Torres Strait Island Biosecurity Action Plans

2018-2023

Torres Strait Island Regional Council

Torres Shire Council

NPARC Northern Peninsula Area Regional Council

Australian Government

Torres Strait Regional Authority

TSRA

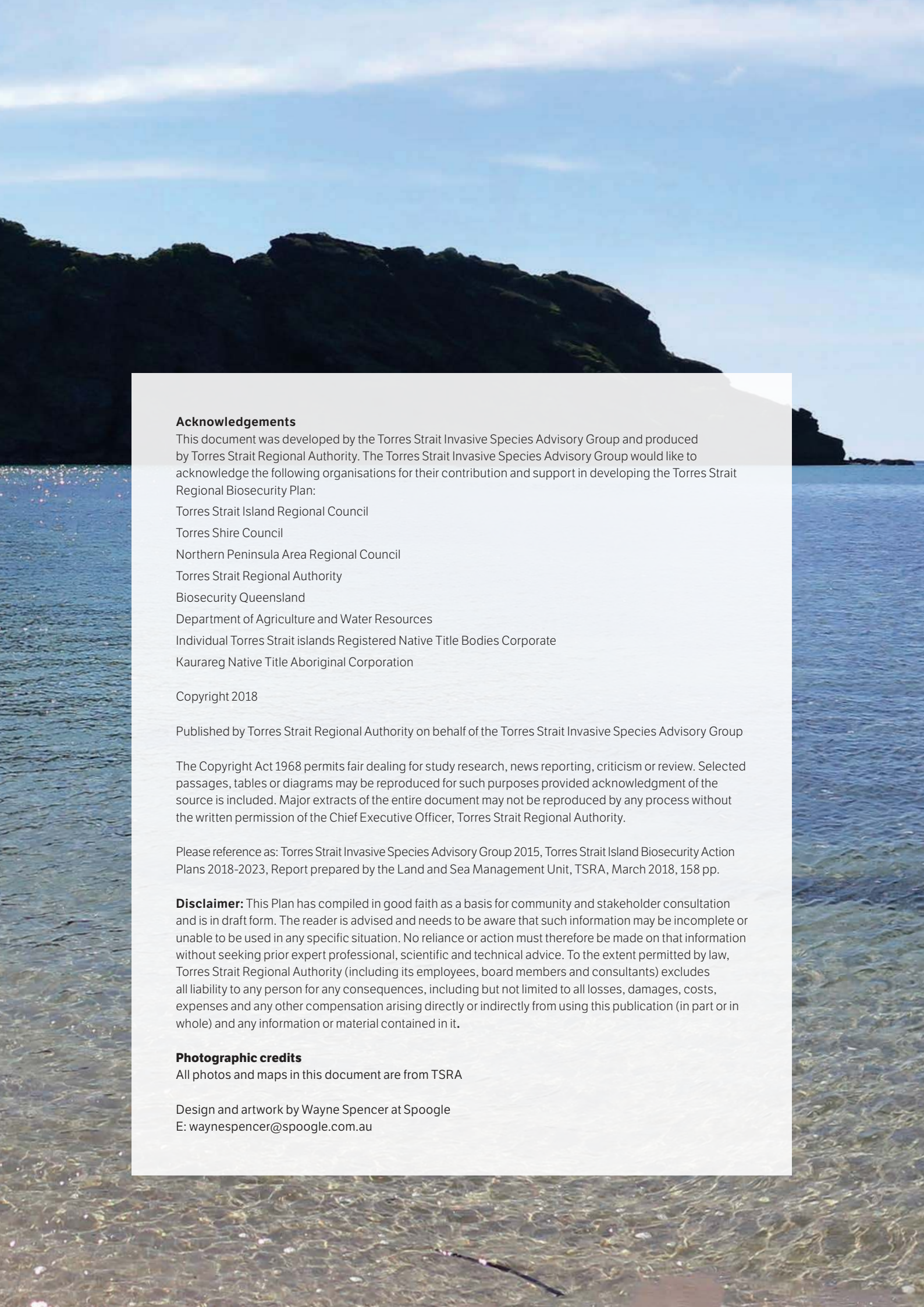
www.tsra.gov.au

Biosecurity Queensland

Queensland Government

Australian Government

Department of Agriculture and Water Resources



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Torres Strait Island Regional Council

Torres Shire Council

Northern Peninsula Area Regional Council

Torres Strait Regional Authority

Biosecurity Queensland

Department of Agriculture and Water Resources

Individual Torres Strait islands Registered Native Title Bodies Corporate

Kaurareg Native Title Aboriginal Corporation

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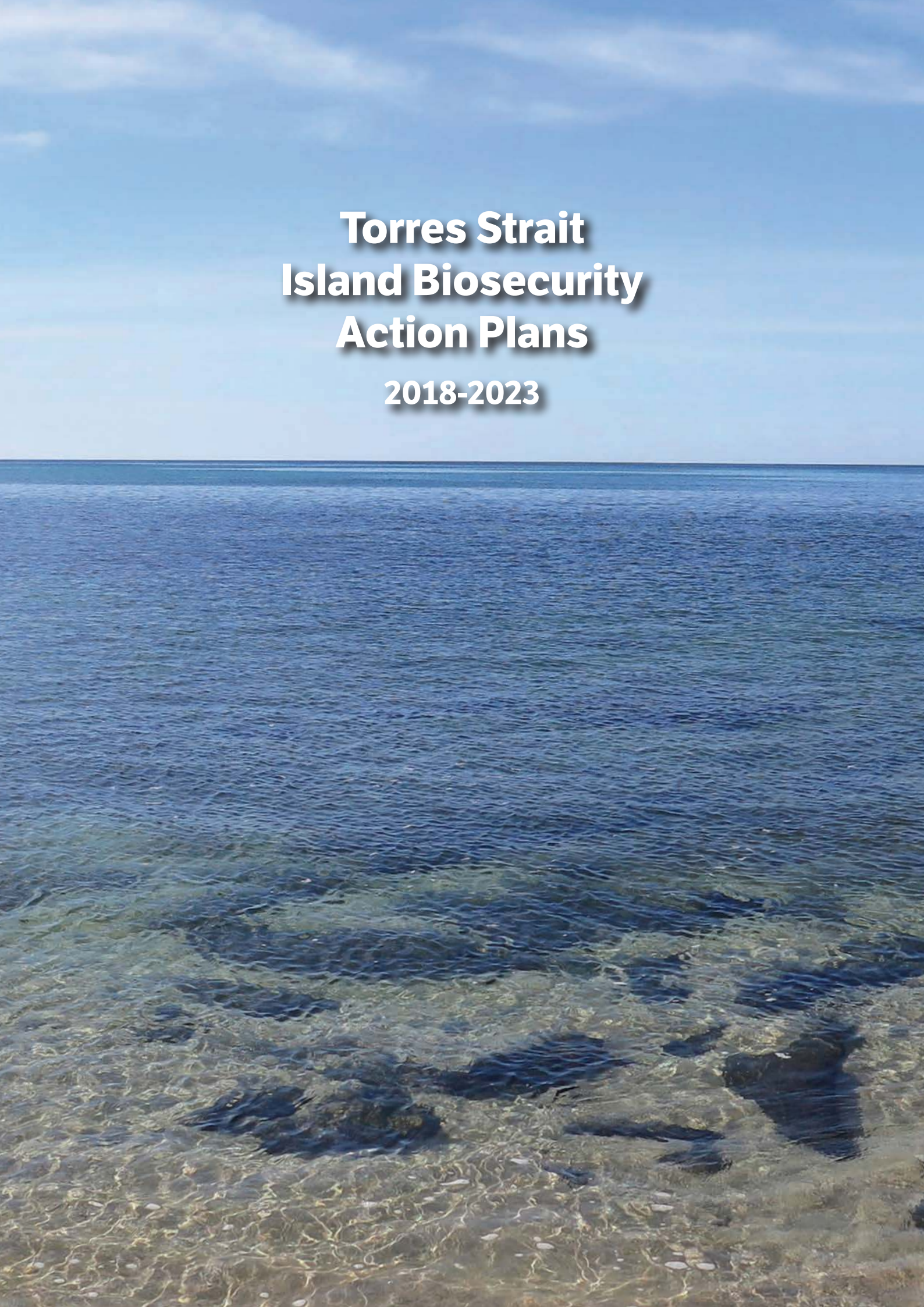

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2018-2023

Contents

Table of Acronyms

ACDC	Agricultural Chemical Distribution Control Training
BQ	Biosecurity Queensland
COs	Compliance Officers
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAF	Department of Agriculture and Fisheries
DAWR	Department of Agriculture and Water Resources
EHWs	Environmental Health Workers
GBK	Gur A Baradharaw Kod
GBO	General Biosecurity Obligation
LGA	Local Government Association
LSMU	Land and Sea Management Unit
NAQS	Northern Australia Quarantine Strategy
NPARC	Northern Peninsula Area Regional Council
PNG	Papua New Guinea
RI	Research Institutions
RNTBCs	Registered Native Title Bodies Corporate
TEK	Traditional Ecological Knowledge
TS&NPA BWG	Torres Strait and Northern Peninsula Area Biosecurity Working Group
TSC	Torres Shire Council
TSIRC	Torres Strait Island Regional Council
TSISAG	Torres Strait Invasive Species Advisory Group
TSRA	Torres Strait Regional Authority
WoNS	Weeds of National Significance

Foreword

The Torres Strait Island Biosecurity Action Plans (IBAPs), below, are designed to support the *Torres Strait Regional Biosecurity Plan 2018-2023* (the Plan) developed by the Torres Strait Regional Authority (TSRA), Torres Shire Council (TSC), Torres Strait Island Regional Council (TSIRC), the Northern Peninsula Area Regional Council (NPARC) and the Torres Strait Invasive Species Advisory Group (TSISAG) in consultation with Torres Strait Islands and NPARC communities and Registered Native Title Bodies Corporate (RNTBCs). These IBAPs, along with the Plan, will serve both TSC and TSIRC as their Local Government Area (LGA) Biosecurity Management Plans.

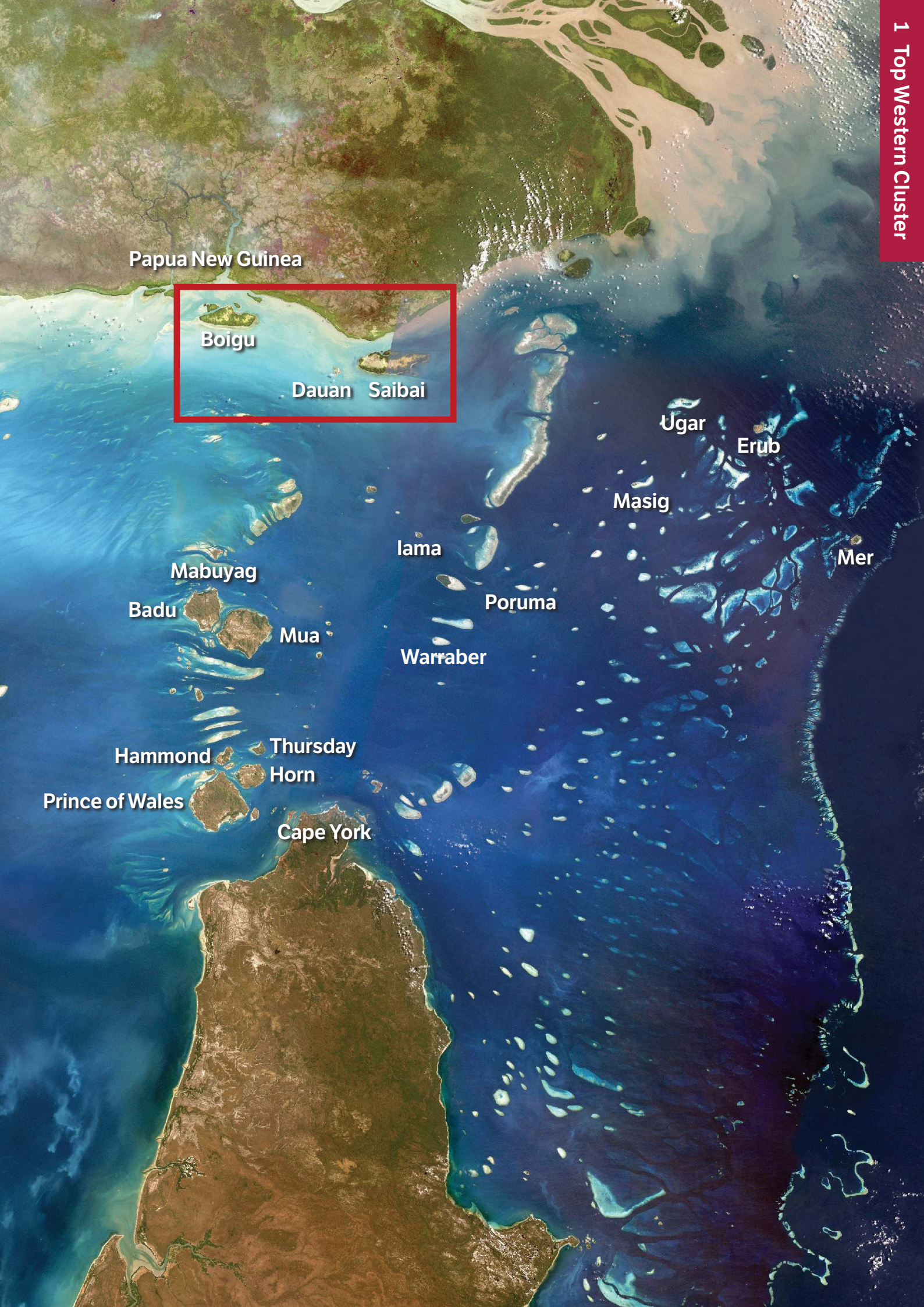
The *Torres Strait Regional Biosecurity Plan 2018-2023* has been developed to address the threat of either existing or new introductions of plant and animal pest species and diseases. The aim of both the *Torres Strait Regional Biosecurity Plan 2018-2023* and the Island Biosecurity Action Plans is to empower Torres Strait Islands communities to recognise and minimise the impacts of exotic weeds, pest animals and diseases of plants and animals.

The individual IBAPs for each island provide a geographic, demographic and environmental overview of that island, including a description of the current proportion, distribution and impact of introduced flora and fauna and the potential impact of the introduction or spread of further non-native species. Each IBAP has been written as a stand alone document for use by the relevant agency staff for each island. Each IBAP also includes links to fact sheets on non-native species currently present on the island to assist in education and awareness and support identification and management.

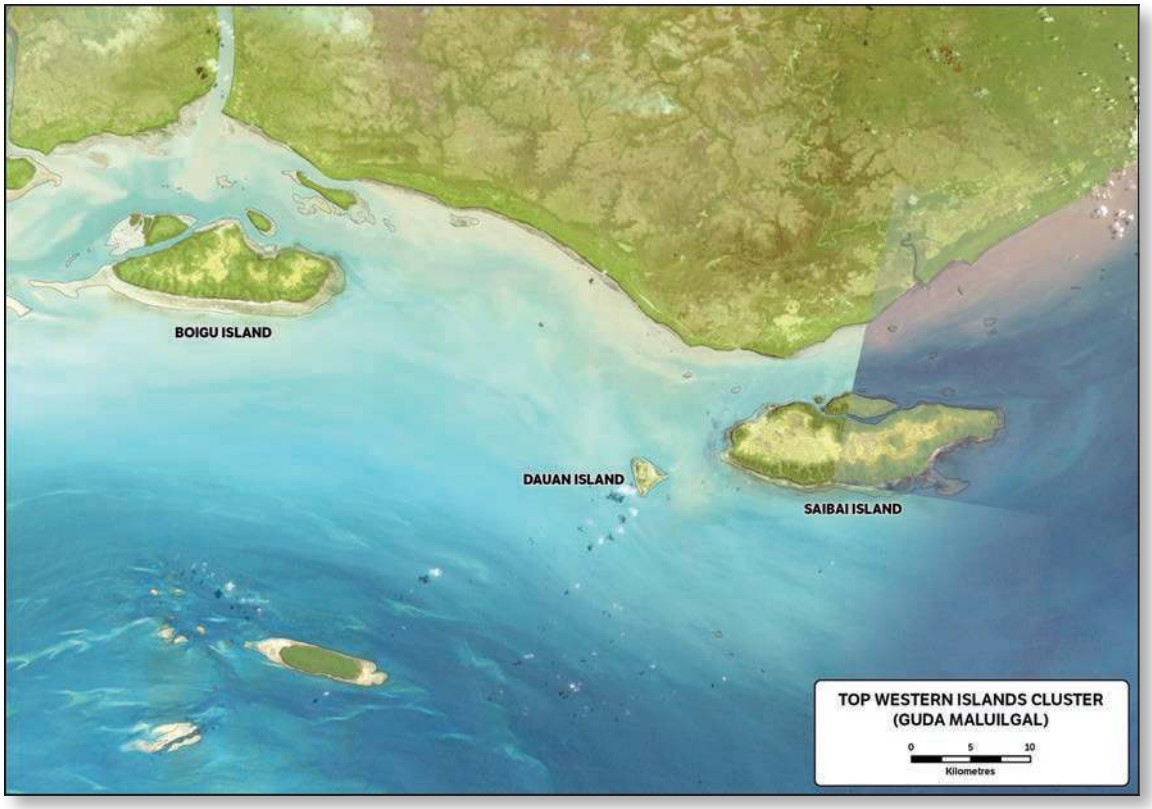
The IBAPs also identify the intended outcomes and the biosecurity management priorities for each island, including general actions together with specific actions to manage weeds, pest animals and plant and animal diseases. The IBAPs provide guidance for actions over the life of the *Torres Strait Regional Biosecurity Plan 2018-2023* to guide pest management operations and ensure the intended outcomes are delivered. Each Island Biosecurity Action Plan specifies action items for each area of interest, identifies who needs to be involved and provides KPIs and details of how KPIs are to be measured, as well as indicative timeframes for action.

It is important to note that the information presented in these IBAPS including maps will need to be regularly updated and this is scheduled for annual review by delegate/s of TSISAG. These IBAPs will be printed so that the local councils and relevant agencies can have hard copies in their offices, but will also be available as an online resource that can be updated with more accurate information as it becomes available and should any new pests and/or diseases appear on any of the islands. It is intended each Local Council will have a copy of the IBAPs relevant to their Local Government Area.

These Island Biosecurity Action Plans have been developed, and will be implemented, in close collaboration and consultation with Traditional Owners and RNTBCs as well as local and state government agencies. This partnership approach recognises that empowering and involving the Torres Strait Islands communities is an essential step to managing the biosecurity threat from pest species and diseases while respecting *Ailan Kastom*, Aboriginal lore and native title rights and interests.


Papua New Guinea
Boigu
Dauan
Saibai
Ugar
Erub
Masig
Iama
Mer
Mabuyag
Badu
Mua
Poruma
Warraber
Hammond
Thursday
Horn
Prince of Wales
Cape York

1 Top Western Islands Cluster



1.1 Boigu

Overview

Boigu Island, Australia's northernmost point, is located in the Top Western Cluster in the Torres Strait, approximately 185 km north of Horn Island and 7 km south of Papua New Guinea (PNG). Boigu is an extremely flat mud island formed predominantly from recent estuarine sedimentary deposits, with large interior swamps filled with brackish water. At approximately 17 km long by 6 km wide, with an approximate area of 6630 ha, it is one of the largest islands in the Torres Strait.

Boigu village is located on the northern shoreline of the island and covers an area of approximately 800 m by 400 m. The terrain of the village is flat and is elevated about 2-3 m above mean sea level with ground level tending to fall away gradually towards the interior swamps. The village is susceptible to king tide-induced seawater inundation. The population of Boigu is 207 (ABS Census 2011).

The Traditional Owners of Boigu are represented by the Malu Ki'ai (TSI) Corporation Registered Native Title Prescribed Body Corporate (RNTBC). The Malu Ki'ai (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land-management activities.

Stanton et al. (2009) report that Boigu's remnant habitats are generally in natural condition with estuarine wetland complexes and mosaics, mangrove forest, woodland and shrubland complexes making up 93 per cent of the island's area. The relatively low number of introduced weed species are predominantly confined to regrowth and cleared areas around the village, which make up 0.5 per cent of the island's area.

Biosecurity Issues

Weeds

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Boigu Island' (3D Environmental, January 2013) identifies 65 non-native species. Field surveys conducted by 3D Environmental, coupled with review of flora species data, indicate that the remnant vegetation is generally free of introduced weeds. As with the majority of the inhabited islands in the Torres Strait, the developed town area and disturbed margins support high numbers of weeds.

The five species identified in **Table A1** are recognised in the *Biosecurity Act 2014* as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Shire Council and landholders

to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are likely to impact on Boigu Island's environmental and cultural assets and values.

Weed Mapping Boigu

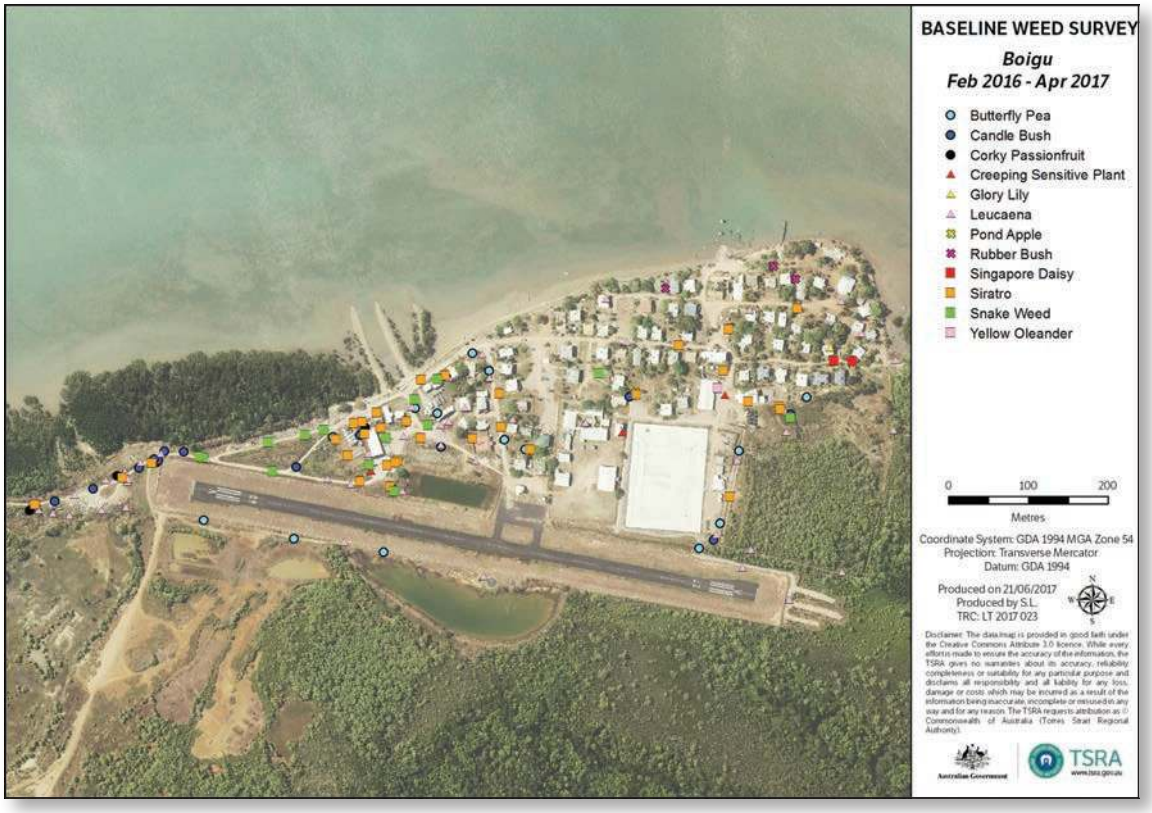


Table A1 identifies each weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table A1: Boigu Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Bellyache bush	*Jatropha gossypiifolia*	Previously recorded in the community and its current presence needs to be verified	High	Bellyache bush
Lantana	*Lantana camara*	In the community	Very high	Lantana
Pond apple	*Annona glabra*	One fruiting plant recorded in the community	Very high	Pond apple
Purple rubber vine	*Cryptostegia madagascariensis*	Recorded near the community	Very high	Purple rubber vine
Yellow bells	*Tecoma stans*	In house gardens throughout the community	High outside of house gardens	Yellow bells

*****Fact sheet Fact sheet hyperlinks are only available on the electronic version of this document

The plants listed in **Table A2** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and Northern Australia Quarantine Strategy (NAQS) as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table A2: Boigu Priority Environmental Weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Brazilian joyweed	*Alternanthera brasiliana*	In the community	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Candle bush	*Senna alata*	In the community	Moderate	Candle bush
Cupid's flower	*Ipomoea quamoclit*	In the community	Moderate	Cupid's flower
Guinea grass	*Megathyrsus maximus*	In the community	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Hyptis	*Hyptis suaveolens*	In the community	Moderate	Hyptis
Leucaena	*Leucaena leucocephala*	In the community and disturbed areas	High	Leucaena
Porcupine flower	*Barleria prionitis*	In the community and has spread to the edges of the community	Moderate	Porcupine flower
Sensitive plant	*Mimosa pudica*	In the community and adjoining disturbed areas	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In the community and on the margins of tracks and roads	Moderate	Siratro
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed

*****Fact sheet Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

A number of introduced fauna species are known to occur on Boigu. **Table 3** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table A3: Boigu Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Cane toad	*Rhinella marina*	Boigu community	Very High	Cane toad
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Wild dog	*Canis familiaris*	Throughout the island	High	Wild dog
Rusa deer	*Cervus timorensis*	Throughout the island	Moderate	Rusa deer
Climbing perch	*Anabas testudineus*	In the swamps	Low	Climbing perch

*****Fact sheet hyperlinks are only available on the electronic version of this document*

A cane toad was discovered and killed on Boigu in May 2017. Cane toads are one of the most significant threats to native fauna if they become established. They would have significant detrimental impacts on the wetland environments and varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Every effort should be made to respond swiftly to any cane toad sightings on Boigu and to find and remove any individual specimens.

Wild dogs may be a significant risk for a number of native species. Dogs are a threat to ground-nesting birds such as beach stone-curlew.

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

While deer are considered an important food source for the community, limited hunting has the potential to result in a significant increase in numbers. The proliferation of Rusa deer presents a major threat to habitat

integrity, especially for deciduous/semi-deciduous vine forest and Pandanus-dominant woodlands and grasslands, significantly increasing the potential for introduction of exotic plant species. An increasing deer population will also promote degradation of overall habitat stability as grazing reduces the effectiveness of fire as a tool to prevent shrubby invasion of grassland. Deer are also known to damage flora by antler rubbing and to degrade water quality and wetland habitat by wallowing (Biosecurity Queensland 2010).

Climbing perch were first reported on Boigu in 2006 and subsequent surveys in 2010, 2014 and 2015 confirmed their presence in hyper-saline conditions in some of the swamp areas on Boigu. Their range and numbers have not expanded since the initial 2010 survey.

Climbing perch were originally found only in the freshwater areas of South-east Asia. However, humans have moved this fish species into new countries, which has resulted in this species becoming a pest, causing changes to native fish and bird communities. It is suspected they were either moved to Boigu by people or, given PNG is only 7 km from Boigu, were carried out in flood waters from PNG rivers during the wet season. To date, researchers have not found a practical management approach to eradicate this species without affecting native fish species.

The most significant potential threats to native fauna on Boigu are the introduction of the exotic cane toad and rats (*Rattus spp.*). Rats are a major threat given their agility and generalist diet. Should exotic rats be present, an extermination or control project is recommended.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements and domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Boigu. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Boigu Island Biosecurity Action Plan is intended to have a positive impact on Boigu's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and disease occurrences and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Boigu.
- Increase Boigu community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest- and disease-management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest and disease management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Boigu Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.
3. All plant and equipment to be inspected, and cleaned if required, prior to entering and before leaving Boigu.
4. Investigate funding opportunities for the construction of a wash-down facility near barge landing.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor project sites for new weed incursions.
4. TSRA rangers and TSIRC staff to manage weeds in priority areas.
5. Prevent spread of weeds to or from Boigu.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to monitor feral animal populations, particularly Rusa deer, and determine if targeted control programs are required. Ongoing surveys for detection of cane toads are required following a 2017 sighting of toads on Boigu.
2. Determine the need for the development of a Boigu Rusa deer management strategy to guide the management of the deer population.
3. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
4. TSRA rangers to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.
5. Develop an education program to raise community awareness of pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and, if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats of concern (present and potential) to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases, including potential new arrivals, and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Boigu provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique Ailan Kastom and by preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time, resourcing and stakeholder involvement for actions will be determined through a negotiated process and on an action-by-action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to the community and to funding providers.

Table A4: Boigu Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Boigu Island Biosecurity Action Plan.	Boigu Island Biosecurity Action Plan is developed by mid-2018.	Plan developed.	TSRA LSMU, Malu Ki'ai TSRA rangers, Malu Ki'ai (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Boigu Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Malu Ki'ai TSRA rangers, Malu Ki'ai (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
	All plant and equipment to be inspected and cleaned if required prior to entering, and before leaving Boigu.	New weed and pest animal incursions prevented from entering and/or leaving Boigu.	No new weed or pest animals on Boigu.	Malu Ki'ai TSRA rangers, Biosecurity Officer	Ongoing
	Investigate funding opportunities for the construction of a wash-down facility in the industrial area.	Wash-down facility constructed.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA, TSIRC	2018
Weeds	Train TSRA rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff trained in weed identification and weed control techniques from 2018.	TSRA rangers, TSIRC staff trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/ participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers, TSIRC staff to monitor project sites for new weed incursions.	Sea wall site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers and TSIRC staff to manage weeds in priority areas.	On-grounds works undertaken at least 10 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/ participants	As required
	Prevent spread of weeds to or from Boigu.	No weeds detected on transport coming and leaving the island.	Number of pest plant control measures implemented.	TSRA rangers, TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed fact sheets developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to monitor feral animal populations, particularly Rusa deer, and determine if targeted control programs are required.	Feral animal surveys are undertaken to determine populations. Ongoing surveys for detection of cane toads are required following a 2017 sighting of toads on Boigu.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers	As required
	Determine the need for the development of a Boigu Rusa deer management strategy to guide the management of the deer population.	Need for the development of a Boigu Rusa deer management strategy determined. Strategy developed if required.	Number of plans developed.	TSRA, TSIRC	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff trained in pest animal monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff	As required
	TSRA rangers to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers and TSIRC staff trained. Number of days involved in training.	TSRA rangers, TSIRC, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required

1.2 Dauan

Overview

Dauan is in the Top Western Islands Cluster of the Torres Strait. It is approximately 180 km north-east of Thursday Island and 10 km south of Papua New Guinea (PNG). The island is approximately 3 km long by 3 km wide with the village located along a narrow coastal strip on the northern shoreline of the island, backed by steep hills. The population of Dauan is 163 (ABS Census 2011).

Dauan is a granite island that rises sharply on all sides to Mt Cornwallis, a peak reaching approximately

295 m above sea level. After Mabaduan in PNG, Mt Cornwallis is the northernmost mountain of Australia's Great Dividing Range, which, in the Torres Strait, became a chain of islands that once extended as a land-bridge to New Guinea. Rocky outcrops occur throughout the elevated vine forests and along the shoreline, with the most noticeable outcrop in the village near the barge ramp. Sandy beaches are also scattered along the coastline.

The Traditional Owners of Dauan are represented by Dauanalgaw (TSI) Corporation RNTBC. The Dauanalgaw (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land-management activities.

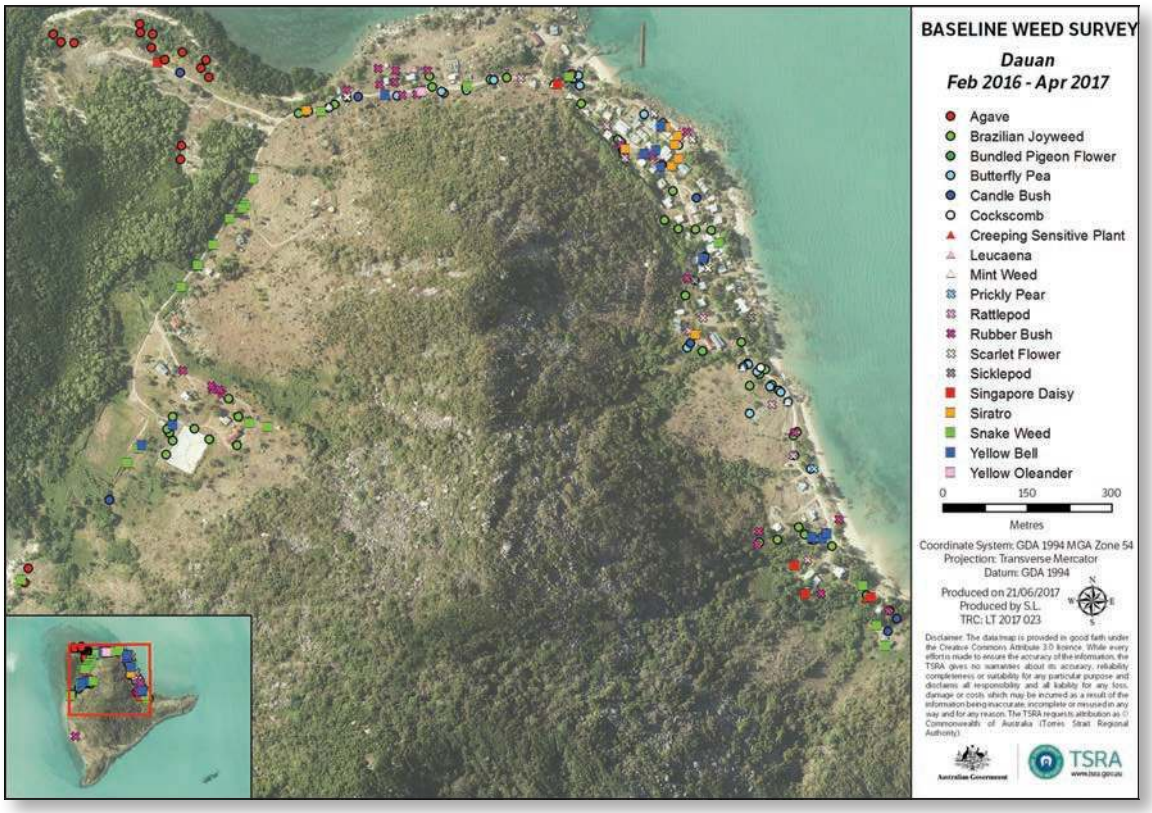
3D Environmental (January 2013) reports Dauan's remnant habitats are generally in natural condition with vine forest and vine thicket, grasslands, mangrove forest, woodland and shrubland complexes making up 83 per cent of the island's area. The relatively low number of introduced weed species are predominantly confined to regrowth and cleared areas around the village and a cleared area on the top of Mt Cornwallis, which make up nine per cent of the island's area.

Biosecurity Issues

Weeds

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Dauan Island' (3D Environmental, January 2013) identifies 402 plant species, with 85 species not native to Dauan. Field surveys conducted by 3D Environmental, coupled with review of flora species data, indicate that the remnant vegetation is generally free of introduced weeds. As with the majority of the inhabited islands in the Torres Strait, the developed town area and disturbed margins support high numbers of weeds.

Weed Mapping Dauan



Four species are recognised in the *Biosecurity Act 2014* as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Dauan's environmental and cultural assets and values.

Table A5 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table A5: Dauan Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Prickly pear	*Opuntia stricta*	In and around the community in disturbed areas	Very high	Prickly pear
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community	High outside of house gardens	Yellow bells
Yellow oleander	*Cascabela thevetia*	In and around the community and in disturbed vegetation fringing village areas	High outside of house gardens	Yellow oleander

***** *Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table A6** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and are able to invade reasonably intact ecosystems.

Table A6: Dauan Priority Environmental Weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Occurs along tracks	High	Annual mission grass
Brazilian joyweed	*Alternanthera brasiliana*	In and around the community	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Candle bush	*Senna alata*	In the community	Moderate	Candle bush
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks towards the dump and around the dump area	Moderate	Guinea grass
Grader grass	*Themeda quadrivalvis*	On the margins of the village and access tracks towards the dump and around the dump area	High	Grader grass
Hyptis	*Hyptis suaveolens*	In the community	Moderate	Hyptis
Calopo	*Calopogonium mucunoides*	In the community	Moderate	Calopo
Leucaena	*Leucaena leucocephala*	In the community and disturbed areas	High	Leucaena
Mother in law's tongue	*Sanseviera trifasciata*	In the community	Moderate	Mother in law's tongue
Round leaf cassia	*Chamaecrista rotundifolia*	In the community	Moderate	Round leaf cassia
Rubber bush	*Calotropis gigantea*	On roadsides on the edge of the village	Moderate	Rubber bush
Rubber tree	*Manihot carthaginensis*	In the community	Moderate	Rubber tree
Scarlet flower	*Ipomoea hederifolia*	In the community	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community and adjoining disturbed areas	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In the community and on the margins of tracks and roads.	Moderate	Siratro
Sisal	*Agave spp.*	On the margins of disturbed littoral dune vine thickets near the dump site and in native grasslands	Moderate	Sisal
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed

*****Fact sheet hyperlinks are only available on the electronic version of this document

Pest Animals

One introduced fauna species is known to occur on Dauan. **Table 7** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table A7: Dauan Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Feral cat	*Felis catus*	Throughout the island	High	Feral cat

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

The most significant potential threats to native fauna on Dauan Island are the possible introduction of the exotic cane toad or rats (*Rattus spp.*). Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Rats are an even greater potential threat given their agility and generalist diet. Should exotic rats be present, an extermination or control project is recommended.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements and domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Dauan. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Dauan Island Biosecurity Action Plan is intended to have a positive impact on Dauan's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Dauan.
- Increase TSIRC staff and Dauan community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment and compliance to weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Dauan Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.
3. All plant and equipment to be inspected, and cleaned if required, prior to entering and before leaving Dauan.
4. Investigate funding opportunities for the construction of a wash-down facility near barge landing.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor project sites for new weed incursions.
4. TSRA rangers and TSIRC staff to manage weeds in priority areas.
5. Investigate options for revegetating weed management project sites.
6. Prevent spread of weeds to or from Dauan.
7. Develop fact sheets for each priority weed.
8. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and, if required, implement management actions.
2. Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases, including potential new arrivals, and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Dauan provides guidance for actions over the life of the Regional Biosecurity Management Plan 2018-2023 to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique Ailan Kastom and preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of the TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table A8: Dauan Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Dauan Island Biosecurity Action Plan.	Dauan Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Simakal TSRA rangers, Dauanalgaw (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Dauan biosecurity management plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Simakal TSRA rangers, Dauanalgaw (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
	All plant and equipment to be inspected and cleaned if required prior to entering, and before leaving Dauan.	New weed and pest animal incursions prevented from entering and/or leaving Dauan.	No new weed or pest animals on Dauan.	Simakal TSRA rangers, Biosecurity Officer	Ongoing
	Investigate funding opportunities for the construction of a wash-down facility near barge landing.	Wash-down facility constructed.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA, TSIRC	2018
Weeds	Train TSRA rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.	TRSA rangers, TSIRC staff trained in weed identification from 2018. TSRA rangers trained in weed monitoring and control techniques.	TSRA rangers, TSIRC staff trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers, TSIRC staff monitor project sites for new weed incursions.	Project sites monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers and TSIRC staff manage weeds in priority areas.	On-ground works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Investigate options for revegetating weed management project sites.	Revegetation options investigated.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Dauan.	No weeds detected on transport leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents produced Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers and TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff trained in feral animal monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training	TSRA rangers, TSIRC staff and My Pathways workers.	As required
	TSRA rangers undertake regular monitoring of shrub land and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	Rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	2018 and as required

1.3 Saibai

Overview

Saibai is in the Top Western Islands Cluster of the Torres Strait. It is approximately 150 km north of Thursday Island and 4 km south of Papua New Guinea. The population of Saibai is approximately 360 (ABS 2011).

The entire island is low-lying and swampy, particularly the interior and southern portions. The most elevated portion of the island coincides with the island's township, which sits 1.7 m above sea level. The island is approximately 22.7 km at its longest point and 8.1 km at its widest (total area 11,211 ha). The village is located on the northern shoreline of the island and covers an area of approximately 1000 m by 400 m. The terrain of the village is flat and is elevated about 1.7 meters above mean sea level, with ground level tending to fall away gradually towards the interior swamps. The village is susceptible to king tide-induced sea-water inundation.

The Traditional Owners of Saibai are represented by the Mura Buway (TSI) Corporation RNTBC. The Mura Buway (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land-management activities.

Stanton et al. (2009) report Saibai's remnant habitats are generally in natural condition with estuarine wetland complexes and mosaics, mangrove forest, grassland, woodland and shrubland complexes making up 95 per cent of the island's area. The relatively low number of introduced weed species are predominantly confined to regrowth and cleared areas around the village, which make up 0.2 per cent of the island's area.

Biosecurity Issues

Weeds

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Saibai Island' (3D Environmental, January 2013) identifies 84 non-native plants, or 19 per cent of the island's plant species. Field surveys, coupled with review of flora species data, indicate that the remnant vegetation is generally free of introduced weeds. As with the majority of the inhabited islands in the Torres Strait, the developed town areas and disturbed margins support high numbers of weeds.

Five species are recognised in the Biosecurity Act 2014 as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain

actions including managing invasive plants to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Saibai's environmental and cultural assets and values.

Weed Mapping Saibai

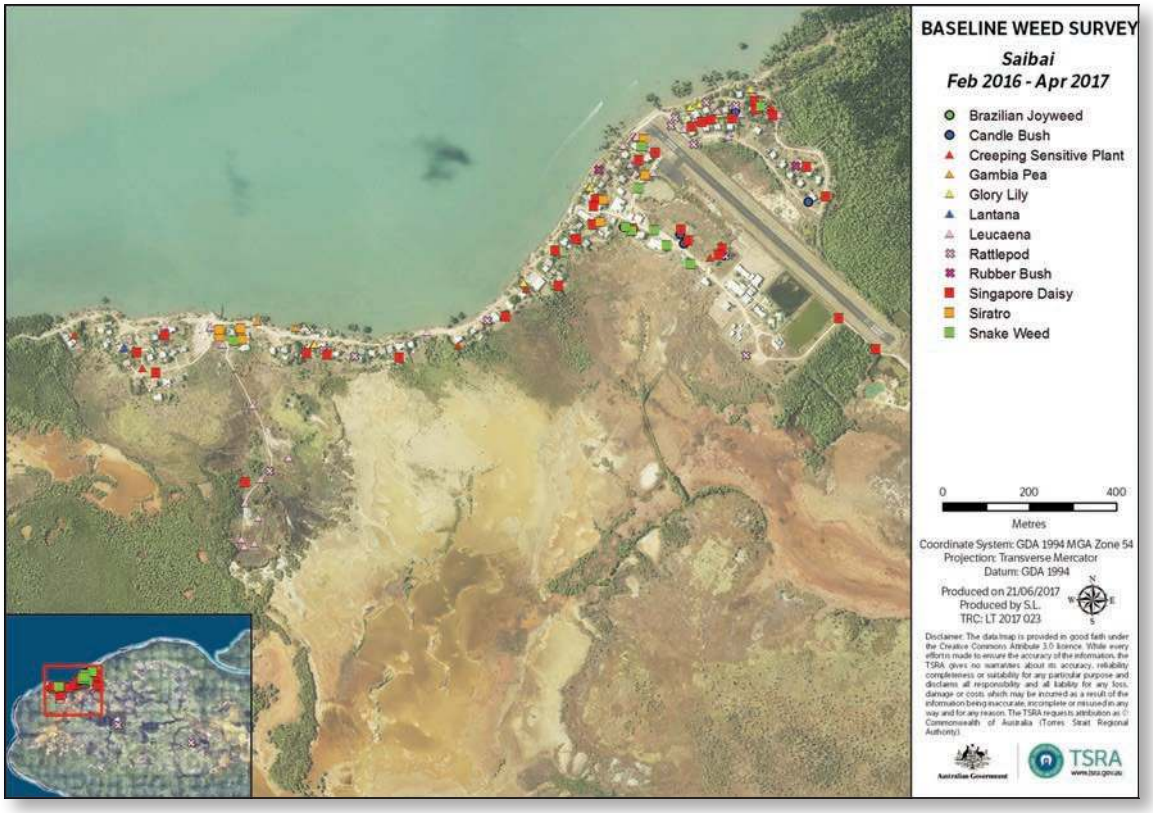


Table A9 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table A9: Saibai Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Pond apple	*Annona glabra*	One plant recorded in the community	Very high	Pond apple
Purple rubber vine	*Cryptostegia madagascariensis*	On the fringe of mangroves to the east of the community	Very high	Purple rubber vine
Sicklepod	*Senna obtusifolia*	Near the new Ergon power station opposite the school	Very high	Sicklepod
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community	Very high outside of house gardens	Yellow bells

*****Fact sheet hyperlinks are only available on the electronic version of this document

The plants listed in **Table A10** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table A10: Saibai Priority Environmental Weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Along tracks and roads into the extensive grasslands to the west of the community	High	Annual mission grass
Brazilian joyweed	*Alternanthera brasiliana*	Near the Ibis building	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Grader grass	*Themeda quadrivalvis*	On the margins of the village and access tracks	High	Grader grass
Green shrimp plant	*Ruellia blechum*	In the community	High	Green shrimp plant
Hyptis	*Hyptis suaveolens*	In the community	Moderate	Hyptis
Leucaena	*Leucaena leucocephala*	In the community and disturbed areas	High	Leucaena
Milkweed	*Euphorbia heterophylla*	In the community	Moderate	Milkweed
Mother of millions	*Bryophyllum spp.*	In the community	Moderate	Mother of millions
Sensitive plant	*Mimosa pudica*	In the community and adjoining disturbed areas	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In the community and on the margins of tracks and roads	Moderate	Siratro
Sisal	*Agave spp.*	In the community	Moderate	Sisal
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed
Tropical kudzu	*Pueraria phaseoloides*	In the community and adjoining disturbed areas	Moderate	Tropical kudzu
Kudzu (Weskepu)	*Pueraria montana var. lobata*	In the community and adjoining disturbed areas	Moderate	Kudzu (Weskepu)

*****Fact sheet hyperlinks are only available on the electronic version of this document

Pest Animals

Four introduced fauna species are known to occur on Saibai. Table 3 below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table A11: Saibai Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Wild dog	*Canis familiaris*	Throughout the island	High	Wild dog
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Rusa deer	*Cervus timorensis*	Throughout the island	Moderate	Rusa deer
Climbing perch	*Anabas testudineus*	In the swamps	Low	Climbing perch

*****Fact sheet hyperlinks are only available on the electronic version of this document

Wild dogs may be a significant risk for a number of native species. Dogs are a threat to ground-nesting birds such as beach stone-curlew.

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

While deer are considered an important food source for the community, limited hunting has the potential to result in a significant increase in numbers. The proliferation of Rusa deer presents a major threat to habitat integrity, especially for deciduous/semi-deciduous vine forest and Pandanus-dominant woodlands and grasslands, significantly increasing the potential for introduction of exotic plant species. An increasing deer population will also promote degradation of overall habitat stability as grazing reduces the effectiveness of fire as a tool to prevent shrubby invasion of grassland. Deer are also known to damage flora by antler rubbing and to degrade water quality and wetland habitat by wallowing (Biosecurity Queensland 2010).

Climbing perch were first reported on Saibai in 2006 and subsequent surveys in 2010, 2014 and 2015 confirmed their presence in hyper-saline conditions in some of the swamp areas. Their range and numbers have not expanded since the initial 2010 survey. Climbing perch were originally found only in the freshwater areas of South-east Asia. However, humans have moved this fish species into new countries, which has resulted in this species becoming a pest species causing changes to the fish and bird communities in those countries. It is suspected they were moved either by people or, given PNG is only 4 km from Saibai, were carried out in flood waters from PNG rivers during the wet season. To date, researchers have not found a practical management approach to eradicate this species without impacting on native fish species.

The most significant potential threats to native fauna on Saibai are the possible introduction of the exotic cane toad or rats (*Rattus spp.*). Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Rats are an even greater potential threat given their agility and generalist diet. Should exotic rats be present, an extermination or control project is recommended.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Saibai. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Saibai Island Biosecurity Action Plan is intended to have a positive impact on Saibai's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Saibai.
- Increase Saibai community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Saibai Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.
3. All plant and equipment to be inspected, and cleaned if required, prior to entering, and before leaving Saibai.
4. Investigate funding opportunities for the construction of a wash-down facility near barge landing.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor new project sites for weed incursions.
4. TSRA rangers, TSIRC staff and My Pathway workers to manage weeds in priority areas.
5. Investigate options for revegetating weed management project sites.
6. Prevent spread of weeds to or from Saibai.
7. Develop fact sheets for each priority weed.
8. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to monitor feral animal populations, particularly Rusa deer, and determine if targeted control programs are required.
2. Determine the need for the development of a Saibai Rusa deer management strategy to guide the management of the deer population.
3. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
4. TSRA rangers to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.
5. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Saibai provides guidance for actions over the life of the Regional Biosecurity Management Plan 2018-2023 to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique Ailan Kastom, preserving and embedding

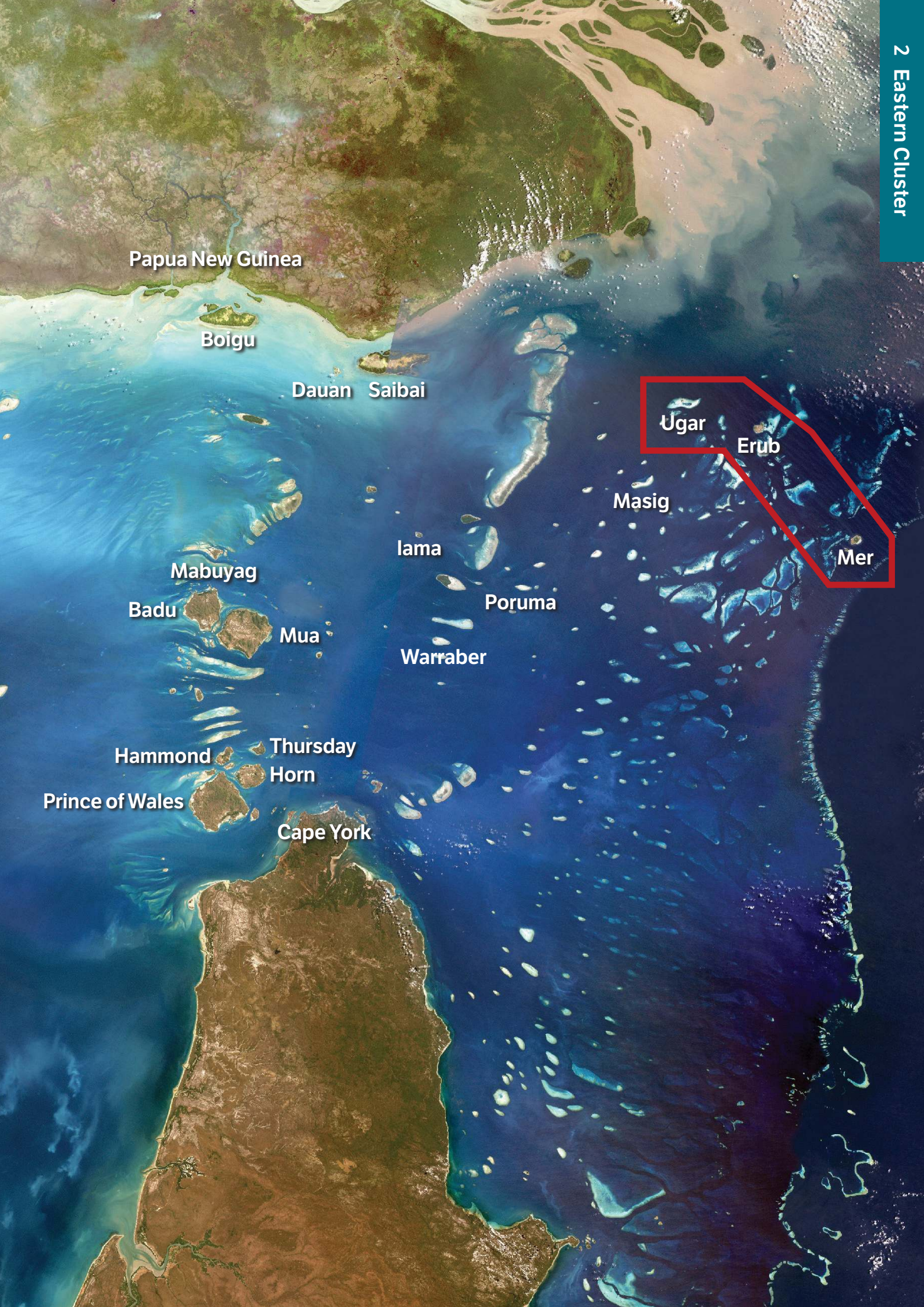
Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action-by-action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report to community and funding providers.

Table A12: Saibai Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Saibai Island Biosecurity Action Plan.	Saibai biosecurity management plan is developed by 2018.	Number of plans developed.	TSRA LSMU, Mura Buway TSRA rangers, Mura Buway (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Saibai Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Mura Buway TSRA rangers, Mura Buway (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
	All plant and equipment to be inspected and cleaned, if required prior to entering, and before leaving Saibai.	New weed and pest animal incursions prevented from entering and/or leaving Saibai.	No new weed or pest animals on Saibai.	Mura Buway TSRA rangers, Biosecurity Officer	On-going
	Investigate funding opportunities for the construction of a wash-down facility in the industrial area.	Wash-down facility constructed.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA, TSIRC	2018
Weeds	Train TSRA rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways workers trained in weed control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers, TSIRC staff monitor project sites for new weed incursions.	Site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2017 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers	As required
	Investigate options for revegetating weed management project sites.	Revegetation options investigated.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Saibai.	No weeds detected on transport coming to or leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochures developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to monitor feral animal populations, particularly Rusa deer, and determine if targeted control programs are required.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers	As required
	Determine the need for the development of a Saibai Rusa deer management strategy to guide the management of the deer population.	Need for the development of a Saibai Rusa deer management strategy determined. Strategy developed if required.	Number of plans developed.	TSRA, TSIRC	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff and My Pathways workers trained in feral animal monitoring and trapping techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	On-going
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required


Papua New Guinea
Boigu
Dauan
Saibai
Ugar
Erub
Masig
Mer
Iama
Mabuyag
Badu
Mua
Poruma
Warraber
Hammond
Thursday
Horn
Prince of Wales
Cape York

2 Eastern Islands Cluster

2.1 Ugar

Overview

Ugar (Stephen Island) is located approximately 160 km north-east of Thursday Island. It is approximately 1 km long and 0.80 km wide and is 36 ha in area. The island – formed on a platform of bedded basalt, up to 30 m high, that is the result of Pleistocene-age volcanic activity – is part of the Eastern Islands Cluster of the Torres Strait, which includes Mer (Murray Island) and Erub (Darnley Island) and a number of small uninhabited islands and sand cays. It is fringed by coral reef, with its shoreline surrounded by numerous fish traps constructed using basalt rock boulders (Ugar Sustainable Land Use Strategy, Conics 2010). The population of Ugar is 49 (ABS 2011).

The Traditional Owners of Ugar are the Ugar Ged Kem Le Zeuber Er Kep (TSI) Corporation RNTBC. The Ugar Ged Kem Le Zeuber Er Kep (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities.

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Ugar Island' (3D Environmental, January 2013) reports the present vegetation on Ugar is simple and dominated by a unique vine forest association, which has been impacted by generations of human land use and more recent clearing for infrastructure. Intact vine forest forms approximately 30 per cent of the island's vegetation cover, persisting on sheltered slopes and escarpments that have escaped clearing. While limited in distribution, the vine thicket habitat is endemic to the Torres Strait Eastern Island Group and has no representation elsewhere in Queensland.

The total known flora of 195 species comprises 116 native species and 79 naturalised species; the latter accounts for 38 per cent of the island's flora, the highest of any of the inhabited islands surveyed in the Torres Strait region and testament to the level of disturbance. Of the nine plants that are regionally significant, two are possible new records for Australia and another, *Cycas scrathchleyana*, is a highly disjunct occurrence that is associated with neighbouring Papua New Guinea.

Biosecurity Issues

Weeds

Of the 74 naturalised species currently known to occur on the island, 15 are considered a current threat to biodiversity on the island requiring management action.

Three species are recognised in the *Biosecurity Act 2014* as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Ugar's environmental and cultural assets and values.

Weed Mapping Ugar

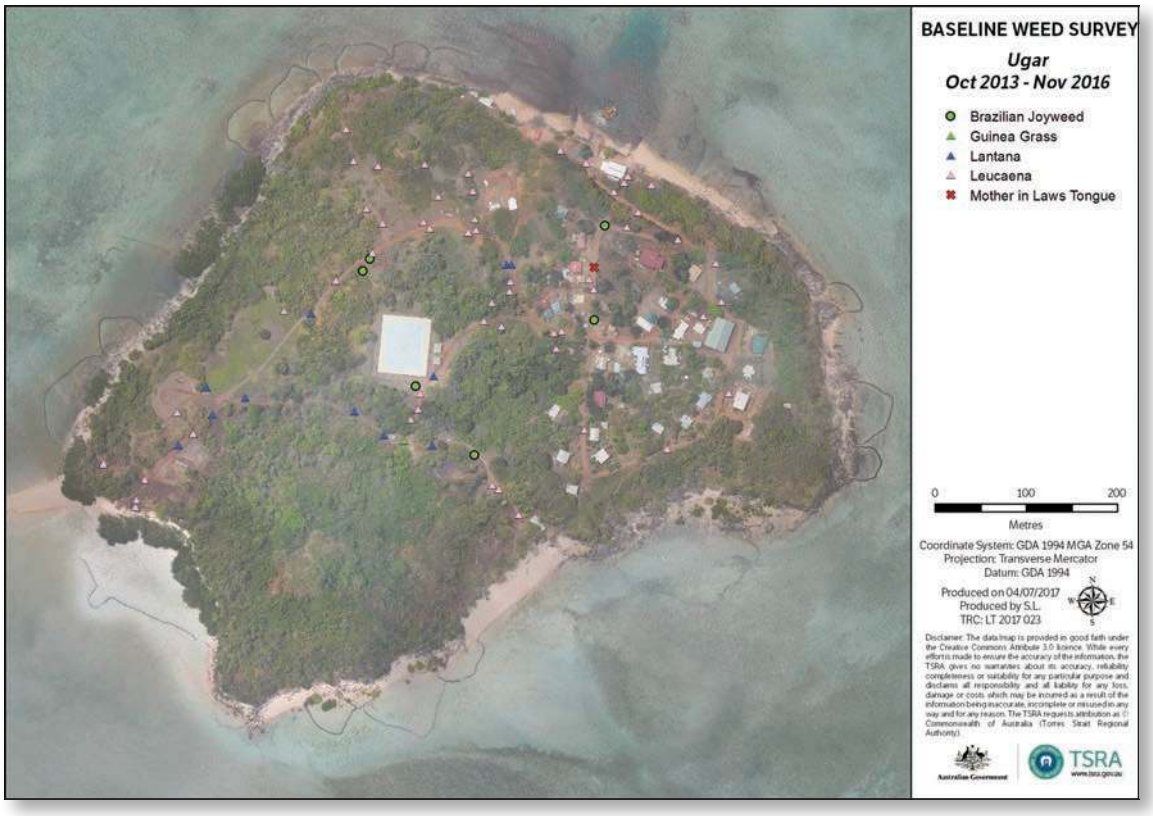


Table B1 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table B1: Ugar Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Lantana	*Lantana camara*	In the community	Very high	Lantana
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community	Very high outside of house gardens	Yellow bells

*****Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table B2** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table B2: Ugar Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Along tracks and roads into the extensive grasslands to the west of the community	High	Annual mission grass
Brazilian joyweed	*Alternanthera brasiliana*	On the margins of the village	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Candle bush	*Senna alata*	In the village	Moderate	Candle bush
Coral berry	*Rivina humilis*	In the village and along access tracks	Moderate	Coral berry
Cupid's flower	*Ipomoea quamoclit*	In the community	Moderate	Cupid's flower
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Hyptis	*Hyptis suaveolens*	In the community	Moderate	Hyptis
Khaki weed	*Alternanthera pungens*	In the community and disturbed areas	Moderate	Khaki weed
Leucaena	*Leucaena leucocephala*	In the community and disturbed areas	High	Leucaena
Mexican sunflower	*Tithonia diversifolia*	Scattered throughout the island	High	Mexican sunflower
Milkweed	*Euphorbia heterophylla*	In the community	Moderate	Milkweed
Mother in law's tongue	*Sanseviera trifasciata*	In the community	Low	Mother in law's tongue
Mother of millions	*Bryophyllum delagoense*	In the community	Moderate	Mother of millions
Scarlet flower	*Ipomea hederifolia*	In the community	Low	Scarlet flower
Sisal	*Agave spp.*	On the margins of vine thicket habitat	Moderate	Sisal
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed
Kudzu (Weskepu)	*Pueraria montana var. lobata*	In the community and adjoining disturbed areas	Moderate	Kudzu (Weskepu)

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Currently there are no introduced fauna species of concern known to occur on Ugar. An ongoing dog management program involving registration, desexing and humane destruction of wild dogs has resulted in no wild dogs currently being reported.

At the present time, there are no known feral cats reported on the island and existing house cats have been desexed. Cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats, it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

The most significant potential threats to native fauna on Ugar are the possible introduction of the exotic cane toad or rats (*Rattus spp.*). Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Rats are an even greater potential threat given their agility and generalist diet. Should exotic rats be present, an extermination or control project is recommended.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Ugar. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Ugar Island Biosecurity Action Plan is intended to have a positive impact on Ugar's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Ugar.
- Increase Ugar community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Ugar Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.
3. All plant and equipment to be inspected, and cleaned if required, prior to entering, and before leaving Ugar.
4. Investigate funding opportunities for the construction of a wash-down facility near barge landing.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor new project sites for weed incursions.
4. TSRA rangers, TSIRC staff and My Pathway workers to manage weeds in priority areas.
5. Investigate options for revegetating weed management project sites.
6. Prevent spread of weeds to or from Ugar.
7. Develop fact sheets for each priority weed.
8. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Ugar provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered both in terms of community aspirations by strengthening the region's unique Ailan Kastom, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table B3: Ugar Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Ugar Island Biosecurity Action Plan.	Ugar biosecurity management plan is developed by 2018.	Number of plans developed.	TSRA LSMU, Ugaram TSRA Rangers, Ugar Ged Kem Le Zeuber Er Kep (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Ugar Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Ugaram TSRA Rangers, Ugar Ged Kem Le Zeuber Er Kep (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
	All plant and equipment to be inspected and cleaned if required prior to entering, and before leaving Ugar.	New weed and pest animal incursions prevented from entering and/or leaving Ugar.	No new weed or pest animals on Ugar.	Ugaram TSRA rangers, Biosecurity Officer	Ongoing
	Investigate funding opportunities for the construction of a wash-down facility near barge landing.	Wash-down facility constructed.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA, TSIRC	2018
Weeds	Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways workers trained in weed control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers and TSIRC staff monitor project sites for new weed incursions.	Site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Investigate options for revegetating weed management project sites.	Revegetation options investigated.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Ugar.	No weeds detected on transport coming to or leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochures developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff and My Pathways workers trained in feral animal monitoring and trapping techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers	As required
	TSRA rangers undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to determine exotic plant and animal disease threats and determine the need for a control program.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required

2.2 Erub

Overview

Erub (Darnley Island) is located approximately 180 km north-east of Thursday Island. The island – formed on a platform of bedded basalt, up to 30 m high, that is the result of Pleistocene-age volcanic activity – is part of the Eastern Islands Cluster of the Torres Strait, which includes Mer (Murray Island), and Ugar (Stephen Island) and a number of small uninhabited islands, including Dauar and Waier (off Mer), and sand cays. Erub is fringed by coral reef, with its shoreline surrounded by numerous fish traps constructed using basalt rock boulders; these are the property of local clan groups. Thee island is approximately 565 ha in area. The population of Erub is 374 (ABS 2011).

The native title rights of the Traditional Owners of Erub, who are part of the Kermer Kemer Meriam Nation, are represented by the Erubam le Traditional Land and Sea Owners (TSI) Corporation RNTBC. The Erubam le Traditional Land and Sea Owners (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities.

The vegetation on Erub is influenced largely by variations in soil moisture and fertility coupled with the impacts of human occupation. Native grassland forms up to 60 per cent of the island's vegetation, with vine forest persisting in fire protected pockets and gully lines. Other vegetation types include mangrove forests and extensive areas of altered forest habitats.

A total of nine natural vegetation communities, within four broad vegetation groups (natural only) and four regional ecosystems are recognised on the island, representing approximately four per cent of regional ecosystems recorded across the broader Torres Strait Island landscape. The total known flora of 281 species (approximately 69 per cent of the known flora for the Torres Strait Islands) includes 193 native species.

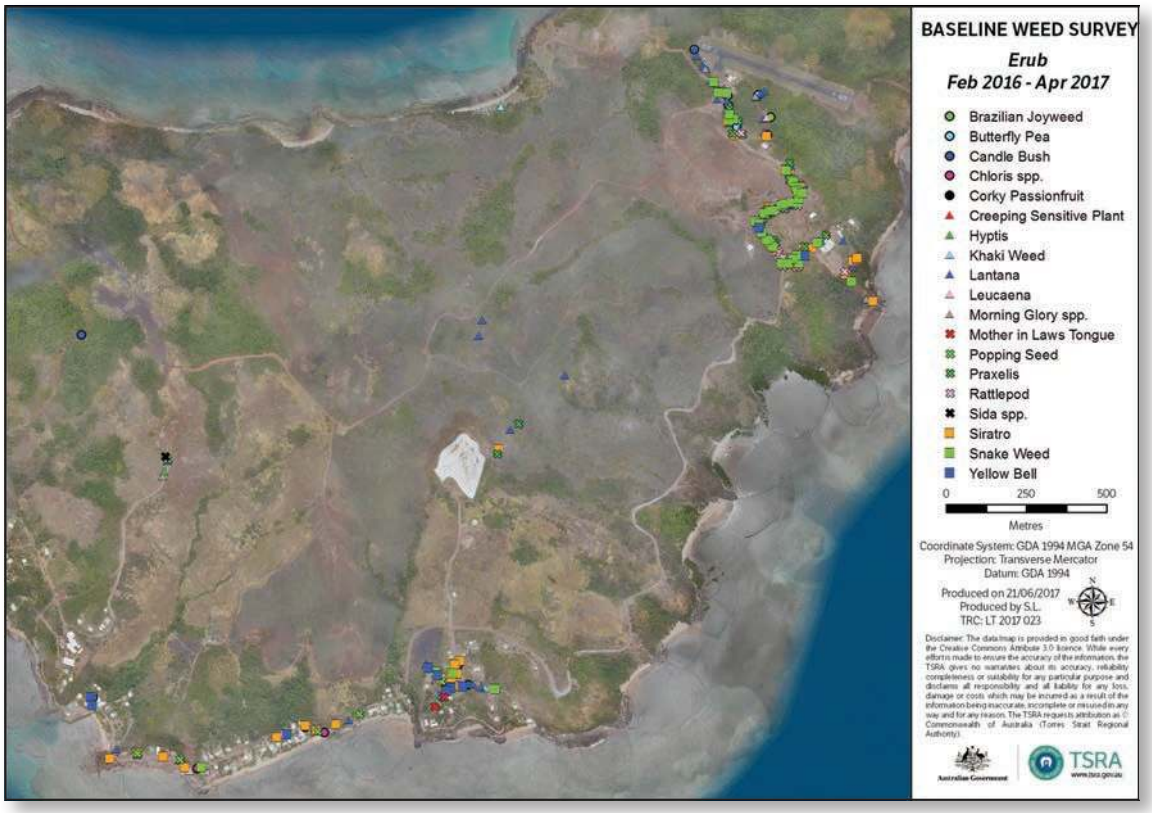
Two of the ecosystems recorded are unique to the Eastern Island Group, in particular Mer and Erub, with no representation elsewhere in Queensland. There are also a number of highly significant culturally influenced forest types on the island. These provide a window into the island's past traditional agricultural practices. Observations suggest that portions of the island have been developed as a permaculture from the time of earliest human settlement. Remnant vegetation on the island is becoming increasingly affected by weeds and a number of species pose serious threats to the island's natural and cultural values.

Biosecurity Issues

Weeds

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Erub Island' (3D Environmental, January 2013) identifies 88 introduced species, accounting for 31 per cent of the island flora. Field surveys coupled with review of flora species data indicate that the remnant vegetation is generally free of introduced weeds. As with the majority of the inhabited islands in the Torres Strait, the developed areas within and surrounding the Erub community and fringing disturbed sites – such as major roads and tracks, dump, airfield, recreation areas and the island cemetery - support high numbers of weeds.

Weed Mapping Erub



Six species are recognised in the *Biosecurity Act 2014* as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Erub's environmental and cultural assets and values .

Table B4 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table B4: Erub Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
African tulip tree	*Spathodea campanulata*	On the road to the airport	Very high	African tulip tree
Chinese apple	*Ziziphus mauritiana*	On the hillside behind the Erub Restoration Full Gospel Church	Very high	Chinese apple
Lantana	*Lantana camara*	Along tracks, on the margins of disturbed areas in parts of the island, and on coastal headlands and cliffs	Very high	Lantana
Sicklepod	*Senna obtusifolia*	On the powerline access road on the hill above the Ibis store	Very high	Sicklepod
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community	Very high outside of house gardens	Yellow bells

*****Fact sheet hyperlinks are only available on the electronic version of this document

The plants listed in **Table B5** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table B5: Erub Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Along tracks and roads into the grasslands outside of the community	High	Annual mission grass
Bell weed	*Dipteracanthus prostratus*	In the village	Moderate	Bell weed
Brazilian joyweed	*Alternanthera brasiliana*	On the margins of the village	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Castor oil bush	*Ricinus communis*	In the village	Moderate	Castor oil bush
Candle bush	*Senna alata*	In the village	Moderate	Candle bush
Coral berry	*Rivina humilis*	In the village	Moderate	Coral berry
Coral vine	*Antigonon leptopus*	In the village	Moderate	Coral vine
Cupid's flower	*Ipomoea quamoclit*	In the community	Moderate	Cupid's flower
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Grader grass	*Themeda quadrivalvis*	On the margins of the village and access tracks	High	Grader grass
Green shrimp plant	*Ruellia blechum*	In the community	Moderate	Green shrimp plant
Hyptis	*Hyptis suaveolens*	In the community	Moderate	Hyptis
Indian calopo	*Calopogonium mucunoides*	In the community	Moderate	Indian calopo
Khaki weed	*Alternanthera pungens*	In the community and disturbed areas	Moderate	Khaki weed
Leucaena	*Leucaena leucocephala*	In the community, disturbed areas and along roadsides	High	Leucaena
Mexican sunflower	*Tithonia diversifolia*	Scattered throughout the island	High	Mexican sunflower
Milkweed	*Euphorbia heterophylla*	In the community	Moderate	Milkweed
Mother in law's tongue	*Sanseviera trifasciata*	In the community	Moderate	Mother in law's tongue
Praxelis	*Praxelis clematidea*	In the community, disturbed areas and along roadsides	Moderate	Praxelis
Round leaf cassia	*Chamaecrista rotundifolia*	In the community	Low	Round leaf cassia
Scarlet flower	*Ipomoea hederifolia*	In the community	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community	Moderate	Sensitive plant
Sisal	*Agave spp.*	In the community	Moderate	Sisal
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed
Kudzu (Weskepu)	*Pueraria montana var. lobata*	In the community and adjoining disturbed areas	Moderate	Kudzu (Weskepu)

*****Fact sheet hyperlinks are only available on the electronic version of this document

Pest Animals

Two introduced fauna species of concern are known to occur on Erub Island. **Table 18** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table B6: Erub Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Black rat	*Rattus rattus*	In the community	High	Black rat
Feral cat	*Felis catus*	Throughout the island	High	Feral cat

*****Fact sheet hyperlinks are only available on the electronic version of this document

The black rat poses a threat to culturally significant flora and native fauna, particularly bird species during nesting when eggs may be vulnerable to foraging. They have been recorded in and around houses and in all the vegetated habitats on Erub, with reports of occasional outbreaks causing potentially serious health problems to the local community and damage to household goods and infrastructure. The control of rats in and around houses provided only temporary reduction in rat numbers and associated damage and the only long-term management option is the eradication of the introduced rat population (Leung unpubl. data).

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

The most significant potential threat to native fauna on Erub Island is the possible introduction of the exotic cane toad. Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Erub. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Erub Island Biosecurity Action Plan is intended to have a positive impact on Erub's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Erub.
- Increase Erub community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.

- Establish long-term community commitment to and compliance with weed and pest animal management by increasing awareness of pest impacts and developing pest management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers and Torres Strait Island Regional Council (TSIRC) staff and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Erub Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor new project sites for weed incursions.
4. TSRA rangers, TSIRC staff and My Pathway workers manage weeds in priority areas.
5. Prevent spread of weeds to or from Erub.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Erub provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique *Ailan Kastom*, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table B7: Erub Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Erub Island Biosecurity Action Plan.	Erub biosecurity management plan is developed by 2018.	Number of plans developed.	TSRA LSMU, Erubam le TSRA rangers, Erubam le Traditional Land and Sea Owners (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Erub Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Erubam le TSRA rangers, Erubam le Traditional Land and Sea Owners (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
Weeds	Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff and My Pathway workers trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways workers trained in weed monitoring and control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers, TSIRC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers control and eradicate weeds in priority areas.	On ground works undertaken at least 8 weeks per year from 2018. To reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Erub.	No weeds detected on transport coming to or leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weeds brochures developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff and My Pathways employees trained in feral animal monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to determine exotic plant and animal disease threats and determine the need for a control program.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required

2.3 Mer (Murray Island) Group

Overview

The three islands of Mer (Murray Island), Dauar and Waier make up the Murray Island group. They are part of the Eastern Islands Cluster of the Torres Strait and are approximately 207 km north-east of Thursday Island. Mer Island occupies a total area of 406 ha, formed on a volcanic vent that rises to a height of 210 m. The stark vent that dominates the island landscape is known as 'Gelam', the creator of the dugong in Torres Strait Island mythology. The volcanic vent of Mer is unique in an Australian context, being the only known example of a volcanic vent forming a discrete island within Australian territory (3D Environmental, January 2013).

The vegetation on Mer is controlled largely by variations in soil structure and fertility. The western side of the island, which is formed on extremely porous volcanic scoria or ash, is covered in grassland due to extreme soil drainage on the volcano rim and regular burning.

The eastern side, which supports more luxuriant rainforest vegetation and garden areas, occupies much more fertile and favourably drained basaltic soil. It is fringed by coral reef with its shoreline surrounded by numerous fish traps constructed by basalt rock boulders. These are the property of local clan groups.

Mer

The landscapes of and the seas surrounding Mer, Dauar and Waier have significant traditional and historical value. The landscapes and their present vegetation covers are products of past land use, which is evident in the remnants of gardens and the presence of introduced food and timber species such as mango and bamboo.

The Mer Ged Kem Le (TSI) Corporation RNTBC represents the native title rights of the Traditional Owners of Mer, Dauar and Waier, who are a part of the Kermer Kemer Meriam Nation. The Mer Ged Kem Le (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities. Mer has a population of 364 (2011 ABS Census).

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Mer Island' (3D Environmental, January 2013) reports the vegetation on Mer is influenced largely by variations in soil moisture and fertility, coupled with the impacts of human occupation. Native grassland forms up to 60 per cent of the island's vegetation, with vine forest persisting in fire protected pockets and gully lines. Other vegetation types include mangrove forests and extensive areas of altered forest habitats.

A total of nine natural vegetation communities, within four broad vegetation groups (natural only) and four regional ecosystems are recognised on the island, representing approximately four per cent of regional ecosystems recorded across the broader Torres Strait Island landscape. Two of the ecosystems recorded are unique to the Eastern Island Group, in particular Mer and Erub, and have no representation elsewhere in Queensland. There are also a number of highly significant culturally influenced forest types on the island, which provide a window into the island's past traditional agricultural practices. Observations suggest that portions of the island have been developed as a permaculture from the time of earliest human settlement.

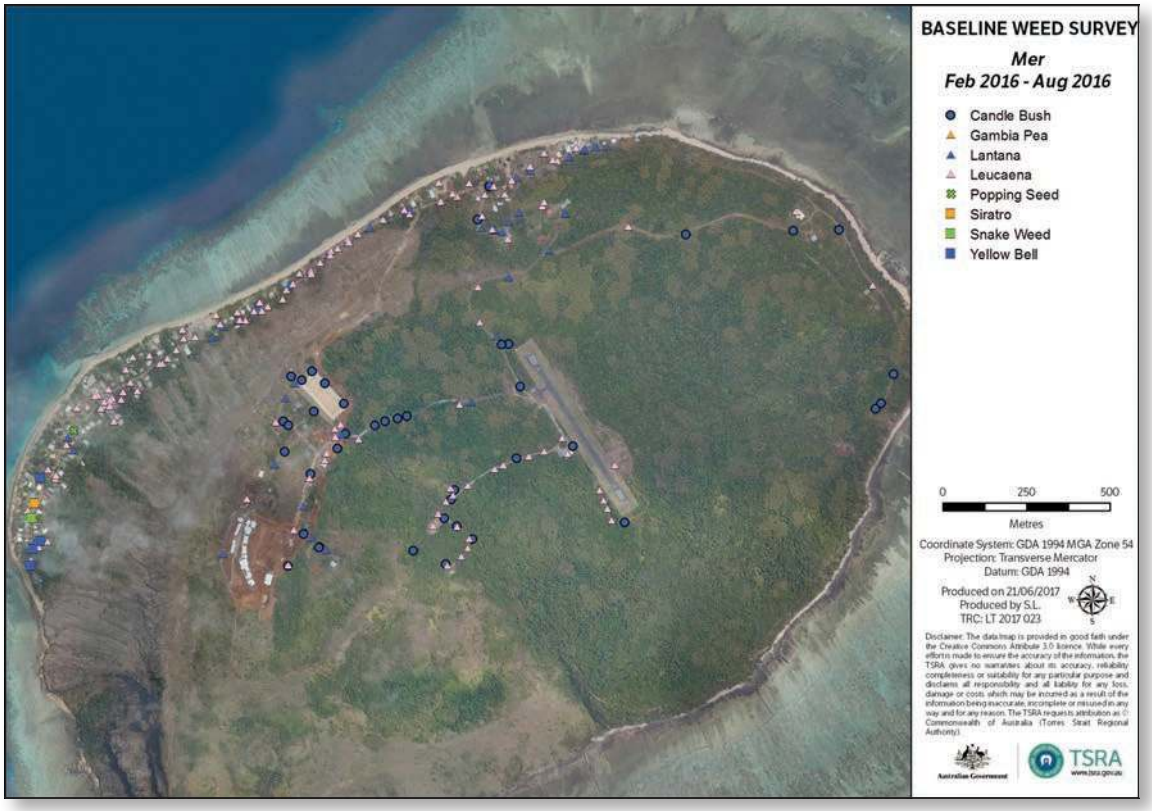
The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Mer Island' (3D Environmental, January 2013) identifies 299 flora species recorded on the island which comprises 215 native species (72 per cent of the island flora) and 84 introduced species (28 per cent of the island flora).

Biosecurity Issues

Weeds

As with all of the inhabited Torres Strait Islands, the majority of the introduced species are associated with disturbed and developed areas within and surrounding the Mer community and fringing disturbed sites, with major roads and tracks, dump, airfield, recreation areas and the island cemetery supporting high numbers of weeds. Weeds are increasingly affecting remnant vegetation throughout the island with a number of species posing serious threats to the island's natural and cultural values. (Environmental, January 2013).

Weed Mapping Mer



Three species are recognised in the Biosecurity Act 2014 as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Mer's environmental and cultural assets and values.

Table B8 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table B8: Mer Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Lantana	*Lantana camara*	Along tracks and on the margins of disturbed areas in the eastern parts of Mer and is also present on Dauar	Very high	Lantana
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community and on the north facing slopes of Gelam	Very high outside of house gardens	Yellow bells

*****Fact sheet hyperlinks are only available on the electronic version of this document*

TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS identified the plants listed in **Table B9** as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table B9: Mer Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Along tracks and roads into the extensive grasslands outside of the community	High	Annual mission grass
Brazilian joyweed	*Alternanthera brasiliana*	On the margins of the village	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of Mer and is also present on Dauar	Moderate	Butterfly pea
Castor oil bush	*Ricinus communis*	In the village	Moderate	Castor oil bush
Candle bush	*Senna alata*	In the village	Moderate	Candle bush
Coral berry	*Rivina humilis*	In the village	Moderate	Coral berry
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the village	Moderate	Glory lily
Green shrimp plant	*Ruellia blechum*	In the village	Moderate	Green shrimp plant
Hyptis	*Hyptis suaveolens*	In the community	Moderate	Hyptis
Leucaena	*Leucaena leucocephala*	In the community area with dense infestations in the cemetery, house yards, and along roadsides throughout the eastern parts of the island	High	Leucaena
Mother in law's tongue	*Sanseviera trifasciata*	In the community	Low	Mother in law's tongue
Popping seed	*Ruellia tuberosa*	In the community	Moderate	Popping seed
Praxelis	*Praxelis clematidea*	On the margins of the village and access tracks	Moderate	Praxelis
Scarlet flower	*Ipomoea hederifolia*	Throughout the residential areas and invading the edges of shrublands and vine thickets	Low	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In the community	Moderate	Siratro
Snake vine	*Merremia dissecta*	In the community	Moderate	Snake vine
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed
Kudzu (Weskepu)	*Pueraria montana var. lobata*	In the community and adjoining disturbed areas	Moderate	Kudzu (Weskepu)
Whitehead broom	*Spermacoce verticillata*	In the community and adjoining disturbed areas	Moderate	Whitehead broom

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Four introduced fauna species of concern are known to occur on Mer. **Table 22** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table B10: Mer Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Pacific rat	*Rattus exulans*	In the community	High	Pacific rat
Black rat	*Rattus rattus*	Throughout the island	High	Black rat
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Wild dog	*Canis familiaris*	Throughout the island	High	Wild dog

*****Fact sheet hyperlinks are only available on the electronic version of this document*

The Pacific rat and black rat poses a threat to culturally significant flora and native fauna, particularly bird species during nesting when eggs may be vulnerable to foraging. Black rats have been recorded in and around houses in all vegetated habitats on Mer, with reports of occasional outbreaks causing potentially serious health problems to the local community and damage to household goods and infrastructure. The control of rats in and around houses provided only temporary reduction in rat numbers and associated damage and the only long-term management option is the eradication of the introduced rat population (Leung unpubl. data). A single Pacific Rat was caught on Mer during a rat control program conducted in 2006 and it is unknown whether they still occur on Mer.

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997). Natural Solutions (2008a) reported the native rodent Grassland Melomys (*Melomys burtoni*) as being common in vine forest and adjacent grasslands. If cat numbers are not controlled, there could be significant future impacts on Melomys and other native fauna.

Wild dogs may be a significant risk for a number of native species. Dogs are a threat to ground-nesting birds such as beach stone-curlew and have been known to attack and eat Green Turtles (*Chelonia mydas*) on Mer.

The most significant potential threats to native fauna on the Mer Island Group are the possible introduction of the exotic cane toad or rats (*Rattus spp.*). Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Rats are an even greater potential threat given their agility and generalist diet. Should exotic rats be present, an extermination or control project is recommended.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Mer. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Mer (Murray Island) Group Island Biosecurity Action Plan is intended to have a positive impact on Mer Group's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique *Ailan Kastom* and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better management of current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.

- Prevent the introduction and establishment of new pests on Mer Island Group.
- Increase Mer community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Mer Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor new project sites for weed incursions.
4. TSRA rangers, TSIRC staff and My Pathway workers to manage weeds in priority areas.
5. Prevent spread of weeds to or from Mer.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

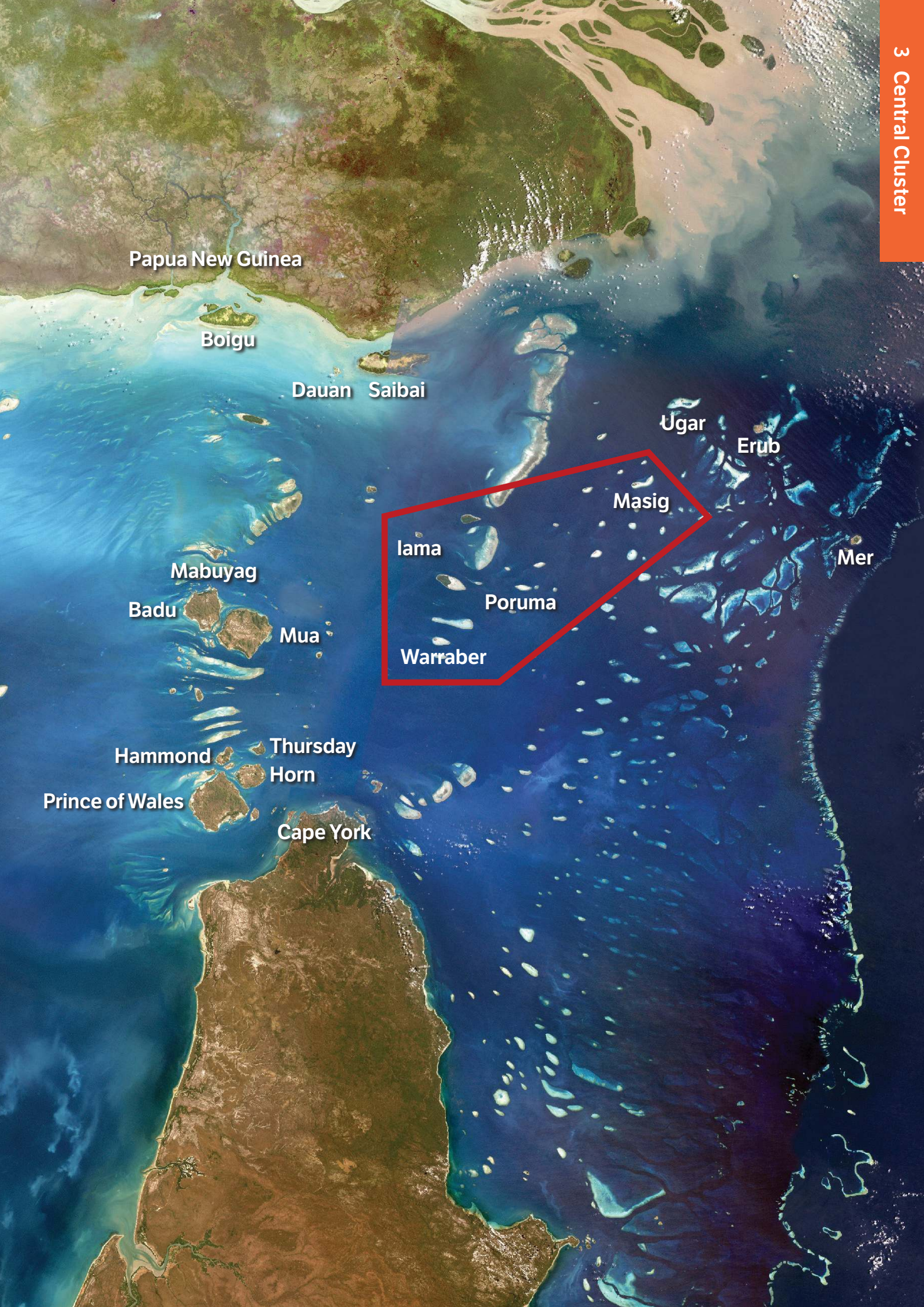
This Island Biosecurity Action Plan for the Mer Island Group provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023*. To ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique *Ailan Kastom*, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The intension of the Island Biosecurity Action Plan is to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to community will be an action by way of newsletters and information sessions.

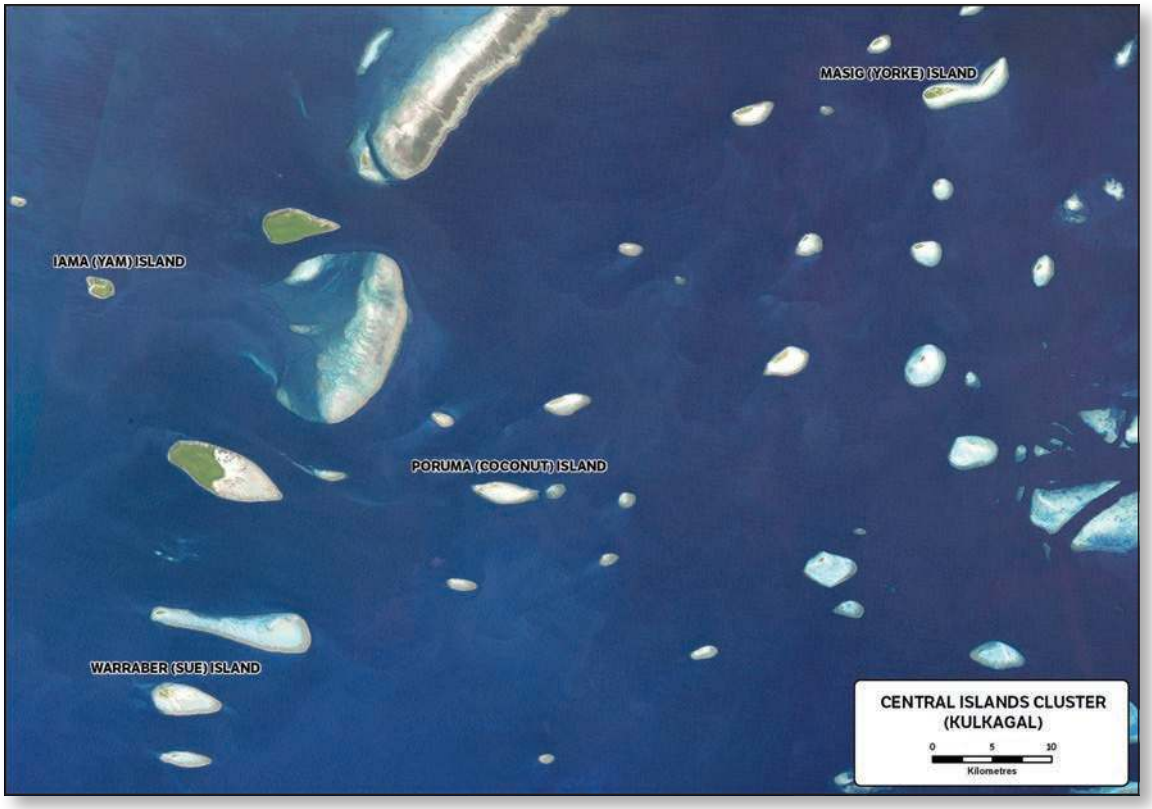
Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn to adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. The agreed actions used as performance indicators can provide reports back to community and funding providers.

Table B11: Mer Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Mer Island Biosecurity Action Plan.	Mer biosecurity management plan is developed by 2018.	Number of plans developed.	TSRA LSMU, Meriam Gesep a Gur TSRA rangers, Mer Ged Kem Le (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Mer Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Meriam Gesep a Gur TSRA rangers, Mer Ged Kem Le (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
Weeds	Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways workers trained in weed control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species on Mer, Dauar and Waier islands.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers, TSIRC staff monitor project sites for new weed incursions.	Site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers control and eradicate weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Investigate options for revegetating weed management project sites.	Revegetation options investigated.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers	As required
	Prevent spread of weeds to or from Mer.	No weeds detected on transport coming to or leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochures developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff and My Pathways workers trained in feral animal monitoring and trapping techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to determine exotic plant and animal disease threats and determine the need for a control program.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required


Papua New Guinea
Boigu
Dauan
Saibai
Ugar
Erub
Masig
Iama
Mer
Poruma
Warraber
Mabuyag
Badu
Mua
Hammond
Thursday
Horn
Prince of Wales
Cape York

3 Central Islands Cluster



3.1 Masig

Overview

Masig (Yorke Island) is located in the Central Islands Cluster of the Torres Strait, approximately 157 km north-east of Thursday Island and 73 km north-west of Mer (Murray Island). The island occupies a total area of 186 ha and is approximately 2.8 km long by approximately 0.8 km wide. The main community is located at the north-western end of the island. The terrain at the community area is relatively flat, rising to approximately 1 to 1.5 m, making the community area susceptible to rising sea levels.

Masig is made up of two islands. The main island is referred to as Masig while the second island is referred to as Kodal. Kodal is a long and narrow island and is currently unoccupied. Masig is a tear-shaped, low-lying coral cay island located on the west end of a narrow east-west oriented reef system. The population of Masig is approximately 240 (ABS 2011).

The topography of Masig is flat, with ground level generally three metres above local mean sea level. The main community is located between the north and south coasts on the north-eastern end of the island and covers an area of approximately 300 m by 300 m. The main community area is naturally elevated to approximately two metres above sea level.

The Masigalgal (TSI) Corporation RNTBC represents the Traditional Owners of Masig. The Masigalgal (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities.

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Masig Island' (3D Environmental, January 2013) reports there are six natural vegetation communities, within three broad vegetation groups and five regional ecosystems recognised on the island. There are currently 209 plant species recorded, within 85 families and 154 genera and comprising 144 natives (69 per cent of total species) and 65 non-natives (31 per cent). This represents approximately 15 per cent of the known flora for the Torres Strait Island group.

Biosecurity Issues

Weeds

The 65 introduced species recorded on the island represent 31 per cent of the island flora. The majority are associated with disturbed and developed areas within and surrounding the Masig community and fringing disturbed sites, such as major roads and tracks, dump, airfield, recreation areas and the island cemetery.

Three species are recognised in the *Biosecurity Act 2014* as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Masig's environmental and cultural assets and values.

Weed Mapping Masig

Table C1 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table C1: Masig Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Lantana	*Lantana camara*	Along tracks, on the margins of disturbed areas in parts of the island	Very high	LanLantana
Singapore daisy	*Sphagneticola trilobata*	In a few house gardens in the village area	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community	Very high outside of house gardens	Yellow bells
Yellow oleander	*Cascabela thevetia*	In and around the community	High	Yellow oleander

*****Fact sheet hyperlinks are only available on the electronic version of this document

The plants listed in **Table C2** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on the efforts of community food production. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table C2: Masig Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	In the community and disturbed areas	High	Annual mission grass
Butterfly pea	*Clitoria ternatea*	Occurs on roadsides and is common on the edge of the vine woodland on the island	Moderate	Butterfly pea
Castor oil bush	*Ricinus communis*	In the village	Moderate	Castor oil bush
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Grader grass	*Themeda quadrivalvis*	On the margins of the village and access tracks	High	Grader grass
Hyptis	*Hyptis suaveolens*	In the community and disturbed areas	Moderate	Hyptis
Indian calopo	*Calopogonium mucunoides*	In the community	Moderate	Indian calopo
Leucaena	*Leucaena leucocephala*	In the community, disturbed areas and along roadsides	High	Leucaena
Milkweed	*Euphorbia heterophylla*	In the community	Moderate	Milkweed
Mother in law's tongue	*Sanseviera trifasciata*	A number of infestations occur on the island	Moderate	Mother in law's tongue
Mother of millions	*Bryophyllum spp.*	In the community	Moderate	Mother of millions
Praxelis	*Praxelis clematidea*	In the community, disturbed areas and along roadsides	Moderate	Praxelis
Scarlet flower	*Ipomoea hederifolia*	In disturbed margins of the community invading shrublands and vine thicket margins	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community	Moderate	Sensitive plant
Sisal	*Agave spp.*	On the margins of dune vine thicket habitats	Moderate	Sisal
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed
Whitehead broom	*Spermacoce verticillata*	In the community	Moderate	Whitehead broom

*****Fact sheet hyperlinks are only available on the electronic version of this document

Pest Animals

Currently there are no introduced fauna species of concern known to occur on Masig. An ongoing dog management program involving registration, desexing and humane destruction of wild dogs has resulted in no wild dogs currently being reported.

At the present time, there are no known feral cats reported on the island and existing house cats have been desexed. Cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats, it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

The most significant potential threats to native fauna on Masig are the possible introduction of the exotic cane toad or rats (*Rattus spp.*). Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Rats are an even greater potential threat given their agility and generalist diet. Should exotic rats be present, an extermination or control project is recommended.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Masig. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Masig Island Biosecurity Action Plan is intended to have a positive impact on Masig's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique *Ailan Kastom* and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Masig.
- Increase Masig community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Masig Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor new project sites for weed incursions.
4. TSRA rangers, TSIRC staff and My Pathway workers to manage weeds in priority areas.
5. Prevent spread of weeds to or from Masig.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Masig provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique Ailan Kastom, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report to community and funding providers.

Table C3: Masig Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Masig Island Biosecurity Action Plan.	Masig Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Masigalgal TSRA rangers, Masigalgal (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Masig Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Masigalgal TSRA rangers, Masigalgal (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
Weeds	Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways workers trained in weed control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers and TSIRC staff monitor project sites for new weed incursions.	Site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers manage weeds in priority areas.	On ground works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Investigate options for revegetating weed management project sites.	Revegetation options investigated.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Masig.	No weeds detected on transport coming to or leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochures developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff and My Pathways workers trained in feral animal monitoring and trapping techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers	As required
	TSRA rangers undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held, Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to determine exotic plant and animal disease threats and determine the need for a control program.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed	TSRA rangers, NAQS	As required
	Train rangers, Council staff in exotic plant and animal disease monitoring methods	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	Rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required

3.2 Iama

Overview

Iama (Yam Island) is located in the Central Islands Cluster in the Torres Strait, approximately 90 km north-east of Thursday Island. The island is 186 ha in area and is approximately 2.2 km long by approximately 1.5 km wide. The main community is located at the north-western end of the island. The terrain at the main community area is relatively flat, rising to approximately 1 to 1.5 m, making the community area susceptible to rising sea levels.

Iama is a vegetated granite island formed on a pile of granitic basement rocks that outcrop to a height of 68 m. A number of younger landform features – including coral sand flats and beach ridges and broad flats formed from estuarine mud – fringe the rocky interior of the island.

The indigenous language is Kulkalgau Ya, a dialect of the Western Central Torres Strait Language. The population of Iama is 316 (ABS Census 2011). The Traditional Owners of Iama and the nearby islands include:

- The Magani Lagaugal (TSI) Corporation RNTBC administers land on behalf of the Iama people and Tudulaig people. The main island the Magani Lagaugal RNTBC speaks for is Iama, also known as Yam Island or Turtle-Backed Island; other islands include Zagai, Tudu (Warrior Island) and Mukar Islet or Muquar Islet (Cap Islet)
- The Gebaralgal (TSI) Corporation RNTBC administers land on behalf of the Gebaralgal People. Their native title determination is over Gebar, also known as Gabba Island or Two Brothers Island, to the north-west of Iama. Gebar is an uninhabited island with a population of feral pigs that were intentionally introduced.
- The Wakeyama (TSI) Corporation administers the Native Title rights and interests recognised over Sassie (Long Island) and surrounding islets on behalf of the Warraber, Poruma and Iama Peoples.

These native title representative bodies have approval responsibilities for all plans to manage land and for permissions for all land management activities on the islands they administer.

A total of fourteen vegetation communities, within six intact broad vegetation groups and 11 regional ecosystems, are recognised across the island, representing approximately 14 per cent of regional ecosystems recorded across the broader Torres Strait Islands. The most widespread vegetation type on the island other than mangrove is an open forest formation dominated by earlobe wattle (Acacia auriculiformis) (thulup in local dialect). This is a unique habitat type found only on Iama.

Biosecurity Issues

Weeds

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Iama Island' (3D Environmental, January 2013) reports there are currently 259 flora species recorded on the island, comprising 202 native species (79 per cent) and 57 introduced species (21 per cent). This represents approximately 20 per cent of the known flora for the Torres Strait Island group.

Weed Mapping Iama

The majority of the 57 introduced species recorded on the island are associated with disturbed and developed areas within and surrounding the Iama community and fringing disturbed sites, such as major roads and tracks, dump, airfield, recreation areas and the island cemetery.

Four species are recognised in the Biosecurity Act 2014 as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Iama's environmental and cultural assets and values.

Table C4 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table C4: Iama Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Lantana	*Lantana camara*	In the village	Very high	Lantana
Sicklepod	*Senna obtusifolia*	A single plant has been recorded on Iama	Very high	Sicklepod
Singapore daisy	*Sphagneticola trilobata*	A small infestation along the main beach area	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community	Very high outside of house gardens	Yellow bells

*****Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table C5** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table C5: Iama Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Brazilian joyweed	*Alternanthera brasiliana*	Invading vine thickets on rocky slopes on the edge of the community area	High	Brazilian joyweed
Bundled pigeon flower	*Desmanthus pernambucanus*	In the village	High	Bundled pigeon flower
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Castor oil bush	*Ricinus communis*	A small infestation at the dump	Moderate	Castor oil bush
Candle bush	*Senna alata*	In the village	Moderate	Candle bush
Cupid's flower	*Ipomoea quamoclit*	In the community	Moderate	Cupid's flower
Grader grass	*Themeda quadrivalvis*	On the margins of the village and access tracks towards the dump and around the dump area	High	Grader grass
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Hyptis	*Hyptis suaveolens*	In the community and access tracks	Moderate	Hyptis
Indian calopo	*Calopogonium mucunoides*	In the community	Moderate	Indian calopo
Mother in law's tongue	*Sanseviera trifasciata*	In the community	Moderate	Mother in law's tongue
Praxelis	*Praxelis clematidea*	In the community, disturbed areas and along roadsides	Moderate	Praxelis
Round leaf cassia	*Chamaecrista rotundifolia*	In the community and along roadsides	Low	Round leaf cassia
Scarlet flower	*Ipomoea hederifolia*	Recorded throughout the disturbed forest margins adjacent to the community	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community and disturbed areas	Moderate	Sensitive plant
Sisal	*Agave spp.*	In the community and used for traditional purposes	Moderate	Sisal
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Snakeweed	*Stachytarpheta jamaicensis*	At the back of the airstrip near the sewerage treatment plant	Moderate	Snakeweed

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Currently there are no introduced fauna species of concern known to occur on Iama. An ongoing dog management program involving registration, desexing and humane destruction of wild dogs has resulted in no wild dogs currently being reported.

At the present time, there are no known feral cats reported on the island and existing house cats have been desexed. Cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats, it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

The most significant potential threats to native fauna on Iama are the possible introduction of the exotic cane toad or rats (*Rattus spp.*). Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Rats are an even greater potential threat given their agility and generalist diet. Should exotic rats be present, an extermination or control project is recommended.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Iama. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Iama Island Biosecurity Action Plan is intended to have a positive impact on Iama's environmental, social and cultural values by providing an overview and a clear and concise set of community agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Iama.
- Increase Iama community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Iama Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathway workers in weed control techniques.
2. Map significant weed species on Iama, Gebar, Tudu, Sassie and Cap islands.
3. TSRA rangers and TSIRC staff to monitor project sites for new weed incursions.
4. TSRA rangers and TSIRC staff to manage weeds in priority areas.
5. Revegetate weed management sites to discourage weed regrowth and prevent erosion where appropriate.
6. Prevent spread of weeds to or from Iama.
7. Develop fact sheets for each priority weed.
8. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations on Gebar and Sassie and determine the need for targeted control programs.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Iama provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique *Ailan Kastom*, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table C6: Iama Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Iama Island Biosecurity Action Plan.	Iama Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Iamalgal TSRA rangers, Magani Lagaugal (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Iama Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Iamalgal TSRA rangers, Magani Lagaugal (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
Weeds	Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff and My Pathway workers trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathway workers trained in weed control techniques.	TSRA rangers, staff and My Pathway workers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species on Iama, Gebar, Tudu, Sassie and Cap islands.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers, TSIRC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathway workers manage weeds in priority areas.	On-ground works undertaken at least 4 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Revegetate weed management sites to discourage weed regrowth and prevent erosion where appropriate.	Weed management sites revegetated.	Total area of revegetation implemented.	TSRA rangers, TSIRC staff	As required
	Prevent spread of weeds to or from Iama.	No weeds detected on transport arriving and leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	Biosecurity Officers	Ongoing
	Develop fact sheets for each priority weed.	High priority weed brochures developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations on Gabba and Sassie Islands and determine the need for a control program.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff trained in feral animal monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training,	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	Rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	2018

3.3 Poruma

Overview

Poruma (Coconut Island) is in the Central Islands Cluster of the Torres Strait, which also includes Warraber, Masig and Iama. Poruma is approximately 100 km north-east of Thursday Island. It is a low-lying coral cay approximately 2 km long and 0.3 km wide.

The island is reasonably flat, with most of the land 5-7 m above sea level except along the southern side of the island, where sand dunes rise up to 12 m in height. The village is located on the coastal strip to the west of the airstrip. Land to the north and east of the airstrip is undeveloped, except for a solid waste depot. The population of Poruma is 146 (ABS 2011).

The Porumalgal (TSI) Corporation RNTBC represents the Traditional Owners of Poruma. The Porumalgal (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities.

The island's vegetation cover has been impacted over time by disturbances associated with human occupation and settlement. Major impacts to the island have been the clearing of vegetation for settlement and infrastructure such as the airstrip, the garbage disposal area and water storage. There are also likely to have been historical impacts to vegetation on the island associated with timber harvesting for industry (3D Environmental, January 2013).

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Poruma Island' (3D Environmental, January 2013) reports the present vegetation cover is simple and limited to a single natural 'vine thicket' vegetation community and a coastal dune complex that comprises dune grassland/ herbland and coastal shrublands. The total known flora comprises 180 species, of which 117 are native (65 per cent) and 63 non-native (35 per cent). No species listed as threatened at the federal and state level are known to occur. Two species are assigned regional significance and 58 are culturally significant.

Biosecurity Issues

Weeds

The majority of the 63 introduced plant species recorded on the island are associated with disturbed and developed areas within and surrounding the Poruma community and fringing disturbed sites such as major roads and tracks, dump, airfield, recreation areas and the island cemetery.

Four species are recognised in the *Biosecurity Act 2014* as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Poruma's environmental and cultural assets and values.

Weed Mapping Poruma

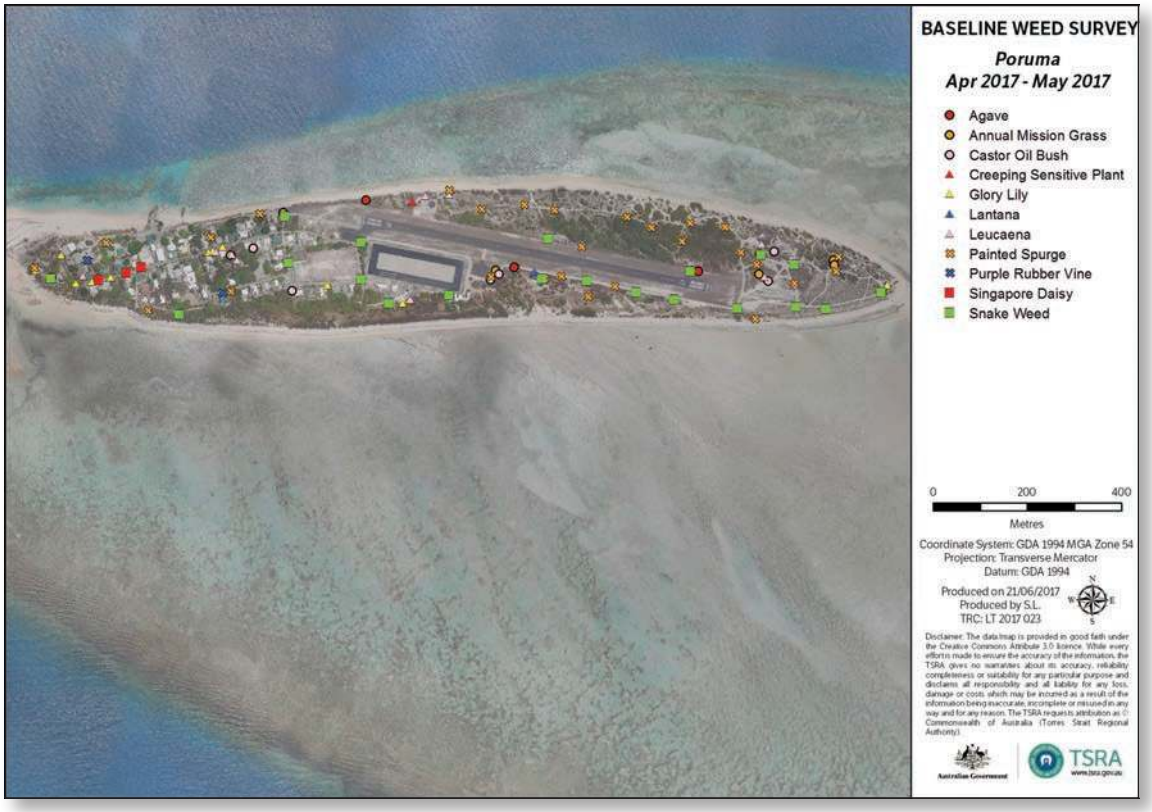


Table C7 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table C7: Poruma Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Lantana	*Lantana camara*	Several infestations around the island	Very high	Lantana
Purple rubber vine	*Cryptostegia madagascariensis*	In house gardens throughout the community	Very high	Purple rubber vine
Singapore daisy	*Sphagneticola trilobata*	Throughout the community	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community and used for cultural purposes	Very high outside of house gardens	Yellow bells

***** *Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table C8** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table C8: Poruma Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Castor oil bush	*Ricinus communis*	A small infestation at the dump	Moderate	Castor oil bush
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Hyptis	*Hyptis suaveolens*	In the community and access tracks	Moderate	Hyptis
Leucaena	*Leucaena leucocephala*	Current distribution is restricted to a few isolated occurrences	High	Leucaena
Mother in law's tongue	*Sanseviera trifasciata*	A number of robust infestations occur on the island	Moderate	Mother in law's tongue
Rubber bush	*Calotropis gigantea*	Current distribution is restricted to a few isolated occurrences	Moderate	Rubber bush
Scarlet flower	*Ipomoea hederifolia*	Recorded throughout the disturbed shrublands and vine thicket margins adjacent to the community	Moderate	Scarlet flower
Sisal	*Agave spp.*	On the margins of vine thicket habitats and used for traditional purposes	Moderate	Sisal
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Snakeweed	*Stachytarpheta jamaicensis*	In disturbed areas	Moderate	Snakeweed

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Two introduced fauna species are known to occur on Poruma. Table 3 below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table C9: Poruma Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Black rat	*Rattus rattus*	In the community	High	Black rat

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

The black rat poses a threat to culturally significant flora and native fauna, particularly bird species during nesting when eggs may be vulnerable to foraging. They have been recorded in and around houses in all vegetated habitats on Poruma, with reports of occasional outbreaks causing potentially serious health problems to the local community and damage to household goods and infrastructure. The control of rats in and

around houses provided only temporary reduction in rat numbers and associated damage and the only long-term management option is the eradication of the introduced rat population (Leung unpubl. data).

A significant potential threat to native fauna on Poruma are the possible introduction of the exotic cane toad. Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Poruma. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Poruma Island Biosecurity Action Plan is intended to have a positive impact on Poruma's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Poruma.
- Increase Poruma community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Poruma Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor new project sites for weed incursions.
4. TSRA rangers, TSIRC staff and My Pathway workers to control and eradicate weeds in priority areas.
5. Prevent spread of weeds to or from Poruma.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Poruma provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique *Ailan Kastom*, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table C10: Poruma Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Poruma Island Biosecurity Action Plan.	Poruma Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Porumalgal TSRA rangers, Porumalgal (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Poruma Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Porumalgal TSRA rangers, Porumalgal (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
Weeds	Train TSRA rangers, TSIRC staff and My Pathways workers in weed control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways workers trained in weed control techniques.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers and TSIRC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Poruma.	No weeds detected on transport coming to and leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents.		Develop fact sheets for each priority weed
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff trained in feral animal monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of bush areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held, Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if Plant and Animal Diseases required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	Rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required

3.4 Warraber

Overview

Warraber (Sue Island) is in the Central Islands Cluster of the Torres Strait, which also includes Masig, Poruma and Iama. Warraber is approximately 78 km north-east of Thursday Island. It is a low-lying coral cay approximately 1.4 km long and 0.7 km wide with a total area of 74 ha.

The Warraber Sustainable Land Use Strategy (Conics 2010) outlines that the island is characterised by vine thickets and dune grasslands. The village is located on the eastern side of the island and is separated from the western side by a 720 m airstrip that bisects the island. Land to the west of the airstrip is uninhabited and contains large vegetated areas, as well as the island's water storage area and waste depot. The population of Warraber is 220 (ABS 2011).

The Traditional Owners of Warraber are represented by the Warraberalgal (TSI) Corporation RNTBC. The Warraberalgal (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities

The island's vegetation cover has been impacted over time by disturbances associated with human occupation and settlement. Major impacts to the island have been the clearing of vegetation for settlement and infrastructure such as the airstrip, the garbage disposal area and water storage. There are also likely to have been historical impacts to vegetation on the island associated with timber harvesting for industry (3D Environmental, January 2013).

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Warraber Island' (3D Environmental, January 2013) reports five natural vegetation communities, within two broad vegetation groups and three regional ecosystems are recognised on the island. There are 201 species of flora comprising 137 native species (68 per cent) and 63 non-native species (32 per cent). No species listed as threatened at the federal and state level are known to occur. Six species are assigned regional significance and 78 (38 per cent) are culturally significant.

Biosecurity Issues

Weeds

The majority of the 63 introduced species recorded on the island are associated with disturbed and developed areas within and surrounding the Warraber community and fringing disturbed sites, such as roads and tracks, dump, airfield and recreation areas.

Three species are recognised in the *Biosecurity Act 2014* as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Warraber's environmental and cultural assets and values.

Weed Mapping Warraber

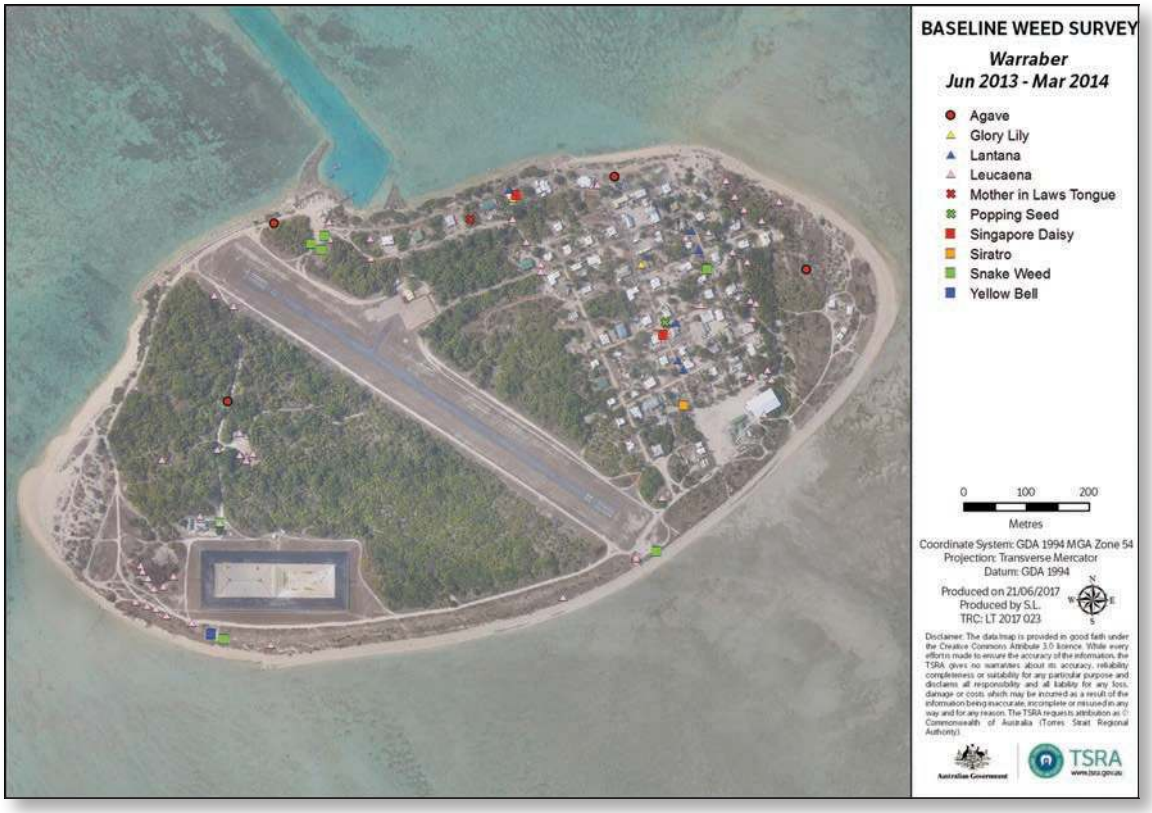


Table C11 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table C11: Warraber Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Lantana	*Lantana camara*	Restricted to disturbed areas near the township and airstrip	Very high	Lantana
Singapore daisy	*Sphagneticola trilobata*	Around the community area	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community	Very high outside of house gardens	Yellow bells

*****Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table C12** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table C12: Warraber Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Bundled pigeon flower	*Desmanthus pernambucanus*	In the village	High	Bundled pigeon flower
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Castor oil bush	*Ricinus communis*	A small infestation at the dump	Moderate	Castor oil bush
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Hyptis	*Hyptis suaveolens*	In the community and access tracks	Moderate	Hyptis
Leucaena	*Leucaena leucocephala*	Restricted to a few isolated occurrences	High	Leucaena
Neem tree	*Azadirachta indica*	Restricted to a few isolated occurrences	Moderate	Neem tree
Scarlet flower	*Ipomoea hederifolia*	Recorded throughout the disturbed forest margins adjacent to the community	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community and disturbed areas	Moderate	Sensitive plant
Sisal	*Agave spp.*	In the community and used for traditional purposes	Moderate	Sisal
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Snakeweed	*Stachytarpheta jamaicensis*	At the back of the airstrip near the sewerage treatment plant	Moderate	Snakeweed

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

One introduced fauna species is known to occur on Warraber. **Table C13** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table C13: Warraber Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Feral cat	*Felis catus*	Throughout the island	High	Feral cat

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Feral cats are reported for the island (Natural Solutions 2008) and pose a threat to native wildlife, including mammals, birds, reptiles and frogs. Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. Should cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

The most significant potential threats to native fauna on Warraber are the possible introduction of the exotic cane toad or rats (*Rattus spp.*). Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Rats are an even greater potential threat given their agility and generalist diet. Should exotic rats be present, an extermination or control, project is recommended.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Warraber. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Warraber Island Biosecurity Action Plan is intended to have a positive impact on Warraber's environmental, social and cultural assets and values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Warraber.
- Increase Warraber community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Warraber Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor project sites for new weed incursions.
4. TSRA rangers, TSIRC staff and My Pathways workers to manage weeds in priority areas.
5. Prevent spread of weeds to or from Warraber.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

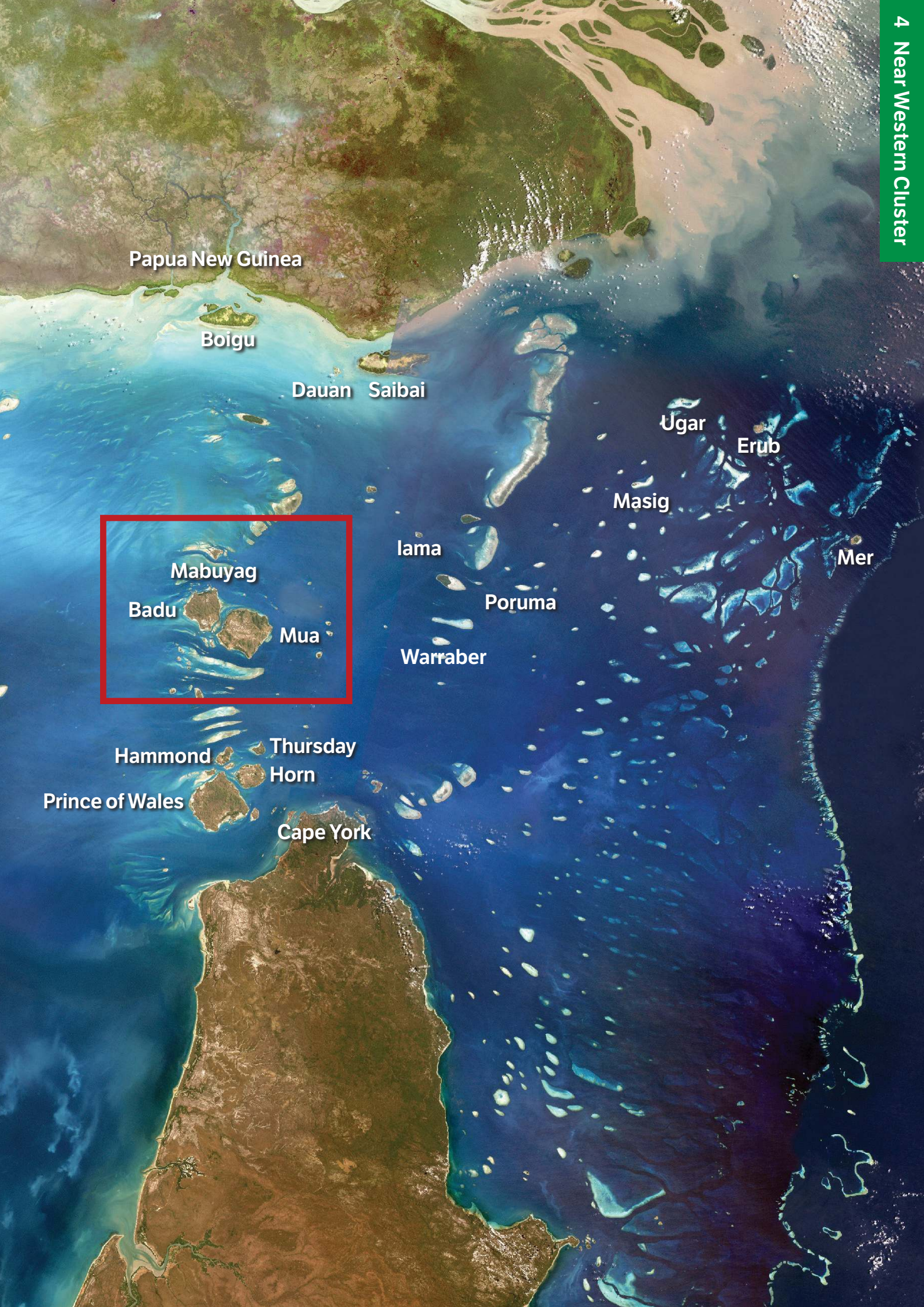
This Island Biosecurity Action Plan for Warraber provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique *Ailan Kastom*, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

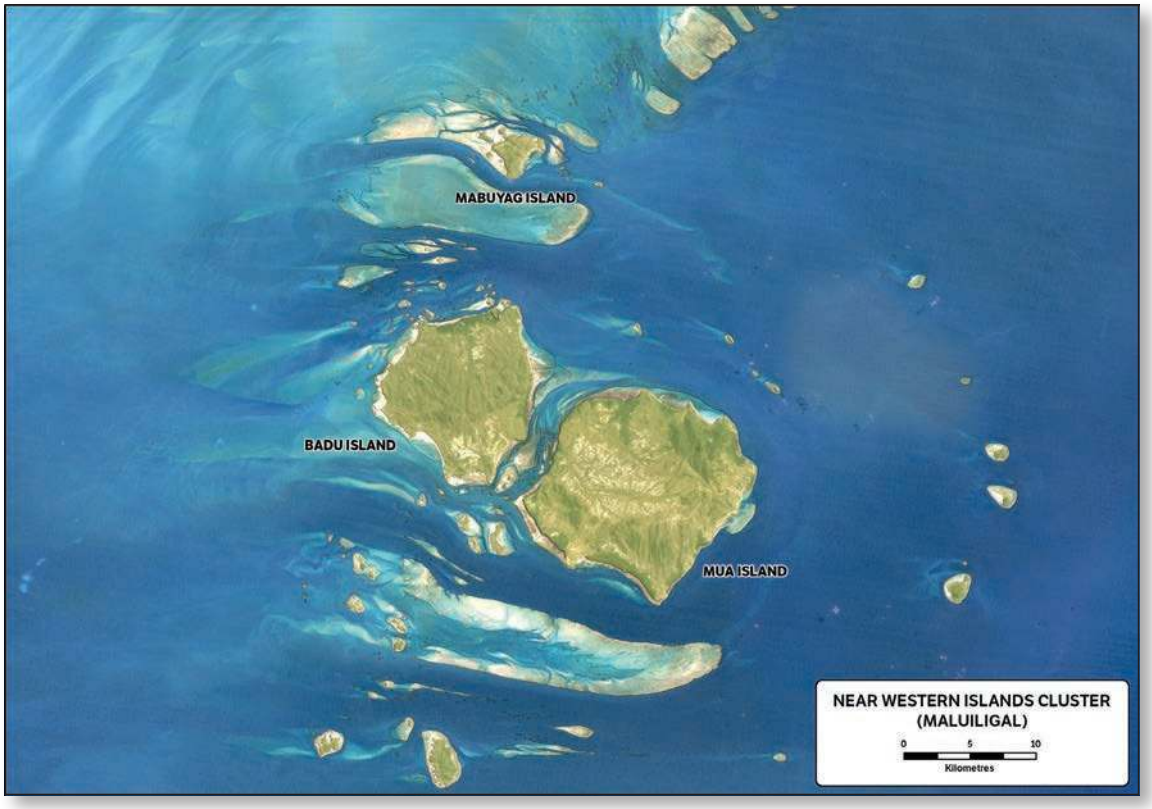
Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table C14: Warraber Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Warraber Island Biosecurity Action Plan.	Warraber Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Warraberalgal TSRA rangers, Warraberalgal (TSI) Corporation RNTBC, TSIRC	2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Warraber biosecurity management plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Warraberalgal TSRA rangers, Warraberalgal (TSI) Corporation RNTBC, TSIRC	2017 and ongoing
Weeds	Train TSRA rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways workers trained in weed control techniques.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers and TSIRC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Warraber.	No weeds detected on transport leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, TSIRC staff	As required
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff trained in feral animal monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required


Papua New Guinea
Boigu
Dauan
Saibai
Ugar
Erub
Masig
Iama
Mer
Poruma
Warraber
Mabuyag
Badu
Mua
Hammond
Thursday
Horn
Prince of Wales
Cape York

4 Near Western Islands Cluster



4.1 Mua - Kubin

Overview

Mua (Moa Island) is in the Near Western Islands Cluster of the Torres Strait and is located about 40 km from Thursday Island. Like Mabuyag to the north and Badu to the west, Mua is part of the submerged land bridge that runs from Cape York to Papua New Guinea and is composed predominantly of old volcanic and granite rocks.

Mua has a population of 420 people, split between the communities of Kubin and St Pauls, with Kubin having a population of 162 (ABS census 2011). Kubin, in the west, is where the majority of traditional inhabitants of Mua reside. The Mualgal, the people of Mua, speak a dialect of Kala Lagaw Ya (the Western-Central Torres Strait Language).

The Traditional Owners of Mua and surrounding uninhabited islets, represented by the Mualgal (TSI) Corporation RNTBC, hold the native title rights that were granted to them in 1999. The Mualgal (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities.

The island occupies a total area of 17,001 ha, making it the largest island in the Near Western Island Group and the second largest island in the Torres Strait. Along with the other islands of Mabuyag and Badu, Mua is formed on continental igneous basement rock with a diverse range of landforms including broad residual granite plains, alluvial terraces and beach ridges. The island is well watered with the larger catchments draining to the west flowing permanently. The highest point on the island is Banks Peak, reaching 376 m.

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Mua Island' (3D Environmental, January 2013) reports a total of 62 vegetation communities, within 23 broad vegetation groups, and 44 regional ecosystems are recognised across the island. This represents approximately 58 per cent of regional ecosystems recorded across the broader Torres Strait Islands landscape and 19 per cent of all regional ecosystems within the Cape York Peninsula Bioregion. The Mua flora is the richest, supporting approximately 51 per cent of the known flora in the Torres Strait region.

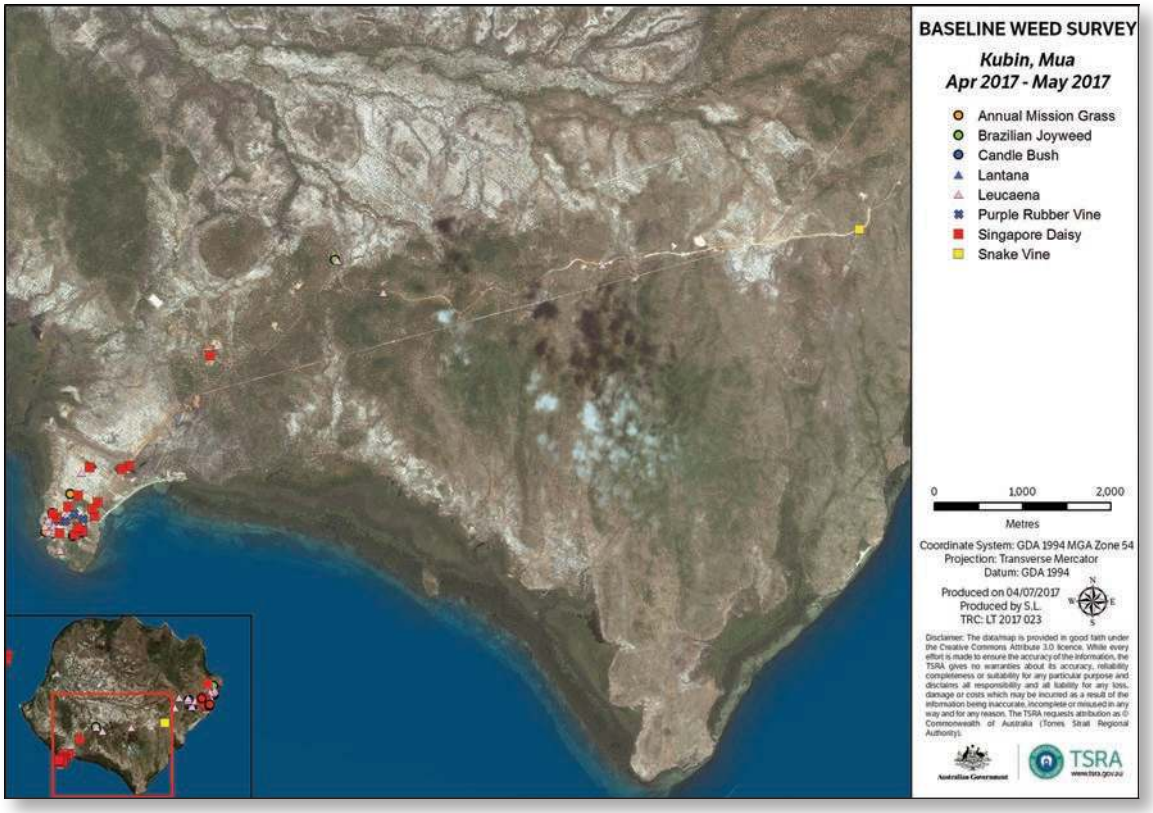
The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Mua Island' (3D Environmental, January 2013) identifies 676 species; however, this number is likely to increase with additional systematic surveys. This is made up of 19 ferns, one cycad, two conifers and 654 flowering plants. The flora comprises 609 native species (90 per cent) and 67 non-native species (10 per cent).

Kubin Biosecurity Issues

Weeds

The majority of species are associated with heavily disturbed and developed areas within and surrounding Kubin and fringing disturbed sites such as major roads and tracks, dumps, airfield, recreation areas and old settlement sites. Remnant vegetation throughout the island is generally free of weeds; however, a number of species pose potential threats.

Weed Mapping Mua - Kubin



Three species are recognised in the Biosecurity Act 2014 as 'restricted matters' (Sections 38–45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Mua's environmental and cultural assets and values.

Table D1 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table D1: Moa - Kubin Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Purple rubber vine	*Cryptostegia madagascariensis*	In house gardens throughout the community	Very high	Purple rubber vine
Singapore daisy	*Sphagneticola trilobata*	Throughout the community	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community and used for cultural purposes	High outside of house gardens	Yellow bells

*****Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table D2** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table D2: Moa - Kubin Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Along tracks and roads into the grasslands outside of the community	High	Annual mission grass
Bell weed	*Dipteracanthus prostratus*	In the village	Moderate	Bell weed
Brazilian joyweed	*Alternanthera brasiliana*	Small infestation on Banks Peak on the edge of the rainforest around the telecommunication tower	High	Brazilian joyweed
Bristly star bur	*Acanthospermum hispidum*	In the village	Moderate	Bristly star bur
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Castor oil bush	*Ricinus communis*	In the village	Moderate	Castor oil bush
Candle bush	*Senna alata*	In the village	Moderate	Candle bush
Coral vine	*Antigonon leptopus*	In the village in some yards	Moderate	Coral vine
Cupid's flower	*Ipomoea quamoclit*	In the community in house gardens	Moderate	Cupid's flower
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Hyptis	*Hyptis suaveolens*	In the community	Moderate	Hyptis
Leucaena	*Leucaena leucocephala*	Dense infestations in house yards, and along roadsides	High	Leucaena
Para grass	*Urochloa mutica*	Heavy infestations of para grass are also prominent in drainage lines outside the Kubin community	High	Para grass
Praxelis	*Praxelis clematidea*	In the community, disturbed areas and along roadsides	Moderate	Praxelis
Round leaf cassia	*Chamaecrista rotundifolia*	In the community	Low	Round leaf cassia
Rubber bush	*Calotropis gigantea*	In the community	Moderate	Rubber bush
Scarlet flower	*Ipomoea hederifolia*	In the village and invading the edges of shrublands and vine thickets	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed
Kudzu (Weskepu)	*Pueraria montana var. lobata*	In the community and adjoining disturbed areas	Moderate	Kudzu (Weskepu)

***** *Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Six introduced fauna species of concern are known to occur on Mua. **Table D3** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table D3: Moa - Kubin Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Cane toad	*Rhinella marina*	St Pauls community	Very High	Cane toad
Brown rat	*Rattus norvegicus*	In the community	Moderate	Brown rat
Feral pig	*Sus scrofa*	Throughout the island	Moderate	Feral pig
Feral horse	*Equus caballus*	Throughout the island	High	Feral horse
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Wild dog	*Canis familiaris*	Throughout the island	High	Wild dog

*****Fact sheet hyperlinks are only available on the electronic version of this document

A cane toad was discovered and killed on Mua at St Pauls community in May 2017. Cane toads are one of the most significant threats to native fauna if they become established. They would have significant detrimental impacts on the wetland environments and varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Every effort should be made to respond swiftly to any cane toad sightings on Mua and to find and remove any individual specimens.

The brown rat poses a threat to culturally significant flora and native fauna, particularly bird species during nesting when eggs may be vulnerable to foraging. They have been recorded in and around houses and in all the vegetated habitats on Mua, with reports of occasional outbreaks causing potentially serious health problems to the local community and damage to household goods and infrastructure. The control of rats in and around houses provided only temporary reduction in rat numbers and associated damage and that the only long-term management option is the eradication of the introduced rat population (Leung unpubl. data).

Feral pigs present a threat directly to frogs, reptiles and birds through predation. Ground-dwelling birds are particularly vulnerable. They also have indirect impacts through habitat destruction and degradation. Any wetland or riparian area is especially susceptible to damage by pigs.

Feral horse herds have the potential to cause significant environmental damage by spreading weeds through manure, creating erosion points along horse tracks and initiating habitat modification and destruction through grazing.

Feral cats are present on the island and pose a threat to native fauna, either directly through predation or by disturbance. Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

Wild dogs may be a significant risk for a number of native species. Dogs are a threat to ground-nesting birds such as beach stone-curlew.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Mua (Kubin). In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Mua – Kubin Island Biosecurity Action Plan is intended to have a positive impact on Mua's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique *Ailan Kastom* and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests.

Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Mua.
- Increase Kubin community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Kubin Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor new project sites for weed incursions.
4. TSRA rangers, TSIRC staff and My Pathway workers to manage weeds in priority areas.
5. Prevent spread of weeds to or from Mua and Kubin.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs. Ongoing surveys for detection of cane toads are required following 2017 sighting of toad on Mua.
2. Train TSRA rangers, TSIRC staff and My pathways workers in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Kubin and Mua provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique *Ailan Kastom*, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table D4: Moa - Kubin Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Kubin Island Biosecurity Action Plan.	Kubin Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Mualgal TSRA rangers, Mualgal (TSI) Corporation RNTBC, TSIRC	2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Kubin Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Mualgal TSRA rangers, Mualgal (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
Weeds	Train TSRA rangers, TSIRC staff and My Pathways workers in weed control techniques.	TSRA rangers, TSIRC staff trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways workers trained in weed control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers, TSIRC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2017 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Mua and Kubin.	No weeds detected on transport leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	Biosecurity Officer	Ongoing
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations of feral pigs on Mua and neighbouring uninhabited islands of Nagir and Getullia. Ongoing surveys for detection of cane toads are required following 2017 sighting of toad on Mua.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed. Rangers and Council staff trained. Number of days involved in training.	TSRA rangers, TSIRC staff	As required
	Train rangers, TSIRC staff and My Pathway workers in feral animal monitoring methods.	TSRA rangers, TSIRC staff and My Pathway workers trained in feral animal monitoring techniques by 2018.	TSRA rangers and TSIRC staff trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of beaches, wetlands and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine impacts of existing pest animal populations.	Number of surveys undertaken. Total area covered while undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees	TSRA, TSIRC, BQ	As required
	Construct a stock grid on the approach to Kubin to restrict feral animal access to the community.	TSIRC constructs a stock grid on the approach to Kubin.	Stock grid constructed.	TSRA, TSIRC	2018
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2017.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2017
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	2018

4.2 Mua - St Pauls

Overview

Mua (Moa Island) is in the Near Western Islands Cluster of the Torres Strait and is located about 40 km from Thursday Island. Like Mabuyag to the north and Badu to the west, Mua Island is part of the submerged land bridge that runs from Cape York to Papua New Guinea and is composed predominantly of old volcanic and granite rocks.

Mua has a population of 420 people split between the communities of Kubin and St Pauls, with St Pauls having a population of 258 (ABS census 2011). St Pauls originated as an Anglican mission and now holds a diverse range of traditional and historical community members. The Mualgal, the people of Mua, speak a dialect of Kala Lagaw Ya (the Western-Central Torres Strait Language).

The Traditional Owners of Mua and surrounding uninhabited islets, represented by the Mualgal (TSI) Corporation RNTBC, hold the native title rights granted to them in 1999. The Mualgal (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities.

The Island occupies a total area of 17,001 ha, making it the largest island in the Near Western Island Group and the second largest island in the Torres Strait. Along with the other islands of Mabuyag and Badu, Mua is formed on continental igneous basement rock with a diverse range of landforms including broad residual granite plains, alluvial terraces and beach ridges. The island is well watered with the larger catchments draining to the west flowing perennially. The highest point on the island is Banks Peak, reaching 376 m.

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Mua Island' (3D Environmental, January 2013) reports a total of 62 vegetation communities, within 23 broad vegetation groups and 44 regional ecosystems are recognised across the island. This represents approximately 58 per cent of regional ecosystems recorded across the broader Torres Strait Islands landscape and 19 per cent of all regional ecosystems within the Cape York Peninsula Bioregion. The Mua flora is the richest in the Torres Strait region.

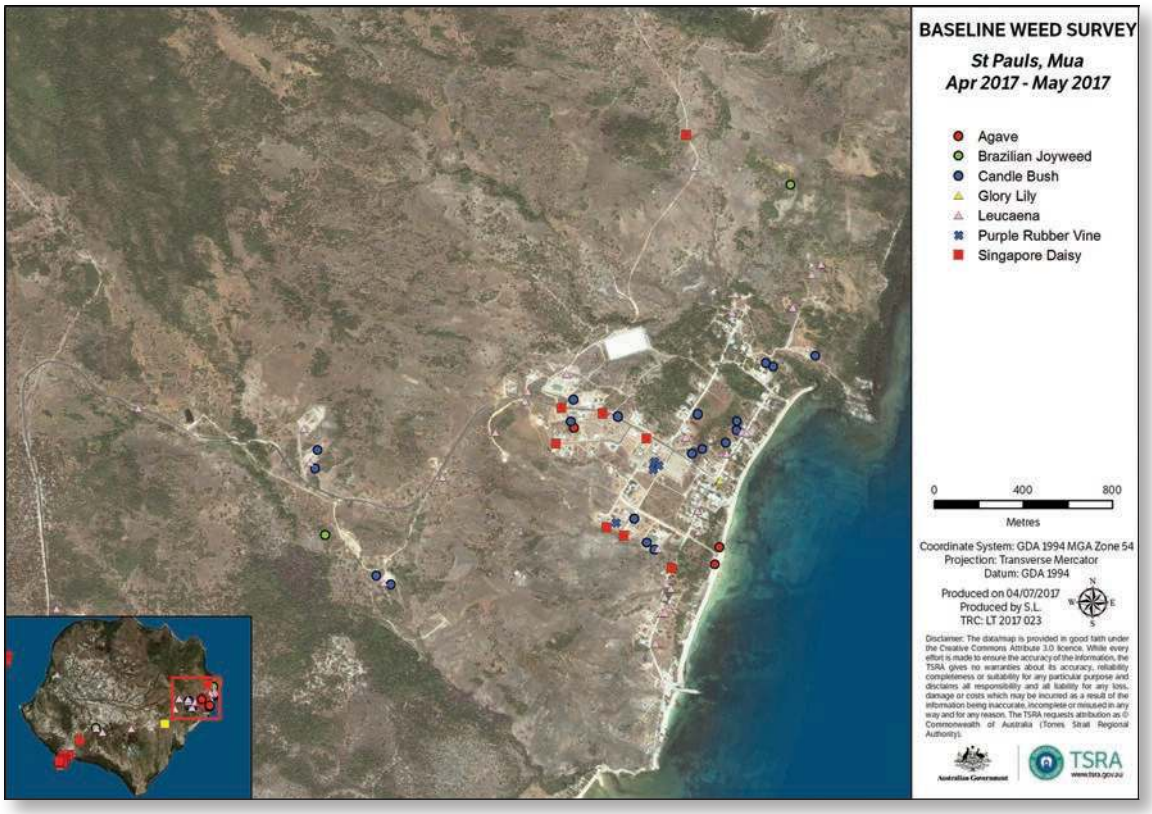
The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Mua Island' (3D Environmental, January 2013) identifies 676 species; however, this number is likely to increase with additional systematic surveys. This is made up of 19 ferns, one cycad, two conifers and 654 flowering plants. The flora comprises 609 native species (90 per cent), with 67 non-native species (10 per cent). The Mua flora supports approximately 51 per cent of the known flora for the Torres Strait Island.

St Pauls Biosecurity Issues

Weeds

The majority of species are associated with heavily disturbed and developed areas within and surrounding the St Pauls community and fringing disturbed sites, such as major roads and tracks, dumps, recreation areas and old settlement sites. Remnant vegetation throughout the island is generally free of weeds; however, a number of species pose potential threats.

Weed Mapping Mua - St Pauls



Five species are recognised in the *Biosecurity Act 2014* as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Mua's environmental and cultural assets and values.

Table D5 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table D5: Moa - St Pauls Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
African tulip tree	*Spathodea campanulata*	Throughout the community	Very high	African tulip tree
Prickly pear	*Opuntia stricta*	A few scattered plants of Prickly pear occur along the foreshore of St Pauls	Very high	Prickly pear
Purple rubber vine	*Cryptostegia madagascariensis*	In house gardens throughout the community	Very high	Purple rubber vine
Singapore daisy	*Sphagneticola trilobata*	Throughout the community	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community and used for cultural purposes	High outside of house gardens	Yellow bells

*****Fact sheet hyperlinks are only available on the electronic version of this document

The plants listed in **Table D6** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table D6: Moa - St Pauls Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Occurs around the northern margins of the St Pauls community	High	Annual mission grass
Brazilian joyweed	*Alternanthera brasiliana*	Small infestation on Banks Peak on the edge of the rainforest around the telecommunication tower	High	Brazilian joyweed
Bristly star bur	*Acanthospermum hispidum*	In the village	Moderate	Bristly star bur
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Castor oil bush	*Ricinus communis*	In the village	Moderate	Castor oil bush
Candle bush	*Senna alata*	In the village	Moderate	Candle bush
Coral vine	*Antigonon leptopus*	In the village in some yards	Moderate	Coral vine
Cupid's flower	*Ipomoea quamoclit*	In house gardens in the St Pauls community forming dense infestations	Moderate	Cupid's flower
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Grader grass	*Themeda quadrivalvis*	Along roadsides and disturbed areas	High	Grader grass
Hyptis	*Hyptis suaveolens*	In the community	Moderate	Hyptis
Leucaena	*Leucaena leucocephala*	Dense infestations in house yards, and along roadsides	High	Leucaena
Neem tree	*Azadirachta indica*	In the community	Moderate	Neem tree
Para grass	*Urochloa mutica*	In drainage lines just west of St Pauls	High	Para grass
Praxelis	*Praxelis clematidea*	In the community, disturbed areas and along roadsides	Moderate	Praxelis
Round leaf cassia	*Chamaecrista rotundifolia*	In the community	Low	Round leaf cassia
Rubber bush	*Calotropis gigantea*	In the community	Moderate	Rubber bush
Scarlet flower	*Ipomoea hederifolia*	In the village and invading the edges of shrublands and vine thickets	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Sisal	*Agave sisalana*	located around the Prickly pear along the beach front at St Pauls	Moderate	Sisal
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed
Thatch grass	*Hyparrhenia rufa*	Beginning to dominate native grasslands in and around St Pauls	High	Thatch grass
Kudzu (Weskepu)	*Pueraria montana var. lobata*	In the community and adjoining disturbed areas	Moderate	Kudzu (Weskepu)

*****Fact sheet hyperlinks are only available on the electronic version of this document

Pest Animals

Six introduced fauna species of concern are known to occur on Mua Island. **Table D7** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table D7: Moa - St Pauls Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Cane toad	*Rhinella marina*	St Pauls community	Very High	Cane toad
Brown rat	*Rattus norvegicus*	In the community	Moderate	Brown rat
Feral pig	*Sus scrofa*	Throughout the island	Moderate	Feral pig
Feral horse	*Equus caballus*	Throughout the island	High	Feral horse
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Wild dog	*Canis familiaris*	Throughout the island	High	Wild dog

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Conics (2008b) reported the exotic brown rat as being present, though the species is not listed in their fauna survey results. The report states that the species was introduced to St Pauls and occupied the IBIS store prior to eradication efforts. It is reported as common within the Kubin community. The black rat is likely to be a greater environmental threat than the brown rat given that the latter species is less likely to occur away from human settlements (Watts & Aplin 2008).

Feral pigs present a threat directly to frogs, reptiles and birds through predation. Ground-dwelling birds are particularly vulnerable. They also have indirect impacts through habitat destruction and degradation. Feral pigs are present on the island and, although hunted on a regular basis, Conics (2008b) reports damage by pigs within all habitat areas. Any wetland or riparian area is especially susceptible to damage by pigs.

The Kubin community reports large numbers of horses are now present on Mua Island and there is evidence of the herd causing significant environmental damage by spreading weeds through manure, creating erosion points along horse tracks and initiating habitat modification and destruction through grazing, and there is the likelihood the overall herd size is environmentally unsustainable. Control measures through the development of a Wild Horse Management Plan have been agreed by the Mua communities and include initiating the development of horse paddocks adjacent to the Kubin and St Paul communities, with horse owners agreeing to manage their horses within the paddocks, desexing stallions and the humane destruction of unwanted animals.

The Mualgal Working on Country Plan 2010–11 reports the existence of goat and deer on Mua, although current reports indicate neither species is present on the island.

One or two cats were present in March 2011 (Terry Reis pers. obs.). This population has significantly increased since that 2011 report, with sightings of feral cats now common throughout Mua. Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred; a cat was found near St Pauls eating a juvenile bandicoot (Isoodon sp.) in March 2011 (Terry Reis pers. obs.). If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997). Mua has three species of native rodent, and further survey work may identify additional native ground-dwelling mammals. Feral cats would kill native rodents and would also prey on small birds, reptiles and frogs.

Dogs are present on Mua in large numbers (Conics 2008b) and may be a significant risk for a number of native species. Dogs are a threat to ground-nesting birds such as beach stone-curlew.

The most significant potential threat to native fauna on the Mua is the possible introduction of the exotic cane toad. An individual cane toad was discovered and killed at St Pauls community in May 2017. Cane toads would have a dramatic impact on the wetlands and varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Every effort should be made to respond swiftly to any cane toad sightings on Mua to find and remove any individuals.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Mua (St Pauls). In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the St Pauls Island Biosecurity Action Plan is intended to have a positive impact on St Pauls' environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Mua.
- Increase St Pauls community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the St Pauls Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathways workers in weed control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor project sites for new weed incursions.
4. TSRA rangers, TSIRC staff and My Pathways workers to manage weeds in priority areas.
5. Prevent spread of weeds to or from Mua and St Pauls.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs. Ongoing surveys for detection of cane toads are required following 2017 sighting of toad on Mua.
2. Train TSRA rangers, TSIRC staff and My pathways workers in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of shrubland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for St Pauls and Mua provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique *Ailan Kastom*, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table D8: Mua - St Pauls Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the St Pauls Island Biosecurity Action Plan.	St Pauls Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Mualgal TSRA rangers, Mualgal (TSI) Corporation RNTBC), TSIRZ	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in St Pauls Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Mualgal TSRA rangers, Mualgal (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
Weeds	Train TSRA rangers, TSIRC staff and My Pathways workers in weed control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways employees trained in weed control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers, TSIRC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from St Pauls and Mua.	No weeds detected on transport leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	Biosecurity Officer	Ongoing
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations of feral pigs on Mua and neighbouring uninhabited islands of Nagir and Getullia. Ongoing surveys for detection of cane toads are required following 2017 sighting of toad on Mua.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff and My Pathway workers in feral animal monitoring methods.	TSRA rangers, TSIRC staff and My Pathway workers trained in feral animal monitoring techniques by 2018.	TSRA rangers and TSIRC staff trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of beaches, wetlands and grassland areas for incursions of pest animals.	Rangers undertake pest animal monitoring to determine impacts of existing pest animal populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
	Construct a stock grid on the approach to St Pauls to restrict feral animal access to the community.	Council constructs a stock grid on the approach to St. Pauls.	Stock grid constructed.	TSRA, TSIRC	2017
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	2018

4.3 Mabuyag

Overview

Mabuyag, along with the larger islands of Mua and Badu, is part of the Near Western Cluster of islands, which are formed on continental igneous rocks. The landscape is rugged, with low, shrubby, windswept vegetation occupying numerous hillocks and knolls. The island, located 69 km north of Thursday Island, is 4 km long and 3.5 km wide and has an area of 744 ha. It is mostly rocky and undulating with a topographic high point of 263 m. There are no permanently flowing streams on the island, although a number of groundwater springs are present which discharge on a seasonal basis.

Like Mua and Badu, Mabuyag is part of the submerged land bridge that runs from Cape York to Papua New Guinea and is composed predominantly of old volcanic and granite rocks.

The population of Mabuyag is 260 (ABS 2011). Land tenure is DOGIT (deed of grant in trust) with native title determined on 06 July 2000. The Goemulgal, the people of Mabuyag, speak one of four dialects of Kala Lagaw Ya (the Western-Central Torres Strait Language).

The Registered Native Title Body Corporate is the Goemulgaw (TSI) Corporation RNTBC, which holds the title of the land on behalf of the Traditional Owners. The Goemulgaw (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities.

The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Mabuyag Island' (3D Environmental, January 2013) identifies a total of 21 vegetation communities, within 11 broad vegetation groups and 31 regional ecosystems are recognised across the island, representing approximately 17 per cent of regional ecosystems recorded across the broader Torres Strait Islands landscape. There are 433 flora species recorded on the island, comprising 363 native species (94 per cent) and 70 introduced species (16 per cent). This represents approximately 32 per cent of the known flora for the Torres Strait Islands group.

Biosecurity Issues

Weeds

As with all the inhabited Torres Strait Islands the majority of species are associated with heavily disturbed and developed areas within and surrounding the community and fringing disturbed sites such as major roads and tracks, dumps, airfield, recreation areas and old settlement sites. Remnant vegetation throughout the island is generally free of weeds; however, a number of species pose potential threats.

Five species are recognised in the Biosecurity Act 2014 as 'restricted matters' (Sections 38–45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Mabuyag's environmental and cultural assets and values.

Weed Mapping Mabuyag

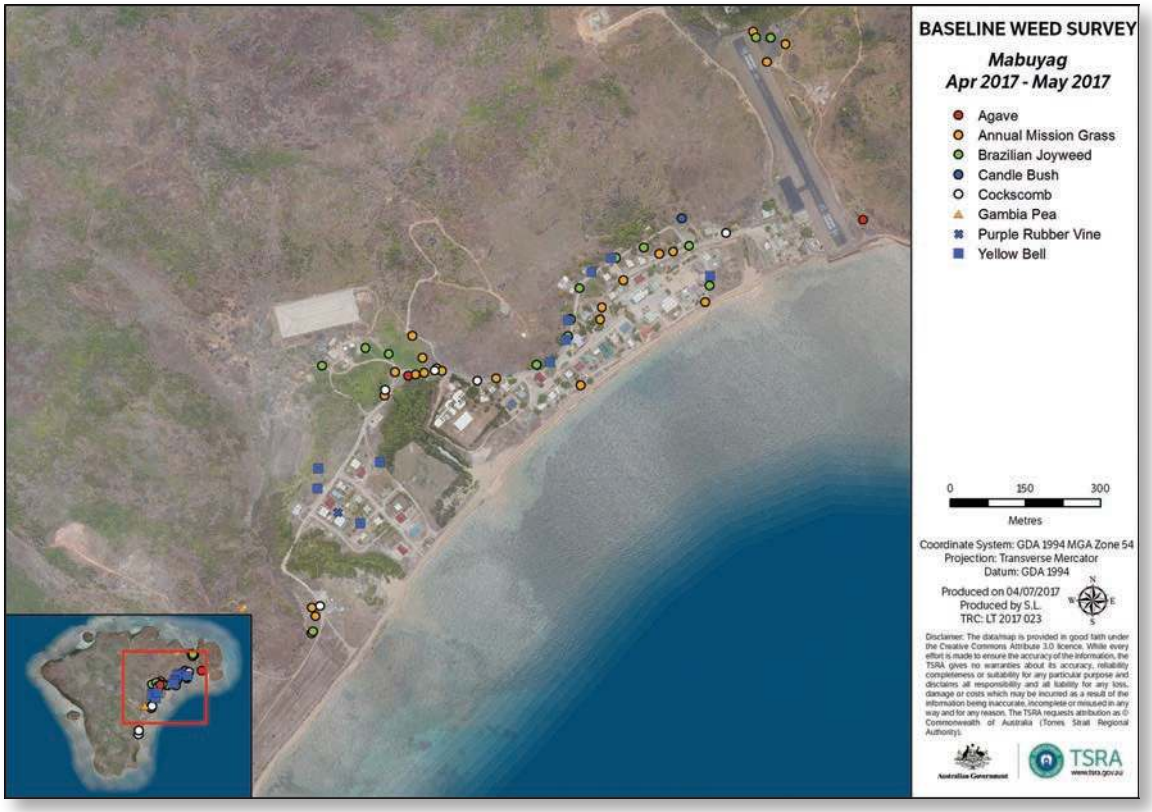


Table D9 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table D9: Mabuyag Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Pond apple	*Annona glabra*	One plant recorded in the community	Very high	Pond apple
Purple rubber vine	*Cryptostegia madagascariensis*	Planted as garden ornamentals in the community	Very high	Purple rubber vine
Sicklepod	*Senna obtusifolia*	A single plant was recorded on the island by McKenna (2011)	Very high	Sicklepod
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	Throughout the community and is in the initial stages of invading rock pavement margins	Very high outside of house gardens	Yellow bells

**Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table D10** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table D10: Mabuyag Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Along tracks and roads into the extensive grasslands to the west of the community	High	Annual mission grass
Brazilian joyweed	*Alternanthera brasiliana*	Near the IBIS building	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Candle bush	*Senna alata*	In the community and disturbed areas	Moderate	Candle bush
Coral vine	*Antigonon leptopus*	Infestation on rock pavement on the edge of the Mabuiag community	Moderate	Coral vine
Cupid's flower	*Ipomoea quamoclit*	On margins of community forming dense infestations	Moderate	Cupid's flower
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Hyptis	*Hyptis suaveolens*	Widespread in and around the community and is becoming prominent on rock pavement shrublands	Moderate	Hyptis
Indian calopo	*Calopogonium mucunoides*	In the community	Moderate	Indian calopo
Leucaena	*Leucaena leucocephala*	In the community and disturbed areas	High	Leucaena
Milkweed	*Euphorbia heterophylla*	In the community	Moderate	Milkweed
Mother in law's tongue	*Sanseviera trifasciata*	In the community	Moderate	Mother in law's tongue
Praxelis	*Praxelis clematidea*	In the community and disturbed areas	Moderate	Praxelis
Scarlet flower	*Ipomoea hederifolia*	On disturbed margins of the community invading swampy woodlands and vine thicket	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community and adjoining disturbed areas	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In the community and on the margins of tracks and roads.	Moderate	Siratro
Sisal	*Agave spp.*	In the community	Moderate	Sisal
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed
Tropical kudzu	*Pueraria phaseoloides*	In the community and adjoining disturbed areas	Moderate	Tropical kudzu
Kudzu (Weskepu)	*Pueraria montana var. lobata*	In the community and adjoining disturbed areas	Moderate	Kudzu (Weskepu)

***** *Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Two introduced fauna species of concern are known to occur on Mabuyag. **Table D11** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pet animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table D11: Mabuyag Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Feral pig	*Sus scrofa*	Throughout the island	Moderate	Feral pig
Feral cat	*Felis catus*	Throughout the island	High	Feral cat

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Cats are reported for the island (Watson 2009) but no level of abundance is provided. Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. Should cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997). At this stage only grassland Melomys (*Melomys burtoni*) have been recorded on Mabuyag Island but further survey work may identify additional native ground-dwelling mammals. Cats would kill Melomys and would also prey on small birds, reptiles and frogs.

Pigs are reported for the island (Watson 2009) but no level of abundance is provided. Pigs present a threat directly to frogs, reptiles and birds through predation. Ground-dwelling birds are particularly vulnerable. They also have indirect impacts through habitat destruction and degradation. Any wetland or riparian area is especially susceptible to damage by pigs.

An unmanaged horse was reported (Watson 2009), but apparently has since gone (Hitchcock pers. comm. 2011).

The most significant potential threat to native fauna on Mabuyag Island is the possible introduction of the exotic cane toad. Cane toads would have a dramatic impact on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Mabuyag. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Mabuyag Island Biosecurity Action Plan is intended to have a positive impact on Mabuyag's environmental, social and cultural values by providing an overview and clear and concise set of community agreed actions that strengthen the island's unique *Ailan Kastom* and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Mabuyag.

- Increase Mabuyag community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Mabuyag Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor new project sites for weed incursions.
4. TSRA rangers, TSIRC staff and My Pathway workers to control and eradicate weeds in priority areas.
5. Investigate options for revegetating weed management project sites.
6. Prevent spread of weeds to or from Mabuyag.
7. Develop fact sheets for each priority weed.
8. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Mabuyag Island provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations and the management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table D12: Mabuyag Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Mabuyag Island Biosecurity Action Plan.	Mabuyag Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Mabuygiw TSRA rangers, Goemulgaw (TSI) Corporation RNTBC, TSIRZ	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Mabuyag Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Mabuygiw TSRA rangers, Goemulgaw (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
Weeds	Train TSRA rangers, TSIRC staff and My Pathway workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff trained in weed identification from 2017. TSRA rangers, TSIRC staff and My Pathways workers trained in weed control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers and TSIRC staff monitor project sites for new weed incursions.	Site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSRA rangers, TSIRC staff	As required
	TSRA rangers, TSIRC staff and My Pathways workers manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Investigate options for revegetating weed management project sites.	Revegetation options investigated.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers	As required
	Prevent spread of weeds to or from Mabuyag.	No weeds detected on transport coming to or leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, Council staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochures developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff and My Pathways workers trained in feral animal monitoring and trapping techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required

4.4 Badu

Overview

Badu is in the Near Western Islands Cluster of the Torres Strait and is located about 40 km north of Thursday Island. Like Mabuyag to the north and Mua to the east, Badu is part of the submerged land bridge that runs from Cape York to Papua New Guinea and is composed predominantly of old volcanic and granite rocks.

The Badu community is the second largest in the Torres Strait, behind Thursday Island, with a population of 783 (ABS census 2011). The main village is located towards the south-eastern end of the island, south of the airstrip. The village comprises two residential areas and a large community services area.

The Traditional Owners of Badu are represented by the Mura Badulgal (TSI) Corporation RNTBC. The Mura Badulgal (TSI) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities.

Badu is roughly square, measuring approximately 10 km by 10 km and has an area of 10,467 ha. The terrain alternates between rocky mountainous outcrops – with Mt. Mulgrave forming the highest peak at 198 m – and sandy ridges covered with light scrub. Low-lying regions of the island contain both swamps and mangroves. (Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Badu Island, 3D Environmental, January 2013).

A total of 51 vegetation communities, within 20 broad vegetation groups, and 32 regional ecosystems are recognised across the island, representing approximately 42 per cent of regional ecosystems recorded across the broader Torres Strait Islands landscape. The 'Profile for Management of the Habitats and Related Ecological and Cultural Resource Values of Badu Island' (3D Environmental, January 2013) identifies 597 plant species recorded on the island but this number is likely to fluctuate with identifications from recent surveys. This is made up of 18 ferns, 1 cycad, 1 conifer and 577 flowering plants. The flora comprises 560 native species (95 per cent) and 37 non-native species (five per cent). One hundred and seventeen families and 390 genera are represented. The Badu Island flora represents approximately 45 per cent of the known flora for the Torres Strait Islands.

Biosecurity Issues

Weeds

The majority of the 37 naturalised species recorded on the island are associated with heavily disturbed and developed areas within and surrounding the Badu community, family beach sites, old settlement sites and fringing disturbed sites such as major roads and tracks, dumps, airfield and recreation areas. Remnant vegetation throughout the island is generally free of weeds; however, a number of species pose potential threats.

Eight species are recognised in the Biosecurity Act 2014 as 'restricted matters' (Sections 38–45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to manage the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Badu's environmental and cultural assets and values.

Weed Mapping Badu

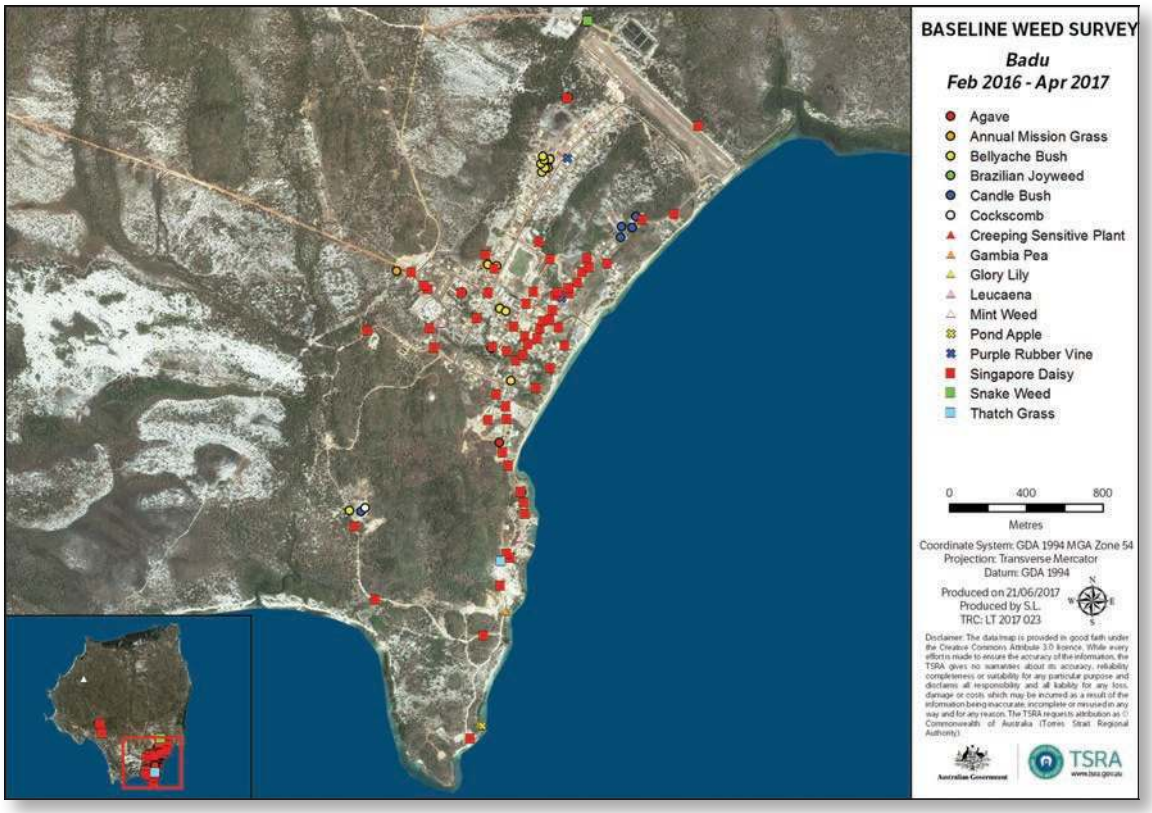


Table D13 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table D13: Badu Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
African tulip tree	*Spathodea campanulata*	In the community	Very high	African tulip tree
Bellyache bush	*Jatropha gossypifolia*	In the village area and at the rubbish dump	Very high	Bellyache bush
Giant parramatta grass	*Sporobolus fertilis*	Along tracks and roads and starting to invade native grasslands, open woodlands and wetland areas	Very high	Giant parramatta grass
American rat's tail grass	*Sporobulus jacqemontii*	Along tracks and roads and starting to open woodlands and grasslands	Very high	American rat's tail grass
Pond apple	*Annona glabra*	An infestation at an old garden site north of the airstrip has been reported	Very high	Pond apple
Purple rubber vine	*Cryptostegia madagascariensis*	Garden plant in a number of house yards around the community	Very high	Purple rubber vine
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	Largely restricted to the main settlement	Very high outside of house gardens	Yellow bells

*****Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table D14** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table D14: Badu Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Along tracks and roads into the grasslands outside of the community	High	Annual mission grass
Butterfly pea	*Clitoria ternatea*	Occurs on the roadsides and is common on the edge of the vine woodland	Moderate	Butterfly pea
Candle bush	*Senna alata*	In the community	Moderate	Candle bush
Guinea grass	*Megathyrsus maximus*	On the margins of the village and access tracks	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Hyptis	*Hyptis suaveolens*	In the community	Moderate	Hyptis
Indian calopo	*Calopogonium mucunoides*	In the community	Moderate	Indian calopo
Leucaena	*Leucaena leucocephala*	In the community, disturbed areas and along roadsides	High	Leucaena
Milkweed	*Euphorbia heterophylla*	In the community	Moderate	Milkweed
Mother in law's tongue	*Sanseviera trifasciata*	In the community	Moderate	Mother in law's tongue
Navua sedge	*Cyperus aromaticus*	In the community	High	Navua sedge
Praxelis	*Praxelis clematidea*	In the community, disturbed areas and along roadsides	Moderate	Praxelis
Round leaf cassia	*Chamaecrista rotundifolia*	In the community	Low	Round leaf cassia
Scarlet flower	*Ipomoea hederifolia*	In the community and the edges of shrublands and vine thickets	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Sisal	*Agave spp.*	On the margins of disturbed littoral dune vine thickets and in native grasslands	Moderate	Sisal
Snake vine	*Merremia dissecta*	Along roadside vegetation and sprawling over adjoining vine thicket	Moderate	Snake vine
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed
Thatch grass	*Hyparrhenia rufa*	Near the quarry and boat ramp	High	Thatch grass

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Five introduced fauna species of concern are known to occur on Badu. **Table D15** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table D15: Badu Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Cane toads	*Rhinella marina*	Badu community	Very High	Feral pig
Feral pig	*Sus scrofa*	Throughout the island	Moderate	Feral cat
Feral horse	*Equus caballus*	Throughout the island	High	
Feral cat	*Felis catus*	Throughout the island	High	
Wild dog	*Canis familiaris*	Throughout the island	High	

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Dogs, cats and horses are present on Badu (Conics 2009a, Stanton & Fell pers. obs.) although population size and impacts on fauna and habitat are not known. Evidence of pigs has been observed in riparian and swamp forest habitats and in open forest, rock pavements/shrub and modified habitats, and they are a focus for hunting using dogs.

Wild dogs may be a significant risk for a number of native species. Dogs are a threat to ground-nesting birds such as beach stone-curlew.

Cats are significant predators of native animals and have been implicated in the extinction of native species both on islands (Bloomer & Bester 1992) and on mainland Australia (Dickman et al. 1993). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. Should house cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997). This would be especially relevant on Badu Island, with its apparent lack of introduced rodents.

Feral pigs present a threat directly to frogs, reptiles and birds through predation. Ground-dwelling birds are particularly vulnerable. They also have indirect impacts through habitat destruction and degradation. Any wetland or riparian area is especially susceptible to damage by pigs.

Horses are known to occur on Badu (Conics 2009a, Stanton & Fell pers. obs. 2007). The introduction of horses occurred in the early 1990s. After their introduction, there was a substantial change in the composition, distribution and abundance of weed species as a direct result of trampling and grazing. Large numbers of horses are capable of substantial habitat modification and destruction, including the fouling of waterholes (Berman 2008). Control measures may be required should the population reach levels that are damaging to the environment.

The most significant potential threat to native fauna on Badu Island is the possible introduction of the exotic cane toad. An unconfirmed report stated that two cane toads were discovered and killed in Badu community in early 2016. Cane toads would have a dramatic impact on the wetlands and varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Every effort should be made to respond swiftly to any cane toad sightings on Badu to find and remove any individuals.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Badu. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Badu Island Biosecurity Action Plan is intended to have a positive impact on Badu's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Badu.
- Increase Badu community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Badu Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.
3. All plant and equipment to be inspected, and cleaned if required, prior to entering, and before leaving Badu.
4. Investigate funding opportunities for the construction of a wash-down facility near barge landing.

Proposed Weed Actions

1. Train rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSRA rangers and TSIRC staff to monitor project sites for new weed incursions.
4. TSRA rangers, TSIRC staff and My Pathways workers to control and eradicate weeds in priority areas.
5. Prevent spread of weeds to or from Badu.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs. Ongoing surveys for detection of cane toads are required following a 2016 sighting of toads on Badu.
2. Train TSRA rangers and TSIRC staff in feral animal monitoring methods.
3. TSRA rangers to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSRA rangers and TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

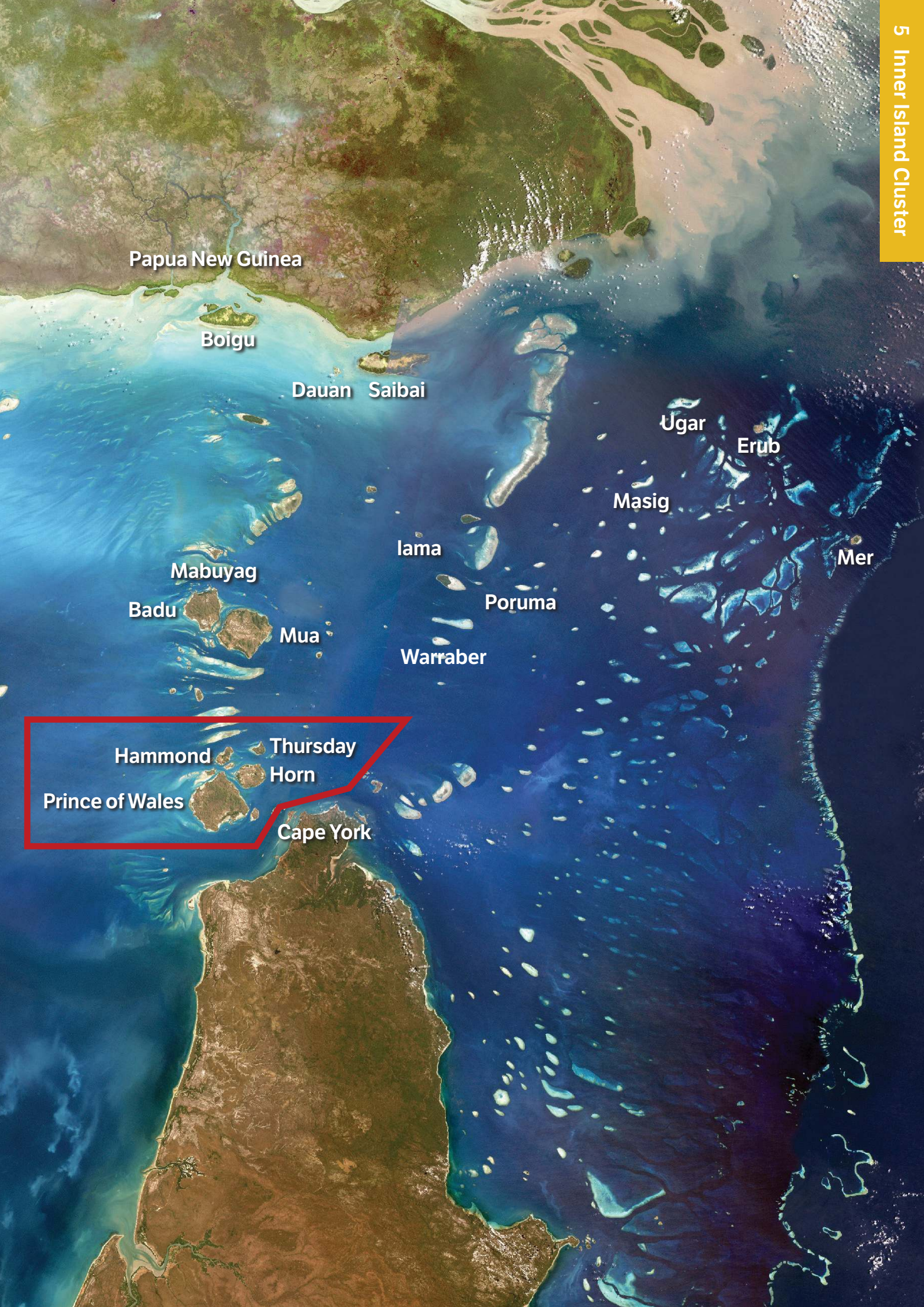
This Island Biosecurity Action Plan for Badu provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique *Ailan Kastom*, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide the development of TSRA ranger six-week work plans and TSIRC operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table D16: Badu Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSRA rangers and TSIRC staff to further develop and implement the actions in the Badu Island Biosecurity Action Plan.	Badu Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Mura Badhulgau TSRA rangers, Mura Badulgal (TSI) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Badu Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	TSRA LSMU, Mura Badhulgau TSRA rangers, Mura Badulgal (TSI) Corporation RNTBC, TSIRC	2018 and ongoing
	All plant and equipment to be inspected and cleaned if required prior to entering, and before leaving Badu.	New weed and pest animal incursions prevented from entering and/or leaving Badu.	No new weed or pest animals on Badu.	Mura Badhulgau TSRA rangers, Biosecurity Officer	Ongoing
	Investigate funding opportunities for the construction of a wash-down facility near barge landing.	Wash-down facility constructed.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA, TSIRC	2018
Weeds	Train TSRA rangers, TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.	TSRA rangers, TSIRC staff and My Pathways workers trained in weed identification from 2018. TSRA rangers, TSIRC staff and My Pathways workers trained in weed control techniques .	TSRA rangers and TSIRC staff trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Mapping undertaken.	Number of maps produced. Area covered.	TSRA rangers	Ongoing
	TSRA rangers, TSIRC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, TSIRC staff	As required
	TSRA rangers and TSIRC staff manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Badu.	No weeds detected on transport leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSRA rangers, TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents produced. Number of recipients.	TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSRA, TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations. Ongoing surveys for detection of cane toads are required following a 2016 sighting of toads on Badu.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, TSIRC staff	As required
	Train TSRA rangers, TSIRC staff in feral animal monitoring methods.	TSRA rangers, TSIRC staff trained in feral animal monitoring techniques by 2018.	TSRA rangers and TSIRC staff trained. Number of days involved in training.	TSRA rangers, TSIRC staff and My Pathways workers/participants	As required
	TSRA rangers undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSRA rangers undertake pest animal monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals.	Number of community meetings held. Number of attendees.	TSRA, TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSRA rangers, NAQS	As required
	Train TSRA rangers, TSIRC staff in exotic plant and animal disease monitoring methods.	TSRA rangers trained in exotic plant and animal disease monitoring techniques by 2018.	TSRA rangers trained. Number of days involved in training.	TSRA rangers, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSRA rangers undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSRA rangers, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSRA, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSRA, NAQS	As required


Papua New Guinea
Boigu
Dauan
Saibai
Ugar
Erub
Masig
Iama
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Badu
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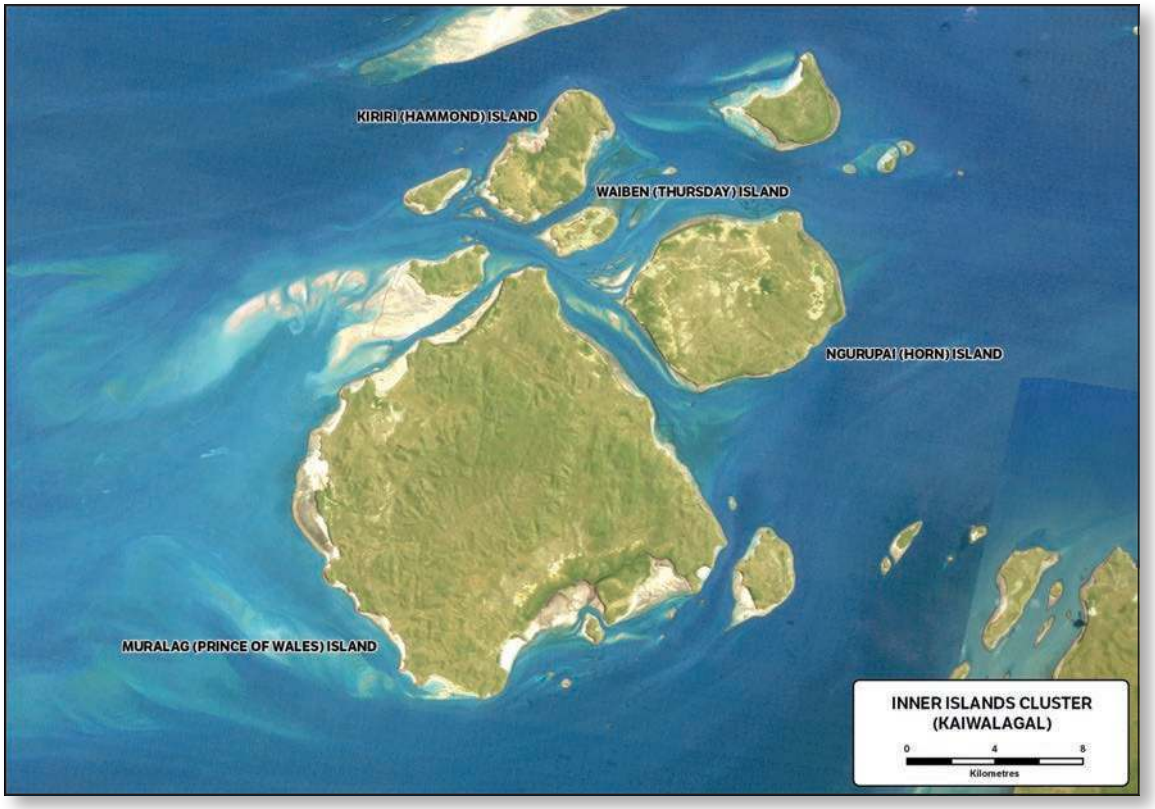
Poruma
Warraber
Hammond
Thursday
Horn
Prince of Wales
Cape York

5 Inner Islands Cluster



5.1 Kirriri (Hammond Island)

Overview

Kirriri (Hammond Island) is in the Inner Islands Cluster of the Torres Strait and is located immediately north of Thursday Island. Like Mua to the north and Ngurupai to the south, Hammond Island is part of the submerged land bridge that runs from Cape York to Papua New Guinea and is predominantly composed of old volcanic and granite rocks.

The island is approximately 6 km long and 3 km wide. It is a granitic island with a mangrove and mudflat coastline. The terrain is hilly except for a narrow coastal strip on the eastern side where part of the community is located. Large areas of Hammond Island are covered by vine forest, grasslands and woodlands. (Hammond Island Land Use Plan. RPS 2010).

The historical community of Hammond Island, St Josephs, originated as a Catholic mission and now hold a diverse range of traditional and historical community members. The community is located in the south-east corner of the island and has a population of 226 (2011 ABS Census).

The Kaurareg, the people of Hammond Island, speak a dialect of Kala Lagaw Ya (the Western-Central Torres Strait Language). The Traditional Owners of Hammond Island are represented by the Kaurareg Native Title (Aboriginal) Corporation RNTBC, which holds the native title rights granted to them in 1999. The Kaurareg Native Title (Aboriginal) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities

A total of 45 vegetation communities, within 11 broad vegetation groups and 8 regional ecosystems, are recognised across the island (Vegetation Communities and regional ecosystems of Torres Strait Islands, Queensland, Australia. 3D Environmental 2008). This represents 28 per cent of the total remnant vegetation communities found throughout the Torres Strait.

Biosecurity Issues

Weeds

The majority of species are associated with heavily disturbed and developed areas within and surrounding the community and fringing disturbed sites such as major roads and tracks, dumps, recreation areas and old settlement sites. Remnant vegetation throughout the island is generally free of weeds; however, a number of species pose potential threats.

Seven species are recognised in the *Biosecurity Act 2014* as 'restricted matters' (Sections 38-45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Hammond Island's environmental and cultural assets and values.

Table E1 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table E1: Kirriri Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Giant parramatta grass	*Sporobolus fertilis*	Along tracks and roads and starting to invade native grasslands, open woodlands and wetland areas	Very high	Giant parramatta grass
American rats tail grass	*Sporobulus jacqemontii*	Along tracks and roads and starting to open woodlands and grasslands	Very high	American rats tail grass
Prickly pear	*Opuntia stricta*	Scattered plants occur in house gardens	Very high	Prickly pear
Purple rubber vine	*Cryptostegia madagascariensis*	Garden plant in a number of house yards around the community	Very high	Purple rubber vine
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	Largely restricted to the main settlement	Very high outside of house gardens	Yellow bells
Yellow oleander	*Cascabela thevetia*	Scattered plants occur in house gardens	Very high outside of house gardens	Yellow oleander

***** *Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table E2** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table E2: Kirriri Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Brazilian joyweed	*Alternanthera brasiliana*	Around the telecommunication infrastructure	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Candle bush	*Senna alata*	In the community	Moderate	Candle bush
Cupid's flower	*Ipomoea quamoclit*	In the community	Moderate	Cupid's flower
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Leucaena	*Leucaena leucocephala*	In the community and disturbed areas	High	Leucaena
Mother in Law's Tongue	*Sanseviera trifasciata*	In the community	Moderate	Mother in Law's Tongue
Neem tree	*Azadirachta indica*	Throughout the community and beginning to infest shrublands, open woodlands, grasslands, floodplains, riparian zones, coastal sites and other disturbed natural vegetation		Neem tree
Rubber tree	*Manihot carthaginensis*	In the community	Moderate	Rubber tree
Scarlet flower	*Ipomoea hederifolia*	In the community	Moderate	Scarlet flower
Sensitive plant	*Mimosa pudica*	In the community and adjoining disturbed areas	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In the community and on the margins of tracks and roads	Moderate	Siratro
Sisal	*Agave spp.*	On the margins of disturbed littoral dune vine thickets near the dump site and in native grasslands	Moderate	Sisal
Snake vine	*Merremia dissecta*	Along roadside vegetation and sprawling over adjoining vine thicket	Moderate	Snake vine
Snakeweed	*Stachytarpheta jamaicensis*	In the community and adjoining disturbed areas	Moderate	Snakeweed

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Four introduced fauna species are known to occur on Hammond Island. **Table E3** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table E3: Kirriri Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Feral pig	*Sus scrofa*	Throughout the island	Moderate	Feral pig
Rusa deer	*Cervus timorensis*	Throughout the island	Moderate	Rusa deer
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Cane Toad	*Rhinella marina*	Throughout the island	Very High	Cane toad

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Feral pigs present a threat directly to frogs, reptiles and birds through predation. Ground-dwelling birds are particularly vulnerable. They also have indirect impacts through habitat destruction and degradation. Feral pigs are present on the island and although hunted on a regular basis, Conics (2008b) report damage by pigs within all habitat areas. Any wetland or riparian area is especially susceptible to damage by pigs.

The proliferation of Rusa deer presents a major threat to habitat integrity, especially for deciduous/semi-deciduous vine forest and Pandanus-dominant woodlands and grasslands, significantly increasing the potential for introduction of exotic plant species. An increasing deer population will also promote degradation of overall habitat stability as grazing reduces the effectiveness of fire as a tool to prevent shrubby invasion of grassland. Deer are also known to damage flora by antler rubbing and to degrade water quality and wetland habitat by wallowing (Biosecurity Queensland 2010).

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997).

Domestic dogs are present on Hammond Island (Conics 2008b) and may be a significant risk for a number of native species. Dogs are a threat to ground-nesting birds such as beach stone-curlew.

The most significant potential threat to native fauna on the Hammond Island would be the introduction of the exotic cane toad, with one recorded sighting in 2008 and recent sightings in July 2017. Cane toads would have a dramatic impact on the wetlands and varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions. Every effort should be made to respond swiftly to any cane toad sightings on Hammond Island to find and remove any individuals.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Hammond Island. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Hammond Island Biosecurity Action Plan is intended to have a positive impact on Hammond Island's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Aboriginal lore and *Ailan Kastom* and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Hammond Island.
- Increase Hammond Island community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Island Regional Council (TSIRC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with TSIRC staff to further develop and implement the actions specified in the Hammond Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSIRC staff to monitor project sites for new weed incursions.
4. TSIRC staff and My Pathways workers to manage weeds in priority areas.
5. Prevent spread of weeds to or from Hammond Island.
6. Develop fact sheets for each priority weed.
7. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs. Ongoing surveys for detection of cane toads are required following 2017 sighting of toads on Hammond Island.
2. Train TSIRC staff in feral animal monitoring methods.
3. TSIRC staff to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSIRC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Hammond Island provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique Aboriginal lore and Ailan Kastom, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

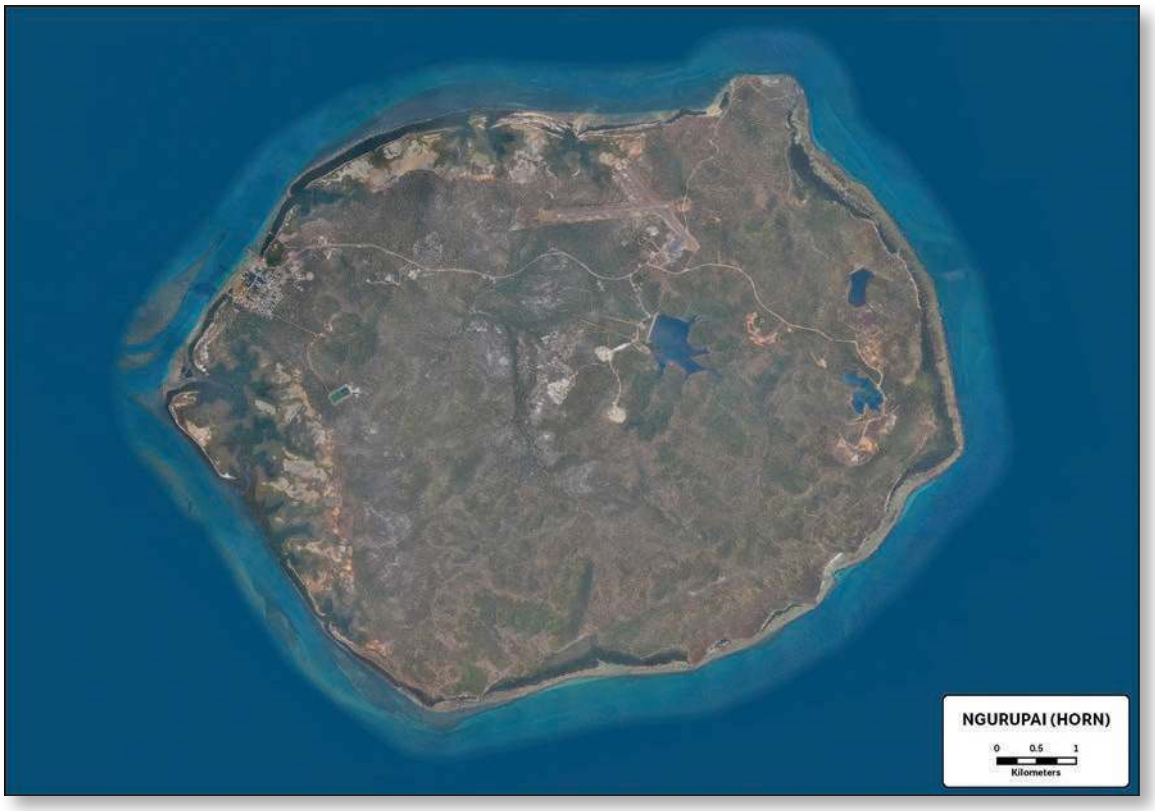
The Island Biosecurity Action Plan is intended to guide TSIRC biosecurity management operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table E4: Kirriri Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with TSIRC staff to further develop and implement the actions in the Hammond Island Biosecurity Action Plan.	Hammond Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Kaurareg Native Title (Aboriginal) Corporation RNTBC, TSIRC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Hammond Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	Kaurareg Native Title (Aboriginal) Corporation RNTBC, TSIRC	2018 and ongoing
Weeds	Train TSIRC staff and My Pathways workers in weed identification, monitoring and control techniques.	TSIRC staff and My Pathways workers trained in weed identification from 2018. TSIRC staff and My Pathways workers trained in weed monitoring and control techniques.	TSIRC staff and My Pathways workers trained. Number of days involved in training.	TSIRC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSIRC	Ongoing
	TSIRC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSIRC staff	As required
	TSIRC staff manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSIRC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Hammond Island.	No weeds detected on transport leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSIRC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents produced. Number of recipients.	TSIRC, TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSIRC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations of feral pigs, deer and goats on Hammond Island. Ongoing surveys for detection of cane toads are required following 2017 sighting of toads on Hammond Island.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSIRC staff	As required
	Train TSIRC staff in feral animal monitoring methods.	TSIRC staff trained in feral animal monitoring techniques by 2018.	TSIRC staff trained. Number of days involved in training.	TSIRC staff and My Pathways workers/participants	As required
	TSIRC staff undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSIRC staff undertake pest animal monitoring to determine impacts of existing pest animal populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSIRC staff	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals and their responsibilities.	Number of community meetings held. Number of attendees.	TSIRC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed	TSIRC staff, NAQS	As required
	Train TSIRC staff in exotic plant and animal disease monitoring methods.	TSIRC staff trained in exotic plant and animal disease monitoring techniques by 2018.	TSIRC staff trained. Number of days involved in training.	TSIRC staff, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSIRC staff undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSIRC staff, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSIRC, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSIRC, TSRA, NAQS	As required

5.2 Ngurupai (Horn Island)



Overview

Ngurupai (Horn Island) is in the Inner Islands Cluster of the Torres Strait and is located immediately south-east of Thursday Island. Like Mua to the north and Thursday Island to the north-west, Horn Island is part of the submerged land bridge that runs from Cape York to Papua New Guinea and is composed predominantly of old volcanic and granite rocks.

The island is approximately 53 km² in area. It is a granitic island with a mangrove and mudflats coastline. The terrain is hilly except for a narrow coastal strip on the eastern and western sides, where the main community is located. Large areas of Horn Island are covered by mangrove forest, grasslands and woodlands.

The historical community of Horn Island originated in 1871 after a massacre on Muralag (Prince of Wales Island), where the community remained until 1922. In 1946, some of the Kaurareg people moved back from Kubin onto Horn Island (Ngurupai) and settled in the present-day Wasaga Village at the western end of the island. Horn Island has a population of 650 (2011 ABS Census).

The Kaurareg, the people of Horn Island, speak a dialect of Kala Lagaw Ya (the Western-Central Torres Strait Language). The Traditional Owners of Horn Island, represented by the Kaurareg Native Title (Aboriginal) Corporation RNTBC, hold the Native Title rights that were granted to them in 1999. The Kaurareg Native Title (Aboriginal) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities on land where native title has not been extinguished.

Biosecurity Issues

Weeds

The majority of species are associated with heavily disturbed and developed areas within and surrounding the community and fringing disturbed sites such as major roads and tracks, dumps, airfield, recreation areas and old mine and settlement sites. Remnant vegetation throughout the island is generally free of weeds; however, a number of species pose potential threats.

Eight species are recognised in the Biosecurity Act 2014 as 'restricted matters' (Sections 38–45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Horn Island's environmental and cultural assets and values.

Table E5 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table E5: Ngurupai Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Giant parramatta grass	*Sporobolus fertilis*	Throughout the island especially along roadsides and tracks	Very high	Giant parramatta grass
Pond apple	*Annona glabra*	At the sand and gravel storage area adjacent to Elikiam Holiday Park, from a small former orchard on a property just outside the community area and in a disturbed site adjacent to Melaleuca woodland and mangroves	Very high	Pond apple
Prickly pear	*Opuntia stricta*	A few infestations of Prickly pear occur in the community	Very high	Prickly pear
Purple rubber vine	*Cryptostegia madagascariensis*	Located in a house yard and naturalising plants collected in woodland and mangroves and saltmarsh areas away from houses	Very high	Purple rubber vine
Sicklepod	*Senna obtusifolia*	Located in the Sea Swift compound near the manager's office, the plant was removed and destroyed	Very high	Sicklepod
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community	Very high outside of house gardens	Yellow bells
Yellow oleander	*Cascabela thevetia*	In house gardens throughout the community	Very high outside of house gardens	Yellow oleander

***** *Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table E6** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table E6: Ngurupai Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Infestations noted around disturbed areas	High	Annual mission grass
Brazilian joyweed	*Alternanthera brasiliana*	Very dense infestation over an area of 100 m2 on a waste block adjacent to 80 Airport Road	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Occurs at King Point and throughout disturbed parts of the island	Moderate	Butterfly pea
Candle bush	*Senna alata*	In the community and disturbed areas	Moderate	Candle bush
Coral vine	*Antigonon leptopus*	Planted as an ornamental in some yards throughout Wasaga	Moderate	Coral vine
Cupid's flower	*Ipomoea quamoclit*	In the community	Moderate	Cupid's flower
Guinea grass	*Megathyrsus maximus*	On the margins of Wasaga and access tracks	Moderate	Guinea grass
Hyptis	*Hyptis suaveolens*	Along the airport road near Vidgen Creek	Moderate	Hyptis
Leucaena	*Leucaena leucocephala*	In the residential areas with dense infestations in some house yards, and along roadsides and creeks	High	Leucaena
Mother of millions	*Bryophyllum spp.*	In the community and disturbed areas	Moderate	Mother of millions
Navua sedge	*Cyperus aromaticus*	On outskirts of Wasaga	High	Navua sedge
Neem tree	*Azadirachta indica*	Intentionally introduced and is beginning to infest shrublands, open woodlands, grasslands, riparian zones, coastal sites and other disturbed natural vegetation	Moderate	Neem tree
Sensitive plant	*Mimosa pudica*	In the community and disturbed areas	Moderate	Sensitive plant
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Snake vine	*Merremia dissecta*	In community areas and on the margins of tracks and roads	Moderate	Snake vine
Snakeweed	*Stachytarpheta jamaicensis*	At the back of the airstrip near the sewerage treatment plant	Moderate	Snakeweed

*****Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Six introduced fauna species of concern are known to occur on Horn Island. **Table E7** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table E7: Ngurupai Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Black rat	*Rattus*	In the community	High	Black rat
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Wild dog	*Canis familiaris*	Throughout the island	High	Wild dog
Cane toad	*Rhinella marina*	Throughout the island	Very high	Cane toad
Feral pig	*Sus scrofa*	Throughout the island	High	Feral pig
Asian honey bees	*Apis cerana*	Throughout the island	High	Asian honey bees

*****Fact sheet hyperlinks are only available on the electronic version of this document*

The black rat poses a threat to culturally significant flora and native fauna, particularly bird species during nesting when eggs may be vulnerable to foraging. They have been recorded in and around houses and in all the vegetated habitats on Horn Island, with reports of occasional outbreaks causing potentially serious health problems to the local community and damage to household goods and infrastructure. The control of rats in and around houses provided only temporary reduction in rat numbers and associated damage and the only long-term management option is the eradication of the introduced rat population (Leung unpubl. data).

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997). Natural Solutions (2008a) reported the native rodent grassland Melomys (*Melomys burtoni*) as being common in vine forest and adjacent grasslands. If cat numbers are not controlled there could be significant future impacts on Melomys and other native fauna.

Wild dogs may be a significant risk for a number of native species. Dogs are a threat to ground-nesting birds such as beach stone-curlew.

The most significant threat to native fauna on the Horn Island is the introduction of the exotic cane toad, with recorded sightings in 2008 and follow-up surveys in 2014 confirming their existence. Over the last two years cane toads have become well established on Horn Island and this will have dramatic impacts on the varanid (goanna) and snake fauna and, given the size of the island, and could lead to local extinctions. .

Feral pigs present a threat directly to frogs, reptiles and birds through predation. Ground-dwelling birds are particularly vulnerable. They also have indirect impacts through habitat destruction and degradation. Any wetland or riparian area is especially susceptible to damage by pigs.

Asian honey bees, Java strain, were first detected in Cairns in 2007. They are an adaptable bee species found throughout Asia and some islands of the Asia-Pacific. This is a tropical strain and most likely arrived via ship from Papua New Guinea or Indonesian Papua. They are established in far-north Queensland and cannot be eradicated. Tools and resources have been developed to help the community and pest control industry with managing this pest bee. Asian honey bees do not appear to be any more aggressive than other species but will still sting if confronted. They are a natural host for Varroa mites which, if introduced, would pose a serious threat to the honey bee industry and crops that are dependent on European honey bees for pollination.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Horn Island. In some cases, these are transient seasonal incursions but in others, the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Horn Island Biosecurity Action Plan is intended to have a positive impact on Horn Island's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Aboriginal lore and Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Horn Island.
- Increase Torres Shire Council (TSC) staff and Horn Island community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed and pest animal management by increasing awareness of pest impacts and developing pest and disease management skills.
- Empower TSC staff and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with the Kaurareg Native Title (Aboriginal) Corporation RNTBC and TSC to further develop and implement the actions in the Horn Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSC staff and My Pathways workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSC staff to monitor project sites for new weed incursions.
4. TSC staff and My Pathways workers to manage weeds in priority areas.
5. Investigate options for revegetating weed management project sites.
6. Prevent spread of weeds to or from Horn Island.
7. Develop fact sheets for each priority weed.
8. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSC staff in feral animal monitoring methods.
3. TSC staff to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to determine exotic plant and animal disease threats and determine the need for a control program.
2. Train TSC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Horn Island provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique Aboriginal lore and Ailan Kastom, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide Torres Shire Council pest management operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table E8: Ngurupai Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with the Kaurareg Native Title (Aboriginal) Corporation RNTBC and TSC to further develop and implement the actions in the Horn Island Biosecurity Action Plan.	Horn Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Kaurareg Native Title (Aboriginal) Corporation RNTBC, TSC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Horn Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	Kaurareg Native Title (Aboriginal) Corporation RNTBC, TSC	2018 and ongoing
Weeds	Train TSC staff and My Pathways workers in weed control techniques.	TSC staff trained in weed identification from 2018. TSC staff trained in weed control techniques.	TSC staff trained. Number of days involved in training.	TSC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSC staff	Ongoing
	TSC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSC staff	As required
	TSC staff control and eradicate weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSC staff and My Pathways workers/participants	As required
	Investigate options for revegetating weed management project sites.	Revegetation options investigated.	Total area of pest plant control measures implemented.	TSC staff and My Pathways workers	As required
	Prevent spread of weeds to or from Horn Island.	No weeds detected on transport leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSC staff, Biosecurity Officer	As required
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents produced. Number of recipients.	TSC, TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations of feral pigs on Horn Island.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSC staff	As required
	Train TSC staff and My Pathways workers in feral animal monitoring methods.	TSC staff and My Pathways workers trained in feral animal monitoring techniques by 2018.	TSC staff trained. Number of days involved in training.	TSC staff and My Pathways workers/participants	As required
	TSC staff undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSC staff undertake pest animal monitoring to determine impacts of existing pest animal populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSC staff	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals and their responsibilities.	Number of community meetings held. Number of attendees.	TSC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSC staff, NAQS	As required
	Train TSC staff in exotic plant and animal disease monitoring methods.	TSC staff trained in exotic plant and animal disease monitoring techniques by 2018.	TSC staff trained. Number of days involved in training.	TSC staff, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSC staff undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSC staff, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSC, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSC, TSRA, NAQS	2018 and as required

5.3 Waiben (Thursday Island)

Overview

Waiben (Thursday Island) is in the Inner Islands Cluster region of the Torres Strait and is located immediately south-west of Horn Island. Like Mua to the north and Murulag (Prince of Wales Island) to the south-west, Thursday Island is part of the submerged land bridge that runs from Cape York to Papua New Guinea and is composed predominantly of old volcanic and granite rocks.

The island is approximately 3.5 km² in area. It is a granitic island with a mangrove and mudflats coastline and surrounding fringing reef. The terrain is hilly except for a narrow coastal strip on the southern side, where the main community is located. The highest point on Thursday Island is Milman Hill, 104 m above sea level. The undeveloped areas of Thursday Island are covered by grasslands and woodlands and patches of vine forest, though often disturbed.

Thursday Island is the main administrative centre for the Torres Strait and has a population of 2610 (2011 ABS Census). The Kaurareg, the people of Thursday Island, speak a dialect of Kala Lagaw Ya (the Western-Central Torres Strait Language).

The Traditional Owners of Thursday Island, represented by the Kaurareg Native Title (Aboriginal) Corporation RNTBC, hold the native title rights that were granted to them in 1999. The Kaurareg Native Title (Aboriginal) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities on land where native title has not been extinguished.

Biosecurity Issues

Weeds

The majority of species are associated with heavily disturbed and developed areas within and surrounding the community and fringing disturbed sites such as major roads and tracks, dump, recreation areas and old settlement sites. Remnant vegetation throughout the island is generally free of weeds; however, a number of species pose potential threats.

Ten species are recognised in the Biosecurity Act 2014 as 'restricted matters' (Sections 38–45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Thursday Island's environmental and cultural assets and values.

Table E9 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table E9: Waiben Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Giant Parramatta grass	*Sporobolus fertilis*	Throughout the island especially along roadsides and tracks	Very high	Giant Parramatta grass
American rat's tail grass	*Sporobulus jacqemontii*	Throughout the island especially along roadsides and tracks	Very high	American rat's tail grass
Lantana	*Lantana camara*	Occurs along tracks and on the margins of disturbed areas	Very high	Lantana
Pond apple	*Annona glabra*	Previously in cultivation at the former 'Mura Mudh' hostel but since removed. Currently no known plants but a 'watch and act' plan should be implemented	Very high	Pond apple
Sicklepod	*Senna obtusifolia*	At the Thursday Island cemetery and around the margins of the housing estate of Aplin	Very high	Sicklepod
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Thunbergia	*Thunbergia grandiflora*	Scattered infestations observed on shrubland margins	Very high	Thunbergia
Yellow bells	*Tecoma stans*	In house gardens throughout the community	Very high outside of house gardens	Yellow bells
Yellow oleander	*Cascabela thevetia*	In house gardens throughout the community	Very high outside of house gardens	Yellow oleander

*****Fact sheet hyperlinks are only available on the electronic version of this document

The plants listed in **Table E10** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table E10: Waiben Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	Infestations noted around disturbed areas	High	Annual mission grass
Brazilian joyweed	*Alternanthera brasiliana*	In the community and disturbed areas	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	In the community and disturbed areas	Moderate	Butterfly pea
Candle bush	*Senna alata*	In the community and disturbed areas	Moderate	Candle bush
Coral vine	*Antigonon leptopus*	In the community and disturbed areas	Moderate	Coral vine
Cupid's flower	*Ipomoea quamoclit*	In the community	Moderate	Cupid's flower
Guinea grass	*Megathyrsus maximus*	On the margins of residential areas and access tracks	Moderate	Guinea grass
Grader grass	*Themeda quadrivalvis*	At the development site in Quarantine station and along roadsides and disturbed areas	High	Grader grass
Hyptis	*Hyptis suaveolens*	Along the roadside to Green Hill and is common along roadsides throughout the island	Moderate	Hyptis
Indian calopo	*Calopogonium mucunoides*	In the community and disturbed areas	Moderate	Indian calopo
Leucaena	*Leucaena leucocephala*	In the residential areas with dense infestations in some house yards, and along roadsides and creeks	High	Leucaena
Mother in law's tongue	*Sanseviera trifasciata*	A number of robust infestations occur on the island	Moderate	Mother in law's tongue
Navua sedge	*Cyperus aromaticus*	In Hastings Street and near the Ergon power station	High	Navua sedge
Neem tree	*Azadirachta indica*	Intentionally introduced and is beginning to infest shrublands, open woodlands, grasslands, riparian zones, coastal sites and other disturbed natural vegetation	Moderate	Neem tree
Sensitive plant	*Mimosa pudica*	In the community and disturbed areas	Moderate	Sensitive plant
Sisal	*Agave spp*	In the community and disturbed areas	Moderate	Sisal
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Snake vine	*Merremia dissecta*	In community areas and on the margins of tracks and roads	Moderate	Snake vine
Snakeweed	*Stachytarpheta jamaicensis*	At the back of the airstrip near the sewerage treatment plant	Moderate	Snakeweed

***** *Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Four introduced fauna species of concern are known to occur on Thursday Island. **Table E11** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table E11: Waiben Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Black rat	*Rattus*	In the community	High	Black rat
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Cane toad	*Rhinella marina*	Throughout the island	Very high	Cane toad
Feral pig	*Sus scrofa*	Throughout the island	High	Feral pig

*****Fact sheet hyperlinks are only available on the electronic version of this document*

The black rat poses a threat to culturally significant flora and native fauna, particularly bird species during nesting when eggs may be vulnerable to foraging. They have been recorded in and around houses and in all the vegetated habitats on Thursday Island, with reports of occasional outbreaks causing potentially serious health problems to the local community and damage to household goods and infrastructure. The control of rats in and around houses provided only temporary reduction in rat numbers and associated damage and the only long-term management option is the eradication of the introduced rat population (Leung unpubl. data).

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997). Natural Solutions (2008a) reported the native rodent grassland Melomys (*Melomys burtoni*) as being common in vine forest and adjacent grasslands. If cat numbers are not controlled there could be significant future impacts on Melomys and other native fauna.

The most significant threat to native fauna on the Thursday Island is the introduction of the exotic cane toad, with recorded sightings in 2008 and follow-up surveys in 2013 and 2014 confirming their presence. They are now well-established on the island. Torres Shire Council has an ongoing management program in place to control the population. Cane toads will have dramatic impacts on the varanid (goanna) and snake fauna and, given the size of the island, could lead to local extinctions if action is not undertaken.

Feral pigs present a threat directly to frogs, reptiles and birds through predation. Ground-dwelling birds are particularly vulnerable. They also have indirect impacts through habitat destruction and degradation. Any wetland or riparian area is especially susceptible to damage by pigs.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Thursday Island. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Thursday Island Biosecurity Action Plan is intended to have a positive impact on Thursday Island's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Aboriginal lore and Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Thursday Island.
- Increase TSC staff and Thursday Island community members' knowledge of pests and diseases and enable the improvement of pest and diseases management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower Torres Strait Regional Authority (TSRA) rangers, Torres Shire Council (TSC) staff and My Pathway workers and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with the Kaurareg Native Title (Aboriginal) Corporation RNTBC and TSC to further develop and implement the actions in the Thursday Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSC staff and My Pathways workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSC staff to monitor project sites for new weed incursions.
4. TSC staff and My Pathways workers to control and eradicate weeds in priority areas.
5. Investigate options for revegetating weed management project sites.
6. Prevent spread of weeds to or from Thursday Island.
7. Develop fact sheets for each priority weed.
8. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSC staff in feral animal monitoring methods.
3. TSC staff to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Thursday Island provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique Aboriginal lore and Ailan Kastom, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide Torres Shire Council pest management operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table E12: Waiben Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with the Kaurareg Native Title (Aboriginal) Corporation RNTBC and TSC to further develop and implement the actions in the Thursday Island Biosecurity Action Plan.	Thursday Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Kaurareg Native Title (Aboriginal) Corporation RNTBC, TSC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Thursday Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	Kaurareg Native Title (Aboriginal) Corporation RNTBC), TSC	2018 and ongoing
Weeds	Train TSC staff and My Pathways workers in weed control techniques.	TSC staff trained in weed identification from 2018. TSC staff trained in weed control techniques.	TSC staff trained. Number of days involved in training.	TSC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSC staff	Ongoing
	TSC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSC staff	As required
	TSC staff manage weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSC staff and My Pathways workers/participants	As required
	Investigate options for revegetating weed management project sites.	Revegetation options investigated.	Total area of pest plant control measures implemented.	TSC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Thursday Island.	No weeds detected on transport leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSC staff	As required
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents produced. Number of recipients.	TSC, TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations of feral animals on Thursday Island.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSC staff	As required
	Train TSC staff and My Pathways workers in feral animal monitoring methods.	TSC staff trained in feral animal monitoring techniques by 2018.	TSC staff trained. Number of days involved in training.	TSC staff and My Pathways workers/participants	As required
	TSC staff undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSC staff undertake pest animal monitoring to determine impacts of existing pest animal populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSC staff	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals and their responsibilities.	Number of community meetings held. Number of attendees.	TSC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSC staff, NAQS	As required
	Train TSC staff in exotic plant and animal disease monitoring methods.	TSC staff trained in exotic plant and animal disease monitoring techniques by 2018.	TSC staff trained. Number of days involved in training.	TSC staff, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSC staff undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSC staff, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSC, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSC, TSRA, NAQS	2018 and as required

5.4 Muralag (Prince of Wales Island)

Overview

Murulag (Prince of Wales Island) is in the Inner Islands Cluster of the Torres Strait and is located less than a kilometre south-west of Thursday Island. Like Mua to the north and Waiben (Thursday Island) to the north-west, Prince of Wales Island is part of the submerged land bridge that runs from Cape York to Papua New Guinea and is composed predominantly of old volcanic and granite rocks.

The island is approximately 204 km2 in area and is the largest of the Torres Strait Islands. It is a granitic island with a rocky and mangrove and mudflats coastline and surrounding fringing reef. The terrain is hilly, with the highest point on island being Mt Scott at 247 m above sea level.

Prince of Wales Island has a resident population of 87 (2011 ABS Census) and is sparsely populated, although it is a popular camping destination with Thursday Island residents. The village in the north is called Murulag, after the language name of the island. There are also numerous permanent and weekender houses and shacks located along Country Women's Beach, Long Beach and other sandy beaches on the north and north-western sides of the island.

The Kaurareg, the people of Murulag, speak a dialect of Kala Lagaw Ya (the Western-Central Torres Strait Language). The Traditional Owners of Prince of Wales Island, represented by the Kaurareg Native Title (Aboriginal) Corporation RNTBC, hold the native title rights granted to them in 1999. The Kaurareg Native Title (Aboriginal) Corporation RNTBC has approval responsibilities for all plans to manage land and for permissions for all land management activities on land where native title has not been extinguished.

Biosecurity Issues

Weeds

The majority of species are associated with heavily disturbed and developed areas within and surrounding the main community and numerous residences along the various sandy beaches and fringing disturbed sites such as major roads and tracks, dump, recreation areas and old settlement sites. Remnant vegetation throughout the island is generally free of weeds; however, a number of species pose potential threats.

Four species are recognised in the Biosecurity Act 2014 as 'restricted matters' (Sections 38–45) that trigger a General Biosecurity Obligation (Section 23), which requires the Council and landholders to undertake certain actions including managing the invasive plant to prevent or minimise the biosecurity risk. These weeds are considered a priority for management because of the legislative obligations raised above and because they are most likely to impact on Prince of Wales Island's environmental and cultural assets and values.

Table E13 identifies the weed, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the weed and its potential impact/s and includes pictures to assist in identifying the weed.

Table E13: Muralag Weeds (Restricted matters in *Biosecurity Act 2014*)

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Pond apple	*Annona glabra*	Isolated occurrences occur near residences	Very high	Pond apple
Singapore daisy	*Sphagneticola trilobata*	In and around the community in disturbed areas	Very high	Singapore daisy
Yellow bells	*Tecoma stans*	In house gardens throughout the community	Very high outside of house gardens	Yellow bells
Yellow oleander	*Cascabela thevetia*	In and around the community and in disturbed vegetation fringing village areas	Very high outside of house gardens	Yellow oleander

*****Fact sheet hyperlinks are only available on the electronic version of this document*

The plants listed in **Table E14** were identified by TSRA Land and Sea Management Unit, Biosecurity Queensland and NAQS as the next highest threat to the island's cultural and biodiversity values because they have a high potential to expand beyond existing infestations. These plants may contribute to changes in fire regimes, reduce groundcover, increase erosion risk and adversely impact on community food production efforts. These plants have a propensity to spread into new areas and can invade reasonably intact ecosystems.

Table E14: Muralag Priority environmental weeds

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Brazilian joyweed	*Alternanthera brasiliana*	In the community and access tracks	High	Brazilian joyweed
Butterfly pea	*Clitoria ternatea*	Throughout the disturbed parts of the island	Moderate	Butterfly pea
Candle bush	*Senna alata*	In the community and disturbed areas	Moderate	Candle bush
Cupid's flower	*Ipomoea quamoclit*	In the community	Moderate	Cupid's flower
Guinea grass	*Megathyrsus maximus*	On the margins of the community and access tracks	Moderate	Guinea grass
Glory lily	*Gloriosa superba*	In the community	Moderate	Glory lily
Hyptis	*Hyptis suaveolens*	In the community and access tracks	Moderate	Hyptis
Indian calopo	*Calopogonium mucunoides*	In the community	Moderate	Indian calopo
Leucaena	*Leucaena leucocephala*	In the residential areas with dense infestations in some house yards, and along roadsides and creeks	High	Leucaena
Mother in law's tongue	*Sanseviera trifasciata*	A number of robust infestations occur on the island	Moderate	Mother in law's tongue
Neem tree	*Azadirachta indica*	Intentionally introduced and is beginning to infest shrublands, open woodlands, grasslands, riparian zones, coastal sites and other disturbed natural vegetation	Moderate	Neem tree
Sensitive plant	*Mimosa pudica*	In the community and disturbed areas	Moderate	Sensitive plant
Sisal	*Agave spp.*	In the community and used for traditional purposes	Moderate	Sisal
Siratro	*Macroptilium atropurpureum*	In community areas and on the margins of tracks and roads	Moderate	Siratro
Snake vine	*Merremia dissecta*	In community areas and on the margins of tracks and roads	Moderate	Snake vine
Snakeweed	*Stachytarpheta jamaicensis*	In community areas and on the margins of tracks and roads	Moderate	Snakeweed

***** *Fact sheet hyperlinks are only available on the electronic version of this document*

Pest Animals

Eight introduced fauna species of concern are known to occur on Prince of Wales Island. **Table E15** below identifies the pest animal, its scientific name, its general location and its priority and provides a hyperlink to a fact sheet that describes the pest animal and its potential impact/s and includes pictures to assist in identifying the pest animal.

Table E15: Muralag Pest Animals

COMMON NAME	SCIENTIFIC NAME	LOCATION	PRIORITY	FACT SHEET HYPERLINK*
Feral pig	*Sus scrofa*	Throughout the island, hunted for food	Moderate	Feral pig
Feral horse	*Equus caballus*	Throughout the island	High	Feral horse
Feral cat	*Felis catus*	Throughout the island	High	Feral cat
Cane toad	*Rhinella marina*	Unknown	Very high	Cane toad
Wild dog	*Canis familiaris*	Throughout the island	High	Wild dog
Feral goat	*Capra hircus*	Throughout the island, hunted for food	Moderate	Feral goat
Feral cattle	*Bos taurus*	Throughout the island, hunted for food	Moderate	Feral cattle
Rusa deer	*Cervus timorensis*	Throughout the island, hunted for food	Moderate	Rusa deer

***** *Fact sheet hyperlinks are only available on the electronic version of this document*

Feral pigs present a threat directly to frogs, reptiles and birds through predation. Ground-dwelling birds are particularly vulnerable. They also have indirect impacts through habitat destruction and degradation. Feral pigs are present on the island and although hunted on a regular basis there is damage by pigs within all habitat areas. Any wetland or riparian area is especially susceptible to damage by pigs.

Deer and goats also have the potential to impact through weed spread, habitat destruction and degradation. While deer are considered an important food source for the community, limited hunting has the potential to result in a significant increase in numbers. The proliferation of Rusa deer presents a major threat to habitat integrity, especially for deciduous/semi-deciduous vine forest and Pandanus-dominant woodlands and grasslands, significantly increasing the potential for introduction of exotic plant species. An increasing deer population will also promote degradation of overall habitat stability as grazing reduces the effectiveness of fire as a tool to prevent shrubby invasion of grassland. Deer are also known to damage flora by antler rubbing and to degrade water quality and wetland habitat by wallowing (Biosecurity Queensland 2010).

Feral goats are reported on the island but not in large numbers due to ongoing hunting for meat. Wild horses and feral cattle are also reported and are capable of substantial habitat modification and destruction and there is a likelihood of individuals establishing a feral population, should one not already exist. Control measures are required.

Domestic dogs are present on Prince of Wales Island (Conics 2008b) and may be a significant risk for a number of native species. Dogs are a threat to ground-nesting birds such as beach stone-curlew.

Feral cats are significant predators of native animals and have been implicated in the extinction of native species on islands (Bloomer and Bester 1992). Cat predatory behaviour appears largely opportunistic, though small mammals are preferred. If cats have access to relatively undisturbed habitats it is likely that they would have a substantial impact on native fauna, particularly mammals (Barratt 1997). Natural Solutions (2008a) reported the native rodent grassland Melomys (*Melomys burtoni*) as being common in vine forest and adjacent grasslands. If cat numbers are not controlled there could be significant future impacts on Melomys and other native fauna.

The most significant potential threat to native fauna on the Prince of Wales Island would be the introduction of the exotic cane toad. Two cane toads were seen and killed on Prince of Wales Island in late 2017. Cane toads are one of the most significant threats to native fauna if they become established, they would have significant detrimental impacts on the wetland environments, varanid (goanna) and snake fauna and could lead to local extinctions. Every effort should be made to respond swiftly to any cane toad sightings on Prince of Wales Island and to find and remove any individual specimens.

Pests and Diseases of Plants and Animals

The Torres Strait Islands lie between and immediately adjacent to the New Guinea and Australia landmasses, which harbour a range of plant and animal pests and diseases not found naturally in the islands. The islands are susceptible to new incursions from the north and south through natural and human-assisted pathways. Natural pathways include wind and tide movements, insect flight and animal migration. Human-assisted pathways include foreign and domestic vessel movements, domestic aircraft movements, domestic passenger and cargo movements through the Torres Strait, and traditional trade between residents of the Western Province (PNG) Treaty Villages and traditional inhabitants of the Torres Strait Protected Zone in accordance with Australia's treaty obligations.

A number of exotic pests have been recorded in the Torres Strait Islands, including Prince of Wales Island. In some cases, these are transient seasonal incursions but in others the pests have become established. Other pests and diseases present in New Guinea or the Australian mainland may also pose a threat.

Intended Outcomes

The development of the Prince of Wales Island Biosecurity Action Plan is intended to have a positive impact on Prince of Wales Island's environmental, social and cultural values by providing an overview and a clear and concise set of community-agreed actions that strengthen the island's unique Aboriginal lore and Ailan Kastom and preserve and embed Traditional Ecological Knowledge into the collaborative management of existing and emerging pests. Anticipated outcomes are:

- Better manage current pest populations and minimise the spread of existing weeds, pest animals and exotic plant and animal diseases through the adoption of best practice control methods.
- Prevent the introduction and establishment of new pests on Prince of Wales Island.
- Increase Torres Shire Council (TSC) staff and Prince of Wales Island community members' knowledge of pests and diseases and enable the improvement of pest management practices by collecting, collating and disseminating relevant pest data.
- Establish long-term community commitment to and compliance with weed, pest animal and disease management by increasing awareness of pest and disease impacts and developing pest and disease management skills.
- Empower TSC staff and increase their pest and disease management skills by providing training opportunities.
- Create a planning framework for pest management by reviewing, evaluating and implementing integrated pest management strategies and programs.

Biosecurity Priorities

Proposed General Actions

1. Work with the Kaurareg Native Title (Aboriginal) Corporation RNTBC and TSC to further develop and implement the actions in the Prince of Wales Island Biosecurity Action Plan.
2. Identify language names and any traditional uses for weeds.

Proposed Weed Actions

1. Train TSC staff and My Pathways workers in weed identification, monitoring and control techniques.
2. Map significant weed species.
3. TSC staff to monitor project sites for new weed incursions.
4. TSC staff and My Pathways workers to manage weeds in priority areas.
5. Investigate options for revegetating weed management project sites.
6. Prevent spread of weeds to or from Prince of Wales Island.
7. Develop fact sheets for each priority weed.
8. Develop an education program to raise community awareness of potential pest threats and proximity.

Proposed Pest Animal Actions

1. Undertake surveys to determine feral animal populations and determine the need for targeted control programs.
2. Train TSC staff in feral animal monitoring methods.
3. TSC staff to undertake regular monitoring of wetland and grassland areas for incursions of pest animals.
4. Develop an education program to raise community awareness about pest animals.

Proposed Plant and Animal Diseases Actions

1. Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.
2. Train TSC staff in exotic plant and animal disease monitoring methods.
3. Develop a monitoring strategy for plant and animal disease threats (present and potential) of concern to the community.
4. Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.
5. Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.

Implementation and Performance Monitoring

This Island Biosecurity Action Plan for Prince of Wales Island provides guidance for actions over the life of the *Regional Biosecurity Management Plan 2018-2023* to ensure intended outcomes are delivered, both in terms of community aspirations by strengthening the region's unique Aboriginal lore and Ailan Kastom, preserving and embedding Traditional Ecological Knowledge into management actions and the timely management of weeds, pest animals and plant and animal diseases.

The Island Biosecurity Action Plan is intended to guide Torres Shire Council pest management operations. Planning, time spent, resourcing and stakeholder involvement on actions will be determined through a negotiated process and on an action by action basis. Feedback to the community through newsletters and other community information sessions will be built into actions.

Documenting the actions and monitoring the outcome of these activities will provide opportunities to learn, adapt and improve. The following table outlines the key performance indicators against each of the agreed actions. These performance indicators will be used to report back to community and funding providers.

Table E16: Muralag Implementation Plan

Area of Interest	Actions	Key Performance Indicators	Measurement of KPI	Who needs to be Involved	By When
General	Work with the Kaurareg Native Title (Aboriginal) Corporation RNTBC and TSC to further develop and implement the actions in the Prince of Wales Island Biosecurity Action Plan.	Prince of Wales Island Biosecurity Action Plan developed by 2018.	Number of plans developed.	TSRA LSMU, Kaurareg Native Title (Aboriginal) Corporation RNTBC, TSC	Mid 2018
	Identify language names and any traditional uses for weeds.	Language names and any traditional uses for weeds included in Prince of Wales Island Biosecurity Action Plan.	Language names and any traditional uses identified and incorporated into relevant documents.	Kaurareg Native Title (Aboriginal) Corporation RNTBC, TSC	2018 and ongoing
Weeds	Train TSC staff and My Pathways workers in weed control techniques.	TSC staff trained in weed identification from 2018. TSC staff trained in weed control techniques.	TSC staff trained. Number of days involved in training.	TSC staff and My Pathways workers/participants	As required
	Map significant weed species.	Weed mapping undertaken.	Number of maps produced. Area covered.	TSC staff	Ongoing
	TSC staff monitor project sites for new weed incursions.	Project site monitoring for new weed incursions.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of species lists developed.	TSC staff	As required
	TSC staff control and eradicate weeds in priority areas.	On-grounds works undertaken at least 8 weeks per year from 2018 to reduce and where possible eradicate weeds.	Total area of pest plant control measures implemented.	TSC staff and My Pathways workers/participants	As required
	Investigate options for revegetating weed management project sites.	Revegetation options investigated.	Total area of pest plant control measures implemented.	TSC staff and My Pathways workers/participants	As required
	Prevent spread of weeds to or from Prince of Wales Island.	No weeds detected on transport leaving the island.	Number of pest plant control measures implemented. Number of weeds detected.	TSC staff	As required
	Develop fact sheets for each priority weed.	High priority weed brochure developed.	Number of documents produced. Number of recipients.	TSC, TSRA, BQ	As required
	Develop an education program to raise community awareness of potential pest threats and proximity.	Community education program developed and implemented.	Number of documents/education materials produced. Number of recipients.	TSC, BQ	As required
Pest Animals	Undertake surveys to determine feral animal populations and determine the need for a control program.	Feral animal surveys are undertaken to determine populations of feral pigs, deer and goats on Prince of Wales Island.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSC staff	As required
	Train TSC staff and My Pathways workers in feral animal monitoring methods.	TSC staff trained in feral animal monitoring techniques by 2018.	TSC staff trained. Number of days involved in training.	TSC staff and My Pathways workers/participants	As required
	TSC staff undertake regular monitoring of wetland and grassland areas for incursions of pest animals.	TSC staff undertake pest animal monitoring to determine impacts of existing pest animal populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSC staff	Ongoing
	Develop an education program to raise community awareness about pest animals.	Community educated about pest animals and their responsibilities.	Number of community meetings held, Number of attendees.	TSC, BQ	As required
Plant and Animal Diseases	Assist researchers and undertake surveys to identify exotic plant and animal disease threats and if required, implement management actions.	Exotic plant and animal disease surveys are undertaken to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys. Number of plans developed.	TSC staff, NAQS	As required
	Train TSC staff in exotic plant and animal disease monitoring methods.	TSC staff trained in exotic plant and animal disease monitoring techniques by 2018.	TSC staff trained. Number of days involved in training.	TSC staff, NAQS	As required
	Develop a monitoring strategy for plant and animal disease threats of concern to the community (present and potential).	TSC staff undertake exotic plant and animal disease monitoring to determine populations.	Number of surveys undertaken. Total area covered whilst undertaking surveys.	TSC staff, NAQS	As required
	Develop a targeted education program relevant to specific, identified exotic plant and animal diseases threats and existing problems to raise community awareness.	Community educated about exotic plant and animal diseases.	Number of community meetings held. Number of attendees at community meetings.	TSC, NAQS	2018
	Develop brochures about exotic plant and animal diseases including potential new arrivals and circulate throughout the community.	Brochures about exotic plant and animal diseases including potential new arrivals developed including potential new arrivals.	Number of documents produced. Number of recipients receiving brochures.	TSC, TSRA, NAQS	2018 and as required

6 Weeds and Pest Animal Distribution Lists

Torres Strait Islands Regional Council Weeds (Restricted matters in *Biosecurity Act 2014*)

Common Name	Scientific Name	Badu	Boigu	Dauan	Erub	Iama	Mabuyag	Masig	Mer	Mua	Poruma	Saibai	Ugar	Warraber	Hammond
African tulip tree	*Spathodea campanulata*	X			X					X					
Bellyache bush	*Jatropha gossypifolia*	X	X												
Chinese apple	*Ziziphus mauritiana*				X										
Giant parramatta grass	*Sporobolus fertilis*	X													X
American rat's tail grass	*Sporobolus jacquemontii*	X													
Lantana	*Lantana camara*		X		X	X		X	X		X		X	X	
Pond apple	*Annona glabra*	X	X				X					X			
Prickly pear	*Opuntia stricta*			X						X					X
Purple rubber vine	*Cryptostegia madagascariensis*	X	X				X			X	X	X			X
Sicklepod	*Senna obtusifolia*				X	X	X					X			
Singapore daisy	*Sphagneticola trilobata*	X		X	X	X	X	X	X	X	X	X	X	X	X
Yellow bells	*Tecoma stans*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yellow oleander	*Cascabela thevetia*			X				X							X

Torres Strait Islands Regional Council Priority Environmental Weeds

Common Name	Scientific Name	Badu	Boigu	Dauan	Erub	Iama	Mabuyag	Masig	Mer	Mua	Poruma	Saibai	Ugar	Warraber	Hammond
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*	X		X	X		X	X	X	X		X	X		
Brazilian Joyweed	*Alternanthera brasiliana*	X	X	X	X	X	X		X	X		X	X		X
Bundled pigeon flower	*Desmanthus pernambucanus*					X									
Butterfly pea	*Clitoria ternatea*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Castor oil bush	*Ricinus communis*				X	X		X	X	X	X			X	
Candle bush	*Senna alata*	X	X	X	X	X	X		X	X			X		X
Coral berry	*Rivina humilis*				X				X				X		
Coral vine	*Antigonon leptopus*	X			X		X			X					
Cupid's flower	*Ipomoea quamoclit*	X	X		X	X	X			X			X		X
Green shrimp plant	*Ruellia blechum*				X				X			X			
Glory lily	*Gloriosa superba*	X	X		X	X	X	X	X		X	X		X	X
Grader grass	*Themeda quadrivalvis*			X	X	X		X				X			
Leucaena	*Leucaena leucocephala*	X	X	X	X			X	X	X	X	X	X	X	X
Navua sedge	*Cyperus aromaticus*	X													
Neem tree	*Azadirachta indica*									X				X	X
Praxelis	*Praxelis clematidea*	X			X	X	X		X	X					
Rubber bush	*Calotropis gigantea*			X						X	X				
Rubber tree	*Manihot carthaginensis*			X											X

Scarlet flower	*Ipomoea hederifolia*	X		X	X	X	X	X	X	X	X		X	X	X
Sensitive plant	*Mimosa pudica*	X	X	X	X	X	X	X	X	X		X		X	X
Sisal	*Agave spp.*			X	X	X	X	X			X	X	X	X	X
Siratro	*Macroptilium atropurpureum*	X	X	X	X	X	X	X	X	X	X	X		X	X
Snake vine	*Merremia dissecta*	X							X						X
Snakeweed	*Stachytarpheta jamaicensis*	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Thatch grass	*Hyparrhenia rufa*	X								X					
Tropical kudzu	*Pueraria phaseoloides*			X								X			
Kudzu (Weskepu)	*Pueraria montana var. lobata*			X	X		X		X	X		X	X		X

NOTE: The weeds contained in this table have been selected by Barbara Waterhouse and Stephen McKenna (NAQS), Corey Bell (Biosecurity Queensland), Mark Geyle (TSRA LSMU) and David Fell (Botanist, Fell Environmental) as the priority environmental weeds requiring on-going management.

Torres Strait Island Regional Council Other Environmental Weeds

Common Name	Scientific Name	Badu	Boigu	Dauan	Erub	Iama	Mabuyag	Masig	Mer	Mua	Poruma	Saibai	Ugar	Warraber	Hammond
Bell weed	*Dipteracanthus prostratus*				X	X				X					
Bristly star burr	*Acanthospermum hispidum*									X					
Calopo	*Calopogonium mucunoides*	X		X		X	X			X					X
Caltrop*	*Tribulus cistoides*									X	X			X	
Giant panic grass	*Megathyrsus maximus var. maximus*			X						X		X	X		
Hyptis	*Hyptis suaveolens*	X	X	X	X	X	X	X	X	X	X	X	X	X	X

* Locally invasive native species

Torres Strait Island Regional Council Other Environmental Weeds *(continued)*

Common Name	Scientific Name	Badu	Boigu	Dauan	Erub	Iama	Mabuyag	Masig	Mer	Mua	Poruma	Saibai	Ugar	Warraber	Hammond
Joint vetch	*Aeschynomene americana*								X	X					
Khaki weed	*Alternanthera pungens*				X				X				X		
Mexican sunflower	*Tithonia diversifolia*				X								X		
Milkweed	*Euphorbia heterophylla*	X			X		X	X				X			
Mother-in-law's tongue	*Sanseviaria trifasciata var. trifasciata*	X		X	X	X	X	X	X		X		X		X
Mother-of-millions	*Bryophyllum pinnatum*							X					X		
Porcupine flower	*Barleria prionitis*		X												
Hophead philipine violet	*Barleria lupulina*										X			X	
Whitehead broom	*Spermococe verticillata*							X		X				X	
Wynn cassia	*Chamaecrista rotundifolia*	X		X	X	X				X					

NOTE: The weeds contained in this table have been selected by Barbara Waterhouse and Stephen McKenna (NAQS), Corey Bell (Biosecurity Queensland), Mark Geyle (TSRA LSMU) and David Fell (Botanist, Fell Environmental) as environmental weeds requiring on-going monitoring as they have the potential to rapidly increase their extent and density.

Torres Shire Council Weeds (Restricted matters in *Biosecurity Act 2014*)

Common name	Scientific name	Prince of Wales	Thursday	Horn
Giant parramatta grass	*Sporobolus fertilis*		X	X
American rat's tail grass	*Sporobolus jacquemontii*		X	
Lantana	*Lantana camara*		X	
Pond apple	*Annona glabra*	X	X	X
Prickly pear	*Opuntia stricta*			X
Purple rubber vine	*Cryptostegia madagascariensis*			X
Sicklepod	*Senna obtusifolia*		X	X
Singapore daisy	*Sphagneticola trilobata*	X	X	X
Thunbergia	*Thunbergia grandiflora*		X	
Yellow bells	*Tecoma stans*	X	X	X
Yellow oleander	*Cascabela thevetia*	X	X	X

Torres Shire Council Priority Environmental Weeds

Common name	Scientific name	Prince of Wales	Thursday	Horn
Annual mission grass	*Cenchrus pedicellatus subsp. unispiculus*		X	X
Brazilian joyweed	*Alternanthera brasiliana*	X	X	X
Butterfly pea	*Clitoria ternatea*	X	X	X
Candle bush	*Senna alata*	X	X	X
Coral vine	*Antigonon leptopus*		X	X
Cupid's flower	*Ipomoea quamoclit*	X	X	X
Glory lily	*Gloriosa superba*	X		X
Leucaena	*Leucaena leucocephala*	X	X	X
Navua sedge	*Cyperus aromaticus*		X	X
Neem tree	*Azadirachta indica*	X	X	X

Torres Shire Council Priority Environmental Weeds *(continued)*

Common name	Scientific name	Prince of Wales	Thursday	Horn
Praxelis	*Praxelis clematidea*	X		X
Scarlet flower	*Ipomoea hederifolia*	X	X	X
Sensitive plant	*Mimosa pudica*	X	X	X
Sisal	*Agave sisalana*	X	X	
Siratro	*Macroptilium atropurpureum*	X	X	X
Snake vine	*Merremia dissecta*	X	X	X
Snakeweed	*Stachytarpheta jamaicensis*	X	X	X
Kudzu (Weskepu)	*Pueraria montana var. lobata*		X	

NOTE: The weeds contained in this table have been selected by Barbara Waterhouse and Stephen McKenna (NAQS), Corey Bell (Biosecurity Queensland) and David Fell (Botanist, Fell Environmental) as the priority environmental weeds requiring on-going management.

Torres Shire Council Other Environmental Weeds

Common name	Scientific name	Prince of Wales	Thursday	Horn
Calopo	*Calopogonium mucunoides*		X	X
Giant panic grass	*Megathrysus maximus var. maximus*	X	X	X
Hyptis	*Hyptis suaveolens*	X	X	X
Mother-of-millions	*Bryophyllum pinnatum*			X
Mother-in-law's tongue	*Sansevieria trifasciata*	X	X	

NOTE: The weeds contained in this table have been selected by Barbara Waterhouse and Stephen McKenna (NAQS), Corey Bell (Biosecurity Queensland) and David Fell (Botanist, Fell Environmental) as environmental weeds requiring on-going monitoring as they have the potential to rapidly increase their extent and density.

Torres Strait Uninhabited Islands Priority Environmental Weeds

Common Name	Scientific Name	Campbell	Dalrymple	Nepean	Marsden	Dugong	Poll	Burra	Ulu	Pulu	Maza Guiya	Waral Kawa
Coral berry	*Rivina humilis*	X	X	X								
Corky passionfruit	*Passiflora suberosa*	X	X	X								
Hyptis	*Hyptis suaveolens*		X									
Lantana	*Lantana camara*	X	X	X	X							
Leucaena	*Leucaena leucocephala*		X									

NOTE: The weeds contained in this table have been selected by Barbara Waterhouse and Stephen McKenna (NAQS), Corey Bell (Biosecurity Queensland), Mark Geyle (TSRA LSMU) and David Fell (Botanist, Fell Environmental) as environmental weeds requiring on-going monitoring as they have the potential to rapidly increase their extent and density.

Torres Strait Islands Regional Council Pest Animals

Common Name	Scientific Name	Badu	Boigu	Dauan	Erub	Iama	Mabuyag	Masig	Mer	Mua	Poruma	Saibai	Ugar	Warraber	Hammond
Black rat	*Rattus ratttus*				X			X							
Brown rat	*Rattus norvegicus*									X					
Feral cat	*Felis catus*	X	X	X	X		X		X	X	X			X	X
Wild dog	*Canis familiaris*	X	X						X	X		X			
Feral horse	*Equus caballus*	X								X					
Feral pig	*Sus scrofa*	X					X			X					X
Pacific rat	*Rattus exulans*								X						
Rusa deer	*Cervus timorensis*		X									X			X
Climbing perch	*Anabas testudineus*		X									X			

Torres Shire Council Pest Animals

Common name	Scientific name	Prince of Wales	Thursday	Horn	Friday
Black rat	*Rattus rattus*		X	X	
Cane toad	*Rhinella marina*	X	X	X	
Feral cat	*Felis catus*	X	X	X	
Wild dog	*Canis familiaris*	X		X	
Feral goat	*Capra hircus*	X			
Feral horse	*Equus caballus*	X			
Feral pig	*Sus scrofa*	X			
Rusa deer	*Cervus timorensis*	X			X
Feral cattle	*Bos taurus*	X			

Torres Strait Uninhabited Islands Priority Pest Animals

Common Name	Scientific Name	Campbell	Dalrymple	Nepean	Dugong	Poll	Burra	Ulu	Pulu	Maza Guiya	Waral Kawa	Sassie	Gebar
Black rat	*Rattus rattus*										X		
Feral cat	*Felis catus*											X	
Feral pig	*Sus scrofa*												X

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