach origin.

VM Status: Endangered; **Biodiversity Status:** Endangered

Reference Sites: ST2, 14, 18

Description. Littoral rainforest with a closed canopy dominated by *Terminalia catappa*, with *Ter. arenicola*, *Ganophyllum falcatum*, *Planchonella obovata*, *Aglaia elaeagnoidea*, *Canarium vitiense*, *Macaranga tanarius*, and *Myristica insipida*. A sparse and open understory with saplings of *Myristica*, *Aglaia*, and *Planchonella*. Dense seedlings throughout the groundcover with *Calamus australis* seedlings dominant throughout.

Distribution and Variability: Occurs on a level sand plain/terrace intergrading with basaltic colluvium upslope. Seaward margins intergrade with a band of *Hibiscus tiliaceus*, *Premna serratifolia* forest, and coastal shrubland of *Scaevola*, *Guilandina*, *Colubrina*, and *Pandanus*.

Values and Condition: This forest is consistent with the littoral rainforest TEC. It supports healthy populations of the vulnerable arenga palm and provides nesting habitat for bridled terns. Habitat health is impacted by *Rivina humilis* which occurs as scattered plants in the groundcover. Canopy gaps on the margins of littoral rainforest support dense patches of *Rivina*, as well as patches of Guinea grass and exotic *Ipomoea*. The latter is also present as patches of vines that trail down from the canopy to the ground. Rare *Solanum torvum* plants were recorded on the outer seaward margin of littoral rainforest. Health status is 'significant concern'.



Plate 44: Trunk of *Terminalia catappa* dominant in canopy (Photo: David Fell, 2024)



Plate 45: Buttressed trunk of *Planchonella obovate* (Photo: David Fell, 2024).

Unit 3. *Scaevola taccada* - *Hibiscus tiliaceus*-*Pandanus tectorius*-*Terminalia* spp. littoral shrubland / low closed forest on foredunes



Plate 46: *Scaevola taccada* shrubland dominates the sandy shoreline on the western end of the island (Photo: David Fell, 2024)



Plate 47: Fringing low closed forest dominated by *Hibiscus tiliaceus* (Photo: David Fell, 2024)

Classification: RE 7.2.7-*Casuarina equisetifolia* +/- *Corymbia tessellaris* open forest +/- groved vine forest shrublands on strand and foredunes

VM Status: Of concern; **Biodiversity Status:** Endangered

Reference Sites: ST8, ST9, ST13

Description. This is shrubland to low closed forest with dense band of *Scaevola taccada* interspersed with straggling stems of *Colubrina asiatica*, *Cassytha filiformis*, *Guilandina bonduc*, and *Premna serratifolia*. Larger trees such as *Hibiscus tiliaceus*, *Pandanus tectorius*, *Terminalia catappa*, *Ter. arenicola* and *Thespesia populnea* are common. Less common species which extend into a narrow band of low closed forest or thicket behind the *Scaevola* edge include *Barringtonia asiatica*, *Hernandia nymphaeifolia*, *Ximenia americana*, *Ochrosia elliptica*, *Huberantha nitidissima*, and *Aglaia elaeagnoidea*. A rare stand of *Pisonia grandis* occurs just behind the shoreline on the edge of this community and littoral rainforest. This unit together with *Ipomoea pes-caprae*-dominated herbland on the western sand spit is consistent with RE 7.2.7a.

Distribution and Variability: Occurs on exposed frontal dune on western sand spit. A dense band of *Scaevola*.

Values and Condition: In good condition with a few patches of *Rivina humilis*, a single patch of *Sphagneticola trilobata*, and one of two mature stems of *Solanum torvum*. Marine debris plastics washed up throughout this community. On north-western beach *Hibiscus tiliaceus* is dominant forming the narrow margin to the littoral rainforest.

Unit 4. *Ipomoea pes-caprae* subsp. *brasiliensis* – *Lepturus repens* herbland



Plate 48: Sparse herbland of *Ipomoea pes-caprae* colonising exposed sand spit at western end of the island (Photo: David Fell, 2024).



Plate 49: Sparse herbland of *Ipomoea pes-caprae* colonising exposed sand spit at western end of the island (Photo: David Fell, 2024).

Classification: RE 7.2.7 *Casuarina equisetifolia* +/- *Corymbia tessellaris* open forest +/- groved vine forest shrublands on strand and foredunes

VM Status: Of concern; **Biodiversity Status:** Endangered

Reference Sites: ST15

Description: Sparse herbland dominated by *Ipomoea pes-caprae* subsp. *brasiliensis* on exposed sand spit. Emerging seedlings of *Barringtonia asiatica*, *Entada phaseoloides*, *Calophyllum inophyllum*, washed up above high tide line. Rare occurrences of *Lepturus repens*, and *Cassytha filiformis* on margins with *Scaevola taccada* shrubland.

Distribution and Variability: Restricted to a narrow band above the shoreline.

Values and Condition: Provides habitat for resting seabirds and shorebirds. A few stems of Mossman river grass occur on the margins with the *Scaevola* shrubland. A small patch of Singapore daisy was recorded in this community, has potential to invade the ecosystem as it has done on the adjacent mainland.

Unit 5A and 5B. *Avicennia marina* shrubland / *Rhizophora stylosa* low open forest



Plate 50: Grey mangrove *Avicennia marina* has colonised intertidal rock platforms (Photo: David Fell, 2024).



Plate 51: A small patch of *Rhizophora stylosa* surrounded by *Avicennia* shrubland at fish trap on eastern end of island (Photo: David Fell, 2024).

Classification: RE 7.1.1 Mangrove closed scrub to open forest. Sheltered coastlines, estuaries, and deep swales between dunes, on fine anaerobic silts, inundated with saline water at high tide. Intertidal.

VM Status: No concern; **Biodiversity Status:** No concern

Reference Sites: ST1, ST16, ST17

Description. Two subunits are recognized. The more common Unit 5A is a shrubland dominated by *Avicennia marina* with a few scattered shrubs of *Aegiceras corniculatum*, *Lumnitzera littorea*, and *Aegialitis annulata*. Unit 5B is a small patch of *Rhizophora stylosa* dominated low closed forest.

Distribution and Variability: Mangroves occur in four locations on the intertidal rocky platforms surrounding the island.

Values and Condition: A colonising community providing habitat for marine species and coastal birds. Ghost nets were observed.

Unit 6A. *Megathyrsus maximus* exotic tussock grassland on exposed rocky basalt slopes.



Plate 52: Dense exotic Guinea grassland on steep basalt cliffs (Photo: David Fell, 2024)



Plate 53: Looking north-west from eastern headland to dense Guinea grass (Photo: David Fell, 2024)

Classification: RE 7.8.7b: *Themeda triandra* tussock grassland. Basalt uplands and highlands, and minor areas on coastal headlands.

VM Status: Of concern; **Biodiversity Status:** Endangered

Reference Sites: ST24

Description: The steep basalt headlands and cliff lines support exotic grasslands which are completely dominated by *Megathyrsus maximus*. The only evidence of what may have been the natural vegetation on these basalt surfaces was found on the extreme eastern headland of the island.

Distribution and Variability: Prior to invasion by Guinea grass, it is possible that these were native grasslands of *Themeda triandra* as mapped by DES within RE 7.8.7.

Values and Condition: Totally degraded by dense Guinea grass to 1 m in height. Potential fire risk to rainforest margins during dry season.

Unit 6B. Sparse herbland-grassland on exposed rocky basalt slopes.



Plate 54: Exposed rock pavements with sparse cover of native and exotic grass and herbs (Photo: David Fell, 2024).



Plate 55: Native species such as *Coleus batianoffii*. Growing in rock crevices (Photo: David Fell, 2024).

Classification: RE 7.8.7b: *Themeda triandra* tussock grassland. Basalt uplands and highlands, and minor areas on coastal headlands.

VM Status: Of Concern; **Biodiversity Status:** Endangered

Reference Sites: ST25

Description. Sparse herbland/grassland of *Lepturus repens*, *Cymbopogon refractus*, and *Cynodon dactylon*, *Coleus batianoffii*, *Pouzolzia zeylanica*, *Evolvulus alsinoides*, and *Cheilanthes* sp. Low windswept native shrubs of *Myoporum* sp., *Ficus opposita*, and *Ficus microcarpa* occur on margins.

Distribution and Variability: Occurs on rock pavement and restricted to eastern headland. Extremely rare in the bioregion. No *Themeda* recorded.

Values and Condition: Provides habitat for seabirds and reptiles. The only reason that this headland has escaped invasion by Guinea grass is the steep and exposed site with minimal soil development. Scattered clumps of Guinea grass were however present together with exotic grasses of *Eleusine indica* and herbs of *Sida cordifolia*.

Appendix B - Flora species list for Bajigal

#unidentified species with voucher numbers waiting for formal identification from the Queensland Herbarium.

*denotes naturalised species; nomenclature follows Census of the Queensland Flora and Fungi 2023;

LF- Life Form – A (aroid), Fe (fern), G (grass), H (herb), P (palm), Pa (pandan), S (shrub), V (vine)

Cover abundance score – VC -very common (>50% cover), C - common (25-50%), O – occasional (5-25%), U - uncommon (1-5%) or 'R – rare (<1%)

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Cover abundance score										Phenology April 24	MALSI April 24	WildNet record
									Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)							
Pteridiophytes (Ferns & Allies)																					
Aspleniaceae	<i>Asplenium nidus</i>	Birds nest fern	Fe				O		U	R						1	WN				
Polypodiaceae	<i>Drynaria sp.</i> ³	Basket fern	Fe				R									1					
Polypodiaceae	<i>Microsorium grossum</i>		Fe	SI36			U									1	WN				
Polypodiaceae	<i>Microsorium membranifolium</i>	Pimple fern	Fe				U									1	WN				
Polypodiaceae	<i>Platycerium hillii</i>	Elkhorn fern	Fe				R									1					
Pteridaceae	<i>Acrostichum speciosum</i>	Mangrove fern	Fe													1					
Pteridaceae	<i>Cheilanthes sp.</i>		Fe	SI24											R	1					
Gymnosperms																					
Podocarpaceae	<i>Podocarpus grayae</i> ⁴	Northern brown pine	T				R										WN				

³ Seen once in canopy possibly *D. rigida*

⁴ Not seen on April 24 survey

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Cover abundance score										Phenology April 24	MALSI April 24	WildNet record
									Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)							
Angiosperms (Flowering Plants)																					
Acanthaceae	<i>Avicennia marina</i>	Grey mangrove	T												VC		1	WN			
Acanthaceae	<i>Pseuderanthemum variable</i>	Pastel flower	H	SI25			O		C								1	WN			
Amaryllidaceae	<i>Crinum pedunculata</i>	Crinum lily	H									R					1				
Anacardiaceae	<i>Mangifera indica*</i>	Mango	T				R										1				
Anacardiaceae	<i>Semecarpus australiensis</i>	Tar tree	T				R										1				
Annonaceae	<i>Huberantha nitidissima</i>	Canary beech	T								R						1	WN			
Annonaceae	<i>Monoon australe</i>	Cape canary beech	T	SI10			R										1	WN			
Apocynaceae	<i>Alstonia scholaris</i>	Milky pine	T				C	U									1	WN			
Apocynaceae	<i>Alyxia spicata</i>	Chain fruit	V						R								1	WN			
Apocynaceae	<i>Hoya australis</i>	Hoya	V						R								1				
Apocynaceae	<i>Kopsia arborea</i>	Kopsia	T				R				R						1	WN			
Apocynaceae	<i>Ochrosia elliptica</i>	Ochrosia	T	SI42							U						1				
Apocynaceae	<i>Parsonsia straminea</i>	Monkey rope vine	V				R											Poll ack			
Apocynaceae	<i>Parsonsia velutina</i>	Hairy silkpod	V	SI37			U								flw		1	WN			
Araceae	<i>Alocasia brisbanensis</i>	Cunjevoi	H				R										1				
Araceae	<i>Epipremnum pinnatum</i>	Native monstera	A				U										1				
Araliaceae	<i>Heptapleurum actinophyllum</i>	Umbrella tree	T				R								R		1				
Arecaceae	<i>Archontophoenix alexandrae</i>	Alexandra palm	P				R				R						1	WN			
Arecaceae	<i>Arenga australasica</i>	Sugar palm	P			V	O		O	O							1	WN			

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Cover abundance score										Phenology April 24	MALSI April 24	WildNet record
							Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)					
Arecaceae	<i>Calamus australis</i>	Wait-a-while	V				O			VC						1	WN		
Arecaceae	<i>Cocos nucifera</i> *	Coconut	P		LI						O	U				1			
Arecaceae	<i>Ptychosperma elegans</i>	Elegant palm	P				O	C	O	R						1			
Asteraceae	<i>Ageratum conyzoides</i> *	Billy goat weed	H		HI									O		1	WN		
Asteraceae	<i>Sphagneticola trilobata</i> *	Singapore daisy	H		HI							R				1	WN		
Asteraceae	<i>Synedrella nodiflora</i> *	Cinderella weed	H	SI46	LI							U				1	WN		
Asteraceae	<i>Tridax procumbens</i> *	Tridax daisy	H		LI									R		1			
Asteraceae	<i>Wallastonia biflora</i>	Beach daisy	H								O	O				1			
Boraginaceae	<i>Cordia dichotoma</i>	Glue tree	T	SI29					R							1			
Boraginaceae	<i>Argusia argentea</i> ⁵	Octopus bush	S								R						WN		
Burseraceae	<i>Canarium vitiense</i>	Scrub canarium	T				C			U						1	WN		
Convolvulaceae	<i>Evolvulus alsinoides</i>	Creeping speedwell	H											R	flw	1			
Cannabaceae	<i>Celtis paniculata</i>	Native celtis	T				R		R							1			
Cannabaceae	<i>Trema orientalis</i>	Poison peach	T				U			U						1			
Cannabaceae	<i>Trema tomentosa</i> var. <i>tomentosa</i> ⁶	Poison peach	S				R										WN		
Cannabaceae	<i>Trema tomentosa</i> var. <i>viridis</i> ⁷	Poison peach	S				R										WN		
Capparaceae	<i>Capparis lanceolaris</i>	Native caper	S				O		O							1	WN		

⁵ Not seen on April 24 survey⁶ Not seen on April 24 survey⁷ Not seen on April 24 survey

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Cover abundance score										Phenology April 24	MALSI /April 24	WildNet record
									Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)							
Caricaceae	<i>Carica papaya</i> *	Paw paw	S		LI		O	O	U	O								1	WN		
Casuarinaceae	<i>Casuarina equisetifolia</i> var. <i>incana</i>	Coastal oak	T									R							WN		
Celastraceae	<i>Elaeodendron melanocarpum</i>	Black olive plum	S				R				R							1	WN		
Calophylliaceae	<i>Calophyllum australianum</i>	Blush touriga	T				U		R									1	WN		
Calophyllaceae	<i>Calophyllum inophyllum</i>	Beach calophyllum	T									U	U					1			
Calophyllaceae	<i>Calophyllum sil</i>	Crocodile bark	T				O											1			
Combretaceae	<i>Lumnitzera littoralis</i>	Red-flowered black mangrove	S	SI07										R				1			
Combretaceae	<i>Terminalia arenicola</i>	Brown damson	T								C					juv fruit		1	WN		
Combretaceae	<i>Terminalia catappa</i>	Beach almond	T								VC	C	U					1			
Combretaceae	<i>Terminalia sericocarpa</i>	Damson plum	T				O				U							1	WN		
Commelinaceae	<i>Commelina ensifolia</i>	Scurvy weed	H												C	fwr		1			
Convolvulaceae	<i>Ipomoea cairica</i> *	Coastal morning glory	V		HI		O				O				O			1	WN		
Convolvulaceae	<i>Ipomoea indica</i> *	Morning glory	V		HI		VC				O				VC			1	WN		
Convolvulaceae	<i>Ipomoea purpurea</i> *	Common morning glory	V	SI06	HI		VC				O				VC			1	WN		
Convolvulaceae	<i>Ipomoea violacea</i>	Morning glory	V								O	O						1			
Cucurbitaceae	<i>Muelleragia timorensis</i>		V	SI28			O		VC							flw		1			
Cucurbitaceae	<i>Diplocyclos palmatus</i> subsp. <i>affinis</i>	Striped cucumber	V	SI02			O		C	O	C				C	flw, frt		1	WN		
Cyperaceae	<i>Cyperus gracilis</i>	Wallaby grass	Se	SI48					R									1			
Cyperaceae	<i>Cyperus javanicus</i>	Java sedge	Se	SI35					R									1			

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Cover abundance score										Phenology April 24	MALSI April 24	WildNet record
									Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)							
Cyperaceae	<i>Cyperus sp.</i>		Se	SI19												R		1			
Dioscoreaceae	<i>Dioscorea sp.*8</i>	Yam	V		HI														WN		
Dracaenaceae	<i>Dracaena angustifolia</i>	Native dracaena	S				O				O							1			
Ebenaceae	<i>Diospyros hebecarpa</i>	Scrub ebony	T				R											1			
Ebenaceae	<i>Diospyros maritima</i>	Sea ebony	T				R		U		O							1	WN		
Elaeocarpaceae	<i>Elaeocarpus grandis</i>	Blue quandong	T				R											1	WN		
Euphorbiaceae	<i>Claoxylon hillii</i>	Northern brittlewood	S				O		U		U							1	WN		
Euphorbiaceae	<i>Endospermum myrmecophilum</i>	Toywood	T	SI39			R		R									1			
Euphorbiaceae	<i>Macaranga tanarius</i>	Macaranga	T				C	O	O		C							1	WN		
Flagellariaceae	<i>Flagellaria indica</i>	Whip vine	V				O		U		U							1	WN		
Goodeniaceae	<i>Scaevola taccada</i>	Sea cabbage	S									VC	U			fruit		1	WN		
Hemerocallidaceae	<i>Dianella caerulea</i>	Flax lily	H						R						R			1	WN		
Hemerocallidaceae	<i>Geitonoplesium cymosum</i>	Scrambling lily	V						O									1	WN		
Hernandiaceae	<i>Hernandia nymphaeifolia</i>	Lantern bush	T									R	R					1			
Lamiaceae	<i>Clerodendrum inerme</i>	Beach clerodendrum	S										R						Pollack		
Lamiaceae	<i>Coleus batianoffii</i>	A native mint	H	SI49											R	flw		1			
Lamiaceae	<i>Premna serratifolia</i>	Coastal premna	S									O	C					1			

⁸ Not seen on April 24 survey

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Cover abundance score										Phenology April 24	MALSI April 24	WildNet record
									Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)							
Lamiaceae	<i>Vitex trifolia</i>	Vitex	S									U						1			
Lauraceae	<i>Cassytha filiformis</i>	Dodder laurel	V									O	O			flw		1	WN		
Lauraceae	<i>Cryptocarya hypospodia</i>	Northern pepperberry	T	SI09			O				R							1	WN		
Lauraceae	<i>Endiandra longipedicellata</i>	Buff walnut	T	SI38 , SI40			U				U							1	WN		
Lauraceae	<i>Cryptocarya cunninghamii</i> ⁹	Coconut laurel	T				R												WN		
Lauraceae	<i>Cryptocarya triplinervis</i> var. <i>riparia</i> ¹⁰	Three-veined laurel	T				R												WN		
Lauraceae	<i>Lindera queenslandica</i> ¹¹	Bolly beech	T				R												WN		
Lauraceae	<i>Litsea fawcettiana</i> ¹²	Brown bollywood	T				R												WN		
Laxmanniaceae	<i>Cordyline manners- suttoniae</i>	Palm lily	S				O	U			U							1	WN		
Lecythidaceae	<i>Barringtonia asiatica</i>	Fish-poison tree	T									R	R					1			
Leguminosae	<i>Archidendron</i> sp. ¹³		T	SI08			O											1			
Leguminosae	<i>Canavalia rosea</i>	Beach bean	V										U					1	WN		

⁹ Not seen on April 24 survey¹⁰ Not seen on April 24 survey¹¹ Not seen on April 24 survey¹² Not seen on April 24 survey¹³ *A. luceyi* or *A. vaillantii*

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Cover abundance score							Phenology April 24	MALSI April 24	WildNet record
									Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)				
Leguminosae	<i>Dendrolobium umbellatum</i> var. <i>umbellatum</i>	Horse bush	S	SI03					O	R	O				fruit	1	WN	
Leguminosae	<i>Entada phaseoloides</i>	Matchbox bean	V				O						R			1	WN	
Leguminosae	<i>Erythrina variegata</i>	Coral tree	T							R	O					1	WN	
Leguminosae	<i>Guilandina bonduc</i>	Nicker nut	S								C	O				1	WN	
Leguminosae	<i>Millettia pinnata</i>	Oil tree	T	SI49						C					flw	1		
Leguminosae	<i>Mucuna gigantea</i>	Burney bean	V				C		O	O						1	WN	
Leguminosae	<i>Sophora tomentosa</i> subsp. <i>australis</i>	Silverbush	S								O				Flw, fruit	1	WN	
Leguminosae	<i>Thespesia populnea</i>	Pacific rosewood	T								U					1		
Malvaceae	<i>Abutilon albescens</i>	Lantern bush	S											R		1	WN	
Malvaceae	<i>Hibiscus tiliaceus</i>	Beach hibiscus	T								VC	O			flw	1	WN	
Malvaceae	<i>Sida cordifolia</i> *	Flannel weed	H	SI21	HI									O	flw	1		
Meliaceae	<i>Aglaia elaeagnoidea</i>	Coastal boodyara	T				U	O	VC	VC						1	WN	
Meliaceae	<i>Anthocarapa nitidula</i>	Incense cedar	T				C	C	O							1	WN	
Meliaceae	<i>Chisocheton longistipitatus</i>	Cream mahogany	T	SI13			O			O						1	WN	
Meliaceae	<i>Didymocheton muelleri</i>	Red bean	T				O			U						1	WN	
Meliaceae	<i>Didymocheton papuanus</i>	Spice mahogany	T				O									1	WN	
Meliaceae	<i>Dysoxylum latifolium</i>		T				O			O						1	WN	
Meliaceae	<i>Melia azedarach</i>	White cedar	T				O	O	C	U					fruit	1		
Menispermaceae	<i>Pachygone sp.</i>		V				R									1		
Menispermaceae	<i>Pycnarrhena novoguineensis</i>		V				R									1	WN	

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Cover abundance score								Phenology April 24	MALSI April 24	WildNet record
									Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)					
Menispermaceae	<i>Tinospora smilacina</i>	Snake vine	V				U			U							1		
Menispermaceae	<i>Legnephora moorei</i>	Round-leaf vine	V	SI30			R										1		
Moraceae	<i>Ficus benjamina</i>	Weeping fig	T						R						U		1		
Moraceae	<i>Ficus drupacea</i>	Red fig	T				R										1		
Moraceae	<i>Ficus fraseri</i>	Sandpaper fig	T				U										1		
Moraceae	<i>Ficus hispida</i> var. <i>hispida</i>	Hairy fig	S				O									fruit	1	WN	
Moraceae	<i>Ficus microcarpa</i>	Small-fruited fig	T				C	O	C						C	fruit	1		
Moraceae	<i>Ficus opposita</i>	Sandpaper fig	S						R								1		
Moraceae	<i>Ficus virens</i>	White fig	T				U										1		
Moraceae	<i>Maclura cochinchinensis</i>	Cockspur	S						R								1		
Myristicaceae	<i>Myristica globosa</i> subsp. <i>muelleri</i>	Nutmeg	T				VC		C	VC							1	WN	
Myristicaceae	<i>Myristica insipida</i> var. <i>cimicifera</i>	Nutmeg	T				VC			VC							1	WN	
Myrsinaceae	<i>Aegiceras corniculatum</i>	River mangrove	S											O			1		
Nyctaginaceae	<i>Pisonia aculeata</i>		V				U										1		
Nyctaginaceae	<i>Pisonia grandis</i>	Grand devil's-claw	T	SI04								R					1		
Nyctaginaceae	<i>Pisonia umbellifera</i>	Cabbage wood	T				O										1	WN	
Oleaceae	<i>Chionanthus ramiflorus</i>	Northern olive	T				C		O	C							1	WN	
Oleaceae	<i>Jasminum elongatum</i>		V				O		O	O							1		
Oleaceae	<i>Jasminum simplicifolium</i> subsp. <i>australiense</i>	Stiff native jasmine	V				C			C	C						1	WN	
Olacaceae	<i>Ximenia americana</i>	Sea lemon	S								R						1		

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Cover abundance score										Phenology April 24	MALSI April 24	WildNet record
									Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)							
Pandanaceae	<i>Pandanus sp.</i> ¹⁴	Pandanus	Pa									U					1				
Pandanaceae	<i>Pandanus tectorius</i>	Screw pine	Pa									O			fruit		1				
Passifloraceae	<i>Passiflora suberosa</i> * ¹⁵	Corky passionfruit	V		HI		R											WN			
Passifloraceae	<i>Passiflora foetida</i> *	Stinking passion flower	V		LI						U			U			1	WN			
Petiveriaceae	<i>Rivina humilis</i> *	Coral berry	H	SI47	HI		VC	U	VC	VC	O			C	flw		1				
Phyllanthaceae	<i>Phyllanthus tenellus</i> *		H		LI									O			1				
Piperaceae	<i>Piper hederaceum</i> var. <i>hederaceum</i>	Native pepper vine	V				U	O									1	WN			
Plumbaginaceae	<i>Aegialitis annulata</i>	Yam-stick mangrove	S										R				1				
Poaceae	<i>Chloris gayana</i> *	Rhodes grass	G		LI									R			1				
Poaceae	<i>Cymbopogon refractus</i>	Barb-wire grass	G											R			1				
Poaceae	<i>Cynodon dactylon</i> *	Couch	G											R			1				
Poaceae	<i>Eleusine indica</i> *	Crows foot grass	G	SI22										C			1				
Poaceae	<i>Lepturus repens</i>	Pacific needle grass	G									C		O	seed		1	WN			
Poaceae	<i>Megathyrsus maximus</i> *	Guinea grass	G	SI44	HI		O		U	U				VC	flw, ft		1	WN			
Poaceae	<i>Sporobolus virginicus</i>	Saltwater couch	G									R						Poll ack			
Poaceae	Poaceae (DGF SI15) [#]		G	SI15			O										1				
Poaceae	Poaceae (DGF SI20) [#]		G	SI20										R			1				

¹⁴ A very narrow leaved Pandanus¹⁵ Not seen on April 24 survey

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Cover abundance score										Phenology April 24	MALSI April 24	WildNet record
									Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)							
Poaceae	Poaceae (camp area) [#]		G	SI34							R							1			
Poaceae	Poaceae (DGF SI23) [#]		G	SI23												R		1			
Portulacaceae	<i>Portulaca oleracea</i> [*]	Pig weed	H		LI											C		1			
Putranjivaceae	<i>Drypetes deplanchei</i>	Yellow boxwood	T				U			O	O							1	WN		
Rhamnaceae	<i>Alphitonia oblata</i>	Sarsaparilla	T	SI43							R							1			
Rhamnaceae	<i>Colubrina asiatica</i>	Shampoo bush	S	SI01								C	C				flw	1	WN		
Rhizophoraceae	<i>Bruguiera</i> sp.		T											R				1			
Rhizophoraceae	<i>Carallia brachiata</i>	Corky bark	T				U				U							1	WN		
Rhizophoraceae	<i>Rhizophora stylosa</i>	Stilt-rooted mangrove	T											C			flw	1			
Rosaceae	<i>Prunus turneriana</i> ¹⁶	Almond bark	T				R												WN		
Rubiaceae	<i>Aidia cowleyi</i>		T				U											1	WN		
Rubiaceae	<i>Aidia racemosa</i>	Archer cherry	T	SI01 ,26			O			U								1	WN		
Rubiaceae	<i>Guettarda speciosa</i>	Beach gardenia	T								U	O						1			
Rubiaceae	<i>Ixora timorensis</i>	Native mulberry	S				O				O							1	WN		
Rubiaceae	<i>Morinda citrifolia</i>	Noni	S				O				O	O						1	WN		
Rutaceae	<i>Glycosmis trifoliata</i>	Glycosmis	S				O			C	O							1	WN		
Rutaceae	<i>Micromelum minutum</i>	Lime berry	T	SI27			C				C	C						1	WN		
Sapindaceae	<i>Ganophyllum falcatum</i>	Scaly ash	T				O				O							1	WN		

¹⁶ Not seen on April 24 survey

Family	Species	Common Name	Life Form	Voucher No.	Weed Status	Conservation Status	Cover abundance score										Phenology April 24	MALSI April 24	WildNet record
							Tropical rainforest basalt (Unit 1A)	Nutmeg Forest (Unit 1B)	Low Closed Rain Forest (Unit 1C)	Littoral rainforest (Unit 2)	Dune Shrubland (Unit 3)	<i>Ipomoea</i> herbland on Strand (Unit 4)	Mangrove (Unit 5A), 5b	Grassland on cliffs (Unit 6A-6B)					
Sapotaceae	<i>Palaquium galactoxylon</i>	Cairns pencil cedar	T				O			U						1	WN		
Sapotaceae	<i>Planchonella obovata</i>	Northern yellow boxwood	T				O	O	VC	VC	C					1	WN		
Scrophulariaceae	<i>Myoporum montanum</i>	Boobialla	S	SI14										R		1			
Solanaceae	<i>Solanum torvum</i> *	Devil's fig	S	SI45	HI		R							R		1	WN		
Solanaceae	<i>Physalis angulata</i> *	Chinese gooseberry	H		LI									O	fruit	1			
Solanaceae	<i>Solanum nigrum</i> *	Black nightshade	H	SI18	LI				R					O	fruit	1			
Sparrmanniaceae	<i>Triumfetta rhomboidea</i> * ¹⁷	Chinese burr	H		LI									R			WN		
Stemonuraceae	<i>Gomphandra australiana</i>	Buff Beech	T				C	O								1	WN		
Sterculiaceae	<i>Heritiera littoralis</i>	Looking glass mangrove	T								R	R	R			1	WN		
Urticaceae	<i>Pipturus argenteus</i>	Native mulberry	S							U		R		C		1	WN		
Urticaceae	<i>Pouzolzia zeylanica</i>	Graceful pouzol bush	S	SI16										R		1			
Verbenaceae	<i>Lantana camara</i> *	Lantana	S		HI									R		1	WN		
Vitaceae	<i>Causonis australasica</i>	Bush killer	V				C		U	C				O		1	WN		
Vitaceae	<i>Cissus hastata</i>		V	SI05			C		O	O				C	flw	1	WN		
Vitaceae	<i>Tetragium nitens</i>	Three-leaf water vine	V				C		O	C				O		1	WN		
Zingiberaceae	<i>Alpinia</i> sp.	Ginger	H				R									1			
Unknown	Unknown perennial woody herb #		H	SI17										R		1			

¹⁷ Not seen on April 24 survey

Appendix C - Vegetation and Flora Data

Appendix C1. Site Data Summary

Site ID	Latitude	Longitude	Site Type	Habitat type	Notes	Unit	RE
ST1	17°44'14.60"S	146°9'26.49"E	Quaternary	Mangrove	Mangrove shrubland dominated by <i>Aegiceras</i> shrubs 1 – 2 m with <i>Avicennia marina</i> .	5A	7.1.1
ST2	17°44'17.29"S	146°9'25.49"E	Quaternary	Littoral rainforest	Health check site. Closed forest dominated by <i>Terminalia catappa</i> with <i>Ter. arenicola</i> , <i>Ganophyllum falcatum</i> , <i>Aglaia elaeagnoidea</i> , <i>Planchonella obovata</i> , <i>Trema orientalis</i> , <i>Cryptocarya hypospodia</i> , <i>Canarium vitiense</i> , and <i>Macaranga tanarius</i> .	2	7.2.1
ST3	17°44'16.28"S	146°9'36.91"E	Quaternary	Lowland rainforest	Well-developed canopy on ridge top <i>Melia azedarach</i> abundant in canopy with <i>Aglaia elaeagnoidea</i> , <i>Planchonella obovata</i> .	1C	7.8.1d
ST4	17°44'17.51"S	146°9'46.42"E	Quaternary	Low closed forest	Edge of steep cliffs with low closed forest of <i>Ficus microcarpa</i> , <i>Aglaia elaeagnoidea</i> , and <i>Planchonella obovata</i> .	1C	7.8.1d
ST5	17°44'16.57"S	146°9'45.73"E	Quaternary	Low closed forest	Low closed rainforest 5 – 7 m with wind sheared canopy dominated by <i>Aglaia elaeagnoidea</i> , <i>Melia azedarach</i> , and <i>Planchonella obovata</i> .	1C	7.8.1d
ST6	17°44'15.33"S	146°9'34.08"E	Quaternary	Lowland rainforest	Well-developed rainforest on upper basaltic slopes.	1A	7.8.1d
ST7	17°44'16.55"S	146°9'30.85"E	Quaternary	Lowland rainforest	Uneven canopy dense cover upper slope.	1A	7.8.1d
ST8	17°44'16.93"S	146°9'24.17"E	Quaternary	Strand	Low closed forest of <i>Hibiscus tiliaceus</i> on frontal dune margins with <i>Premna serratifolia</i> , <i>Sophora tomentosa</i> , <i>Thespesia populnea</i> , and <i>Terminalia catappa</i> .	3	7.2.1
ST9	17°44'17.29"S	146°9'23.81"E	Quaternary	Strand	Low closed forest of <i>Hibiscus tiliaceus</i> on frontal dune margins with <i>Premna serratifolia</i> , <i>Sophora tomentosa</i> , <i>Thespesia populnea</i> , <i>Milletia pinnata</i> and <i>Terminalia catappa</i> .	3	7.2.1
ST10	17°44'19.02"S	146°9'28.70"E	Quaternary	Low closed wind sheared rainforest	Low closed wind sheared rainforest on steep upper slopes with <i>Ficus microcarpa</i> , <i>Aglaia elaeagnoidea</i> , <i>Planchonella obovata</i> , and <i>Melia azedarach</i>	1C	7.8.1

Site ID	Latitude	Longitude	Site Type	Habitat type	Notes	Unit	RE
ST11	17°44'18.15"S	146°9'30.26"E	Quaternary	Lowland rainforest	Closed forest dominated by <i>Myristica globosa</i> subsp. <i>Muelleri</i> with <i>Semecarpus australiensis</i> , and <i>Macaranga tanarius</i> , on steep south aspect basalt slope with open understorey.	1B	7.8.1
ST12	17°44'17.64"S	146°9'33.63"E	Secondary	Lowland rainforest	Health check site. Well-developed lowland rainforest on steep southern aspect. Canopy dominated by <i>Myristica globosa</i> subsp. <i>Muelleri</i> with <i>Semecarpus australiensis</i> , <i>Macaranga tanarius</i> , <i>Anthocarapa nitidula</i> , <i>Calophyllum sil</i> , <i>Ficus virens</i> , and <i>Ficus drupacea</i> .	1B	7.8.1
ST13	17°44'18.36"S	146°9'23.55"E	Quaternary	Strand	Closed shrubland dominated by <i>Scaevola taccada</i> on frontal dune (strand) with <i>Colubrina asiatica</i> , <i>Hibiscus tiliaceus</i> , <i>Cassytha filiformis</i> , <i>Guilandina bonduc</i> , <i>Cocos nucifera</i> , <i>Barringtonia asiatica</i> , <i>Hernandia nymphaeifolia</i> , <i>Terminalia catappa</i> , <i>Canavalia rosea</i> , and <i>Ipomoea violacea</i> .	3	7.2.7
ST14	-17.73816946	146.1571988	Quaternary	Littoral rainforest	Closed forest of <i>Terminalia catappa</i> , <i>Ter. arenicola</i> , <i>Planchonella obovata</i> , <i>Ganophyllum falcatum</i> .	2	7.2.1
ST15	-17.7383474	146.1558933	Quaternary	Herbland	Herbland-grassland on sand spit dune. <i>Ipomoea pes-caprae</i> dominant 40% cover rare <i>Barringtonia asiatica</i> and patch of <i>Lepturus repens</i> and <i>Cassytha filiformis</i> on edge.	4	7.2.7
ST16	-17.73899397	146.1574528	Quaternary	Mangrove	<i>Avicennia marina</i> and <i>Rhizophora stylosa</i> only.	5A	7.1.1
ST17	-17.73740376	146.1573521	Quaternary	Mangrove shrubland	<i>Aegiceras corniculatum</i> mainly with <i>Avicennia marina</i> on outer edges.	5A	7.1.1
ST18	-17.73816539	146.1571546	Health Check	Littoral rainforest	<i>Arenga australasica</i> seedlings abundant.	2	7.2.1
ST19	-17.73815558	146.1588776	Quaternary	Lowland rainforest	Complex meso-notophyll vine forest with <i>Ficus virens</i> .	1A	7.2.8
ST20	-17.7382871	146.1593365	Health Check	Lowland rainforest	Complex meso-notophyll vine forest.	1A	7.8.1
ST21	-17.73833926	146.1565221	Quaternary	Coastal shrubland		4	7.2.7

Appendix C2. Threatened and Significant Flora Data Summary

Threatened and Significant flora	Latitude	Longitude	Habitat	Life stage	No. individuals	Phenology	Notes
Arenga palm <i>Arenga australasica</i>	17°44'17.64"S	146°9'29.99"E	Lowland rainforest	Mature	Single	No	Up on basalt ridge amongst rock. Lots of young plants coppicing at base around the main plant.
Arenga palm <i>Arenga australasica</i>	17°44'17.34"S	146°9'25.79"E	Littoral rainforest	Mature	Single	No	8 – 10 m palm sprouting from base.
Arenga palm <i>Arenga australasica</i>	17°44'16.74"S	146°9'31.19"E	Lowland rainforest	Mature	Single	No	
Arenga palm <i>Arenga australasica</i>	17°44'15.14"S	146°9'33.66"E	Lowland rainforest	Mature	Single	No	Basalt slope.
Arenga palm <i>Arenga australasica</i>	17°44'15.76"S	146°9'36.75"E	Littoral rainforest	Mature	Single	No	Top of ridge north.
Arenga palm <i>Arenga australasica</i>	17°44'15.65"S	146°9'37.83"E	Lowland rainforest	Mature	Single	No	Bottom of ridge.
Arenga palm <i>Arenga australasica</i>	17°44'17.36"S	146°9'26.51"E	Littoral rainforest	Immature	Single	No	
Arenga palm <i>Arenga australasica</i>	17°44'17.81"S	146°9'26.75"E	Littoral rainforest	Immature	Single	No	
Arenga palm <i>Arenga australasica</i>	17°44'17.93"S	146°9'26.95"E	Littoral rainforest	Immature	Single	No	
Arenga palm <i>Arenga australasica</i>	17°44'18.26"S	146°9'27.16"E	Littoral rainforest	Immature	Single	No	
Arenga palm <i>Arenga australasica</i>	17°44'16.72"S	146°9'46.44"E	Lowland rainforest	Mature	Single	No	On eastern point of island large plant.
Arenga palm <i>Arenga australasica</i>	17°44'15.95"S	146°9'45.08"E	Littoral rainforest	Mature	Single	No	
Arenga palm <i>Arenga australasica</i>	17°44'15.38"S	146°9'38.03"E	Lowland rainforest	Mature	Single	No	
Arenga palm <i>Arenga australasica</i>	17°44'15.30"S	146°9'38.26"E	Lowland rainforest	Mature	Single	No	On northern aspect large plant.
Arenga palm <i>Arenga australasica</i>	17°44'15.18"S	146°9'40.51"E	Lowland rainforest	Mature	Single	No	Eastern end basalt ridge.

Threatened and Significant flora	Latitude	Longitude	Habitat	Life stage	No. individuals	Phenology	Notes
Arenga palm <i>Arenga australasica</i>	17°44'17.29"S	146°9'24.92"E	Littoral rainforest	Immature	Single	No	Seedling.
Arenga palm <i>Arenga australasica</i>	17°44'17.45"S	146°9'25.13"E	Littoral rainforest	Immature	Single	No	Seedlings scattered in ground cover.
Arenga palm <i>Arenga australasica</i>	17°44'16.18"S	146°9'36.83"E	Lowland rainforest	Immature	Single	No	
Arenga palm <i>Arenga australasica</i>	17°44'17.11"S	146°9'46.41"E	Low closed forest	Mature	Single	No	Large clump.
Arenga palm <i>Arenga australasica</i>	17°44'17.91"S	146°9'30.02"E	Lowland rainforest	Immature	Single	No	Seedlings.
Arenga palm <i>Arenga australasica</i>	17°44'24.27"S	146°9'36.95"E	Low closed forest	Immature	Single	No	Seedlings.
Arenga palm <i>Arenga australasica</i>	17°44'18.31"S	146°9'26.60"E	Littoral rainforest	Mature	Single	No	Adult.
Arenga palm <i>Arenga australasica</i>	17°44'18.09"S	146°9'26.74"E	Littoral rainforest	Mature	Single	No	With <i>Ipomoea</i> invasion.
Arenga palm <i>Arenga australasica</i>	17°44'18.34"S	146°9'25.80"E	Shrubland	Immature	Single	No	Seedlings.
Arenga palm <i>Arenga australasica</i>	17°44'18.71"S	146°9'26.92"E	Littoral rainforest	Immature	Single	No	Seedling.
<i>Pisonia grandis</i>	17°44'19"S	146°9'27"E	Margin of Littoral Rainforest	Mature	8	No	Patch of trees behind foredune.
<i>Pisonia grandis</i>	17°44'19"S	146°9'27"E	Margin of Littoral Rainforest	Mature	1	No	Patch of trees behind foredune.
<i>Pisonia grandis</i>	17°44'19"S	146°9'27"E	Margin of Littoral Rainforest	Mature	1	No	Patch of trees behind foredune.
<i>Pisonia grandis</i>	17°44'19"S	146°9'27"E	Margin of Littoral Rainforest	Mature	1	No	Patch of trees behind foredune.
<i>Pisonia grandis</i>	17°44'19"S	146°9'27"E	Margin of Littoral Rainforest	Mature	1	No	Patch of trees behind foredune
<i>Pisonia grandis</i>	17°44'19"S	146°9'27"E	Margin of Littoral Rainforest	Mature	1	No	Patch of trees behind foredune

Note: *Pisonia grandis* records reported here are individual records and can be spatially separated in the associated geodatabase.

Appendix C3. Weed data summary

ID	Latitude / Longitude	Habitat	Species	Growth stage	Reproductive status	Density	Cover score	Notes
214	17°44'17.50"S 146°9'46.94"E	Grassland (in cliffs/headlands)	Blue top <i>Ageratum conyzoides</i>	Mature	Flowers /buds	Scattered plants	1 (1-5%)	Not common.
88	17°44'16.60"S 146°9'31.43"E	Lowland rainforest	Coastal morning glory <i>Ipomoea cairica</i>	Mature	Fruit	Dense	4 (50-75%)	Top of ridge.
139	17°44'15.69"S 146°9'26.43"E	Strand	Coastal morning glory <i>Ipomoea cairica</i>	Mature	Flowers /buds	Dense	4 (50-75%)	Crawling over hibiscus above shoreline.
211	17°44'17.28"S 146°9'46.44"E	Low closed forest	Coastal morning glory <i>Ipomoea cairica</i>	Mature	Flowers /buds	Scattered plants	1 (1-5%)	
87	17°44'16.63"S 146°9'31.79"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	5 (75-100%)	Top of edge 20 m to 5 m.
132	17°44'16.99"S 146°9'26.06"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Sterile	Dense	3 (25-50%)	Vine towers abundant.
140	17°44'15.54"S 146°9'26.29"E	Strand	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	3 (25-50%)	Crawling over veg on shoreline.
144	17°44'13.58"S 146°9'27.75"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	3 (25-50%)	
178	17°44'15.65"S 146°9'29.59"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Sterile	Dense	3 (25-50%)	
179	17°44'17.01"S 146°9'29.16"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Vine	Scattered plants	2 (5-25%)	
180	17°44'16.65"S 146°9'29.99"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Sterile	Dense	4 (50-75%)	
182	17°44'16.03"S 146°9'31.49"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Sterile	Dense	4 (50-75%)	Patch in gap trailing into canopy.
194	17°44'15.79"S 146°9'38.56"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	5 (75-100%)	In gap.

ID	Latitude / Longitude	Habitat	Species	Growth stage	Reproductive status	Density	Cover score	Notes
238	17°44'16.15"S 146°9'38.54"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	4 (50-75%)	Trailing in understorey from canopy vine.
242	17°44'16.41"S 146°9'30.97"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	3 (25-50%)	Vine stems trailing down from the canopy.
263	17°44'18.10"S 146°9'31.32"E	Low closed nutmeg forest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Sterile	Scattered plants	1 (1-5%)	Vine stems trailing from the canopy in small patches easy to control.
285	17°44'16.20"S 146°9'35.37"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	5 (75-100%)	Dominant in canopy gap.
287	17°44'16.82"S 146°9'30.41"E	Lowland rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	4 (50-75%)	Dominant in canopy gap.
289	17°44'18.00"S 146°9'27.08"E	Littoral rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	4 (50-75%)	Vines trailers abundant.
292	17°44'18.29"S 146°9'26.20"E	Littoral rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Fruit	Dense	4 (50-75%)	Vines trailers abundant.
308	17°44'19.27"S 146°9'27.48"E	Littoral rainforest	Common morning glory <i>Ipomoea purpurea</i>	Mature	Flowers /buds	Dense	3 (25-50%)	Towers on edge of scrub.
70	17°44'17.45"S 146°9'29.96"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Fruit	Isolated plant	4 (50-75%)	Fruits green turning red.
74	17°44'18.84"S 146°9'28.81"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Isolated plant	3 (25-50%)	On edge.
80	17°44'18.59"S 146°9'26.22"E	Strand	Coral berry <i>Rivina humilis</i>	Immature (non-reproductive)	Nil	Scattered plants	2 (5-25%)	Edge of forest.
96	17°44'16.48"S 146°9'37.14"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Dense	4 (50-75%)	Top of ridge north side, with paw paw.
104	17°44'15.71"S 146°9'40.05"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Fruit	Scattered plants	1 (1-5%)	Top of ridge.

ID	Latitude / Longitude	Habitat	Species	Growth stage	Reproductive status	Density	Cover score	Notes
106	17°44'15.90"S 146°9'40.18"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Fruit	Dense	4 (50-75%)	Top of ridge.
113	17°44'15.83"S 146°9'42.07"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Fruit	Scattered plants	3 (25-50%)	Above thick Guinea grass on slope eastern end.
133	17°44'16.52"S 146°9'26.06"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Juvenile	Flowers /buds	Scattered plants	1 (1-5%)	
175	17°44'17.10"S 146°9'27.34"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Isolated plant	0 (<1%)	
183	17°44'15.91"S 146°9'31.45"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Scattered plants	1 (1-5%)	
188	17°44'16.29"S 146°9'36.81"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Isolated plant	0 (<1%)	In good rainforest on plateau ridge top.
209	17°44'18.17"S 146°9'45.79"E	Shrubland	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Dense	4 (50-75%)	
225	17°44'16.77"S 146°9'46.08"E	Low closed forest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Dense	5 (75-100%)	Dominant in ground cover.
231	17°44'16.36"S 146°9'43.95"E	Low closed forest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Dense	5 (75-100%)	Dominant in ground cover in closed forest.
232	17°44'16.26"S 146°9'43.01"E	Low closed forest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Dense	4 (50-75%)	
248	17°44'17.79"S 146°9'24.60"E	Strand	Coral berry <i>Rivina humilis</i>	Mature	Sterile	Isolated plant	1 (1-5%)	
249	17°44'17.68"S 146°9'24.56"E	Strand	Coral berry <i>Rivina humilis</i>	Mature	Fruit	Dense	4 (50-75%)	
251	17°44'17.43"S 146°9'29.95"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers/buds	Dense	4 (50-75%)	Patch 5 x 5 m.
254	17°44'18.84"S 146°9'28.80"E	Low closed forest	Coral berry <i>Rivina humilis</i>	Mature	Flowers/buds	Dense	3 (25-50%)	Small patch 5 x 5 m.

ID	Latitude / Longitude	Habitat	Species	Growth stage	Reproductive status	Density	Cover score	Notes
262	17°44'18.55"S 146°9'30.46"E	Low closed forest	Coral berry <i>Rivina humilis</i>	Mature	Flowers/buds	Dense	3 (25-50%)	On exposed steep cliffs on edge of bush line.
264	17°44'17.94"S 146°9'34.50"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Fruit	Dense	3 (25-50%)	Patch 5 x 10 m.
270	17°44'17.53"S 146°9'32.26"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Juvenile	Flowers/buds	Isolated plant	0 (<1%)	Rare in well-developed forest.
271	17°44'17.79"S 146°9'37.56"E	Offshore	Coral berry <i>Rivina humilis</i>	Mature	Fruit	Dense	4 (50-75%)	On ridge 20 m off
277	17°44'18.27"S 146°9'34.46"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers/buds	Dense	5 (75-100%)	Dominant in ground cover on lower steep slopes.
279	17°44'18.20"S 146°9'32.80"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers/buds	Dense	5 (75-100%)	Patch on lower slope above sea 10 x 10 m dominated ground cover.
282	17°44'18.38"S 146°9'34.64"E	Lowland rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Scattered plants	1 (1-5%)	Lower edge of nutmeg forest scattered plants.
296	17°44'17.90"S 146°9'23.73"E	Strand	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Dense	4 (50-75%)	5 x 5 m patch in strand tall shrubland.
297	17°44'18.43"S 146°9'25.69"E	Strand	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Scattered plants	1 (1-5%)	
301	17°44'18.68"S 146°9'26.11"E	Strand	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Dense	4 (50-75%)	10 x 10 m patch in ground cover in low swale.
302	17°44'18.75"S 146°9'26.72"E	Strand	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Dense	5 (75-100%)	10 x 10 m patch in swale.
304	17°44'19.28"S 146°9'27.33"E	Strand	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Scattered plants	3 (25-50%)	
309	17°44'19.40"S 146°9'27.82"E	Littoral rainforest	Coral berry <i>Rivina humilis</i>	Mature	Flowers /buds	Scattered plants	3 (25-50%)	

ID	Latitude / Longitude	Habitat	Species	Growth stage	Reproductive status	Density	Cover score	Notes
143	17°44'14.02"S 146°9'27.76"E	Littoral rainforest	Devil's fig <i>Solanum torvum</i>	Mature	Flowers /buds	Isolated plant	1 (1-5%)	One or two on edge of cliff.
305	17°44'19.35"S 146°9'27.54"E	Strand	Devil's fig <i>Solanum torvum</i>	Mature	Fruit	Isolated plant	1 (1-5%)	Single plant to 3 m.
220	17°44'17.75"S 146°9'47.16"E	Grassland (in cliffs/headlands)	Flannel weed <i>Sida cordifolia</i>	Mature	Flowers /buds	Scattered plants	2 (5-25%)	Dense patch on edge of Guinea grass swathe and scattered on eastern headland.
71	17°44'18.56"S 146°9'28.99"E	Lowland rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	Thick stand on spring facing south.
81	17°44'18.56"S 146°9'26.42"E	Littoral rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Isolated plant	1 (1-5%)	Small patch edge of forest.
100	17°44'14.19"S 146°9'37.65"E	Lowland rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	On northern side island 100 m from top of ridge.
109	17°44'15.83"S 146°9'40.56"E	Lowland rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	On southern edge of island on steep slope leading down to beach 30 x 40 m.
110	17°44'16.09"S 146°9'41.45"E	Lowland rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	100 m east of last Guinea grass point on south end slope down to sea. Side slopes about 1.5 m Guinea grass
116	17°44'15.87"S 146°9'43.26"E	Lowland rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Fruit	Scattered plants	4 (50-75%)	Guinea grass low slope coral berry top of ridge.
121	17°44'17.36"S 146°9'47.24"E	Lowland rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	On eastern point of island.
131	17°44'16.60"S 146°9'26.01"E	Lowland rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	F	Dense	5 (75-100%)	Patch 8 x 8 m.

ID	Latitude / Longitude	Habitat	Species	Growth stage	Reproductive status	Density	Cover score	Notes
137	17°44'16.50"S 146°9'25.82"E	Lowland rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	4 (50-75%)	Patch 5 x 5 m in gap.
138	17°44'16.17"S 146°9'25.78"E	Strand	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	10 x 10 m patch above shoreline.
145	17°44'13.60"S 146°9'27.67"E	Littoral rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	Dense on steep cliffs above.
157	17°44'12.48"S 146°9'28.80"E	Grassland (in cliffs/headlands)	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	On cliffs above.
192	17°44'15.95"S 146°9'25.49"E	Littoral rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Scattered plants	3 (25-50%)	Small opening canopy off northern ridge.
213	17°44'17.47"S 146°9'46.86"E	Grassland (in cliffs/headlands)	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	
216	17°44'17.89"S 146°9'47.18"E	Grassland (in cliffs/headlands)	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Scattered plants	1 (1-5%)	On headland rock face one clump.
217	17°44'18.35"S 146°9'47.12"E	Grassland (in cliffs/headlands)	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Isolated plant	0 (<1%)	
218	17°44'18.22"S 146°9'47.40"E	Grassland (in cliffs/headlands)	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Scattered plants	1 (1-5%)	
219	17°44'18.16"S 146°9'46.53"E	Grassland (in cliffs/headlands)	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	3 (25-50%)	
233	17°44'16.15"S 146°9'41.64"E	Low closed forest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	
256	17°44'18.83"S 146°9'28.73"E	Low closed forest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	4 (50-75%)	Edge of big patch extending down cliffs.
269	17°44'18.11"S 146°9'36.26"E	Offshore	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Scattered plants	4 (50-75%)	End on bottom of ridge.
273	17°44'17.60"S 146°9'37.65"E	Guinea grass	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	3 (25-50%)	On ridge 2 m off beach.

ID	Latitude / Longitude	Habitat	Species	Growth stage	Reproductive status	Density	Cover score	Notes
281	17°44'18.36"S 146°9'34.42"E	Lowland rainforest	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	5 (75-100%)	Upper edge of tongue coming up from base on hill.
300	17°44'18.63"S 146°9'26.17"E	Strand	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Isolated plant	0 (<1%)	
307	17°44'19.40"S 146°9'27.53"E	Strand	Guinea grass <i>Megathyrsus maximus</i>	Mature	Flowers /buds	Dense	3 (25-50%)	5 x 5 m patch.
77	17°44'18.73"S 146°9'26.28"E	Strand	Singapore daisy <i>Sphagneticola triloba</i>	Mature	No	Dense	4 (50-75%)	Small patch 5 x 5 m edge of dune.
299	17°44'18.62"S 146°9'26.22"E	Strand	Singapore daisy <i>Sphagneticola triloba</i>	Mature	Flowers /buds	Dense	4 (50-75%)	5 x 5 m patch.
13	17°44'16.7141"S 146°9'26.54064"E	Littoral rainforest	Coastal morning glory <i>Ipomoea cairica</i>	Mature	No	Scattered plants	1 (1-5%)	Small patch 5 x 5 m.

Appendix D - Fauna species list for Bajigal

Note that in some instances, source material for historic records follows a different taxonomy to this document and both scientific and common names may vary.

Conservation significant: listed within the Qld NC Act and Cth EPBC Act

Migratory listed: Species currently on the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) migratory species list established under section 209. Included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II); the Japan-Australia Migratory Bird Agreement (JAMBA); the China-Australia Migratory Bird Agreement (CAMBA); and the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Habitat: T-terrestrial, M-marine, C-coastal/water association; **Non-native:** *species name**; **Notes:** * not listed in ALA 1 km search from Bajigal

Class	Species Name	Common Name	Conservation significant	Migratory listed	Habitat	Source WN ¹⁸	Source ALA	Field survey 2024	NOTES
Amphibia	<i>Rhinella marinus*</i>	Cane toad	N	N	T	X	*	X	Two juvenile individuals caught in lowland rainforest.
Aves	<i>Actitis hypoleucos</i>	Common sand piper	Y	Y	C	X	*		
Aves	<i>Alectura lathami</i>	Australian brush turkey	N		T	X	*		
Aves	<i>Anous minutus</i>	Black noddy	N		C	X			

¹⁸ Species derived from 1km search radius of Atlas of Living Australia and Wildnet.

Class	Species Name	Common Name	Conservation significant	Migratory listed	Habitat	Source WN ¹⁸	Source ALA	Field survey 2024	NOTES
Aves	<i>Anous stolidus</i>	Common noddy	Y	Y	C	X			
Aves	<i>Arenaria interpres</i>	Ruddy turnstone	Y	Y	C	X			
Aves	<i>Artamus leucorhynchus</i>	White-breasted woodswallow	N		T	X		X	Common flying around island.
Aves	<i>Butorides striata</i>	Striated heron	N		C	X			
Aves	<i>Caprimulgus macrurus</i>	Large-tailed nightjar	N		T	X		X	One individual observed in low littoral rainforest.
Aves	<i>Centropus phasianinus</i>	Pheasant coucal	N		T	X			
Aves	<i>Ceyx pusillus</i>	Little kingfisher	N		C	X			
Aves	<i>Chalcophaps longirostris</i>	Brown-capped emerald-dove	N		T	X		X	
Aves	<i>Cinnyris jugularis</i>	Olive-backed sunbird	N		T	X	*	X	
Aves	<i>Coracina novaehollandiae</i>	Black-faced cuckoo-shrike	N		T	X		X	

Class	Species Name	Common Name	Conservation significant	Migratory listed	Habitat	Source WN ¹⁸	Source ALA	Field survey 2024	NOTES
Aves	<i>Coracina papuensis</i>	White-bellied cuckoo-shrike	N		T	X			
Aves	<i>Dicrurus bracteatus</i>	Spangled drongo	N		T	X		X	
Aves	<i>Ducula bicolor</i>	Pied imperial-pigeon	N		T	X			
Aves	<i>Egretta novaehollandiae</i>	White-faced heron	N		C	X			
Aves	<i>Egretta sacra</i>	Eastern reef egret	N		C	X		X	
Aves	<i>Esacus magnirostris</i>	Beach stone-curlew	Y	Y	C	X		X	One individual recorded on shoreline.
Aves	<i>Eurystomus orientalis</i>	Dollarbird	N		T	X	*		
Aves	<i>Fregata ariel</i>	Lesser frigatebird	Y	Y	C	X			
Aves	<i>Gallirallus philippensis</i>	Buff-banded rail	N		T	X		X	One call recorded and identified.
Aves	<i>Gavicalis versicolor</i>	Varied honeyeater	N		T	X		X	Abundant in littoral rainforest.

Class	Species Name	Common Name	Conservation significant	Migratory listed	Habitat	Source WN ¹⁸	Source ALA	Field survey 2024	NOTES
Aves	<i>Geopelia humeralis</i>	Bar-shouldered dove	N		T	X		X	Abundant throughout the island.
Aves	<i>Haematopus fuliginosus</i>	Sooty oystercatcher	N		C	X			
Aves	<i>Haematopus longirostris</i>	Australian pied oystercatcher	N		C	X			
Aves	<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle	N		C	X		X	A pair observed flying over the island.
Aves	<i>Haliastur sphenurus</i>	Whistling kite	N		T	X			
Aves	<i>Himantopus leucocephalus</i>	Black-winged stilt	N		C	X			
Aves	<i>Hirundo neoxena</i>	Welcome swallow	N		T	X			
Aves	<i>Lalage leucomela</i>	Varied triller	N		T	X			

Class	Species Name	Common Name	Conservation significant	Migratory listed	Habitat	Source WN ¹⁸	Source ALA	Field survey 2024	NOTES
Aves	<i>Megapodius reinwardt</i>	Orange-footed scrubfowl	N		T	X		X	Abundant throughout the island with numerous nesting mounds.
Aves	<i>Melloria quoyi</i>	Black butcherbird	N		T	X	*		
Aves	<i>Merops ornatus</i>	Rainbow bee-eater	N		C	X			
Aves	<i>Numenius madagascariensis</i>	Eastern curlew	Y	Y	C	X		X	One individual observed along southern intertidal shoreline.
Aves	<i>Numenius phaeopus</i>	Whimbrel	Y	Y	C	X			
Aves	<i>Onychoprion anaethetus</i>	Bridled tern	Y	Y	C	X		X	
Aves	<i>Onychoprion fuscatus</i>	Sooty tern	N		C	X			
Aves	<i>Pandion haliaetus cristatus</i>	Osprey	Y		C	X			

Class	Species Name	Common Name	Conservation significant	Migratory listed	Habitat	Source WN ¹⁸	Source ALA	Field survey 2024	NOTES
Aves	<i>Pelecanus conspicillatus</i>	Australian pelican	N		C	X		X	One individual observed flying high over island.
Aves	<i>Phalacrocorax varius</i>	Pied cormorant	N		C	X			
Aves	<i>Phaps chalcoptera</i>	Common bronzewing	N		T	X			
Aves	<i>Pitta versicolor</i>	Noisy pitta	N		T	X			
Aves	<i>Pluvialis fulva</i>	Pacific golden plover	Y	Y	C	X			
Aves	<i>Podargus strigoides</i>	Tawny frogmouth	N		T	X			
Aves	<i>Ptilinopus regina</i>	Rose-crowned fruit-dove	N		T	X		X	
Aves	<i>Ptilinopus superbus</i>	Superb fruit-dove	N		T	X		X	
Aves	<i>Ptiloris victoriae</i>	Victoria's riflebird	N		T	X			
Aves	<i>Rallina tricolor</i>	Red-necked crake	N		T	X		X	

Class	Species Name	Common Name	Conservation significant	Migratory listed	Habitat	Source WN ¹⁸	Source ALA	Field survey 2024	NOTES
Aves	<i>Ramsayornis modestus</i>	Brown-backed honeyeater	N		T	X			
Aves	<i>Rhipidura rufifrons</i>	Rufous fantail	Y	Y	T	X		X	
Aves	<i>Sphecotheres vieilloti</i>	Australasian figbird	N		T	X			
Aves	<i>Sterna dougallii</i>	Roseate tern	Y	Y	C	X			
Aves	<i>Sterna sumatrana</i>	Black-naped tern	Y	Y	C	X			
Aves	<i>Sternula albifrons</i>	Little tern	Y	Y	C	X			
Aves	<i>Sula leucogaster</i>	Brown booby	Y	Y	C	X			
Aves	<i>Symposiachrus trivirgatus</i>	Spectacled monarch	Y	Y	T	X			
Aves	<i>Synoicus ypsilophorus</i>	Brown quail	N		T	X			
Aves	<i>Thalasseus bengalensis</i>	Lesser crested tern	N		C	X		X	
Aves	<i>Thalasseus bergii</i>	Crested tern	Y	Y	C	X		X	

Class	Species Name	Common Name	Conservation significant	Migratory listed	Habitat	Source WN ¹⁸	Source ALA	Field survey 2024	NOTES
Aves	<i>Todiramphus macleayi</i>	Forest kingfisher	N		T	X			
Aves	<i>Todiramphus sanctus</i>	Sacred kingfisher	N		T	X		X	
Aves	<i>Todiramphus sordidus</i>	Collared kingfisher	N		T	X		X	
Aves	<i>Tringa brevipes</i>	Grey-tailed tattler	Y	Y	C	X			
Aves	<i>Tringa incana</i>	Wandering tattler	Y	Y	C	X			
Aves	<i>Zosterops lateralis</i>	Silvereye	N		T	X		X	Abundant.
Aves	<i>Zosterops lateralis vegetus</i>	Silvereye (Cape York Peninsula)	N		T	X	*		
Aves	<i>Eudynamys orientalis</i>	Eastern koel	N		T			X	
Mammalia	<i>Pteropus conspicillatus</i>	Spectacled flying-fox (Vulnerable)	Y		T	X	*		
Mammalia	<i>Rattus rattus</i> *	Black rat (eradicated)	N		T	X	*		

Class	Species Name	Common Name	Conservation significant	Migratory listed	Habitat	Source WN ¹⁸	Source ALA	Field survey 2024	NOTES
Reptilia	<i>Bellatorias frerei</i>	Major skink	N		T	X	*	X	
Reptilia	<i>Lepidodactylus lugubris</i>	Mourning gecko	N		T	X			
Reptilia	<i>Cryptoblepharus virgatus</i>	Striped snake-eyed skink	N		T			X	
Reptilia	<i>Carlia rubrigularis</i>	Red-throated rainbow skink	N		T			X	
Reptilia	<i>Stegonotus cucullatus</i>	Slaty-grey snake	N		T			X	

Appendix D1. Fauna survey data

Cam No.	Type	Habitat	Species	Scientific Name
1	Garde Pro A5WF	Littoral Rainforest	Orange-footed scrubfowl	<i>Megapodius reinwardt</i>
			Pacific emerald dove	<i>Chalcophaps longirostris</i>
2	Garde Pro A5WF	Lowland Rainforest	Orange-footed scrubfowl	<i>Megapodius reinwardt</i>
			Bar-shouldered dove	<i>Geopelia humeralis</i>
3	Garde Pro A5WF	Lowland Rainforest	Major skink	<i>Bellatorias frerei</i>
			Orange-footed scrubfowl	<i>Megapodius reinwardt</i>
			Pacific emerald dove	<i>Chalcophaps longirostris</i>
4	Garde Pro A5WF	Lowland Rainforest	Orange-footed scrubfowl	<i>Megapodius reinwardt</i>
			Bar-shouldered dove	<i>Geopelia humeralis</i>
5	Garde Pro A5WF	Lowland Rainforest	Pacific Emerald dove	<i>Chalcophaps longirostris</i>
			Bar-shouldered dove	<i>Geopelia humeralis</i>
			Orange-footed scrubfowl	<i>Megapodius reinwardt</i>
6	Garde Pro A5WF	Low closed forest	Bar-shouldered dove	<i>Geopelia humeralis</i>
			Orange-footed scrubfowl	<i>Megapodius reinwardt</i>
			Pacific Emerald dove	<i>Chalcophaps longirostris</i>
7	Reconnyx HF2X	Low closed forest	Bar-shouldered dove	<i>Geopelia humeralis</i>
			Orange-footed scrubfowl	<i>Megapodius reinwardt</i>
8	Reconnyx HF2X	Lowland Rainforest	Orange-footed scrubfowl	<i>Megapodius reinwardt</i>
			Major skink	<i>Bellatorias frerei</i>
			Pacific emerald dove	<i>Chalcophaps longirostris</i>
9	Gerber IR40	Littoral Rainforest	NIL	
10	Gerber IR40	Littoral Rainforest	NIL	

Appendix D2. Shorebird and forest bird survey results

Shorebird Surveys

No shorebirds were observed during the three shorebird survey periods.

Forest Bird Surveys

Record type: Seen = S; Heard = H **Microhabitat:** In Tree = IT; On ground = GR Shrub

Survey 1 – 25/04/2024 - Littoral rainforest 100 m east of campground, Time 1015-1035 hours Area 100 m x 100 m (1 ha)					
Species	Count	Record type	Offsite (X)	Microhab code	Comments
Bar-shouldered dove	2	H	X		Up on hill to east.
Orange-footed scrubfowl	2	S		GR	
Orange-footed scrubfowl	2	H	X	GR	
Spangled drongo	1	H		IT	Behind north beach.
Sunbird	1	S		IT	
Varied honeyeater	7	H		IT	
Varied honeyeater	2	S		IT	
Survey 2 – 26/04/2024 – <i>Myristica</i> dominated rainforest on basalt soils 100 m east of top of natural spring, northern side of island. Time 1025-1045 hours Area 100 m x 100 m (1 ha)					
Bar-shouldered dove	4	H	X		South-west site, ridge and near spring.
Orange-footed scrubfowl	2	S		GR	
Rose-crowned fruit dove	1	H	X	IT	Ridge.
Silvereye	1	H		IT	Towards ridge in canopy.
Silvereye	1	S		SH	Lower slope.
Varied honeyeater	3	H	X	IT	Above on ridge and on west side.

Survey 3 – 26/04/2024 – Eastern Island Banyan Figs between Camera Traps 6 and 8 Time - 1220-1240 hours 100 m x 100 m (1 ha)					
Bar-shouldered dove	2	H	X		North of site.
Bar-shouldered dove	2	H		GR	North-east corner of site.
Orange-footed scrubfowl	2	H		GR	West along ridge.
Orange-footed scrubfowl	2	H	X	IT	East of site.
Rose-crowned fruit dove	1	H	X		West along ridge.
Silvereye	3	H		IT	
Varied honeyeater	2	H	X	IT	West along ridge.
Varied honeyeater	2	H		IT	North.

Record type: Seen = S; Heard = H Microhabitat: In Tree = IT; On ground = GR Shrub

Appendix D3. Results of scat, track, and sign searches

Scat, Track and Sign survey – 26/04/2024 – Sand beach and foredune area western end of Bajigal Time – 0938 – 0953 hours 200 m x 100 m (2 ha)						
Species	No.	Record type	Reliability of ID			Comments
			Definite	Probable	Possible	
Bird species	2	DT	X			Nil
Bird species	1	DT	X			Nil
Crab species	1	DT	X			Nil
Bird species	1	DT	X			Nil
Crab species	3	BU	X			Nil
Bird species	2	DT	X			Nil
Bird species	1	DT	X			Nil
Bird species	2	DT	X			Nil
Bird species	1	DT	X			Nil

DT = Tracks; BU = Burrow; DS = Scats; DR = Dead Remains

Appendix D4. eDNA results

ID	Sample date	Site code	Replicate	Latitude	Longitude	Sample type	Volume (mL)	Storage	Notes
1	25/04/2024	Spring eDNA	1	-17.738500	146.158100	Soil	50	Fridge	Top of spring, north side of island. Targeting invasive rats and cane toads.
2	25/04/2024	Spring eDNA	2	-17.738500	146.158100	Soil	50	Fridge	Top of spring, north side of island. Targeting invasive rats and cane toads.
3	25/04/2024	Top ridge	1	-17.737900	146.158700	Soil	50	Fridge	North side of ridge, bridled tern habitat, targeting invasive rats and cane toads.
4	25/04/2024	Top ridge	2	-17.737900	146.158700	Soil	50	Fridge	North side of ridge, bridled tern habitat, targeting invasive rats and cane toads.
5	26/04/2024	Beach camp	1	-17.738100	146.156800	Soil	50	Fridge	Littoral rainforest area adjacent to campground, targeting invasive rats and cane toads.
6	26/04/2024	Beach camp	2	-17.738100	146.156800	Soil	50	Fridge	Littoral rainforest area adjacent to campground, targeting invasive rats and cane toads.

Processing of eDNA sampling recorded the presence of two species of birds and human DNA. No other DNA were recorded and PCR analysis for the presence of cane toads failed to detect the species. Advice from the processing laboratory is that eDNA in soil can be challenging as the animals need to come in direct contact with the soil sampled for their DNA to be detected.

The full report by EnviroDNA is provided below.

Appendix E - Field images

Appendix E1. Examples of weed invasion captured during the survey

Field images collected by David Fell, April 2024.



Plate 56: Example of dense vine towers of Ipomoea purpurea in heavily disturbed lowland rainforest (Unit 1A)



Plate 57: Trailing vine stems of Ipomoea sp. in closed canopy littoral rainforest (Unit 2)



Plate 58: Patch of Singapore daisy in littoral vegetation behind the shoreline.



Plate 59: Vine tower of Ipomoea cairica on exposed margin of low closed rainforest.



Plate 60: Typical infestation of Guinea grass on exposed cliffs with overlapping exotic and native vines.



Plate 61: Dense infestations of Guinea grass on exposed cliffs.



Plate 62: Margin of low closed rainforest and Guinea grass on eastern headland.



Plate 63: This patch of lantana on steep cliff line was the only plant recorded during the survey. there is potential that additional isolated infestations occur in similar inaccessible locations.



Plate 64: Coral berry forms dense infestations on the edges of canopy gaps and littoral forest on sand, and in low closed forest.



Plate 65: An example of dense infestations of coral berry in heavily shaded low closed forest.



Plate 66: Dense patches of Sida cordifolia on margin of exposed basalt headland.



Plate 67: Stinking passionflower on exposed basalt headland.

Appendix E2. Example images of fauna captured by camera traps during the survey



Plate 68: Camera 1 – Littoral rainforest - orange-footed scrubfowl and Pacific emerald dove



Plate 69: Camera 2 – Top of spring - bar-shouldered dove and orange-footed scrubfowl

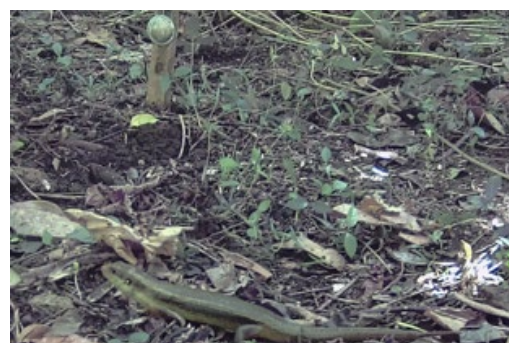
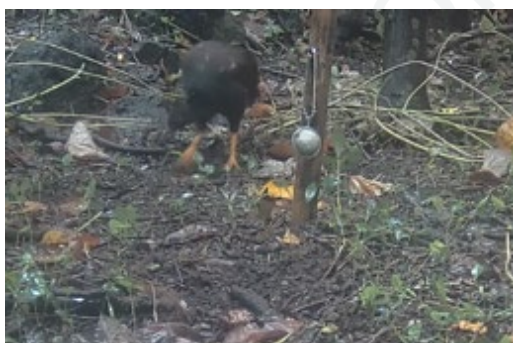


Plate 70: Camera 3 – bridled tern nesting area – bar-shouldered dove, orange-footed scrubfowl, major skink



Plate 71: Camera 4 – bridled tern nesting habitat – orange-footed scrubfowl, bar-shouldered dove



Plate 72: Camera 5 – north side of ridge – pacific emerald dove and orange-footed scrubfowl



Plate 73: Camera 6 – eastern end of island – pacific emerald dove and orange-footed scrubfowls



Plate 74: Camera 7 – far eastern – bar-shouldered doves and orange-footed scrubfowl – hyperfire h2x



Plate 75: Camera 8 – far eastern end of island – major skink and orange-footed scrubfowl – hyperfire h2x

