Australian Government
Great Barrier Reef Marine Park Authority

DAVIDFELL ENVIRONMENTAL
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RESTORATION OF REEF ISLANDS PROJECT

RAPID ECOLOGICAL SURVEY

Bimi Vegetation Assessment

Supplementary island threat assessment report

April 2025

A Great Barrier Reef Joint Field Management Program Priority Project

We acknowledge the Mandubarra Traditional Owners who are the custodians of Bimi 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	Bimi vegetation assessment	David Fell, Andrew Palmer-Brodie	Naomi Maxwell	9/01/2025
v0.2	Bimi vegetation assessment	David Fell, Andrew Palmer-Brodie	Sam Gibbs (Reef Authority) Naomi Maxwell	31/03/2025
v0.3	Bimi vegetation assessment	Aestra	MALSI	03/04/2025
v1.0	Bimi vegetation assessment	Aestra	Naomi Maxwell	10/04/2025

Citation: Fell, 2025, *Bimi vegetation assessment (supplementary island threat assessment)*, prepared for Aestra and the Reef Joint Field Management Program on behalf of the Great Barrier Reef Marine Park Authority, Commonwealth of Australia.

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- Kurrimine Beach Hire for their safe and professional transportation.

1 Introduction

This report is a study completed as part of the Restoration of Reef Islands Project (the Project) which aims to facilitate the rehabilitation or enhancement of habitat values for selected islands in the Great Barrier Reef World Heritage Area. The Project has been delivered using funding supplied by the Reef Trust administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water.

The Project includes two components, Component 1 which focusses on islands with known threats (such as weeds and pests) and Component 2 which focusses on understanding potential threats to islands with *Pisonia grandis* (Pisonia) particularly as a result of soft scale.

The Component 1 assessments for Bajigal is reported in the *Ecological Assessment for Bajigal (Stephens Island)* (Fell *et al,* 2024). The Component 1 assessment for Bimi is comprised of three supplementary island threat assessment reports which should be read in conjunction with the Ecological Assessment for Bajigal. The relevant supplementary reports are:

- Rapid survey for *Pisonia grandis* – Bajigal and Bimi (Stephens and Sisters islands) (Aestra, 2025a)
- Bimi vegetation assessment (this report)
- Bridled tern survey report – Bajigal and Bimi (Stephens and Sisters islands) (Aestra, 2025b)

This report relates to the assessment of vegetation on Bimi (Sisters Island).

Figure 1 Bimi, looking south-west towards mainland

1.1 Aims and objectives

The field surveys of Bimi were intended to provide a rapid assessment of biodiversity values and threats with a focus on weed threats to bridled tern nesting habitat. The surveys are intended to complement work by Queensland Parks and Wildlife Service (QPWS) and Mandubarra Aboriginal Land and Sea Incorporated (MALSI).

Breeding seabirds are an important feature of both Bimi and neighbouring 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 (MALSI, 2020).

Concurrent surveys of seabirds were undertaken at the time of this assessment (refer Aestra, 2025b). 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 on Bimi in relation to:

- western science interpretation of the extent, value and condition of island habitats and the associated flora,
- island-scale ecological threats which are influencing Bimi's habitats and may present a risk to the integrity of the environment on Bajigal.

1.2 Survey location

Bimi (6.5 ha) is situated on the wet tropical coast of north Queensland within the Wet Tropics bioregion (Figure 2). The island is located 6.7 km northeast of Kurrimine Beach, which is approximately half-way between Cairns and Townsville. There is a rocky reef between the Bimi and its sister island Bajigal, which is less than 1 metre deep at low tide (MALSI, pers. comm.). The distance between the two islands is 0.7 km.

Bimi lies within the Sea Country of the Mandubarra people and is part of the Barnard Island Group National Park which is managed by Queensland Parks and Wildlife Service (QPWS). It is also located within the Marine National Park (Green) Zone (Commonwealth of Australia (GBRMPA) 2016).

Access to Bimi is limited, there are no camping or recreation facilities on the island and vessel access is constrained by surrounding areas of reef.

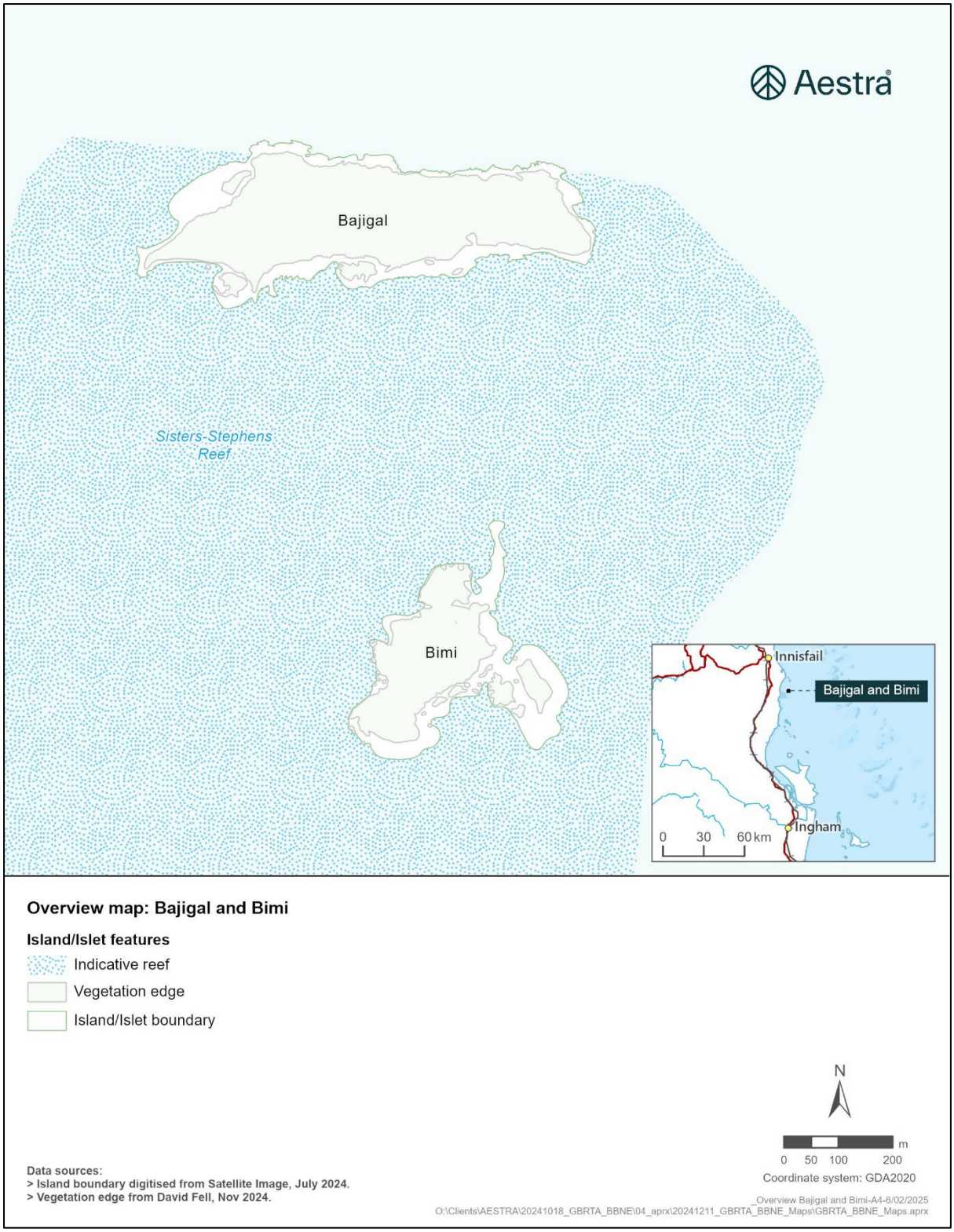

Figure 2: Overview map of Bimi

2 Methods

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

Field surveys of Bimi were carried out over a two-day period between 28 - 29 November 2024. 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 Rangers James Epong and Naomi Epong (MALSI) and Project Team Leader, Botanist David Fell.

A full list of field survey participants is found in Table 1.

Table 1: Field survey participants

Name	Position
Naomi Epong	MALSI Senior Ranger
Sean Kyle	MALSI Ranger
Sharon Casey	MALSI Ranger Trainee
Caylin Epong	MALSI Junior Ranger
David Fell	Aestra Field Team Leader and Botanist
Dr Anthony Rice	Entomologist

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.

2.1.1 Data collection

Data was collected by various methods throughout the survey. The ArcGIS® Field Maps 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.

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 *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as critically endangered, endangered, or vulnerable.
- State significant: species listed on the *Nature Conservation Act 1992* (NC Act) as critically endangered, endangered, vulnerable, near threatened, or special least concern.

2.1.2 Vegetation and flora survey methods

Field data on vegetation structure and floristics was collected in a format consistent with Queensland Herbarium quaternary sites (Neldner *et al*. 2019). Additional field notes were recorded into field notebooks and a FieldMaps 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. 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.

Vegetation is also classified in Regional Ecosystems (REs). In Queensland, the Department of Environment and Science (DES) publish mapping of REs which are a coded classification system for vegetation communities across the state (QPWS, 2024). 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 Bimi, 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 given the limited spatial occurrence on the island. In these instances, an explanatory note is made to this effect.

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).

Flora species lists were recorded, 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. Taxa that were challenging to identify in the field were identified in the laboratory with assistance from the Queensland Herbarium. Vouchers are scheduled for lodgement with the Queensland Herbarium with duplicates provided to the Australian Tropical Herbarium and the MALSI Herbarium (Attachment A3). For flora, the terms ‘species’ include species, subspecies, varieties, forms, and any undescribed taxa recognised by the Queensland Flora Census (Bean, 2024).

Tides restricted vessel access and constrained the amount of time spent in ground to carry out flora survey activities. Time of the islands was as follows:

Table 2 Flora survey periods

Date	Arrive	Depart	Time on islands (hours)
28/11/24	8.00 am	11.00 am	3 hrs
29/11/24	8.00 am	11.00 am	3 hrs

3 Results

3.1 Vegetation

The vegetation of Bimi comprises six vegetation communities within five remnant Regional Ecosystems (RE) and one non-remnant RE (Figure 3). A summary of survey sites carried out are listed in Attachment A2.

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. Remnant grassland - herbland occurs on the eastern basalt headland. Mangroves occur on intertidal rock shelves and estuarine deposits. Exotic grassland intergrading with vineland occurs on exposed basalt slopes. Vegetation condition across the island was variable with some areas in good condition and others impacted by weed infestations.

3.1.1 Lowland Rainforest on Basalt

Plate 1 Closed canopy of lowland rainforest on basalt ridge. Image: D. Fell, 2024

Plate 2 Canopy tree and open understorey of lowland rainforest on basalt. Image: D. Fell, 2024

Description

Lowland rainforest (RE7.8.2, Veg Community 1a,1b) occurs on basalt slopes and crests. It features a low closed canopy dominated by *Myristica globosa* var. *muelleri* with *Hibiscus tiliaceus, Macaranga tanarius, Planchonella obovoidea*, and *Pandanus tectorius*. More disturbed examples are of mesophyll vine forest mapped as community 1a has been heavily impacted by historic disturbance associated with a bech de mer station and cyclones. Access to assess this community type was restricted by the dense Guinea grass (*Megathyrsus maximus*) cover and nesting of Bridled terns. Examples of advanced regrowth features *Trema orientalis, Didymocheton gaudichaudianus,* and *Macaranga tanarius* which are covered by vine towers of the exotic *Ipomoea indica* were observed at distance. Further survey work is required within to better understand the extent of this community, and succession trajectory given weed impacts.

Condition

Lowland rainforest has been heavily impacted by past disturbance with large areas now converted to dense Guinea grass stands. The margins of the lowland rainforest are impacted by Guinea grass together with occasional devil's fig (*Solanum torvum*) and coral berry (*Rivina humilis*).

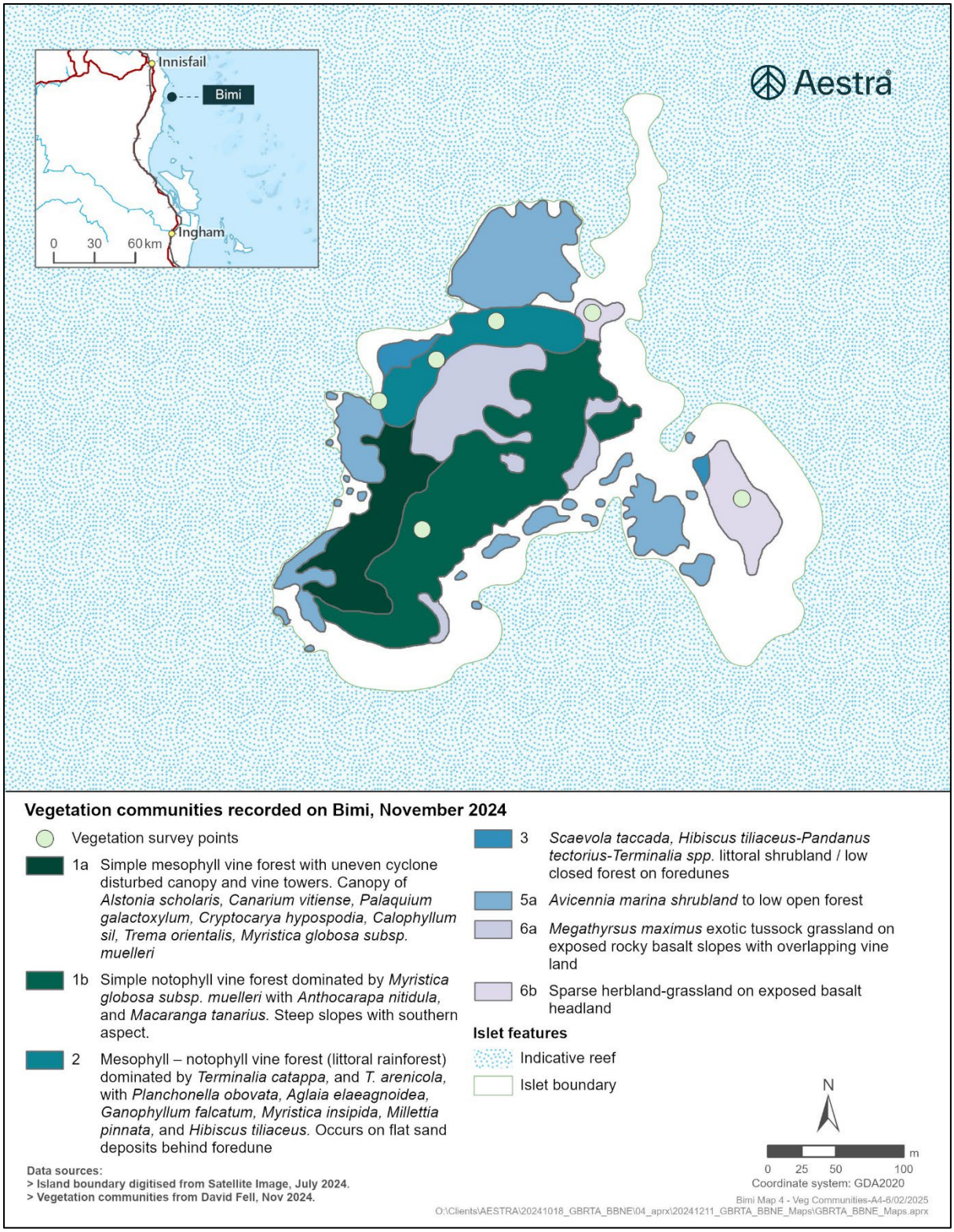

Figure 3: Vegetation communities recorded on Bimi, November 2024

3.1.2 Littoral Rainforest on dune deposits

Plate 3 MALSI Rangers surveying littoral rainforest. The tree in centre is Erythrina variegata. Image: D. Fell, 2024

Plate 4 Large Terminalia arenicola trees dominate the canopy of littoral rainforest. Image: D. Fell, 2024

Description

A small area of littoral rainforest consistent with RE7.2.1 and the Critically Endangered EPBC listed 'Littoral rainforests and thickets of Eastern Australia' community occurs on dune deposits on the northeastern side of the island. It is dominated by a simple suite of canopy species namely *Terminalia arenicola, T. catappa, Erythrina variegata*, *Pongamia pinnata* and *Ganophyllum falcatum*. The understorey features *Ochrosia elliptica, Micromelum minutum, Chionanthus ramiflorus* and *Glycosmis trifolia*. This RE was not recognised in existing RE mapping given the limited spatial extent.

Condition

The inland margin of the forest is heavily impacted by infestations of the winged yam (*Dioscorea alata*). At the time of survey, the vine had died back and was just starting to resprout from the large tubers. During the growing season, the vine forms vine towers that completely engulf the inland margin of the littoral rainforest causing dieback. The senescence of the vines during the late dry season creates an exposed sandy soil surface which provides opportunities for further infestation of a host of weeds such as Guinea grass, devil's fig, morning glory (*Ipomoea indica* and *I. cairica*), Chinese burr (*Triumfetta rhomboidei*), coral berry, stinking passion flower (*Passiflora foetida*), and cinderella weed (*Synedrella nodiflora*). Where canopy cover remains robust, the littoral rainforest is intact and seemingly free of yam vine impacts, nevertheless weeds such as coral berry persist throughout the groundcover.

3.1.3 Coastal Shrubland (Strand Vegetation) on frontal dune deposits

Plate 5 Coastal shrubland community fringing the shoreline dominated on foredune. Image: D. Fell, 2024.

Plate 6 Dense thicket of Colubrina asiatica with Guilandina bonduc dominate the coastal shrubland. Image: D. Fell, 2024.

Description

Fringing coastal shrubland to low closed forest vegetation occurs along the northeastern shoreline. It has been mapped as Unit 3 and is consistent with RE7.2.7a. It forms a dense band of vegetation with *Colubrina asiatica, Guilandina bonduc, Premna serratifolia, Hibiscus tiliaceus, Scaevola taccada, Pandanus tectorius, Cordia subcordata* and *Thespesia populnea*. Larger trees such as *Terminalia catappa* and *T. arenicola* are common on the inland margins forming the canopy of the littoral rainforest type. Some limited areas of herbland with *Ipomoea pes-caprae* subsp. *brasiliensis* and *Sesuvium portulacastrum* occur on the narrow sand spit.

Condition

The fringing coastal shrublands appear in good condition with no obvious weed infestation or dieback from tidal inundation and coastal erosion.

3.1.4 Mangroves on estuarine sediments

Plate 7 Fringing mangroves dominated by Grey Mangrove Avicennia marina var. australasica. Image: D. Fell, 2024.

Plate 8 Patches of Rhizophora stylosa on outer margin of mangrove low closed forest. Image: D. Fell, 2024.

Description

Mangroves consistent with RE7.1.1 (Veg community 5a) form low closed forests and shrublands around the perimeter of the islet. The dominant species is grey mangrove (*Avicennia marina* var. *australasica*), with patches of *Rhizophora stylosa* and more limited occurrences of *Lumnitzera littoralis, Bruguiera gymnorhiza, Excoecaria agallocha, Aegiceras corniculatus* and rare *Pemphis acidula*.

Condition

The fringing mangroves appear in good condition with no obvious weed infestation or dieback.

3.1.5 Grassland-Herbland on basalt

Plate 9 Saltwater couch dominant grassland on basalt headland with Coleus batinoffii. Image: D. Fell, 2024.

Plate 10 Exposed basalt with nesting bridled terns. Image: D. Fell, 2024.

Description

A significant patch of remnant grassland-herbland occurs on the exposed eastern basalt headland. This is a rare variant within the RE7.8.7 that is dominated by saltwater couch (*Sporobolus virginicus*) and the endemic mint Coleus batianoffii. Other native species include creeping speedwell (*Evolvulus alsinoides*) and Pacific needle grass (*Lepturus repens*). The population of Coleus is estimated at 1,000 individuals and extends from a small population found on the eastern headland of Bajigal.

Condition

This habitat is exposed to the prevailing maritime conditions of salt laden air and sea spray. These conditions preclude Guinea grass infestation which can only persist in small clumps on the leeward side of the basalt outcrops where some protection is offered.

3.1.6 Exotic Grassland on basalt

Plate 11 Dense Guinea grass on basalt slopes with devil's fig in foreground left. Image: D. Fell, 2024

Plate 12 Heavily disturbed margin of littoral rainforest impacted by aerial yam which has died back in the late dry season. The Guinea grass extends up the basalt foot slope in an area once vegetated with tropical lowland rainforest. Image: D. Fell, 2024

Description

Guinea grass forms pure dense stands over on the basalt slopes on the eastern side of the island where it has displaced rainforest and other native grasses and herbs.

3.1.7 Threatened Ecological Communities

Two Threatened Ecological Communities (TECs) are confirmed as present on Bimi (refer Figure 3):

- Lowland Tropical Rainforest of the Wet Tropics threatened ecological community (lowland rainforest) which is listed as endangered under the EPBC Act (Unit 1A) (Department of the Environment, 2021).
- 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, and 2), (Department of the Environment, 2015).

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).

Table 3 Summary description of vegetation

Vegetation Unit	Unit description	Applicable Regional Ecosystem	Conservation Status (Qld VM Act)	Biodiversity Status (Qld NC Act)	TEC Status EPBC Act	Vegetation condition
Rainforests on basalt slopes						
1A	Simple mesophyll vine forest with uneven cyclone disturbed canopy and vine towers. On krasnozem soils derived from basalt. Cyclone disturbed with vine towers.	7.8.1d	Least Concern	Endangered	Endangered	Significant concern to critical
1B	Simple notophyll vine forest dominated by *Myristica globosa* subsp. *muelleri* and *Macaranga tanarius.* Steep basalt slopes and crests.	7.8.1d	Least Concern	Endangered	Critically Endangered	Good with some concern
Littoral Rainforest on interior sand deposits						
2	Notophyll to microphyll vine forest (closed forest) dominated by *T. arenicola*, *Terminalia catappa Ganophyllum falcatum, Pongamia pinnata, Planchonella obovata,* and *Aglaia elaeagnoidea*. Occurs on beach ridge deposits adjacent to the foredune.	7.2.1c	Endangered	Endangered	Critically Endangered	Significant concern
Frontal Beach and Foreshore Vegetation						
3	Littoral shrubland on foredune of *Scaevola taccada, Guilandina bonduc, Colubrina asiatica, Cordia subcordata.*	7.2.7a	Least Concern	No concern	-	Good with some concern
Intertidal Mangrove Vegetation on intertidal rock platforms						
5A	*Avicennia marina* shrubland to low open forest.	RE7.1.1	Least Concern	No concern	-	Good with some concern
Exposed basalt cliff and headland vegetation						
6A	*Megathyrsus maximus* exotic tussock grassland on exposed rocky basalt slopes.	Non-remnant	-	-	-	Exotic dominated
6B	Grassland herbland of *Sporobolus virginicus* and *Coleus batinoffii* on exposed basalt headland.	7.8.7b	Of Concern	Endangered	-	Exotic dominated

3.2 Flora

3.2.1 Composition of the flora

The field survey of recorded 93 species (Appendix A). In combination with the previous 61 records for the island derived from desktop searches (Queensland Government, 2024), a preliminary island flora of 129 species is documented (Table 4).

There are 105 native species (81%) and 24 naturalised species (19%). The most common of the 56 native families are Leguminosae (11 native species), Moraceae (6 species), and Arecaceae /Lamiaceae/ Poaceae/ Rubiaceae and Vitaceae (4 species). Drift seeds recorded along the shorelines were *Cocos nucifera, Entada phaseoloides, Mucuna gigantea, Barringtonia asiatica, Terminalia catappa, Rhizophora stylosa,* and *Xylocarpus* sp.

Table 4 Summary of flora species - Bimi

Island Area (ha)	No. Species previously recorded	No. Species Dec 2024 Rapid Survey	Total Species for island	Total & % introduced
6.5	58	93	129	25 (19%)

3.2.2 Introduced flora (weeds)

Of the 24 introduced species recorded for Bimi, the more highly invasive species which are currently causing the most impact are aerial yam (*Dioscorea alata*), Guinea grass (*Megathyrsus maximus),* devil's fig *(Solanum torvum),* coral berry *(Rivina humilis),* morning glory *(Ipomoea indica),* coastal morning glory *(Ipomoea cairica)*, and Chinese burr (*Triumfetta rhomboidei)* (Table 4).

With reference to Table 4, there are eight introduced species which are not known to occur on neighbouring Bajigal. These are C*rotalaria pallida, Dioscorea alata, Emilia sonchifolia, Euphorbia hirta, Phyllanthus tenellus, Portulaca oleracea, Salvia plebeia,* and *Sonchus oleraceus.*

The majority of those weeds which are not currently recorded on Bajigal are however more ephemeral herbs with low invasive risk. Exceptions are *Dioscorea alata* and perhaps *Crotalaria pallida*. Previous records of Dioscorea from Bajigal were noted in desktop searches, however the species was not recorded in the April 2024 field survey (Fell *et al.* 2024). The most likely impact of any future Crotalaria infestations would be on the steep basalt headlands and cliffs, the majority of which are currently infested with Guinea grass.

Plate 13: MALSI Ranger Naomi Epong surveying Dioscorea alata impacts on inland margin of littoral rainforest. Image: D. Fell, 2024.

Plate 14: Dense swards of Guinea grass on steep basalt slopes on northeastern side of Bimi. Image: D. Fell, 2024.

Table 4: Summary of introduced flora species – Bimi

Species	Common name	Life Form	Nov 2024	Historic Records	Bajigal	Notes
*Ageratum conyzoides**	Blue top	herb	X		X	
*Chloris gayana**	Rhodes grass	grass	X		X	
Cocos nucifera	Coconut	palm	X	X	X	A couple of scattered juvenile palms to 1 m recorded.
Crotalaria pallida	Rattlepod	herb	X	X		A few plants recorded on sandy edge of eastern basalt headland.
Dioscorea alata	Winged Yam	vine	X	X		Vigorous populations on inland edge of littoral rainforest.
Emilia sonchifolia	Sour thistle	herb	X			Annual herb generally non-invasive.
Euphorbia hirta	Spurge	herb		X		Historic record not observed in Nov 24 survey.
Eleusine indica	Crows foot grass	grass		X	X	Historic record not observed in Nov 24 survey.
Ipomoea indica	Blue Morning Glory	vine	X	X	X	Vigorous populations on inland edge of littoral rainforest and forming vine towers over regrowth trees on western edge of rainforest.
Ipomoea cairica	Coastal Morning Glory	vine	X	X	X	Scattered populations on coastal rocky headlands.
Lantana camara	Lantana	shrub		X	X	Historic record not observed in Nov 24 survey.
Megathyrsus maximus var. maximus	Guinea Grass	grass	X	X	X	Dense infestations on inland edge of littoral rainforest amongst Dioscorea infestations and on basalt slopes and cliffs.
Passiflora foetida	Stinking Passionflower	vine	X		X	Scattered populations on inland edge of littoral rainforest amongst Dioscorea infestations.
Phyllanthus tenellus		herb	X			Annual herb, non-invasive and scattered in groundcover on edge of Guinea dominant grasslands.
Physalis angulata	Cape Gooseberry	herb	X		X	Scattered populations on inland edge of littoral rainforest amongst Dioscorea infestations.
Portulaca oleracea	Pig weed	herb	X	X		Scattered populations on coastal rocky headlands.
Rivina humilis	Coral Berry	herb	X		X	Vigorous populations in rainforest and scattered on coastal rocky headlands.
Salvia plebeia	Salvia	herb		X		Historic record not observed in Nov 24 survey.
Solanum nigrum	Black Nightshade	herb	X		X	Scattered populations on inland edge of littoral rainforest amongst Dioscorea infestations.

Species	Common name	Life Form	Nov 2024	Historic Records	Bajigal	Notes
Solanum torvum	Devils Fig	shrub	X	X	X	Scattered populations on inland edge of littoral rainforest amongst Dioscorea infestations and at base of steep basalt slopes along eastern side of the island.
Sonchus oleraceus	Common sow thistle	herb		X		Historic record not observed in Nov 24 survey.
Synedrella nodiflora	Cinderella Weed	herb	X		X	Limited populations on inland edge of littoral rainforest amongst Dioscorea infestations.
Tridax procumbens	Tridax daisy	herb	X	X	X	Scattered populations on coastal rocky headlands. May also occur on dune deposits above the shoreline.
Triumfetta rhomboidea	Chinese Burr	shrub	X		X	Scattered populations on inland edge of littoral rainforest amongst Dioscorea infestations.

Table 5: Occurrence of weeds on Bajigal and Bimi

Species	Species recorded on Bajigal only	Species recorded on Bimi only
*Carica papaya**	X	
Cenchrus echinatus	X	
Crotalaria pallida		X
Dioscorea alata		X
Emilia sonchifolia		X
Euphorbia hirta		X
Ipomoea purpurea	X	
Passiflora superba	X	
Phyllanthus tenellus		X
Portulaca oleracea		X
Salvia phlebia		X
Sida corrugata	X	
Sonchus oleraceus		X
Sphagneticola trilobata	X	

3.2.3 Flora of biodiversity significance

Two flora species of biodiversity significance were recorded.

3.2.3.1 Arenga Palm (Arenga australasica) - Vulnerable (NC Act)

The Arenga Palm or Bingil Bay palm (*Arenga australasica)* 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 grayish-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.

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. 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.

Healthy populations of Arenga Palm were recorded on Bajigal (Fell *et al*. 2024). The population on Bimi occurs in littoral rainforest on dune deposits and basalt slopes. The rapid nature of the survey precludes an estimate of population size, however mature palms and seedling regeneration were noted. Past cyclone disturbance, burning and weed infestations have no doubt impacted the extent of available habitat and the population size of Arenga on Bimi. Clear evidence of impacts were observed behind the littoral rainforest where the health and vigour of a mature palm was being impacted by the seasonal growth of yam vine.

Figure 4 Winged yam (Dioscorea alata) impacting the Vulnerable listed Arenga palm on margin of littoral rainforest (Image: David Fell, 2024)

3.2.3.2 *Coleus batianoffii*

Coleus batianoffii is a prostrate to semi-erect perennial herb to 30cm in height. It has square stems and opposite, succulent and broadly ovate leaves which are discolorous below and with no obvious scent when crushed. The leaves appear hairy with marginal teeth and with petioles of between 5-18mm in length (Forster, 2008).

It is known to occur from continental islands in the Cape York bioregion namely Lizard, and on Palfrey and Stanley islands (Flinders Group), where it occurs on granite outcrops, pavements and boulder strewn grasslands (Forster, 2008). It has recently been recorded on Bajigal Island (Barnard Group) on a steep basalt headland (Fell *et al.,* 2024).

A large population estimated at 1,000 individuals was recorded during the survey on the eastern exposed basalt headland of Bimi. The habitat is a grassland dominated by saltwater couch (*Sporobolus virginicus*) and co-dominated by Coleus. Associated herbs include *Evolvulus alsinoides, Desmodium* sp., and *Portulaca oleracea*. The habitat also provides nesting for bridled terns and crested terns during November - December period (Aestra, 2025b).

Figure 5 Coleus batianoffii recorded on Bimi

Figure 6 Habitat for Coleus batianoffii on Bimi

4 Discussion

In comparison to neighbouring Bajigal, Bimi is a much smaller island that has undergone dramatic ecosystem transformation as a result of waves of past disturbance which include historic occupation as a bech de mer station, repetitive cyclones and fire. These have resulted in the loss of significant rainforest habitat and the large-scale invasion of Guinea grass and morning glory vine. Guinea grass prevents natural succession back to rainforest and has also converted limited areas of native basalt headland grassland to an exotic dominant grassland. In combination with robust invasion of morning glory and aerial yam over the margins of littoral rainforest, there is considerable pressure on the ecology of Bimi. Aerial yam is a cultural significant species to the Mandubarra people (J. Epong *pers. comm*, November 2024). The impact on the health and function of littoral rainforest and threatened Arenga palms presents a management opportunity that requires balancing the preservation of cultural resource values with maintenance of nature conservation values.

Bimi supports some limited but intact stands of littoral rainforest on sand and more extensive lowland rainforest on basalt, both providing habitat for the vulnerable listed Arenga palm. Additionally, a healthy mangrove ecosystem occurs as a buffer around parts of the shoreline.

The most outstanding natural vegetation feature of Bimi is the presence of a unique grassland community on basalt on the exposed eastern headland. This community is dominated by saltwater couch and features a robust population of the rare herb *Coleus batianoffii*. This population adds to the small population on Bajigal and represents a significant range extension of a plant previously known only from a few continental islands along the east coast of Cape York. Whilst not formally listed as threatened in Qld or by the Commonwealth, it is a rarity and the population on Bimi is at the southern limit in the Wet Tropical bioregion and its distribution (Forster, 2008, Fell *et al.* 2024).

The 129 plant species (56 families) recorded for Bimi compares to the 180 species (72 families) known for Bajigal (Fell *et al.* 2024). Interestingly the naturalised flora of Bajigal has 19 species (11% of the island flora) whereas Bimi's 24 naturalised species represent 19% of its flora.

Given the proximity between Bimi and Bajigal, there is always the potential for introduced flora species to spread between islands and from the mainland. The results of these rapid surveys suggest that there is only a handful of lower risk weeds on Bimi that are not recorded on Bajigal. Nevertheless, to limit the potential for spread between the two islands, it is recommended that hygiene protocols be implemented when transiting from the mainland and between the two islands to ensure that propagules of all weeds are not inadvertently transferred. Hygiene protocols are recommended to include:

- All clothing and equipment are to be inspected for weed seeds, insects, soil or other biosecurity hazards prior to departure from each island.
- Any contaminating material is to be removed with a stiff brush and equipment including shoes are to be cleaned with a bleach spray solution prior to departure. A bleach spray should be available for this purpose.
- Any biosecurity risks identified during field activities are to be discussed during the morning pre-departure briefings.

5 Bibliography

Aestra (2025a), Rapid survey for *Pisonia grandis* - Bajigal and Bimi (Stephens and Sisters islands) (supplementary island threat assessment report), prepared for the Reef Joint Field Management Program on behalf of the Great Barrier Reef Marine Park Authority, Commonwealth of Australia.

Aestra (2025b), *Bridled tern survey report – Bajigal and Bimi* (supplementary island threat assessment), prepared for the Reef Joint Field Management Program on behalf of the Great Barrier Reef Marine Park Authority, Commonwealth of Australia.

Bean AR, 2024 *Census of the Queensland Flora*. Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

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.

Neldner, V.J., Butler, D.W. and G.P. Guymer (2019) *Queensland's regional ecosystems: Building a maintaining a biodiversity inventory, planning framework and information system for Queensland, Version 2.0*, Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

Queensland Government (2024) *WildNet database*, https://www.qld.gov.au/environment/plants-animals/species-information/wildnet.

Queensland Department of Environment, Science and Innovation (2024) *Regional Ecosystem Database*. Accessed online 10 June 2024.

Department of the Environment (2015). *Approved Conservation Advice for the Littoral Rainforest and Coastal Vine Thickets of Eastern Australia ecological community*. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/76-conservation-advice-12112015.pdf. In effect under the EPBC Act from 12-Nov-2015.

Department of Agriculture, Water and the Environment (2021). *Approved Conservation Advice for the Lowland tropical rainforest of the Wet Tropics*. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/170-conservation-advice.pdf. In effect under the EPBC Act from 26-Nov-2021.

Mandubarra Aboriginal Land and Sea Incorporated (MALSI), (2020), *Mandubarra Sea Country Cultural Values 2019:2020 mapping project*. Mandubarra Aboriginal Land and Sea Inc, Queensland.

Attachment A – Field data

Attachment A1 - Flora species

A total of 129 flora species have been recorded for Bimi comprising 105 native species and 24 naturalised species (19%). The most common of the 56 native families are Leguminosae (11 native species), Moraceae (6 species), and Arecaceae/Lamiaceae/Poaceae/Rubiaceae and Vitaceae (4 species). Drift seeds recorded along the shorelines were *Cocos nucifera, Entada phaseoloides, Mucuna gigantea, Barringtonia asiatica, Terminalia catappa, Rhizophora stylosa,* and *Xylocarpus sp.*

#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 name	Common Name	Life Form	Voucher	Weed Status	Cons. Stat	Tropical RF basalt	Littoral rainforest	Dune Shrubland	Mangrove	Grassland on basalt	Phenology Dec 24	Bimi Nov 24	Walker & Olroyd	Qld Herb	Pollock et al
Ferns																
Aspleniaceae	*Asplenium nidus*	Birds nest fern	Fe				O						X	X		
Polypodiaceae	*Platycerium superbum*		Fe				R							X		
Pteridaceae	*Cheilanthes sp.*		Fe								R		X			
Flowering Plants																
Acanthaceae	*Avicennia marina var. australasica*	Grey mangrove	T	BIM						VC		flw	X			
Acanthaceae	*Pseuderanthemum variabile*	Pastel flower	H				R						X			
Amaryllidaceae	*Crinum pedunculatum*	Crinum lily	H						R					X		
Anacardiaceae	*Semecarpus australiensis*	Tar tree	T				R						X			
Annonaceae	*Monoon australe*	Cape canary beech	T				R	O					X			
Apocynaceae	*Hoya australis*	Wax flower	V				R							X		

Family	Species name	Common Name	Life Form	Voucher	Weed Status	Cons. Stat	Tropical RF basalt	Littoral rainforest	Dune Shrubland	Mangrove	Grassland on basalt	Phenology Dec 24	Bimi Nov 24	Walker & Olroyd	Qld Herb	Pollock et al
Apocynaceae	Kopsia arborea	Kopsia	T				R	R								
Apocynaceae	Ochrosia elliptica	Ochrosia	S	BIM				C				ft	X	X		
Araliaceae	*Heptapleurum actinophyllum*	Umbrella tree	T				O						X	X		
Arecaceae	*Archontophoenix alexandrae*	Alexandra palm	P				R	R					X			
Arecaceae	*Arenga australasica* (Vulnerable)	Sugar palm	P			V	O	R					X			
Arecaceae	*Calamus australis*	Wait a while	V				R									
Arecaceae	*Cocos nucifera**	Coconut	P		LI				R				X	X		
Arecaceae	*Ptychosperma elegans*	Elegant palm	P				O						X			
Asteraceae	*Wollastonia biflora*	Beach daisy	H						U				X	X		
Asteraceae	*Ageratum conyzoides**	Billy goat weed	H		HI						R			X		
Asteraceae	*Emilia sonchifolia**		H		LI						U			X		
Asteraceae	*Sonchus oleraceus**	Sow thistle	H		LI						R			X		
Asteraceae	*Synedrella nodiflora**	Cinderella weed	H		LI						C		X			
Asteraceae	*Tridax procumbens**	Tridax daisy	H	BIM	LI						C		X			
Boraginaceae	*Argusia argentea*	Octopus bush	S						R				X			
Boraginaceae	*Cordia subcordata*	Orange trumpet tree	T	BIM					C					X		
Calophyllaceae	*Calophyllum inophyllum*	Beach calophyllum	T						R					X		
Cannabaceae	*Trema orientalis*	Poison peach	T				C						X			
Casuarinaceae	*Casuarina equisetifolia var. incana*	Coastal oak	T						R				X	X		
Celastraceae	*Elaeodendron melanocarpum*	Black olive plum	S				R	R					X			

Family	Species name	Common Name	Life Form	Voucher	Weed Status	Cons. Stat	Tropical RF basalt	Littoral rainforest	Dune Shrubland	Mangrove	Grassland on basalt	Phenology Dec 24	Bimi Nov 24	Walker & Olroyd	Qld Herb	Pollock et al
Combretaceae	*Lumnitzera littoralis*	Red-flowered black mangrove	S							R			X			
Combretaceae	*Terminalia arenicola*	Brown damson	T					VC				juv fruit	X	X		
Combretaceae	*Terminalia catappa*	Beach almond	T					VC	C				X	X		
Commelinaceae	*Commelina ensifolia*	Scurvy weed	H								C	fwr	X	X		
Convolvulaceae	*Evolvulus alsinoides*	Creeping speedwell	H	BIM							R	flw	X			
Convolvulaceae	*Ipomoea cairica**	Coastal morning glory	V		HI		O	O			O		X	X		
Convolvulaceae	*Ipomoea indica**	Morning glory	V		HI		VC	O			VC			X		
Convolvulaceae	*Ipomoea pes-caprae subsp. brasiliensis*	Goats foot convolvulus	V						R				X	X		
Convolvulaceae	*Ipomoea violacea*	Morning glory	V					O	O				X	X	X	X
Cucurbitaceae	*Luffa aegyptiaca*	Sponge gourd	V				O	VC					X		X	X
Cyperaceae	*Cyperus javanicus*	Java sedge	Se								R		X			
Dioscoreaceae	*Dioscorea alata**	Winged Yam	V	BIM	HI			VC					X	X		
Dioscoreaceae	*Dioscorea bulbifera var. bulbifera*	Aerial Yam	V		HI			?							X	X
Drac	*Draceana angustifolia*	Native Draceana	Se				O							X		
Ebenaceae	*Diospyros hebecarpa*	Scrub ebony	T				R									
Ebenaceae	*Diospyros maritima*	Sea ebony	T				R	R						X		
Euphorbiaceae	*Euphorbia hirta**		H		LI						R			X		
Euphorbiaceae	*Macaranga tanarius*	Macaranga	T				C	C					X			
Flagellariaceae	*Flagellaria indica*	Whip vine	V				O									

Family	Species name	Common Name	Life Form	Voucher	Weed Status	Cons. Stat	Tropical RF basalt	Littoral rainforest	Dune Shrubland	Mangrove	Grassland on basalt	Phenology Dec 24	Bimi Nov 24	Walker & Olroyd	Qld Herb	Pollock et al
Goodeniaceae	*Scaevola taccada*	Sea cabbage	S						VC			fruit	X	X		
Hemerocallidaceae	*Dianella caerulea*	Flax lily	H								R			X		
Lamiaceae	*Clerodendrum inerme*	Beach Clerodendrum	S						O				X	X		
Lamiaceae	*Coleus batianoffii*	A native mint	H	BIM							VC	flw	X			
Lamiaceae	*Premna serratifolia*	Coastal Premna	S						C				X			
Lamiaceae	*Salvia plebeia**	Sage	H		LI						R			X		
Lamiaceae	*Vitex trifolia*	Vitex	S	BIM					O				X	X		
Lauraceae	*Cassytha filiformis*	Dodder laurel	V						O			flw	X			
Lauraceae	*Cryptocarya hypospodia*	Northern pepperberry	T				O	R					X			
Leguminosae	*Canavalia rosea*	Beach bean	V						U				X	X		
Leguminosae	*Crotalaria pallida**	Rattlepod	H		LI						R		X	X		
Leguminosae	*Dendrolobium umbellatum var. umbellatum*	Horse bush	S	BIM				R				fruit	X			
Leguminosae	*Desmodium sp.*		H	BIM							R		X			
Leguminosae	*Entada phaseoloides*	Matchbox bean	V				O						X			
Leguminosae	*Erythrina variegata*	Coral tree	T	BIM				O					X	X		
Leguminosae	*Guilandina bonduc*	Nicker nut	S					C	VC			ft	X	X		
Leguminosae	*Millettia pinnata*	Oil tree	T					C				flw	X			
Leguminosae	*Mucuna gigantea*	Burney bean	V				C	O					X			
Leguminosae	*Sophora tomentosa subsp. australis*	Silverbush	S						O			Flw, fruit	X	X		
Leguminosae	*Thespesia populnea*	Pacific rosewood	T					O	U				X	X		

Family	Species name	Common Name	Life Form	Voucher	Weed Status	Cons. Stat	Tropical RF basalt	Littoral rainforest	Dune Shrubland	Mangrove	Grassland on basalt	Phenology Dec 24	Bimi Nov 24	Walker & Olroyd	Qld Herb	Pollock et al
Leguminosae	*Vigna marina*	Beach bean	H	BIM					U				X	X		
Malvaceae	*Abutilon albescens*	Lantern bush	S								R		X			
Malvaceae	*Hibiscus tiliaceus*	Beach hibiscus	T				O	O	VC			ft	X	X		
Meliaceae	*Aglaia elaeagnoidea*	Coastal boodyara	T				C	VC				flw	X			
Meliaceae	*Didymocheton gaudichaudianus*		T				O	U				ft				
Meliaceae	*Melia azedarach*	White cedar	T				O	U					X			
Menispermaceae	*Legnephora moorei*	Round-leaf vine	V	SI30			R						X			
Menispermaceae	*Tinospora smilacina*	Snake vine	V				U	U					X			
Moraceae	*Ficus drupacea*	Red fig	T				R									
Moraceae	*Ficus hispida var. hispida*	Hairy fig	S				O					fruit				
Moraceae	*Ficus opposita*	Sandpaper fig	S				R							X		
Moraceae	*Ficus rubiginosa*	Small-fruited fig	T				C				C		X			
Moraceae	*Ficus virens*	White fig	T				O									
Moraceae	*Maclura cochinchinensis*	Cockspur	S				O						X			
Myristicaceae	*Eucalyptus sp.*		T											X		
Myristicaceae	*Myristica globosa subsp. muelleri*	Nutmeg	T				VC	VC				ft	X			
Myrsinaceae	*Aegiceras corniculatum*	River mangrove	S							O						
Nyctaginaceae	*Boerhavia sp.*		H								R			X		
Nyctaginaceae	*Pisonia aculeata*		V				R							X		
Nyctaginaceae	*Plumbago zeylanica*		H								R			X		

Family	Species name	Common Name	Life Form	Voucher	Weed Status	Cons. Stat	Tropical RF basalt	Littoral rainforest	Dune Shrubland	Mangrove	Grassland on basalt	Phenology Dec 24	Bimi Nov 24	Walker & Olroyd	Qld Herb	Pollock et al
Olacaceae	*Ximenia americana*	Sea lemon	S						R				X			
Oleaceae	*Chionanthus ramiflorus*	Northern olive	T				C	C					X			
Oleaceae	*Jasminum elongatum*		V				O	O					X			
Oleaceae	*Jasminum simplicifolium subsp. australiense*	Stiff native jasmine	V				O	R					X			
Pandanaceae	*Pandanus tectorius*	Screw pine	Pa					O	O			ft	X	X		
Passifloraceae	*Passiflora foetida**	Stinking passion flower	V		LI				U		C		X	X		
Petiveriaceae	*Rivina humilis**	Coral berry	H		HI		VC	VC	O		C	flw	X			
Phyllanthaceae	*Phyllanthus tenellus**		H		LI						R		X			
Poaceae	*Chloris gayana**	Rhodes grass	G		LI						R					
Poaceae	*Eleusine indica**	Crows foot grass	G		HI						U			X		
Poaceae	*Imperata cylindrica*	Blady grass	G								R			X		
Poaceae	*Lepturus repens*	Pacific needle grass	G								O	seed	X	X		
Poaceae	*Megathyrsus maximus**	Guinea grass	G	BIM	HI		O	U			VC	flw	X			
Poaceae	*Sporobolus virginicus*	Salt water couch	G								VC		X	X		
Poaceae	*Thuarea involuta*		G								R			X		
Portulacaceae	*Portulaca australis*	Pig weed	H								U	flw	X	X		
Portulacaceae	*Portulaca oleracea**	Pig weed	H	BIM	LI						C	flw	X	X		
Portulacaceae	*Sesuvium portulacastrum*	Sea purslane	H						O		O	flw	X	X		
Putranjivaceae	*Drypetes deplanchei*	Yellow boxwood	T				O	O					X			

Family	Species name	Common Name	Life Form	Voucher	Weed Status	Cons. Stat	Tropical RF basalt	Littoral rainforest	Dune Shrubland	Mangrove	Grassland on basalt	Phenology Dec 24	Bimi Nov 24	Walker & Olroyd	Qld Herb	Pollock et al
Rhamnaceae	*Colubrina asiatica*	Shampoo bush	S	BIM					C			ft	X	X		
Rhizophoraceae	*Bruguiera gymnorhiza*		T	BIM						R			X			
Rhizophoraceae	*Rhizophora stylosa*	Stilt-rooted mangrove	T							U		flw	X			
Rubiaceae	*Aidia racemosa*	Archer cherry	T				O	O					X			
Rubiaceae	*Guettarda speciosa*	Beach gardenia	T	BIM					O			flw	X	X		
Rubiaceae	*Ixora timorensis*	Native ixora	S				O	O					X			
Rubiaceae	*Morinda citrifolia*	Noni	S				O	O	O			ft	X	X	X	X
Rutaceae	*Glycosmis trifoliata*	Glycosmis	S	BIM			O	C				flw	X			
Rutaceae	*Micromelum minutum*	Lime berry	T				C	C					X			
Sapindaceae	*Ganophyllum falcatum*	Scaly ash	T				O	O					X			
Sapotaceae	*Planchonella obovata*	Northern yellow boxwood	T				O	VC	O				X			
Solanaceae	*Physalis angulata**	Chinese gooseberry	H		LI						O	fruit	X			
Solanaceae	*Solanum nigrum**	Black nightshade	H		LI		O				O	ft	X			
Solanaceae	*Solanum torvum**	Devil's fig	S	BIM	HI		R				R		X	X		
Sparrmanniaceae	*Triumfetta rhomboidea**	Chinese burr	H		LI						VC	ft	X			
Sterculiaceae	*Heritiera littoralis*	Looking glass mangrove	T							R			X			
Urticaceae	*Pouzolzia zeylanica*	Graceful Pouzolzia bush	H	BIM							C		X			
Verbenaceae	*Lantana camara**	Lantana	S		HI		?				R			X		

Family	Species name	Common Name	Life Form	Voucher	Weed Status	Cons. Stat	Tropical RF basalt	Littoral rainforest	Dune Shrubland	Mangrove	Grassland on basalt	Phenology Dec 24	Bimi Nov 24	Walker & Olroyd	Qld Herb	Pollock et al
Vitaceae	*Causonis clematidea*	Bush killer	V					U					X		X	X
Vitaceae	*Causonis maritima*		V					U					X			
Vitaceae	*Cissus hastata*		V				C	O			C	flw				
Vitaceae	*Tetrastigma nitens*	Three-leaf water vine	V				C	C								

Attachment A2 - Summary Vegetation Site Data - November 2024 survey

Table 6 Vegetation site summary data

Site #	Site Type	Lat	Long	Vegetation Summary	Note
BIM Q13	Quaternary	-		Littoral rainforest on sand with *Terminalia arenicola, T. catappa, Erythrina variegata* and *Aglaia elaeagnoidea.*	Northern side of island.
BIMQ14	Quaternary			Low closed mangrove forest 3-5 m dominated by *Avicennia marina* var. *australasica*.	Eastern low headland.
BIMQ15	Quaternary			Low dwarf shrubland /grassland with low windswept shrubs of *Vitex trifolia* and herbs of *Evolvulus alsinoides* and *Desmodium* sp. with infestations of Guinea grass on wind protected margins.	Basalt headland.
BIMQ17	Quaternary			Closed littoral rainforest with *Terminalia arenicola, Erythrina variegata, Pongamia pinnata* on sand with understorey of *Glycosmis trifolia, Aglaia elaeagnoidea* and *Micromelum minutum*.	North side behind landing area.
BIMQ18	Quaternary			Native remnant grassland herbland of *Sporobolus virginicus* and *Coleus batianoffii* with *Pouzolzia zeylanica.* Additional species are *Commelina ensifolia, Ipomoea pes capre* subsp*. brasiliensis,* and *Lepturus repens.*	Guinea grass infestations on western margin in 10x10 area. No Themeda observed.
BIMQ19	Quaternary			Closed forest rainforest to 12 m on narrow basalt plateau. Dominant trees are *Terminalia arenicola, Myristica globosa var. muelleri, Schefflera actinophylla, Aglaia elaeagnoidea* and *Planchonella obovata.*	Basalt ridge line and upper slope.

Attachment A3 - Voucher specimens - November 2024 survey

Table 7 Flora voucher specimens

Collection no.	Collecting date	Family	Genus	Species	Subspecies	Variety
DGF BIM1	28/11/2024	Boraginaceae	*Cordia*	*subcordata*		
DGF BIM2	28/11/2024	Acanthaceae	*Avicennia*	*marina*		*australasica*
DGF BIM3	28/11/2024	Apocynaceae	*Ochrosia*	*elliptica*		
DGF BIM4	28/11/2024	Lamiaceae	*Vitex*	*trifolia*		
DGF BIM5	28/11/2024	Solanaceae	*Solanum*	*nigrum*		
DGF BIM6	28/11/2024	Solanaceae	*Solanum*	*torvum*		
DGF BIM7	28/11/2024	Malvaceae	*Abutilon*	*albescens*		
DGF BIM8	28/11/2024	Petiveriaceae	*Rivina*	*humilis*		
DGF BIM9	28/11/2024	Poaceae	*Megathyrsus*	*maximus*		*maximus*
DGF BIM10	28/11/2024	Malvaceae	*Triumfetta*	*rhomboidea*		
DGF BIM11	28/11/2024	Convolvulaceae	*Ipomoea*	*indica*		
DGF BIM12	28/11/2024	Leguminosae	*Desmodium*			
DGF BIM13	28/11/2024	Convolvulaceae	*Evolvulus*	*alsinoides*		
DGF BIM14	28/11/2024	Dioscoreaceae	*Dioscorea*	*alata*		
DGF BIM15	28/11/2024	Lythraceae	*Pemphis*	*acidula*		
DGF BIM16	28/11/2024	Leguminosae	*Vigna*	*marina*		
DGF BIM17	28/11/2024	Lamiaceae	*Coleus*	*batianoffii*		
DGF BIM18	28/11/2024	Urticaceae	*Pouzolzia*	*zeylanica*		
DGF BIM19	28/11/2024	Rubiaceae	*Guettarda*	*speciosa*		
DGF BIM20	28/11/2024	Asteraceae	*Tridax*	*procumbens*		
DGF BIM21	28/11/2024	Portulacaceae	*Portulaca*	*oleracea*		
DGF BIM22	28/11/2024	Rhizophoraceae	*Bruguiera*	*gymnorhiza*		
DGF BIM23	28/11/2024	Rhamnaceae	*Colubrina*	*asiatica*		
DGF BIM24	28/11/2024					

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