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### Inventory of the land conservation values of the Houtman Abrolhos Islands.

Department of Fisheries. Western Australia

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# **INVENTORY OF THE LAND CONSERVATION VALUES OF THE HOUTMAN ABROLHOS ISLANDS**

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Department of Fisheries

OCTOBER 2003



Inventory of the Land Conservation Values  
of the Houtman Abrolhos Islands

Coordinated by Jo McCrea

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*Main Cover picture:*

*Keru Island (Wallabi Group)*

*B. Bachman*

*This photograph may only be used for purposes  
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*For any other usage, contact Bill Bachman on (03) 9882 2461.*

*Back Cover picture:*

*Noddies in flight.*

*Dr Chris Surnam*

*Inset pictures:*

*L to R: Sea lion pup, environmental mooring - Turtle Bay, and sooty tern on Pelsaert Island.*

*(Pics. Shaun Sims and Dr Chris Surnam)*

DEPARTMENT OF FISHERIES

3rd floor, The Atrium

168 St George's Tce, Perth WA 6000

Note that the information contained within this report have been gathered from literature and through consultations and are not necessarily the view of the Department of Fisheries  
Figures 4.1 to 4.68 were adapted from: *A flora and vegetation survey of the Houtman Abrolhos, Western Australia*, published in the Department of Conservation and Land Management's *CALMScience*.



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## EXECUTIVE SUMMARY

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There is growing pressure for increased development on the Houtman Abrolhos Islands (Abrolhos Islands). The number and variety of users of the islands is likely to increase in the coming years, particularly in light of the recently released *Aquaculture Plan for the Houtman Abrolhos Islands* (Fisheries Management Paper No. 137, Fisheries WA, 2000) and the *Sustainable Tourism Plan for the Houtman Abrolhos Islands* (Fisheries Management Paper No. 146, Fisheries WA, 2001). The terrestrial environment of the Abrolhos Islands has numerous features of high conservation value including significant fauna, flora, and geological and historical sites. It is important that these values are considered during the process of increasing visitor access and when evaluating any future development applications.

Much work on the natural, historical and cultural values of the islands has been undertaken. This document is a review of this work, which provides an overview of the conservation values of the islands, and should prove useful in considering the selection, design and evaluation of proposed developments at the Abrolhos Islands.

Based on existing information, the purpose of the *Review of the Land Conservation Values of the Houtman Abrolhos Islands* is to:

- identify and map areas of conservation value (natural, historical and cultural); and
- assess and document sites of conservation value.

### Scope of review

The review considers the features of geology and geomorphology, birds, mammals, reptiles, flora, historic and cultural sites. The review also addresses threatening influences on the islands including fire and introduced flora and fauna.

The review summarises existing information on these features and makes statements relating to their management needs.

### Island management plans

Some islands of the Abrolhos system, which have high conservation significance, require the development of an island-specific management plan or site management plan. This is necessary so that different conservation features found in the same location (such as the historic sites and fauna species on West Wallabi Island) can be managed in co-ordination.

Based on the conservation values reviewed in this report, islands requiring specific management plans are Pelsaert Island, West Wallabi Island, East Wallabi Island, Beacon Island, Wooded Island and Morley Island.

### Future management planning

Following further investigations, it is proposed that the islands of the Abrolhos system be classified according to a permitted level of access. The permitted level of access for each island would be based on a cumulative assessment of all the values, as opposed to the individual assessment of each feature as is done in this review.

## Executive Summary

An associated Fisheries Management Paper, entitled *Recommendations of the Review of the Land Conservation Values of the Houtman Abrolhos Islands*, will be published by the Department of Fisheries and consider the findings of this review and the framework above.

# 1. INTRODUCTION

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There is growing pressure for increased development on the Houtman Abrolhos Islands ('Abrolhos Islands'). The number and variety of users of the islands is likely to increase in the coming years, particularly in light of the *Aquaculture Plan for the Houtman Abrolhos Islands* (Fisheries Management Paper No. 137, Fisheries WA, 2000) and the *Sustainable Tourism Plan for the Houtman Abrolhos Islands* (FMP No. 146, Fisheries WA, 2001). The terrestrial environment of the Abrolhos Islands has numerous features of high conservation value including significant fauna, flora, and geological and historical sites. It is important that these values are considered during the process of increasing access and when evaluating any future development applications.

Much work on the natural, historical and cultural values of the islands has been undertaken. This document is a review of this work and provides an overview of the conservation values of the islands in a format useful to provide input into the selection, design or evaluation of proposed changes to access arrangements and/or proposed developments at the Abrolhos Islands.

## A Brief Overview

The Abrolhos Islands are a complex of islands, reefs and lagoons, located at the edge of the continental shelf, approximately 60km offshore from Geraldton on the mid-west coast of Western Australia. The islands and surrounding waters are of recognised conservation significance in terms of the natural, historic and cultural environment.

There are three major groups of islands: North Island-Wallabi Group; Easter Group; and Pelsaert (Southern) Group – **Figure 1**.

The islands are geomorphologically diverse and contain important geological features. The flora includes a number of communities of conservation significance as well as important fauna. It is one of Australia's most important seabird breeding areas and contains some of Australia's most significant historic sites.

Marine areas of the Abrolhos Islands also have high conservation significance. The area is high in species richness and habitat diversity, with a unique blend of tropical and temperate species. It is also the site of the commercially valuable western rock lobster fishery, as well as fisheries for scallops and finfish.

## Policy Directives

In December 1998, the *Management of the Houtman Abrolhos System* (FMP No. 117, Fisheries WA) was released by the then Minister for Fisheries. This document provides an overarching framework for the direction and management of the Abrolhos System.

The plan *Management of the Houtman Abrolhos System* contains 112 strategies, including many relevant to this review. Information contained within this *Review of the Land Conservation Values of the Houtman Abrolhos Islands* may be used in the implementation of these strategies.

Strategies of relevance to this review are found in the following sections of the plan *Management of the Houtman Abrolhos System*:

- Land-use Planning;
- Terrestrial Flora and Fauna;
- Introduced Flora and Fauna;
- Fauna Management;
- Historic and Heritage Sites; and
- Tourism.

These strategies recommend additional surveys, reporting on management options, development of both strategic and specific management, and land use plans for development sites.

In the *Sustainable Tourism Plan for the Houtman Abrolhos Islands* (FMP No. 121, Fisheries WA, 2001), it was recommended that the environmental constraints of each terrestrial site needed to be determined and categorised based on permitted level of access. This document forms the first step towards achieving this recommendation by reviewing and collating existing information and identifying gaps in the information.

### **Objective of the Draft Review**

Based on existing information, the purpose of the *Review of the Land Conservation Values of the Houtman Abrolhos Islands* is to:

- identify and map areas of conservation value (natural, historical and cultural); and
- document existing information on sites of conservation value.

## 2. METHODOLOGY

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The preparation of the *Review of the Land Conservation Values of the Houtman Abrolhos Islands* involved the following three stages:

1. Information/Data Gathering;
2. Mapping and Interpretation of Information; and
3. Statement of Conservation Values.

These elements are described in more detail below.

### 2.1 Information/Data Gathering

Information gathering was based on a review of existing publications and research data, and consultation with informed Perth and Geraldton-based stakeholders. Stakeholders consisted of people and organisations known to have an interest, experience or knowledge of aspects of the Abrolhos Islands.

Where possible, original articles on the Abrolhos Islands have been obtained to ensure that data gathered is as accurate as possible and the source of information can be identified and recorded. Information obtained from referred scientific journals has been used in preference to the information contained in reports, strategies and management plans.

Information gathered from various documents was supplemented with information gathered from numerous stakeholders, particularly those who have had experience in research and management of the Abrolhos Islands. The purpose of the stakeholder consultation was:

- to inform stakeholders that this review was being undertaken and to provide an opportunity for input;
- for stakeholders to identify conservation areas on maps and provide details of the significance of these areas; and
- for stakeholders to suggest appropriate management strategies and/or appropriate land uses to protect the conservation values of the islands.

Consultation took place by meetings and phone interviews. Stakeholders were also asked if they knew of other persons with relevant information on the Abrolhos Islands. Additional people were then either contacted by phone or included on the mailing list to be sent a copy of the draft version of the document for comment. Stakeholders consulted during the preparation of this report are listed in **Appendix A**. A draft of this document was reviewed by numerous stakeholders and experts during its development.

### 2.2 Mapping and Interpretation of Information

Information gathered from the literature review and consultation was reviewed and collated. These values were mapped using Arc View 3.0 on base maps provided by the Department of Transport.

## 2.3 Statement of Conservation Value

Based on the information gathered, the conservation values of the islands, their sensitivities and possible threats were assessed and documented.

### 3. FUTURE MANAGEMENT PLANNING

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Following further investigations, it is proposed that the islands of the Abrolhos System be classified according to a permitted level of access. The permitted level of access for each island would be based on a cumulative assessment of all the values, as opposed to the individual assessment of each feature as is done in this review.

A possible framework for access management designed to maximise the protection of the conservation features of the islands is as follows:

- **Totally Closed Islands** – Conservation is given the highest priority on these islands, which would be protected from human disturbance all year.
- **Restricted Visitation (Number of Occupants) Islands** – Human visitation would be allowed on these islands, up to a defined carrying capacity.
- **Restricted Visitation (Seasonal Closure) Islands** – Human visitation would be allowed on these islands at times of the year which are not likely to interfere with the values of the islands (for example, seabird breeding).

Islands currently inhabited by licensees of the western rock lobster fishery would most likely fall into the category of ‘restricted visitation (number of occupants)’.

An associated Fisheries Management Plan, entitled *Recommendations of the Review of the Land Conservation Values of the Houtman Abrolhos Islands* will be published by the Department of Fisheries and will consider the findings of this review and the framework above.

## 4. CONSERVATION FEATURES

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This section contains a summary of conservation features of the Abrolhos Island, under the following categories:

- Geology and Geomorphology;
- Birds;
- Mammals and Reptiles;
- Flora;
- Fire, Introduced Flora and Fauna; and
- Historic and Cultural Sites.

Each section contains general information about the feature concerned, their conservation significance and possible threats to them.

**Appendix B** contains a *Summary of Conservation Values* in a table format. This table summarises information on the conservation features, significance, management implications and land access for each island. The table contains seven columns containing the following information:

- **Island** – the name of the island.
- **Category** – the type of feature which has been identified.
- **Feature** – a description of the feature.
- **Conservation Significance** – a statement which describes the conservation value of the feature, according to the following criteria:

A 'High' conservation value has been allocated to sites with:

- features of national or international significance;
- rare, vulnerable or threatened flora or fauna; and
- features of special conservation significance.

A 'Medium' value has been given to sites with features that are:

- significant to the Abrolhos Islands; and/or
- significant to the State, such as historic sites registered on State Heritage List; or
- nesting areas of seabirds, which have conservation significance, but are well represented on other islands of the Abrolhos.

Sites with limited conservation value (for example, an island which has previously been mined for guano and is now heavily developed with fisher's camps) are described as having a 'Low' conservation significance.

Some sites were not assigned a conservation significance category as not enough information was available to make a determination of their significance.

- **Management Implications** – describes current or potential threats that could impact on the conservation value of the feature.
- **Land Access** – recommendation on the appropriate level of permitted access in order to protect the conservation value from the identified threatening processes.

- **Source** – details of source (either a reference to the literature or to the stakeholder).

It should be noted that the conservation significance of a site can change over time. For example, the conservation value of a seabird colony on one island may increase if the seabird becomes threatened on another island, or in other parts of the world, or if seabirds increase their use of the area for nesting.

There are gaps in information on the conservation values of the Abrolhos Islands. Not all of the islands have been thoroughly investigated so an absence of information for a particular island doesn't necessarily mean that the island is without conservation value. When considering any proposal for development, or change in visitation, each island should be assessed individually, with this review as a guideline. Further consultation and field investigations may be necessary.

The *Review of the Land Conservation Values of the Houtman Abrolhos Islands* will be updated in the future as more information becomes available or changes in conservation features or values occur.

Habitat protection is an important issue when considering wildlife protection, and attempts were made to include this information within the review.

Conservation features have been mapped and are referred to throughout the text.

## 4.1 Geology and Geomorphology

### 4.1.1 General

Studies of the surface geology and geomorphology of the Abrolhos Islands have been summarised in previous reports (Abrolhos Islands Consultative Council, 1989).

The Abrolhos Islands have two distinct periods of formation. The Central Platform islands (i.e. North, East and West Islands in the Wallabi Group; the Rat Island chain in the Easter Group; Gun, Middle and Murray Islands and the numbered islands in the Pelsaert Group) all contain emergent reef which formed during the last Interglacial period, around 125,000 years ago (Fisheries WA, 1998). The leeward islands, composed of coral rubble and present in all three groups are much younger, and have emergent reef foundations which are about 5,000 years old (Fisheries WA, 1998).

On several of the larger islands are relics of continental surfaces which retain moderately rich vegetation. These contain relics of mainland flora and fauna. Islands, such as West Wallabi, have a high conservation value because of the flora and fauna inhabiting the island. At the other extreme are islands that consist mainly of recent accumulations of debris cast up by storms from nearby reefs. These islands have little or no vegetation, so have little value in terms of vegetation. However, some of these structures are extremely important for seabird and seal breeding (Storr *et al.*, 1986).

In previous submissions to the Abrolhos Islands Consultative Council, the WA Museum has indicated it had information on geological sites at the Abrolhos Islands of national and international significance. These sites need to be investigated, their conservation significance assessed, and appropriate management strategies and/or land uses need to be determined.

There are more than 50 tidal ponds at the Abrolhos Islands. Black and Johnson, (1997) examined the seven ponds that occur in Long Island in the Wallabi Group in 1994. These ponds range from small depressions in the shoreline beyond the high tide mark to one nearly 100 metres in length. The ponds provide a set of highly

unusual habitats containing a distinctive fauna, including unusual molluscs, and are diverse in nature (Black and Johnson, 1997). **Figure 2** shows the location of the tidal ponds on Long Island.

## 4.2 Birds

### 4.2.1 General

The Abrolhos Islands are among the most important seabird breeding islands in Australia and support significant breeding colonies of some species (Fuller *et al.*, 1994). A summary of the birds of the Abrolhos Islands has been published by Storr *et al.*, (1986). The islands are particularly important for the conservation of the following seabirds:

- Wedge-tailed shearwaters;
- Little shearwater;
- Roseate tern;
- Sooty tern;
- Fairy tern;
- Common noddy;
- Lesser noddy;
- Abrolhos painted button quail; and
- Brush bronzewing.

In the *Summary of Conservation Values* (**Appendix B**) islands commonly used for breeding by these seabirds have been assigned a 'High' conservation significance.

Wedge-tailed shearwaters excavate their nest burrows in beds of sand/coral grit covered with saltbush (*Atriplex cinerea*) and also burrow in semi-consolidated dunes carrying *Nitraria billardierei* and *Spinifex longifolius*, but rarely lay in rock crevices (Storr *et al.*, 1986). Dune areas and other sandy habitats should be protected to avoid disturbance to shearwaters and fragile vegetation (Surman, pers. comm.). The Abrolhos wedge-tailed shearwater colonies are by far the largest in the eastern Indian Ocean. The Abrolhos Islands also represent the northern limit of the breeding range for the little shearwater.

Roseate tern colonies may change significantly in size from year to year. The colonies may be located in the same place for consecutive years, or may vary significantly shifting from island to island. Breeding sites regularly utilised should be considered sensitive areas. The location of colonies can vary significantly.

Sooty terns are mainly susceptible to heavy predation on chicks and eggs by skinks, especially when disturbed (Surman, pers. comm.). The locations of the sooty tern colonies do not vary significantly.

The Abrolhos Islands are a breeding stronghold for fairy terns, which are comparatively rare in other areas of its distribution. Breeding sites regularly utilised should be considered sensitive areas.

When common noddy nests are disturbed, the young are exposed to predation by aerial and terrestrial predators (Surman, pers. comm.).

The lesser noddy is listed as "fauna which is rare, or likely to become extinct" under the (State) *Wildlife Conservation Act 1950*. The species is also listed as vulnerable in the Australian and New Zealand Environment

and Conservation Council (ANZECC) *Threatened Australian Fauna* list. The seasonal variation of this species is reported in Surman (1992).

The Australasian subspecies of the lesser noddy breeds only on three islands (Wooded, Morley and Pelsaert) in the Abrolhos Islands (Storr *et al.*, 1986), nesting in mangrove trees. Lesser noddies are dependent on these nesting sites through the year, which affords importance to the mangroves. Islands where these birds are found and breed have also been given a ‘High’ conservation significance in the *Summary of Conservation Values* (**Appendix B**).

Little shearwater utilise dune areas and other sandy habitats. These areas should be protected to avoid disturbance to shearwaters and fragile vegetation (Surman, pers. comm.).

Other than those seabird species listed above, there are a number of other species that have conservation significance at the islands. These species are described below.

The Abrolhos painted button-quail is listed as ‘fauna which is rare, or likely to become extinct’ under the (State) *Wildlife Conservation Act 1950*. The species is also listed as vulnerable in the ANZECC *Threatened Australian Fauna* list. The painted button-quail is found on North Island and the Wallabi Group (East Wallabi, West Wallabi, Seagull and Pigeon Islands) (Storr *et al.*, 1986). Their nests are a scrape in loose soil underneath vegetation. On West Wallabi, the bird favours low dunes covered with *Spinifex longifolious* and flats of coral grit wherever the halophytic shrubbery (*Atriplex cinerea* and *Halosarcia halocnemoides*) is relatively open. Islands where these birds are found and breed have also been given a ‘High’ conservation significance in *Summary of Conservation Values* (**Appendix B**).

The brush bronzewing is confined to North Island and the Wallabi Group (East Wallabi, West Wallabi, Tattler, Pigeon and Long Islands) (Storr *et al.*, 1986). This species is common on North Island where the birds feed on the seeds of the littoral plant (*Cakile maritima*), and occasionally aggregate near water. They are uncommon to moderately common on other islands where they are found in all kinds of vegetation. The mainland populations of this species are decreasing (Abrolhos Islands Consultative Council, 1989).

The red-tailed tropicbird has been listed previously as a rare species but has now been taken off that list. It is mentioned here for recognition only.

There is a large colony of pied cormorants at the edge of the lagoon on Wooded Island. This colony is badly affected by visitors at times. Cormorant colonies are very susceptible to interference and should never be approached within 200 metres unless breeding is only at the egg or very small chick stage.

#### Seabird breeding schedules and locations

The vulnerability of seabird species to interference and disturbance from human activities differs depending on breeding habits, schedules and locations.

A knowledge of seabird breeding schedules can be used to ensure that seabirds are protected during their most vulnerable stages of breeding, by developing management strategies which prevent disturbance of their nesting sites.

Most islands in the Abrolhos Islands are used by birds for breeding. **Figure 3** (a-d) shows the location of the most significant colonies in the Abrolhos Islands (Department of Fisheries, unpublished data). These maps show only the location of major, long-term seabird rookeries.

Seabird species differ in their strategy for selecting breeding sites. Some seabirds (such as the lesser noddy) will return to the same nests year after year, whereas other birds (for example, fairy terns, roseate tern, crested tern, osprey, Pacific gull) do not have fixed breeding sites and may move their breeding place each year (Fuller and Burbidge, 1981). Due to this complexity, it is not possible to prepare a comprehensive map of seabird nesting sites which would show the location of all breeding sites for every year. Therefore, there will be many more breeding sites at the islands that are not represented in **Figure 3**.

Most seabirds at the Abrolhos Islands breed during spring/summer, but four species breed during autumn as well (Surman, 1998). The number of active breeders varies from year to year for all seabird species. However, for colonial species, such as shearwaters, noddies and sooty terns, breeding sites remain in the same areas (Surman, pers. comm.).

A list of seabirds recorded as breeding on each of the islands in the Abrolhos was prepared by Fuller and Burbidge in 1994 (**Appendix C**). This list describes the location of seabirds breeding during that particular study period.

Pelsaert Island supports the most diverse and dense number of breeding seabirds in the Abrolhos Islands and along the Australian coast, apart from the massive breeding populations of short-tailed shearwaters found on islands in south-east Australia (Chris Surman, pers. comm.). Thirteen species of seabird breed regularly on Pelsaert Island (Surman, 1998). Pelsaert Island has the largest breeding colonies of sooty terns, common noddies and lesser noddies in Australia. There is also a colony of Caspian terns which nest at Big Lagoon.

When disturbed by a plane, all of the birds (including nesting birds) fly off from their nests, leaving eggs and chicks vulnerable to predation. Birds also tend to regurgitate their food when scared or stressed. Areas that are off limits to aircraft are enforced by the Civil Aviation Safety Authority or by the Department of Fisheries. Currently, float planes land directly in the flight paths of these seabirds. Float planes landing at Pelsaert Island should land further out and motor in slowly to avoid this impact.

Surman (1998) recorded the timing of seabird breeding at the Pelsaert Group between 1993 and 1998. This information is essential when developing appropriate management strategies for any increase in visits to the Abrolhos Islands, as well as for existing user groups. **Appendix D** shows the breeding chronology of 14 seabirds which breed in the Pelsaert Group (Surman, 1998). The breeding seasons described in this figure include all activities from nest acquisition to the fledging of young.

Since it is difficult to predict the breeding locations of species from year to year, a more successful strategy may be to provide protection according to the known habitats which are used to make nests or lay eggs (Fuller and Burbidge, 1981; Fuller *et al.*, 1994). Potential seabird breeding sites could be mapped according to the habitats on the islands. For example, potential breeding sites for wedge-tailed shearwaters could be identified by mapping sandy areas.

### 4.2.2 Management Considerations

The *Abrolhos Islands Planning Strategy* recommended that access to bird breeding areas should be restricted during breeding seasons (Abrolhos Islands Consultative Council, 1989). The Planning Strategy also recommended that restriction of flight paths for fixed wing and rotary aircraft during breeding seasons should be investigated in consultation with the Department of Planning and Infrastructure.

Guidelines for control/mitigation measures for aircraft disturbance on the Great Barrier Reef were prepared by the Great Barrier Reef Marine Park Authority in 1997. These should be considered as part of an overall management plan for seabirds at the Abrolhos Islands.

**Appendix E** contains a code of conduct for human visitation to seabird breeding colonies (Abrolhos Islands Consultative Council, 1995). This provides guidelines for visitors to follow, to avoid detrimental impacts to seabird breeding colonies. This code of conduct should be actively distributed to all potential visitors of the islands.

Further information on appropriate conduct around seabird colonies may be found in a report by the Great Barrier Reef Marine Park Authority, entitled *Guidelines for Managing Visitation to Seabird Breeding Islands*. The report details the range of human disturbance factors contributing to the vulnerability of breeding seabirds (Great Barrier Reef Marine Park Authority, 1997). A summary of this information is provided in **Appendix F**.

When considering the management of visitors, the way in which visitors move around the islands needs to be considered (Dunlop, pers. comm.). Different seabirds have different responses to human presence so a management framework should be developed based on how birds behave. The introduction of disturbance should be carefully managed and access should be controlled accordingly. At appropriate sites, infrastructure could be developed so that visitor patterns of movement allows birds to habituate.

Appropriate interpretation and signage is also required. There are examples of management of human visitation to other seabird breeding islands in WA, for example Lancelin Island and Penguin Island.

## 4.3 Mammals & Reptiles

### 4.3.1 Terrestrial Mammals

Only two species of indigenous land mammals have been recorded on the Abrolhos Islands – the tammar wallaby (*Macropus eugenii derbianus*) and the southern bush rat (*Rattus fuscipes*).

In the *Summary of Conservation Values* (**Appendix B**) the islands where the tammar wallaby and southern bush rat are found have been assigned a ‘High’ conservation significance.

Until 1998, the tammar wallaby was gazetted as “rare or otherwise in need of special protection” under the (State) *Wildlife Conservation Act 1950*. The tammar wallaby is a Priority 4 species on the CALM Priority Fauna List and the Western Australian population is listed as ‘Conservation Dependent’ in the ANZECC *Threatened Australian Fauna List*.

The tammar wallaby is found on East Wallabi, West Wallabi and North Island (introduced from the Wallabi Islands) (Abbott and Burbidge, 1995). Storr (1965) reports that the tammar wallaby population, on West Wallabi, inhabits the flats of shell grit where they hide during the day in tunnels through dense clumps of saltbush and samphire. They are also found on the pavement limestone communities (Storr, 1965). On East Wallabi Island, most animals were found in low scrub around the airstrip. Their principal source of water is from the vegetation on which they feed and from the old well (Storr, 1965).

Australia wide threats to the tammar wallaby are fox predation, loss of suitable thickets due to inappropriate fire regimes and vegetation clearing. Foxes have not been introduced to the Abrolhos Islands, so this is not a current threat.

The southern bush rat is found on East Wallabi and West Wallabi Islands (Abbott and Burbidge, 1995). The southern bush rat inhabits sandy country, well vegetated with *Spinifex longifolious* where they spend the day hidden in the bases of shrubs and tussock grass (Storr, 1965). The introduction of cats would threaten the southern bush rat.

There is no information on the current population status of the tammar wallaby or the southern bush rat at the Abrolhos Islands. Future monitoring would be needed to identify any decline in these populations.

Management measures to protect both the tammar wallaby and the southern bush rat at the Abrolhos Islands should include management of vegetation on islands they inhabit, including restrictions on vegetation clearing. There never has been a formal fire management regime at the islands.

### 4.3.2 Marine Mammals

The Abrolhos Islands are at the northern limit of the Australian sea lion's (*Neophoca cinerea*) Western Australian range (Storr, 1960; Gales *et al.*, 1992). This species is one of the world's rarest pinnipeds (Gales *et al.*, 1994) and is listed as 'in need of special protection' under Schedule 4 of the (State) *Wildlife Conservation Act 1950*.

The small population of sea lions at the Abrolhos Islands is probably a remnant of a more substantial colony (Gales *et al.*, 1992). Publications on historic aspects of the Abrolhos Islands have included accounts of sea lion colonies made by early visitors to the islands (described in Gales *et al.*, 1992). Shipwrecked survivors from the *Batavia* are known to have killed large numbers of sea lions when they were camped on the islands in 1629. Survivors of the *Zeewijk* in 1727 killed 147 sea lions for food on islands of the Pelsaert Group. In 1843, the islands of the Wallabi Group were described as being thickly inhabited with sea lions.

The Australian sea lion has a 17-18 month breeding cycle off the west coast of Western Australia. Sea lion breeding sites are utilised at all times during their reproductive cycle, with maximum use occurring during the pupping season (Gales *et al.*, 1992). Sea lions breed on low-lying limestone islands that are well protected by perimeter reef systems.

Sea lions haul out (come ashore to rest and breed) on beaches on the lee side of these islands. The interior of these islands support moderately heavy stands of the shrub *Nitraria billardierei*. These are used extensively by cows to give birth and provide shelter for their pups (Gales *et al.*, 1994).

The most important areas for sea lion conservation at the Abrolhos Islands are the breeding islands. Human visitation to islands where sea lions are breeding should be avoided as these animals are highly sensitive to disturbance. The sea lions can also be aggressive during the breeding season (Gales *et al.*, 1994). Due to the 17-18 month breeding cycle, it is not possible to ban visitation to these islands at a consistent time each year. Rather, visitors should be aware of, and avoid, the islands likely to be used as breeding areas when visiting the islands at any time of year. In the *Summary of Conservation Values (Appendix B)* the islands used by sea lions for breeding have been assigned a 'High' conservation significance.

Visitation to islands with sea lion haul-out sites is less critical in terms of disturbance, although there have been significant detrimental effects from human visitation recorded in some places (Gales *et al.*, 1994). Gales *et al.* (1994) report a case in which a beach was used extensively by sea lions for breeding and as a haul-out site. After its extensive use as an anchorage by fishers, sea lions were rarely seen. However, they also report a case where no detectable detrimental effect on sea lion numbers was recorded after large numbers of tourists visited a colony in supervised groups.

During four surveys of sea lion sightings at the Abrolhos Islands between July 1988 and October 1990 (Gales *et al.*, 1992), most were recorded on islands in the Easter Group. Breeding, defined as presence of pups, was recorded at Serventy Island, Gilbert Island, Alexander Island and Suomi Island in 1989 (Gales *et al.*, 1992). The

populations of sea lions at the Abrolhos is small and widespread and it is possible that other small pupping sites were overlooked.

Other islands where breeding sea lions have been observed are Keru Island, Square Island, Stick Island, Gibson Island, Gun Island, Morley Island and Wooded Island (Suckling, pers com).

**Figures 3a-3d** show the location of sea lion breeding sites and favourite haul-out sites for each island group. Sea lions probably haul-out on virtually all islands at one time or another, with some islands being favourite haul-out sites. In the *Summary of Conservation Values* (**Appendix B**) the islands with favourite haul-out sites have been assigned a 'Medium' conservation significance.

Although historic data show that sea lions were once abundant at the Abrolhos Islands, these populations have still not recovered to these reported levels. The reason for this needs further investigation (Gales, pers. comm.). Research is needed for both terrestrial and marine areas to determine if there are any processes which are threatening the Abrolhos Island sea lions. Long-term monitoring is required to determine the status of the Abrolhos Islands sea lion population.

### 4.3.3 Reptiles

#### 4.3.3.1 General

Twenty six species of reptiles have been recorded at the Abrolhos Islands by the WA Museum. The Wallabi Group, particularly the islands of East and West Wallabi, have been identified as having the richest reptile assemblage of the island groups (Abrolhos Islands Consultative Council, 1989).

Particularly significant species are the Spiny-tailed skink (*Ergenia stokesii stokesii*), the carpet python (*Morelia spilota imbricata*) and the Abrolhos dwarf bearded dragon (*Pogona minor minima*).

The carpet python has been listed as "rare or otherwise in need of special protection" under the (State) *Wildlife Conservation Act 1950*. This species is also listed under Schedule 4 (Other Specially Protected Fauna) of the (State) *Wildlife Conservation Act 1950* and as 'Conservation Dependent' in the ANZECC *Threatened Australian Fauna List*. The carpet python is found on East Wallabi and West Wallabi Island, and is common in all habitats (Storr, 1965).

The spiny-tailed skink has also been listed as "rare or otherwise in need of special protection" under the (State) *Wildlife Conservation Act 1950*. This species is also included on the Vulnerable Reptiles List of Environment Australia's Endangered Species Program. The sub-species of the Houtman Abrolhos spiny-tailed skink is endemic to the Abrolhos Islands (Abrolhos Islands Consultative Council, 1989).

The Abrolhos dwarf bearded dragon is a Priority 4 species on the CALM Priority Fauna list meaning that this species is "declining but not yet threatened or in need of special protection". This species is endemic to the Abrolhos Islands and has been recorded on Rat Island, East Wallabi, West Wallabi, Tattler and Pigeon Islands (Storr, 1965).

The main threats to reptile fauna would be disturbance of habitat, fire and predation from feral animals such as cats.

## 4.4 Flora

### 4.4.1 General

A flora and vegetation survey of the islands of the Houtman Abrolhos by Harvey *et al.* (2001) lists 239 species of terrestrial vascular plants from a total of 68 families: 144 natives species from 55 families, and 95 introduced/naturalised species from 29 families (Table 1a, 1b and 1c, *Appendix G*).

Vegetation maps for the individual islands/islets of the Houtman Abrolhos were reproduced from Harvey *et al.* (2001) (Refer to Appendix G).

### 4.4.2 Priority flora

There are five species of flora found on the islands included in CALM's Priority Flora list (see Table 2).

Table 2. Priority species found on the Abrolhos Islands (reproduced from Harvey *et al.*, 2001).

Priority flora	Conservation Code – Priority	Occurrence	Other population knowledge
<i>Acacia didyma</i>	3	East Wallabi Island	Dirk Hartog Island, Tamala Station
<i>Calocephalus aervoides</i>	3	East Wallabi Island, West Wallabi Island	Port Gregory, Dorre Island, Balladonia
<i>Chthonocephalus tomentellus</i>	2	West Wallabi Island	Shark Bay, Denham
<i>Galium migrans</i>	3	East Wallabi Island	Eucla, Caiguna, Cape Leeuwin, Margaret River, Cape Le Grand, National Park, Eastern States
<i>Lepidium puberulum</i>	4	Alexander Island, Bynoe Island, Campbell Island, Eastern Island, First Sister, Gilbert Island, Keru Island, Leo Island, Little North Island, Morley Island, Serventy Island, White Island	Rottnest Island, Dorre Island, Boullanger Island, Garden Island, Zuytdorp Cliffs, Dirk Hartog Island

Conservation Codes are defined in Atkins (1998) as follows:

- Priority 2 – Poorly Known Taxa: taxa which are known from one or a few (generally < 5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- Priority 3 – Poorly Known Taxa: taxa which are known from several populations (generally > 5), and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations, or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey.

- Priority 4 – Rare Taxa: taxa which are considered to have been adequately surveyed and which, while being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

#### 4.4.3 Vegetation communities of special conservation interest

Vegetation communities of the Abrolhos Islands, of special conservation interest, are displayed in Figures 4.1 to 4.68 and include (Fisheries WA, 1998):

- **Mangrove community, ‘mangal’ (*Avicennia marina*).** This rare and special plant community requires specific environmental conditions to survive. Mangals form highly productive communities and provide an important source of primary production of marine food chains, habitat for fish and breeding habitat for Australian sea lions and seabirds (especially the lesser noddy). Mangroves also protect shorelines from erosion and storm damage. Threats to mangrove communities include direct clearing, landfill, oil spills, dumping of rubbish and sewage disposal (causing nutrient enrichment) (Harvey *et al.*, 2001). Rubbish from inhabited island and boats may pollute mangroves on adjacent islands (although there has been no formal studies to verify this). Shacks and jetties built on or near mangroves may have an adverse effect on the health of these mangrove communities.

Mangrove communities are found on the following islands (Harvey *et al.*, 2001):

*Wallabi Group:* Akerstrom Island, “East Mangrove Island”, Marinula Island, Oystercatcher Island, Seagull Island, Tattler Island, Turnstone Island and West Wallabi Island.

*Easter Group:* Alexander Island, Campbell Island, Keru Island, Little Rat Island, “Little Stokes Island”, Morley Island, Serventy Island, Suomi Island and Wooded Island.

*Pelsaert Group:* Basile Island, Burnett Island, Burton Island, Coronation Island, “Coronation Islet”, Diver Island, Gaze Island, Iris Refuge Island, Jackson Island, “Little Jackson Island”, Newman Island, Pelsaert Island, Post Office Island, Robertson Island, Travia Island, Uncle Margie Island.

- ***Atriplex cinerea* dwarf shrubland.** This vegetation occurs on sandy soils or shell grit. The deeper soils supporting them are suitable for burrowing seabirds, such as petrels and shearwaters to build nests. These breeding areas occur throughout the islands and are easily disturbed by humans walking through them. Threats to *Atriplex* communities include direct clearing, trampling by visitors, weed infestation, landfill, grazing by feral animals, fire and dumping of rubbish (Harvey *et al.*, 2001).
- **Pavement limestone, dunes and unconsolidated dunes on North Island and East and West Wallabi Islands.** These communities contain rich and diverse flora. They are highly sensitive to disturbance and have slow rates of regeneration. Threats to communities on pavement limestone, dunes and unconsolidated dunes include direct clearing, trampling by visitors, weed infestation, landfill, grazing by feral animals, fire and dumping of rubbish (Harvey *et al.*, 2001).
- **Salt lakes and low saltbush flats.** These communities are rare on offshore islands in south west Western Australia. Threats to salt lakes and low saltbush flats include direct clearing, trampling by visitors, weed infestation, landfill, grazing by feral animals, fire and dumping of rubbish (Harvey *et al.*, 2001).
- ***Eucalyptus oraria* on East Wallabi Island.** The Abrolhos Islands are the only islands south of Barrow Island and west of Albany on which this eucalyptus species occurs (Harvey *et al.*, 2001).

These significant vegetation communities have been mapped for each island group in the *Abrolhos Islands Planning Strategy* (Abrolhos Islands Consultative Council, 1989).

The bushy shrubs of *Nitraria billardierei* are used extensively as places for sea lion cows to give birth to and provide shelter for their pups (Gales *et al.*, 1994). Mangrove communities are also important historically. Survivors of the Zeewijk cut wood for fires and for building their boat. (Myra Stanbury, pers. comm.).

A summary of this information relevant to conservation management has been provided for this report and is contained within the *Summary of Conservation Values* (Appendix B).

## 4.5 Fire, Introduced Flora and Fauna

### 4.5.1 General

The introduction and establishment of feral mammalian predators could have a significant impact on the native fauna of the Houtman Abrolhos Islands. Monitoring is required to ensure the early detection and immediate eradication of any introductions.

On Rat Island, there has been a local extinction of the formerly very large colonies of wedge-tailed shearwater, sooty tern and common noddy due to the combined effects of guano mining and the introduction of cats and rats (Fuller *et al.*, 1994).

Rabbits (*Oryctolagus cuniculus*) were released on to Leo Island, Wooded Island, Middle Island and Pelsaert Island, but are now absent (Abbott and Burbidge, 1995). Rabbits are currently on Long Island and an eradication campaign should be undertaken, possibly using the calici virus.

House mice (*Mus musculus*) are established on Rat and North Island (Abbott and Burbidge, 1995). Black rats (*Rattus rattus*) were introduced to Pigeon Island and Rat Island, but are now absent (Abbott and Burbidge, 1995). Mice periodically occur on other islands.

Cats (*Felis catus*) were introduced to Rat Island around 1900 (Abbott and Burbidge, 1995). There may be at least one cat remaining on the island (O'Halloran, pers comm).

No jetty extension has been allowed at the West Wallabi Island settlement, 'Westside', to minimise the risk of vermin being introduced to the island (Fisheries WA, 1996). The Department of Fisheries policy is that no substantial jetty will be constructed at this location.

The noxious weed African boxthorn (*Lycium ferocissium*), present at the islands, is a dangerous trap for wildlife (for example, bird chicks) with its intricately branched spiny stems. Rigorous eradication should continue. Recently, the presence of 'mother of million' (*Bryophyllum delagoense*) and prickly pear was discovered at the islands.

The location of introduced flora and fauna have been included in the *Summary of Conservation Values* (**Appendix B**).

Fire risk would be much higher than at present if there was to be tourist visitation in summer. Visitors should be restricted to designated tracks and visits confined to daylight hours in an effort to reduce the chance of fire (Longman *et al.*, in prep.).

Further introduction and spread of weeds, especially grasses that dry off in summer, would also lead to increased fire risk (Harvey *et al.*, 2001).

There is currently a lack of signage at the Abrolhos Islands warning visitors of the risk of igniting fires (Surman, pers. comm.). Some sites are used regularly by visitors for campfires. In particular, a regular campfire site at the guano jetty on Pelsaert Island is located next to a sign indicating that the island is an A Class Reserve. The sign does not inform the public that camping/campfires are prohibited in A Class Reserves.

## 4.6 Historic and Cultural Sites

### 4.6.1 General

The historical and cultural environment of the Houtman Abrolhos Islands has been described in a number of publications (Green and Stanbury, 1988; Stanbury, 1991; Stanbury, 1993). The Abrolhos Islands have connections with the earliest periods of European history in Australia. They are the site of a number of historic shipwrecks, including the Dutch ships *Batavia* and *Zeewijk*. They are also the site of some of the earliest constructed European structures. During the colonial period, guano mining occurred on several of the Abrolhos Islands, extending to Pelsaert Island during World War II. During the 20th century, fisheries for rock lobster and finfish were developed.

Shipwrecks and associated land sites are protected under the (State) *Maritime Archaeology Act 1973* and the (Commonwealth) *Historic Shipwrecks Act 1976*. Seven shipwrecks in the Abrolhos Islands are gazetted as historic shipwrecks under the (Commonwealth) *Historic Shipwrecks Act 1976*. These are: *Batavia* (1629), *Zeewijk* (1727), *Ocean Queen* (1842), *Hadda* (1877), *Ben Ledi* (1879), *Marten* (1879) and *Windsor* (1908).

The Western Australian Maritime Museum describes three categories of land sites that are considered to be worthy of protection:

1. **Sites Associated with pre-European Settlement Shipwrecks** (culturally unique, historically significant at a national and international level, earliest evidence of European settlements on Australian territories). The islands which are particularly associated with the Dutch wrecks are: West and East Wallabi Islands, Long Island and Beacon Island in the Wallabi Group; and Gun Island, Middle Island, Numbered Islands and Pelsaert Island in the Pelsaert Group. These sites are classified as having a 'High' conservation significance in the *Summary of Conservation Values*.
2. **Sites Associated with Post-settlement or Colonial Period Shipwrecks** (these are not culturally unique but significant in terms of maritime history of Abrolhos Islands, and to the broader colonial history of Western Australia). These sites were classified as having a 'Medium – High' conservation significance in the *Summary of Conservation Values*.
3. **Sites Associated with Colonial Maritime Industries** (such as guano mining). These sites are of historical, cultural and social interest (Green and Stanbury, 1988). These sites were classified as having a 'Medium' conservation significance in the *Summary of Conservation Values*.

Areas of significance not covered by the (State) *Maritime Archaeology Act 1973* include:

- sites associated with colonial maritime industries;
- submerged and/or partially submerged jetties, wharfs, causeways; and
- sites associated with historic events.

A code of conduct for visitors to historical sites at the Abrolhos Islands was prepared by the Western Australian Maritime Museum (**Appendix H**). This code of conduct was taken from the report *Historic Areas of the*

*Houtman Abrolhos* (Stanbury, 1991) and also contains preliminary drafts for the development of on-site informative plaques which outline the significance, history, discovery and laws pertaining to the sites.

As stated in the code of conduct for historic areas, the following areas have ‘protected zone’ restrictions:

- Beacon Island (Wallabi Group);
- Long Island (Wallabi Group);
- Traitors Island and small islets of Morning Reef (Wallabi Group);
- West Wallabi Island (Wallabi Group);
- Gun Island (Pelsaert Group);
- Middle Island (Pelsaert Group); and
- Pelsaert Island (Pelsaert Group).

Protected zone restrictions are that “visitors shall not carry out any digging or major earthworks within the zones around declared maritime archaeological sites unless permitted to do so”. Visitors shall also not “take metal-detecting devices into any of the designated historic areas without approval from the Executive Director, WA Museum”.

The location of historic sites, guano-mined areas and guano-mining rail/tram lines were mapped for each island group in preparation of the *Abrolhos Islands Planning Strategy* (Abrolhos Islands Consultative Council, 1989). This information is contained in this review as **Figure 5a-c**. Note that there were no historic sites mapped for North Island.

In 1982, the Western Australian Museum recommended that no (further) housing or accommodation be allowed (and removal of camps be undertaken in the longer term) on West Wallabi Island, Gun Island, Beacon Island, Long Island and the southern end of Pelsaert Island (1982). The camps on Gun Island have been removed and “unauthorised” digging has occurred (Owens, pers. comm.). The issue of removal of camps needs further investigation.

Stanbury (1993) identified and documented guano mining sites and historic sites associated with the early fishing industry in the Easter Group and recommended management strategies for particular sites. These are included in the *Summary of Conservation Values* (**Appendix B**). There is very little protection afforded to sites associated with the early fishing history of the Abrolhos Islands and consideration should be given to mechanisms through which these sites could be preserved.

The physical remains and remnants of the early fishing industries (finfish and rock lobster) have been researched and evaluated, and preliminary management criteria developed (Gray, 1993). Gray (1993) concluded that further research and formal documentation of specific sites associated with the rock lobster fishery is required. The report also states that there is a need to retain increasingly valuable heritage sites and materials. Significant ‘early’ camps should be set aside for preservation and restoration. These sites were not specified in the report as further assessment is required, although suggestions on methods to undertake this were provided.

The *Summary of Conservation Values* (**Appendix B**) contains information on the location, conservation significance, management implications and recommended access limitations for sites with historic and/or cultural significance.

Several important sites are discussed as dot points on the following page. Further information about these sites is contained in the original reports which are referred to herein.

- Gun Island – Gun Island contains the site of the *Zeewijk* (1727) survivors' camps (containing artefacts, camp sites, burial sites and rock holes or 'wells'). This site is historically significant at a national level.
- Middle Island – Middle Island is a historical site containing stone structures, artefacts, non-European burial grounds, and the *Venus* (1861) shipwreck survivors' refuge and burial site. The exact origin of the limestone structure and a stone tower is uncertain.
- Middle Island – The well at the south eastern end of Middle Island, used by the survivors of the *Zeewijk* (1727), is a historical site of national and international significance.
- Murray Island – The site of the well used by the *Zeewijk* (1727) survivors is a historical site of national and international significance.
- Pelsaert Island – The settlement site, guano fields, guano-loading bay and chute, phosphate-loading wharf (no longer present), jetties, limestone causeway, quarry and wooden punt are historical sites of medium importance.
- Pelsaert Island – The shipwreck survivors' (from the *Marten* (1878) and *Ben Ledi* (1879)) encampment on Pelsaert Island is historically significant in terms of maritime history of the Abrolhos Islands and to the broader colonial history of WA.
- Pelsaert Island – The sawn-off mangrove tree-stump artefacts deposit, and wreckage deposit, marks a site used by the survivors of the *Zeewijk* (1727). This a historic site of national and international significance.
- Beacon Island – Beacon Island contains sites of the *Batavia* (1629) shipwreck survivors' encampment, burial place or 'graveyard', cannon and other artefacts. The site was also used by the survivors of the *Hadda* (1877) shipwreck. This is a historical site of very high significance at national and international levels.
- East Wallabi Island – East Wallabi Island is the site of the wells used by the survivors of the *Batavia* (1629), and is also a slaughter site.
- Long Island – Long Island contains a site of *Batavia* survivors' occupation and a slaughter site, as well as gallows and a mutineers' prison. This is a historically significant site at national and international levels.
- Traitor Island – Traitor Island was occupied by survivors of the *Batavia* shipwreck (1629). No archaeological evidence of this has been located to date.
- West Wallabi Island – The slaughter point used by survivors of the *Batavia* (1629) is a historical site of national and international significance. This site contains two limestone structures. Limestone structure 1 is located at the Weibbe-Hayes encampment. Limestone structure 2 could have been built by Weibbe-Hayes or guano miners.
- West Wallabi Island – West Wallabi Island contains fireplaces, middens, wells and other artefacts of medium to high conservation significance.

## 5. SPECIFIC ISLANDS

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### 5.1 General

Some islands of the Houtman Abrolhos, which have high conservation significance, require the development of an island-specific management plans or site management plan. In some cases, this is necessary so that different conservation features found in the same location (such as the historic sites and fauna species on West Wallabi Island) can be managed in co-ordination.

Based on the conservation values reviewed in this report, islands requiring specific management plans have been identified. These are:

- Pelsaert Island;
- West Wallabi Island;
- East Wallabi Island;
- Beacon Island;
- Wooded Island; and
- Morley Island.

These islands have features with a high conservation value in one or more categories, have attributes which attract visitors, and management and access issues which generally more complex than other islands.

Island-specific management plans should consider, but not be limited to, the following issues:

- conservation of natural, historic and cultural values;
- protection of the natural environment from fire and introduced flora and fauna, and other human impacts;
- provision of access that does not adversely impact on conservation values;
- management of public access and wildlife interaction so that conservation values are protected;
- provision of opportunities for visitors to increase visitors knowledge and appreciation of Abrolhos Islands conservation features;
- minimisation of wildlife disturbance; and
- preparation of appropriate research and monitoring programs.

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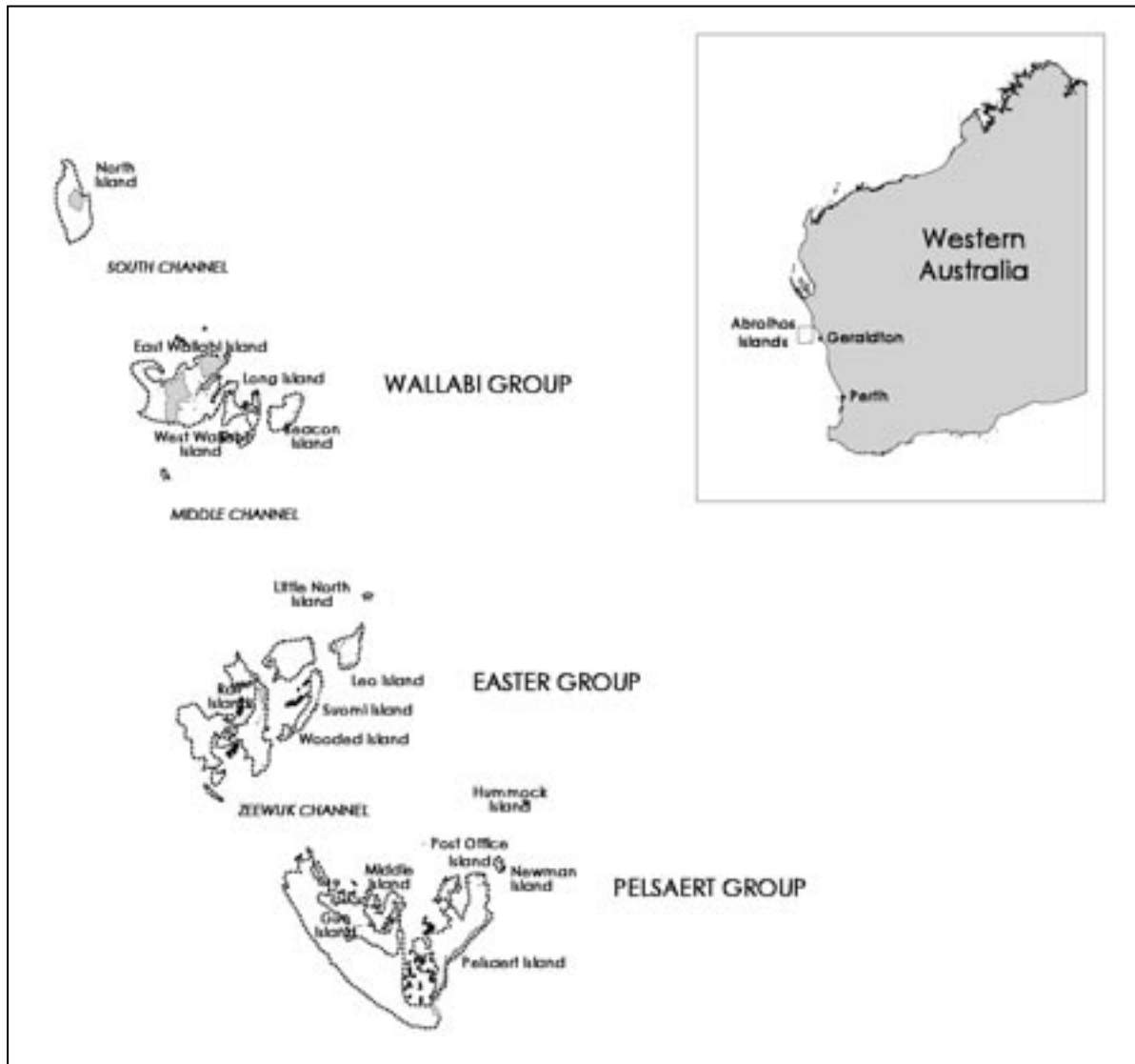
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# Figures



**Fig. 1.** Island Groups of the Abrolhos Island System.

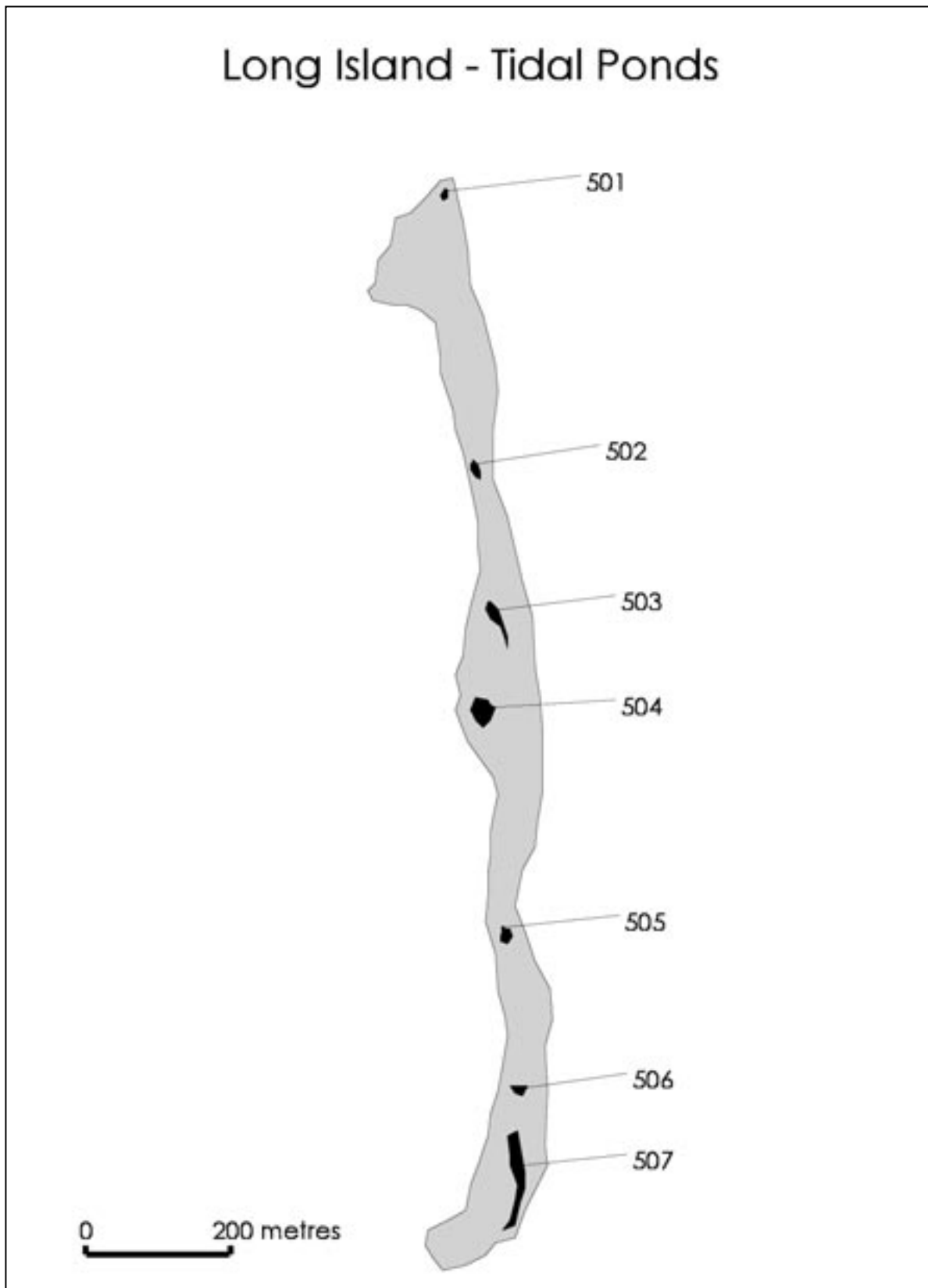
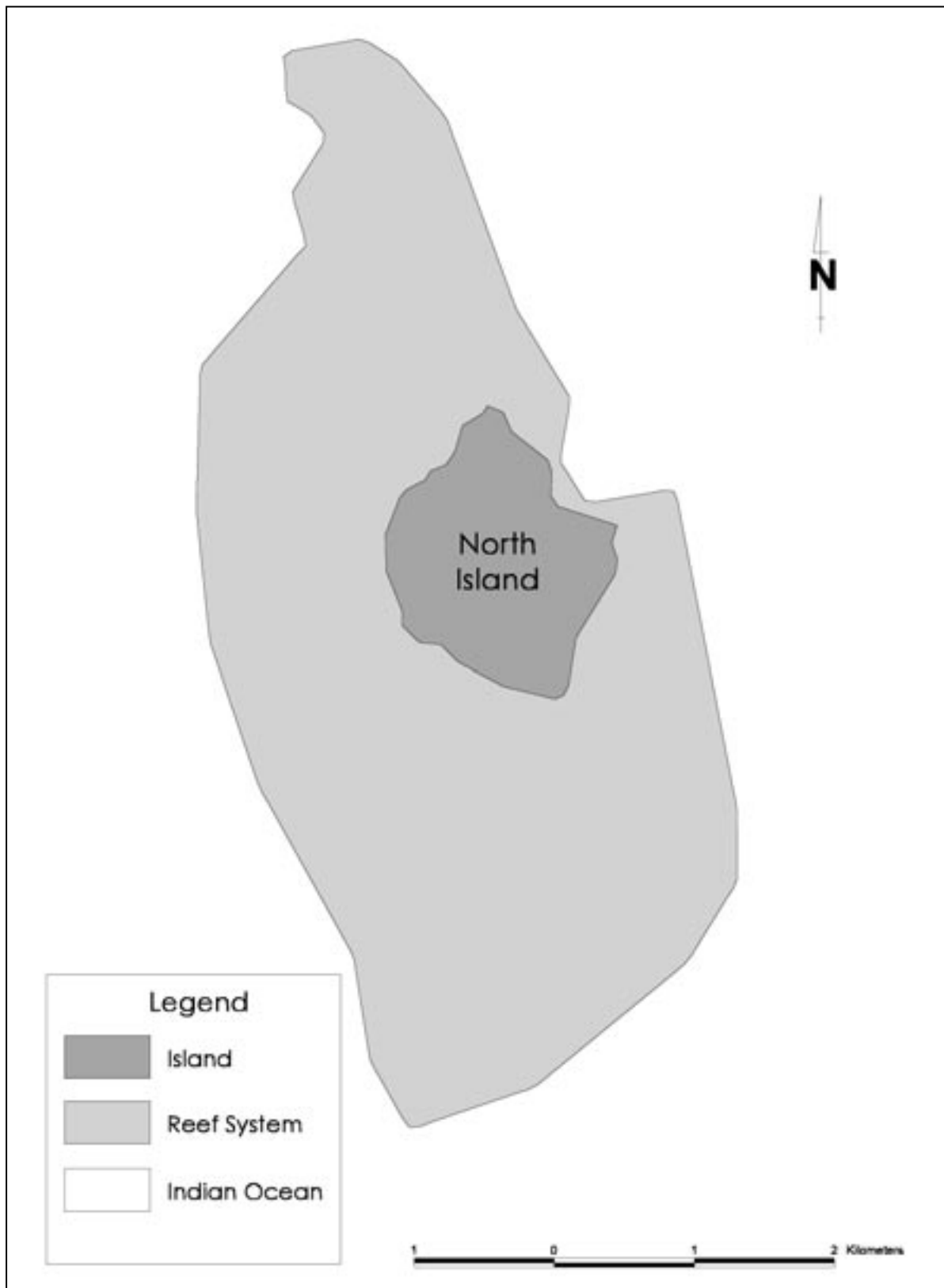
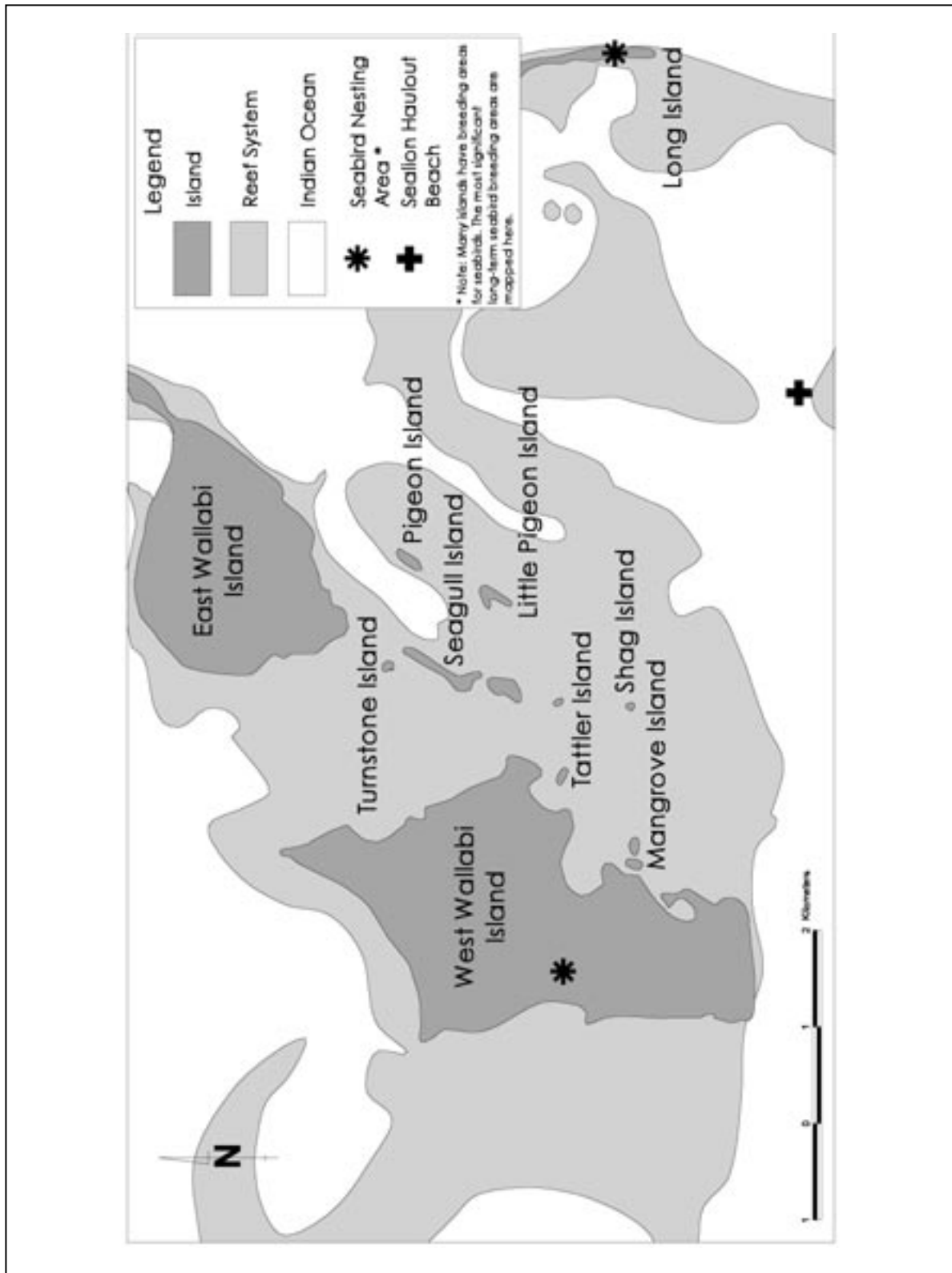


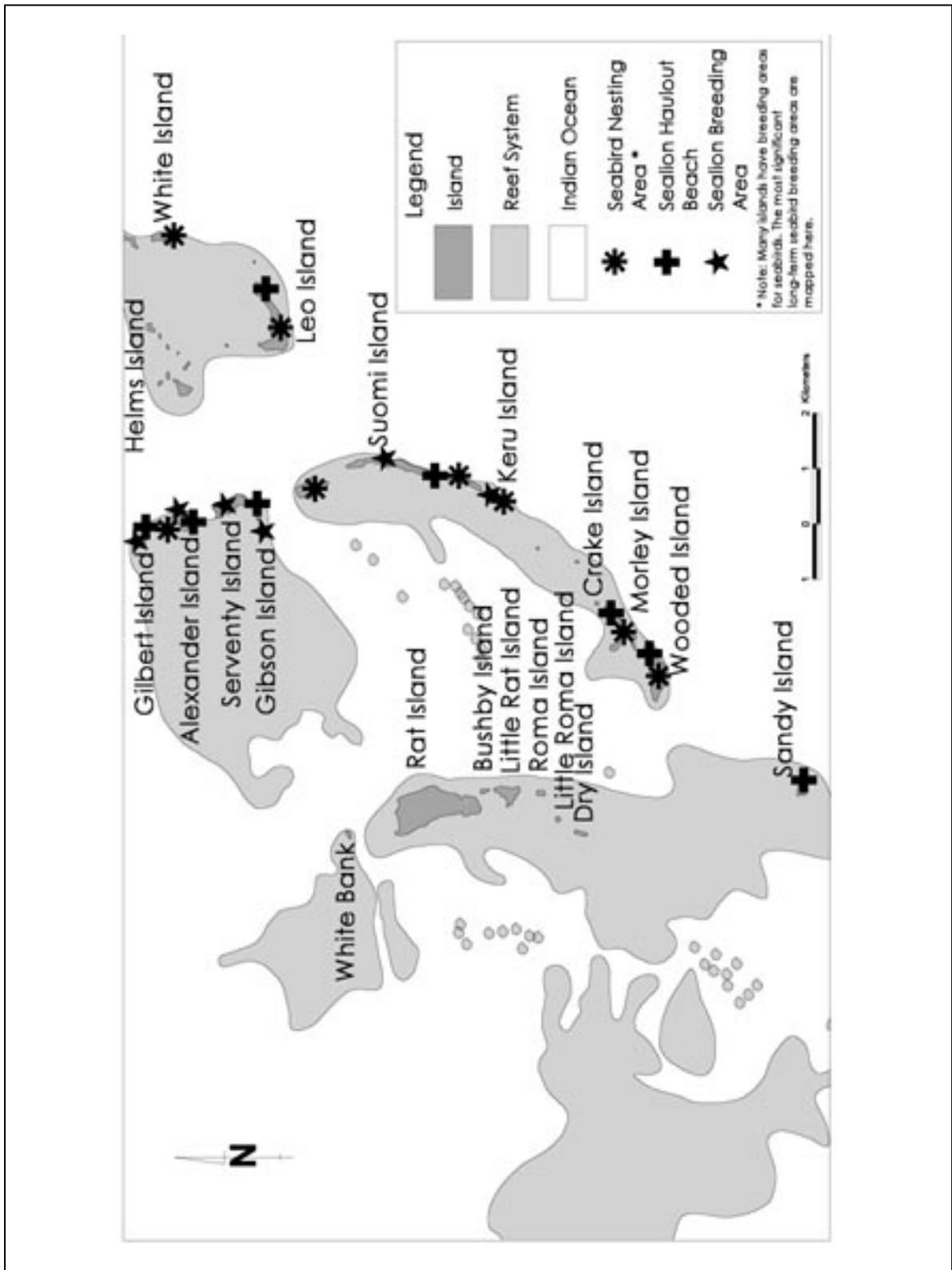
Fig. 2. Map of Long Island showing the locations of the seven tidal ponds.



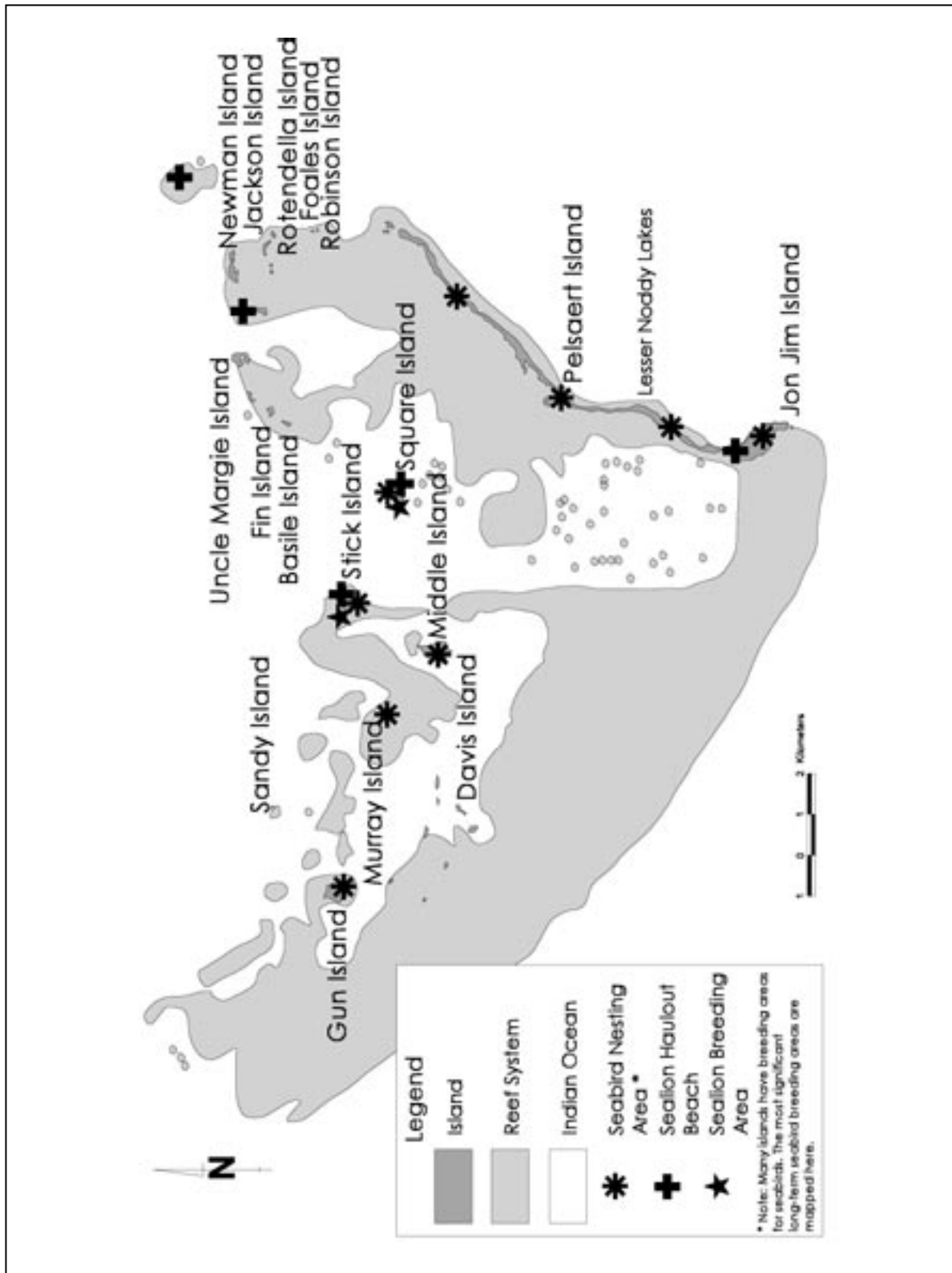
**Fig. 3a.** Location of major seabird breeding colonies, sea lion breeding areas and haulout sites for North Island (Fisheries WA, unpublished data, with modifications by N. Gales, CALM and C. Surman, Murdoch University).



**Fig. 3b.** Location of major seabird breeding colonies, sea lion breeding areas and haulout sites within the Wallabi group (Fisheries WA, unpublished data, with modifications by N. Gales, CALM and C. Surman, Murdoch University).



**Fig. 3c.** Location of major seabird breeding colonies, sea lion breeding areas and haulout sites within the Easter group (Fisheries WA, unpublished data, with modifications by N. Gales, CALM and C. Surman, Murdoch University).



**Fig. 3d.** Location of major seabird breeding colonies, sea lion breeding areas and haulout sites within the Pelsaert group (Fisheries WA, unpublished data, with modifications by N. Gales, CALM and C. Surman, Murdoch University).

## Figures 4.1 to 4.68

The following vegetation maps for the Houtman Abrolhos islands were reproduced from Harvey *et al.* 2001. The maps were adapted from: *A flora and vegetation survey of the Houtman Abrolhos, Western Australia*, published in the Department of Conservation and Land Managements’s *CALM Science*. Table A lists mapped islands/islets arranged alphabetically (whenever possible) for each island group: Wallabi, Easter and Pelsaert. Each island is referenced against its figure number, page number and the accuracy of the vegetation mapping (reproduced from Harvey *et al.* 2001).

Mapping of vegetation was based on the Beard’s (1981) vegetation classification (see Table B, reproduced from Harvey *et al.*, 2001). This classification describes vegetation on the basis of two characteristics: nature/height of the dominant stratum and the density of strata in the above. Dominant plant species are indicated and coded (refer to Table C, reproduced from Harvey *et al.*, 2001). Where there are two or more strata the code is given as a string: e.g. nSr a2mZc xFi – which stand for:

n (dominant species, refer to Table C) Sr (vegetation classification code, refer to Table B) – *Nitraria billardierei* Open scrub.

Similarly, “a2mZc”- stands for *Atriplex* spp., *Myoporum insulare* Heath or “xFi” – mixed species list (usually listed in map caption) Herbfield.

Different surfaces are indicated with the codes: **B** – beach; **BG** – bare ground; **C** – coral rubble; **D** – disturbed areas; **L** – lagoons; **R** – rock; **S** – sinkhole.

**Table A.** List of vegetation maps: figure numbers and accuracy codes for the islands and islets of the Houtman Abrolhos.

Accuracy codes for vegetation mapping are defined by Harvey *et al.*, 2001 as follow:

Code	Accuracy description
1	Interpretation of aerial photograph (stereo pairs and/or large scale) only.
2	Interpretation of aerial photograph, limited species lists and limited notes.
3	Interpretation of aerial photograph, species lists and detailed written descriptions.
4	Interpretation of aerial photograph, species lists, written descriptions, mud maps and some photos. No field verification.
5	Interpretation of aerial photograph, species lists, written descriptions, mud maps and some photos. Some field verification.
6	Comprehensive field verification by Harvey and Longman.

Island name	Fig. No.	Page No.	Accu- racy	Island name	Fig. No.	Page No.	Accu- racy	Island name	Fig. No.	Page No.	Accu- racy
WALLABI GROUP				EASTER GROUP				PELSAERT GROUP			
Akerstrom Island	4.1	33	6	Alexander Island	4.25	45	4	Arthur Island	4.43	58	5
Alcatraz Island	4.2	33	6	“Alexander Islet 1”	4.25	45	5	Basile Island	4.44	58	4
Barge Rock	4.3	33	6	“Alexander Islet 2”	4.25	45	1	Burnett Island	4.45	59	4
Beacon Island	4.4	34	6	Bushby Island	4.36	53	6	“Burnett Islet 1”	4.45	59	1
Dakin Island	4.5	35	6	Bynoe Island	4.26	46	5	“Burnett Islet 2”	4.45	59	1
Dick Island	4.6	35	6	“Bynoe Islet 1”	4.26	46	1	Burton Island	4.46	59	4
“Eagle Point Islet”	4.7	36	6	“Bynoe Islet 2”	4.26	46	1	Coronation Island	4.47	60	4
Eastern Island	4.8	36	6	“Bynoe Islet 3”	4.26	46	1	“Coronation Islet”	4.47	60	1
“East Mangrove Island”	4.1	33	6	“Bynoe Islet 4”	4.26	46	1	Davis Island	4.48	61	4

## Figures

Island name	Fig. No.	Page No.	Accuracy	Island name	Fig. No.	Page No.	Accuracy	Island name	Fig. No.	Page No.	Accuracy
WALLABI GROUP (cont'd)				EASTER GROUP (cont'd)				PELSAERT GROUP (cont'd)			
East Wallabi Island	4.7	36	5	Campbell Island	4.27	47	4	Diver Island	4.49	61	1
Far Island	4.9	37	6	"Campbell Islet"	4.27	47	1	Eight Island	4.48	61	4
"Far Islet 1"	4.9	37	1	Crake Island	4.28	48	4	Foale Island	4.50	62	5
"Far Islet 2"	4.9	37	1	Disappearing Island	4.29	48	5	Gaze Island	4.51	63	4
First Sister	4.10	37	6	Dry Island	4.38	55	5	"Gaze Islet 1"	4.51	63	4
"First Sister Islet"	4.10	37	6	Gibson Island	4.30	49	5	"Gaze Islet 2"	4.51	63	1
"G Island"	4.11	37	6	Gilbert Island	4.25	45	5	"Gaze Islet 3"	4.51	63	1
Hall Island	4.5	35	6	"Gilbert Islet 1"	4.25	45	1	Gregory Island	4.43	58	5
Little Pigeon Island	4.2	33	6	"Gilbert Islet 2"	4.25	45	1	Gun Island	4.52	64	4
Long Island	4.12	38	6	"Gilbert Islet 3"	4.25	45	1	"Gun Islet"	4.52	64	5
Marinula Island	4.1	33	6	"Gilbert Islet 4"	4.25	45	1	Hummock Island	4.53	65	4
"Naturalist Island"	4.10	37	6	Helms Island	4.31	50	4	Iris Refuge Island	4.50	62	4
North Island	4.13	39	6	"Helms Islet 1"	4.31	50	1	Jackson Island	4.54	65	4
Oystercatcher Island	4.14	40	6	"Helms Islet 2"	4.31	50	4	"Jackson Islets" (7 islets)	4.54	65	1
Pelican Island	4.15	41	6	Joe Smith Island	4.32	50	4	Jon Jim Island	4.55	66	4
Pigeon Island	4.16	41	6	Keru Island	4.33	51	4	Lagoon Island	4.56	66	4
Plover Island	4.17	41	6	"Landscape Island"	4.31	51	5	"Little Jackson Island"	4.54	65	4
Saville-Kent Island	4.5	35	6	Leo Island	4.34	52	6	Middle Island	4.57	67	4
Seagull Island	4.14	40	6	"Leo Islet 1"	4.34	52	6	Murray Island	4.58	67	5
Seal Island	4.11	37	6	"Leo Islet 2"	4.34	52	5	Newbold Island	4.50	62	1
Second Sister	4.18	42	6	Little North Island	4.35	52	4	Newman Island	4.59	68	3
Shag Rock	4.19	42	6	Little Rat Island	4.36	53	6	"Newman Islet 1"	4.59	68	1
"Shag Rock"	4.13	39	4	Little Roma Island	4.38	55	2	"Newman Islet 2"	4.59	68	1
"Short Island"	4.12	38	6	"Little Stokes Island"	4.31	50	4	Nook Island	4.60	68	4
Tattler Island	4.20	42	6	Morley Island	4.28	48	4	One Island	4.48	61	4
"Tectus Island"	4.10	37	6	"Morley Islet"	4.28	48	1	Pelsaert Island	4.61	69/70	5
Third Sister	4.21	42	6	"Nitraria Island"	4.31	50	5	Post Office Island	4.62	71	3
Traitors Island	4.22	43	6	Rat Island	4.37	54	6	"Post Office Islet"	4.62	71	1
"Traitors Islet 1"	4.22	43	6	"Rat Islet"	4.37	54	1	Robertson Island	4.50	62	4
"Traitors Islet 2"	4.22	43	6	Roma Island	4.38	55	6	Rotondella Island	4.56	66	4
"Traitors Islet 3"	4.22	43	6	"Roma Islet"	4.38	55	1	"Rotondella Islet 1"	4.56	66	1

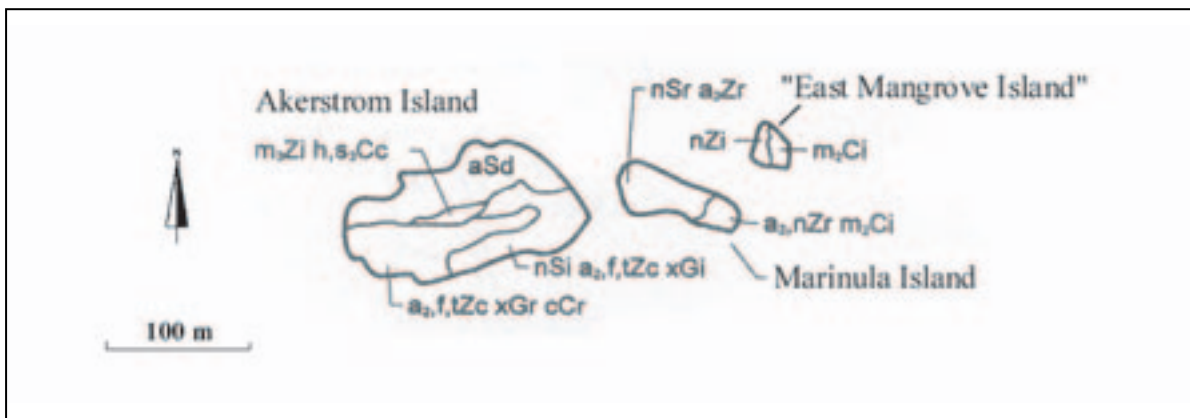
Island name	Fig. No.	Page No.	Accuracy	Island name	Fig. No.	Page No.	Accuracy	Island name	Fig. No.	Page No.	Accuracy
WALLABI GROUP (cont'd)				EASTER GROUP (cont'd)				PELSAERT GROUP (cont'd)			
"Traitors Islet 4"	4.22	43	6	Sandy Island	4.39	56	5	"Rotondella Islet 2"	4.56	66	1
"Traitors Islet 5"	4.22	43	6	Serventy Island	4.30	49	5	Sandy Island	4.63	72	5
"Traitors Islet 6"	4.22	43	6	"Serventy Islet 1"	4.30	49	1	Seven Island	4.48	61	4
Turnstone Island	4.14	40	6	"Serventy Islet 2"	4.30	49	1	"Seven Islet"	4.48	61	4
Wann Island	4.23	43	6	"Serventy Islet 3"	4.30	49	1	Ship Rock	4.64		4
West Wallabi Island	4.24	44	6	Shearwater Island	4.40	56	5	Sid Liddon Island	4.48	61	4
				"Shearwater Islet"	4.40	56	5	Square Island	4.65	72	5
				Stokes Island	4.31	50	4	Stick Island	4.66	73	4
				Suomi Island	4.33	51	4	Sweet Island	4.48	61	4
				Tapani Island	4.31	50	5	The Coral Patches (13 Islets)	4.67	73	2
				White Bank	4.37	54	3	Three Island	4.48	61	
				White Island	4.41	57	4	Travia Island	4.51	63	
				"White Islet"	4.41	57	1	Two Island	4.48	61	
				Wooded Island	4.42	57	4	Uncle Margie Island	4.68	74	
								"Uncle Margie Islet"	4.68	74	

**Table B.** The classification scheme used for vegetation mapping (Harvey *et al.*, 2001)

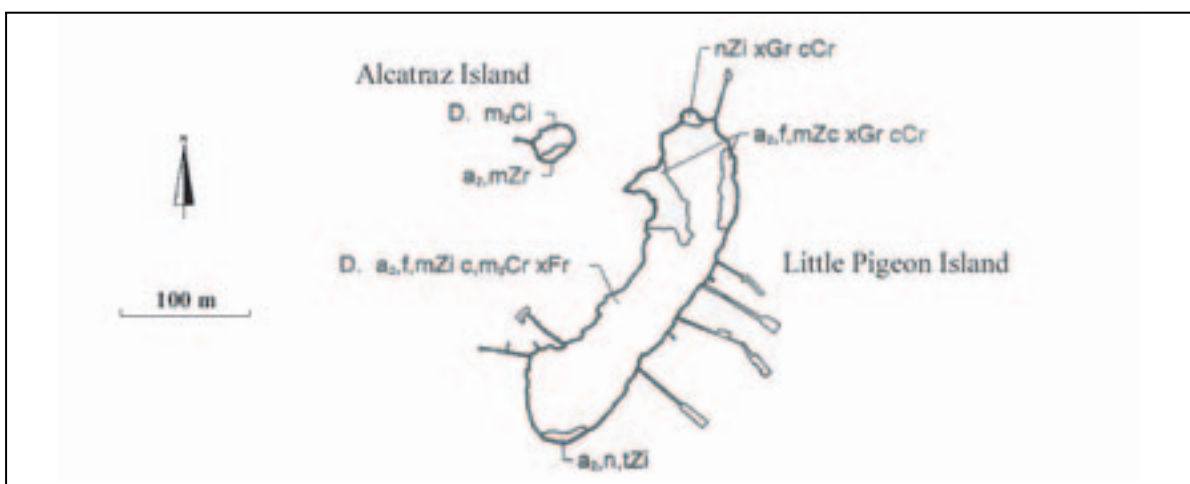
Life Form/ Height Class	<b>d:</b> Dense canopy. Projective foliage cover > 70%	<b>c:</b> Mid-dense canopy. Projective foliage cover 30-70%	<b>i:</b> Incomplete canopy. Projective foliage cover 10-30%	<b>r:</b> Sparse canopy. Projective foliage cover < 10%	<b>p:</b> Very sparse canopy. Projective foliage cover 0%
<b>L:</b> Low trees < 10 m	<b>Ld:</b> Dense low forest	<b>Lc:</b> Low forest	<b>Li:</b> Low woodland	<b>Lr:</b> Open Low woodland	<b>Lp:</b> Sparse low woodland
<b>S:</b> Shrubs >1 m tall	<b>Sd:</b> Dense thicket	<b>Sc:</b> Thicket	<b>Si:</b> Scrub Sr: Open scrub	<b>Sr:</b> Open scrub	<b>Sp:</b> Sparse scrub
<b>Z:</b> Dwarf shrubs < 1 m tall	<b>Zd:</b> Dense heath	<b>Zc:</b> Heath	<b>Zi:</b> Dwarf scrub	<b>Zr:</b> Open dwarf scrub	<b>Zp:</b> Sparse dwarf scrub
<b>G:</b> Bunch grasses, sedges	<b>Gd:</b> Dense grassland	<b>Gc:</b> Mid-dense grassland	<b>Gi:</b> Grassland	<b>Gr:</b> Open grassland	<b>Gp:</b> Sparse grassland
<b>F:</b> Forbs	<b>Fd:</b> Dense herbfield	<b>Fc:</b> Mid-dense herbfield	<b>Fi:</b> Herbfield	<b>Fr:</b> Open herbfield	<b>Fp:</b> Sparse herbfield
<b>C:</b> Succulents		<b>Cc:</b> Closed succulent mat	<b>Ci:</b> Succulent mat	<b>Cr:</b> Open succulent mat	<b>Cp:</b> Sparse succulent mat

**Table C.** Dominant plant species codes used in vegetation mapping on Figures 4.1-4.68. When the letter x is used with bunch grass (G) or forbs (F), it indicates mixed species, which differ for each map and are listed in the map caption (reproduced from Harvey *et al.* 2001).

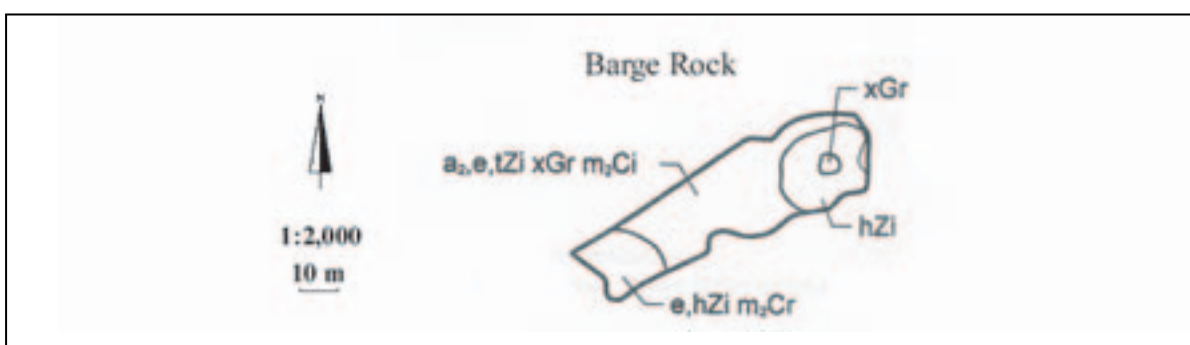
Life Form/ Height Class	Code	Plant species
S: Shrubs > 1 m tall	a <sub>2</sub>	<i>Atriplex</i> spp.
	a	<i>Avicennia marina</i>
	d	<i>Diplolaena grandiflora</i>
	e <sub>3</sub>	<i>Eucalyptus oraria</i>
	h	<i>Halosarcia halocnemoides</i>
	m	<i>Myoporum insulare</i>
	n	<i>Nitraria billardierei</i>
	o	<i>Olearia axillaris</i>
	p	<i>Pittosporum phylliraeoides</i>
	r	<i>Rhagodia</i> spp.
	s <sub>6</sub>	<i>Scaevola crassifolia</i>
	x <sub>1</sub>	East Wallabi pavement limestone species (listed on relevant map)
	x <sub>2</sub>	East Wallabi consolidated dunes species (listed on relevant map)
	Z: Dwarf shrubs <1 m tall	a <sub>2</sub>
a		<i>Avicennia marina</i>
c <sub>2</sub>		* <i>SCakile maritime</i>
d		<i>Diplolaena grandiflora</i>
e		<i>Enchylaena tomentosa</i>
e <sub>2</sub>		<i>Eremophila glabra</i>
f		<i>Frankenia pauciflora</i>
g		<i>Grevillea argyrophylla</i>
h		<i>Halosarcia halocnemoides</i>
h <sub>2</sub>		<i>Hibbertia racemosa</i>
m <sub>3</sub>		<i>Muellerolimon salicorniaceum</i>
m		<i>Myoporum insulare</i>
n		<i>Nitraria billardierei</i>
o		<i>Olearia axillaries</i>
p <sub>2</sub>		<i>Pimelea microcephala</i>
p		<i>Pittosporum phylliraeoides</i>
r		<i>Rhagodia</i> spp.
s <sub>4</sub>		<i>Sarcostemma viminalis</i>
s <sub>6</sub>		<i>Scaevola crassifolia</i>
t		<i>Threlkeldia diffusa</i>
w	<i>Westringia dampieri</i>	
x <sub>1</sub>	East Wallabi pavement limestone species (listed on relevant map)	
x <sub>2</sub>	East Wallabi consolidated dunes species (listed on relevant map)	
x <sub>3</sub>	West Wallabi pavement limestone species (listed on relevant map)	
x <sub>2</sub>	North Island consolidated dunes species (listed on relevant map)	
G: Bunch grasses	b	<i>Bromus</i> spp. (introduced and/or native)
	s	<i>Spinifex longifolius</i>
	x	Mixed, species listed
F: Forbs	s <sub>2</sub>	<i>Senecio lautus</i>
	u	<i>Urospermum picroides</i>
	x	Mixed, species list
C: Succulent	c	<i>Carpobrotus virescens</i>
	h	<i>Halosarcia indica</i>
	m <sub>2</sub>	<i>Mesembryanthemum crystallinum</i>
	s <sub>3</sub>	<i>Sarcocornia quinqueflora</i>
	s <sub>5</sub>	<i>Suaeda australis</i>
	x	Mixed, species listed



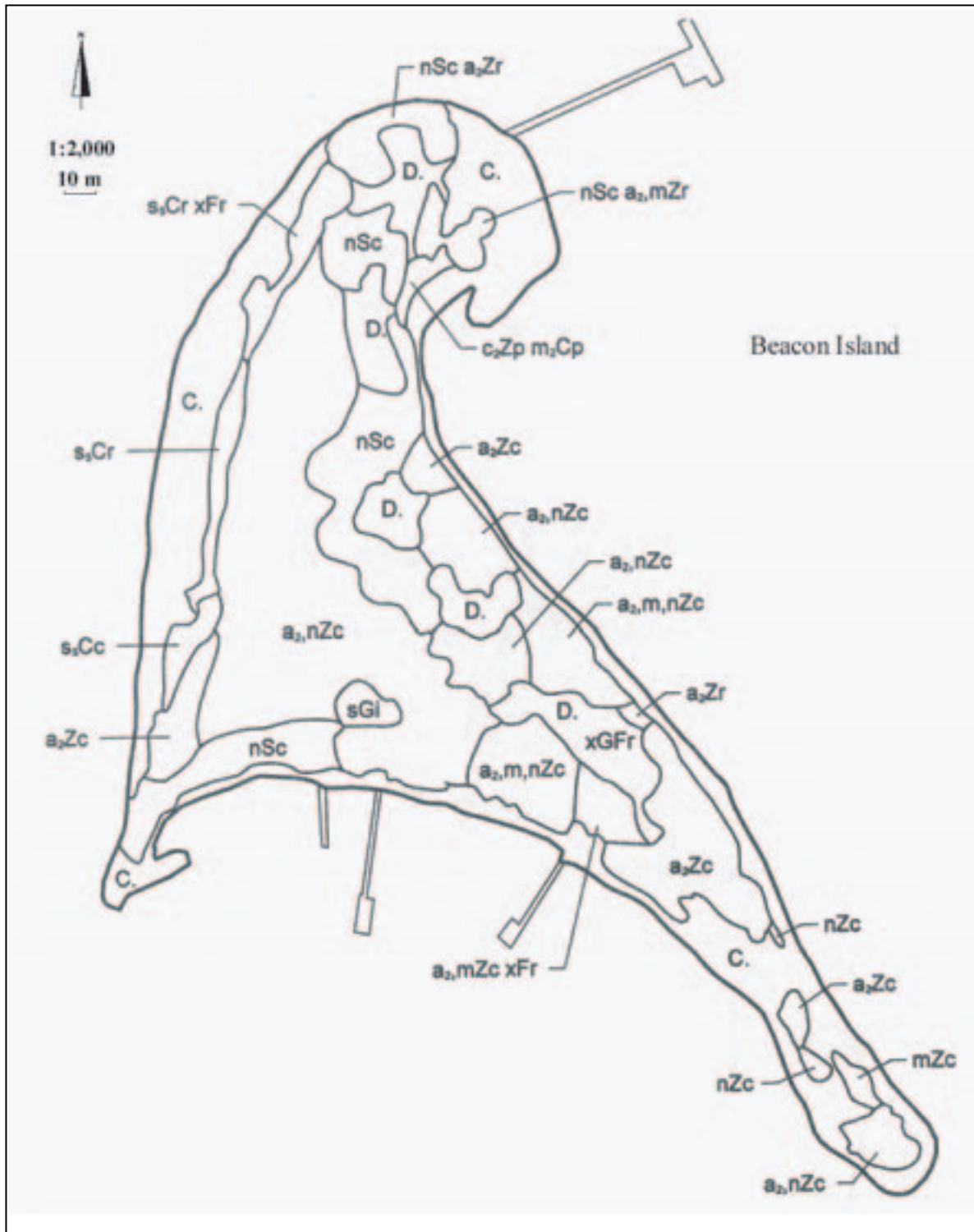
**Fig. 4.1.** Vegetation map of Akerstrom Island, “East Mangrove Island”, Marinula Island – Wallabi Group.  
For Akerstrom Island: x of xGi and xGr includes *Eragrostis dielsii*, *Setaria dielsii*.



**Fig. 4.2.** Vegetation map of Alcatraz Island, Little Pigeon Island – Wallabi Group.  
For Little Pigeon Island: x of xFr includes *\*Conyza bonariensis*, *\*Euphorbia tannensis subsp. eremophila*, *\*Medicago polymorpha*, *Senecio lautus*.  
For Little Pigeon Island: x of xGr includes *\*Avena barbata*, *Bromus* sp., *\*Hordeum leporinum*, *\*Lolium rigidum*, *\*Polypogon monspeliensis*, *Setaria dielsii*.



**Fig. 4.3.** Vegetation map of Barge Rock – Wallabi Group.  
For Barge Rock: x of xGr includes *Bromus* sp., *\*Ehrharta longiflora*, *Setaria dielsii*.



**Fig. 4.4.** Vegetation map of Beacon Island – Wallabi Group.

For Beacon Island: x of xFr includes *\*Sisymbrium orientale*, *\*Sonchus oleraceus*.

For Beacon Island: x of xGFr includes *\*Avena* sp., *Bromus* sp., *\*Poa annua*, *\*Sisymbrium orientale*, *\*Sonchus oleraceus*.

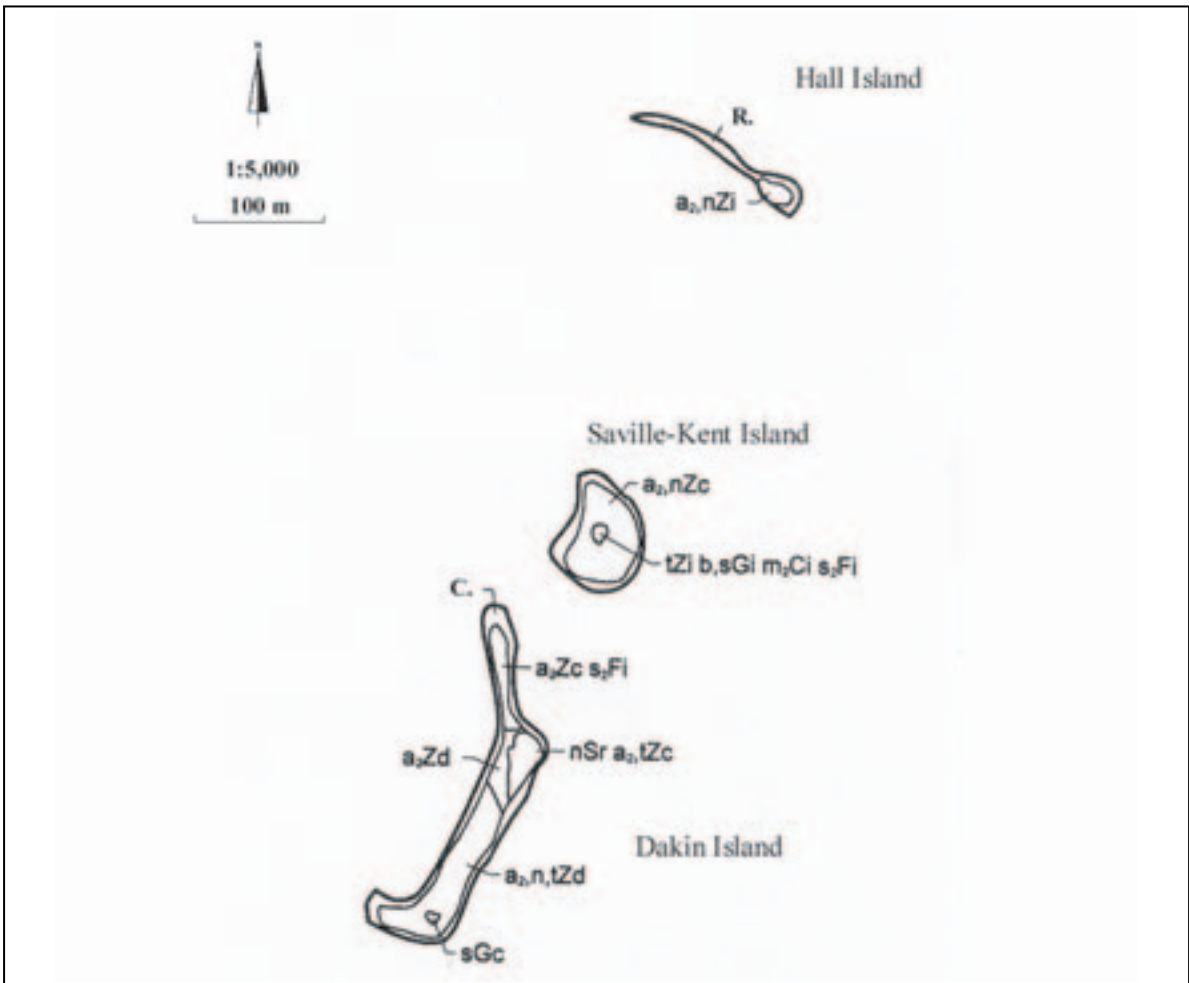


Fig. 4.5. Vegetation map of Dakin Island, Hall Island, Saville-Kent Island – Wallabi Group.

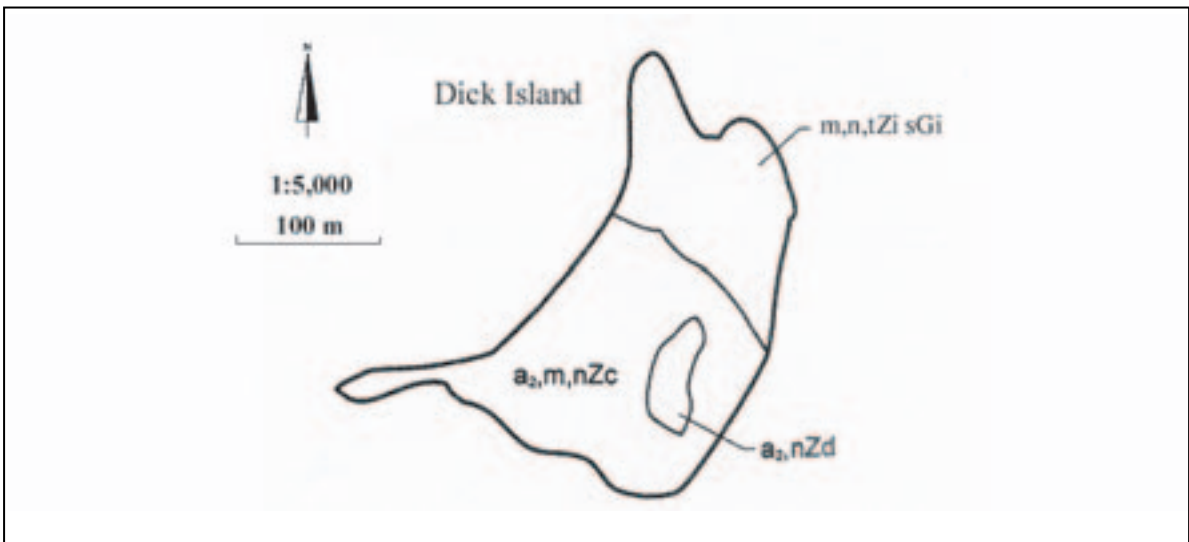
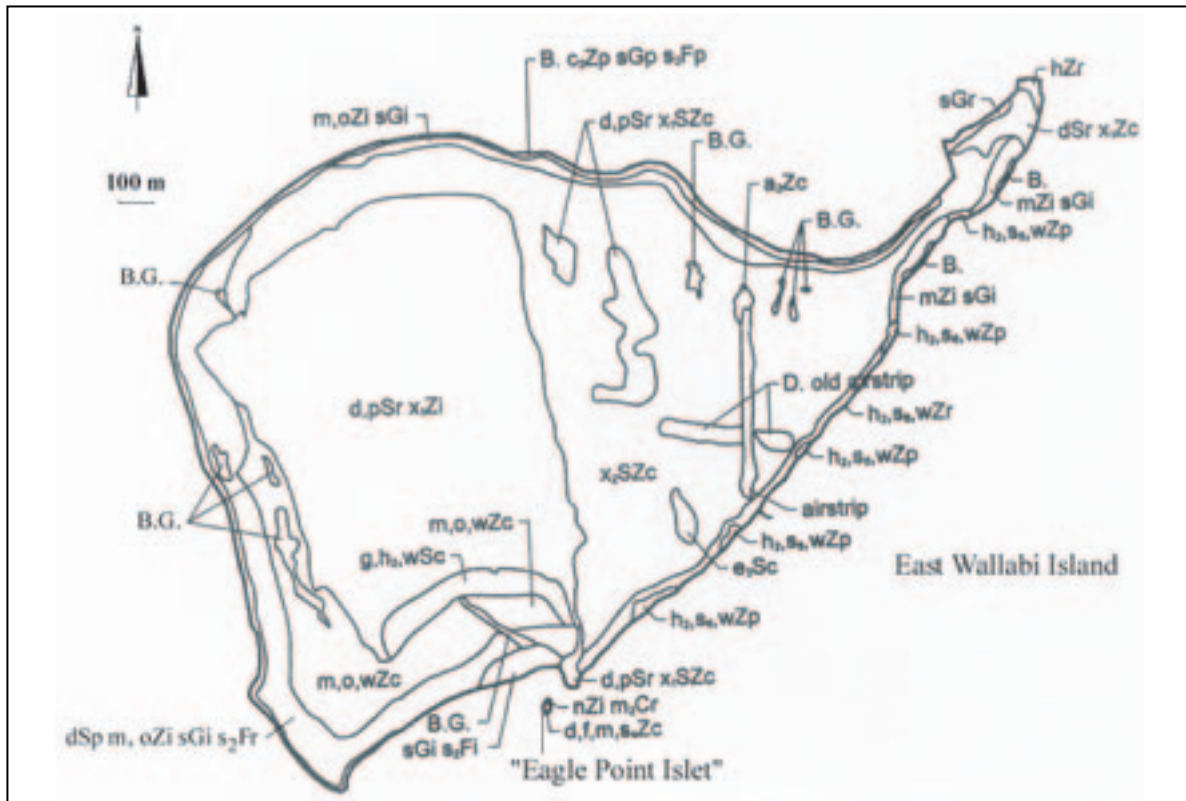


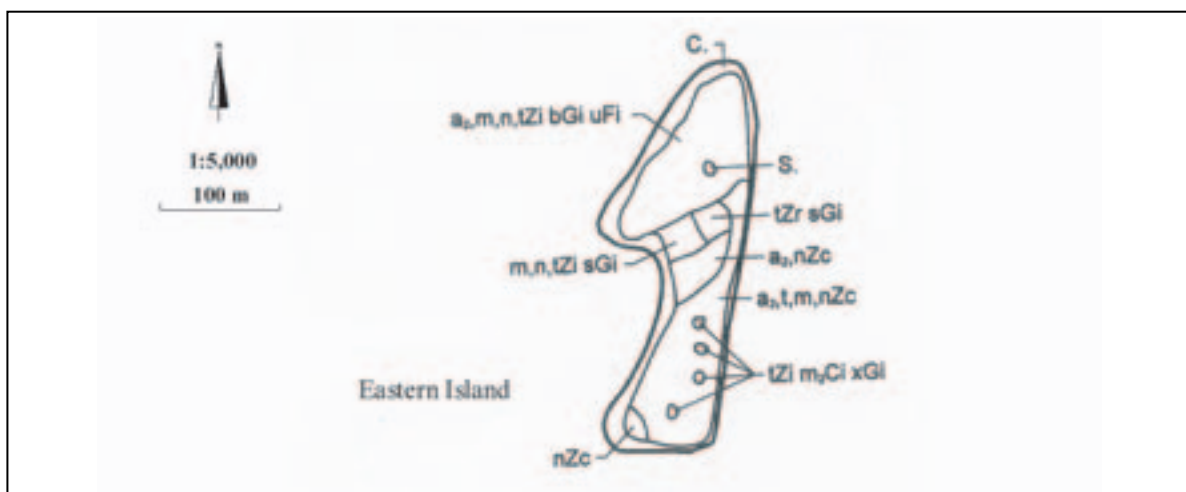
Fig. 4.6. Vegetation map of Dick Island – Wallabi Group.



**Fig. 4.7.** Vegetation map of “Eagle Point Islet”, East Wallabi Island – Wallabi Group.

On East Wallabi Island: x1 denotes pavement limestone species (*Capparis spinosa*, *Exocarpos aphyllus*, *Grevillea argyrophylla*, *Hibbertia racemosa*, *Pimelea microcephala*)

On East Wallabi Island: x2 denotes consolidated dunes species (x<sub>1</sub> species plus *Acacia didyma*, *Alyxia buxifolia*, *Bossiaea spinescens*, *Dodonaea* spp., *Lasiopetalum angustifolium*, *Leucopogon insularis*, *Mirbelia ramulosa*, *Ptilotus divaricatus*).



**Fig. 4.8.** Vegetation map of Eastern Island – Wallabi Group.

For Eastern Island: x of xGi denotes mixed grasses (species not specified).

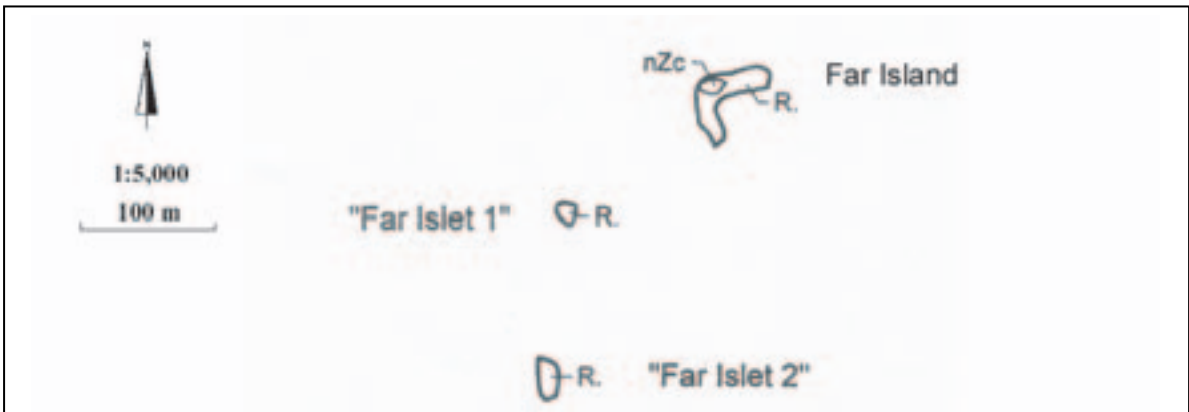


Fig. 4.9. Vegetation map of Far Island, “Far Islet 1”, “Far Islet 2” – Wallabi Group.

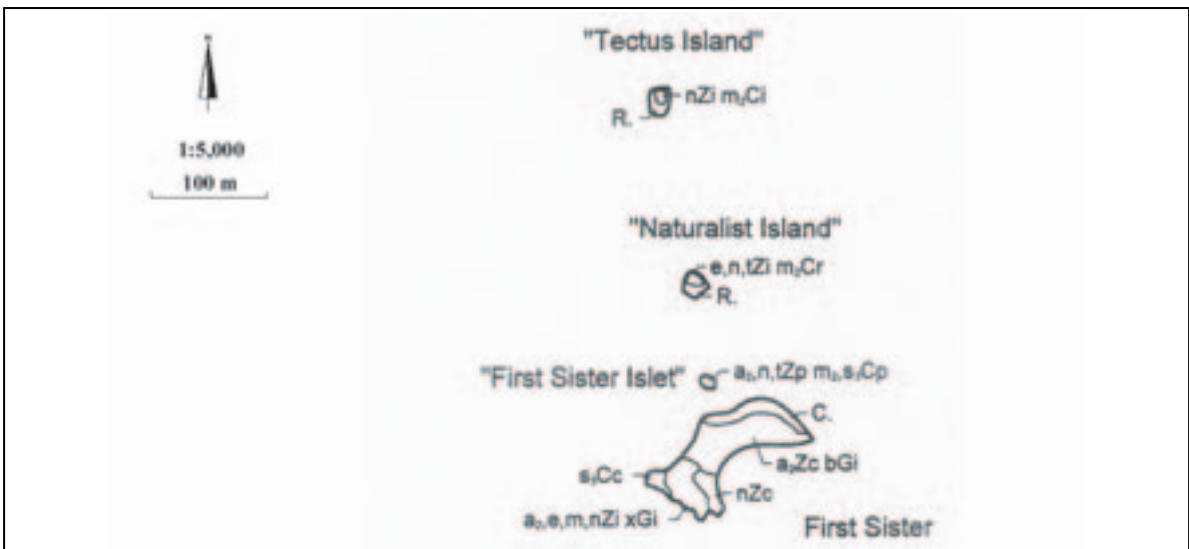


Fig. 4.10. Vegetation map of First Sister, “First Sister Islet”, “Naturalist Island”, “Tectus Island” – Wallabi Group.

For First Sister: x of xGi includes *Bromus arenarius*, *Setaria dielsii*.

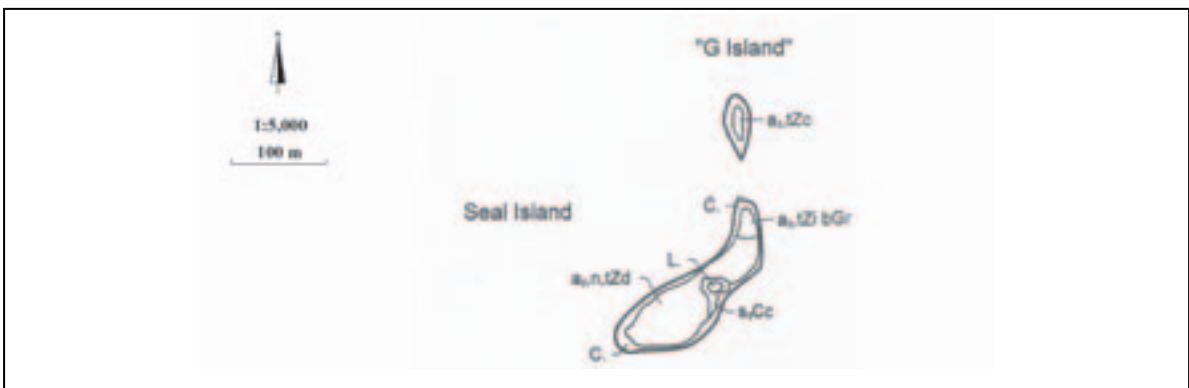
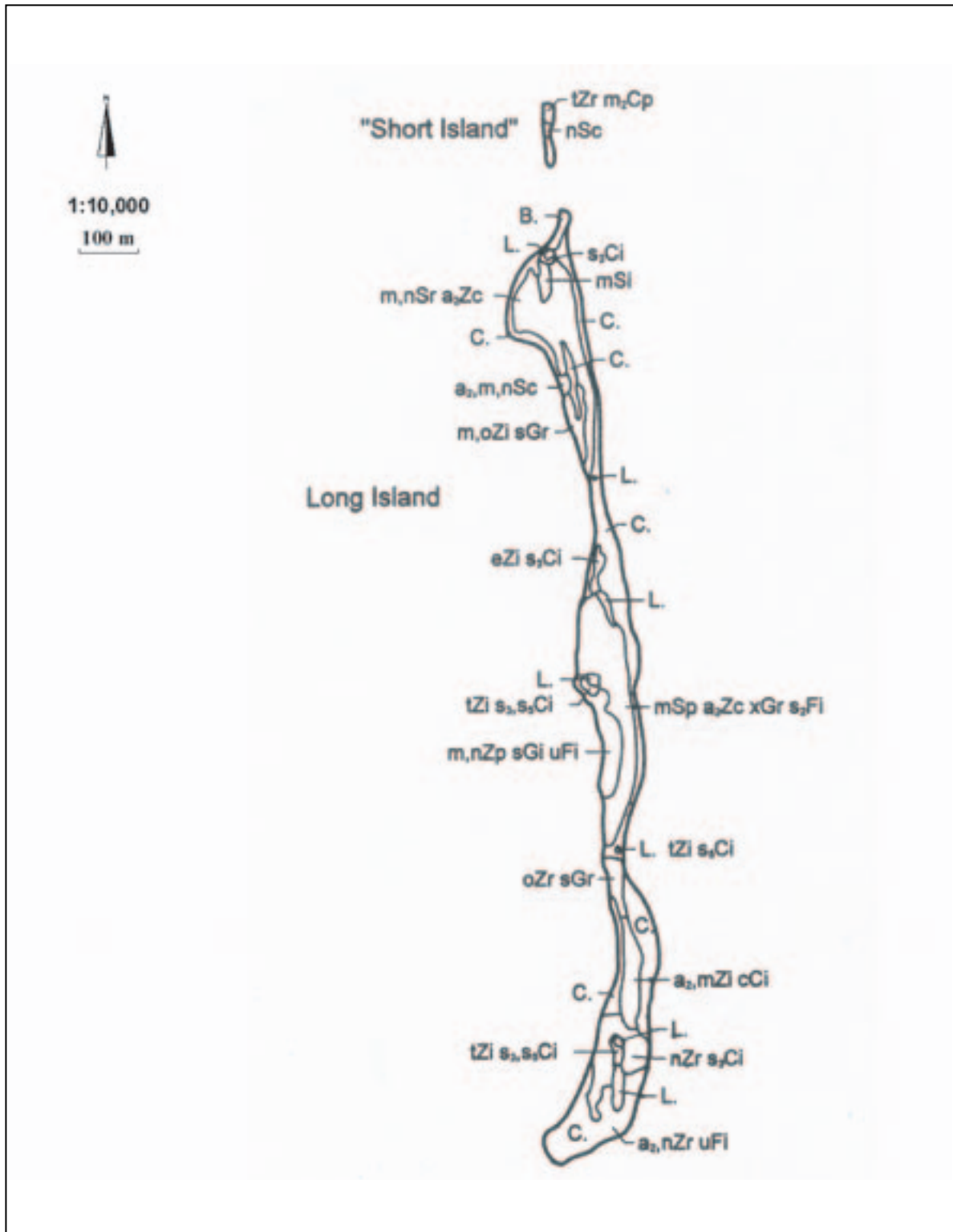


Fig. 4.11. Vegetation map of “G Island”, Seal Island – Wallabi Group.



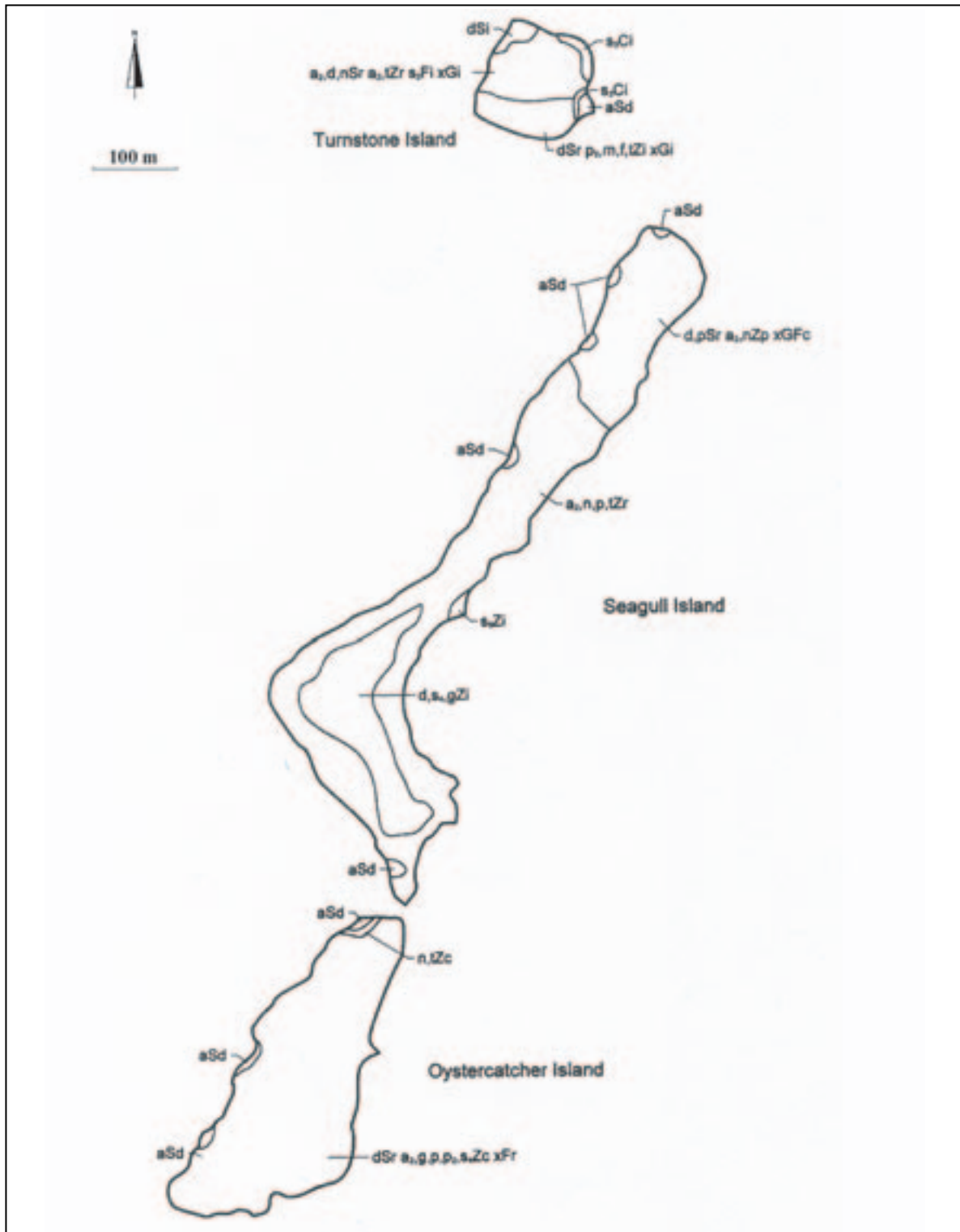
**Fig. 4.12.** Vegetation map of Long Island, "Short Island" – Wallabi Group.

For Long Island: x of xGr includes *Bromus arenarius*, *Setaria dielsii*.

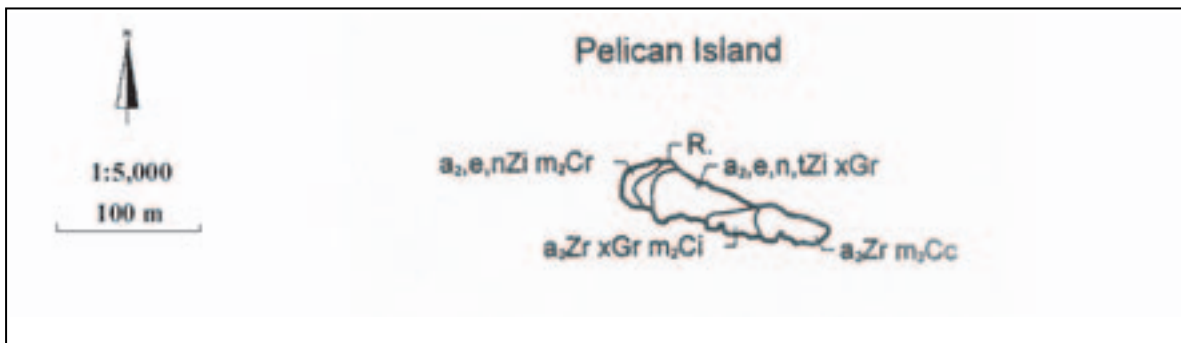


**Fig. 4.13.** Vegetation map of “Shag Rock”, North Island – Wallabi Group.

On North Island: x4 denotes consolidated dunes species (*Exocarpos aphyllus*, *Myoporum insulare*, *Pimelea microcephala*, *Olearia axillaries*, *Rhagodia* sp., *Scaevola crassifolia*, *Threlkeldia diffusa*).

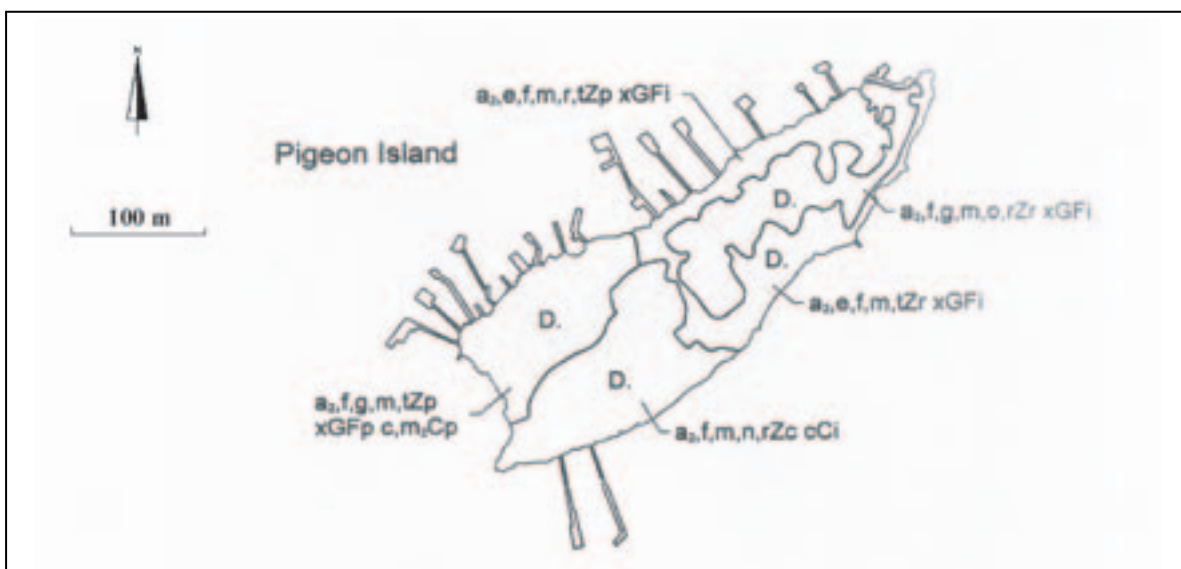


**Fig. 4.14.** Vegetation map of Oystercatcher Island, Seagull Island, Turnstone Island – Wallabi Group.  
 For Oystercatcher Island: x of xFr includes *Senecio lautus*, *\*Sonchus oleraceus*, *\*Urospermum picroides*.  
 For Seagull Island: x of xGfC includes *\*Bromus* sp., *Senecio lautus*, *\*Urospermum picroides*.  
 For Turnstone Island: x of xGi includes *Austrostipa elegantissima*, *Bromus* sp., *Setaria dielsii*.



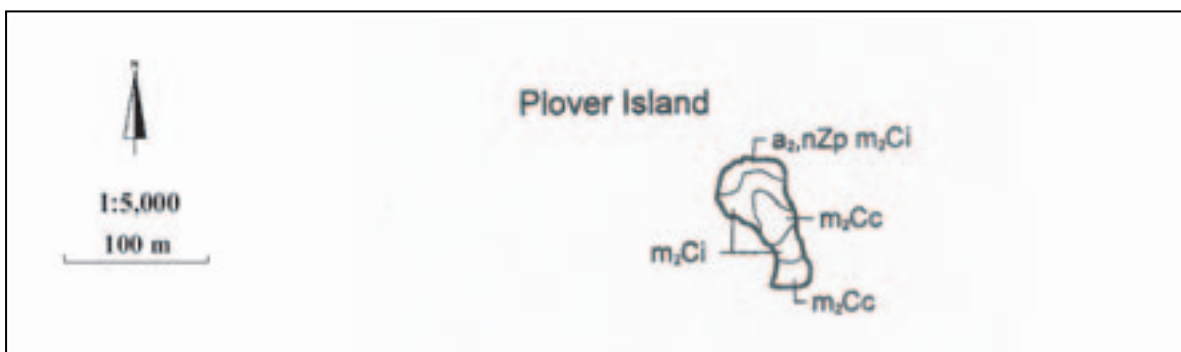
**Fig. 4.15.** Vegetation map of Pelican Island – Wallabi Group.

For Pelican Island: x of xGr denotes mixed grasses (species not listed).



**Fig. 4.16.** Vegetation map of Pigeon Island – Wallabi Group.

For Pigeon Island: x of xGFi denotes introduced grasses, garden plants and weeds, including *\*Bromus* sp., *\*Bryophyllum* sp., *\*Nicotiana glauca*, *Setaria dielsii*, *\*Solanum nigrum*, *\*Sonchus oleraceus*, *\*Tamarix* sp.



**Fig. 4.17.** Vegetation map of Plover Island – Wallabi Group.

## Figures

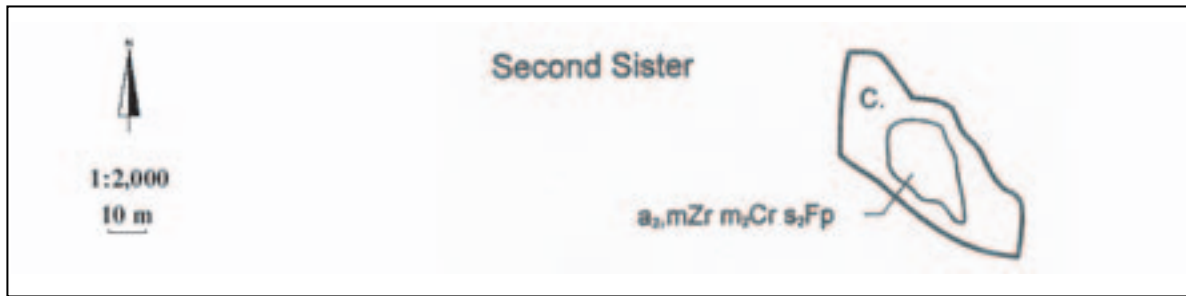


Fig. 4.18. Vegetation map of Second Sister Island – Wallabi Group.



Fig. 4.19. Vegetation map of Shag Rock – Wallabi Group.

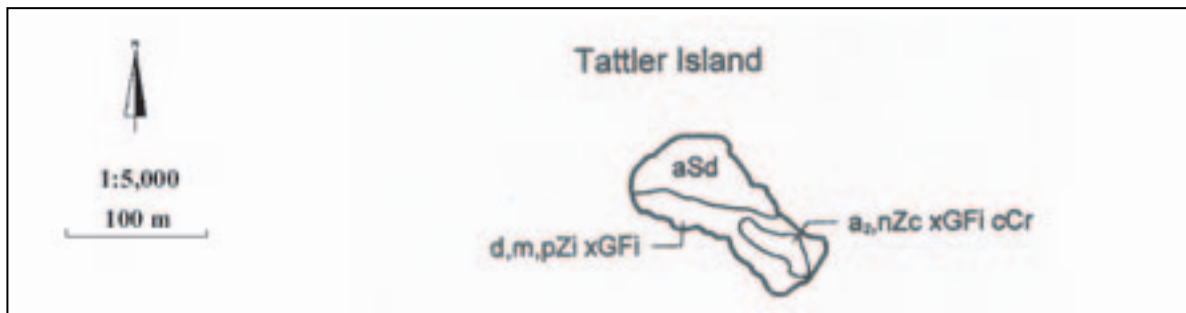


Fig. 4.20. Vegetation map of Tattler Island – Wallabi Group.

For Tattler Island: x of xGFi includes *\*Avena* sp., *\*Centaurium spicatum*, *Senecio lautus*, *Setaria dielsii*, *\*Sonchus oleraceus*.

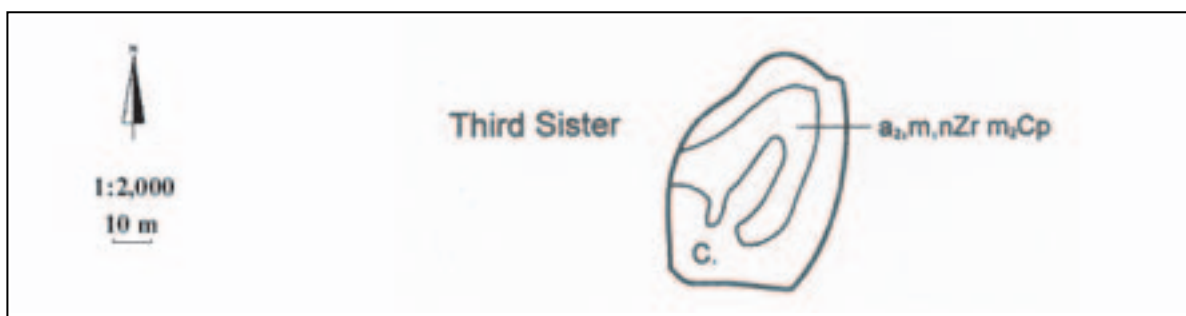


Fig. 4.21. Vegetation map of Third Sister – Wallabi Group.

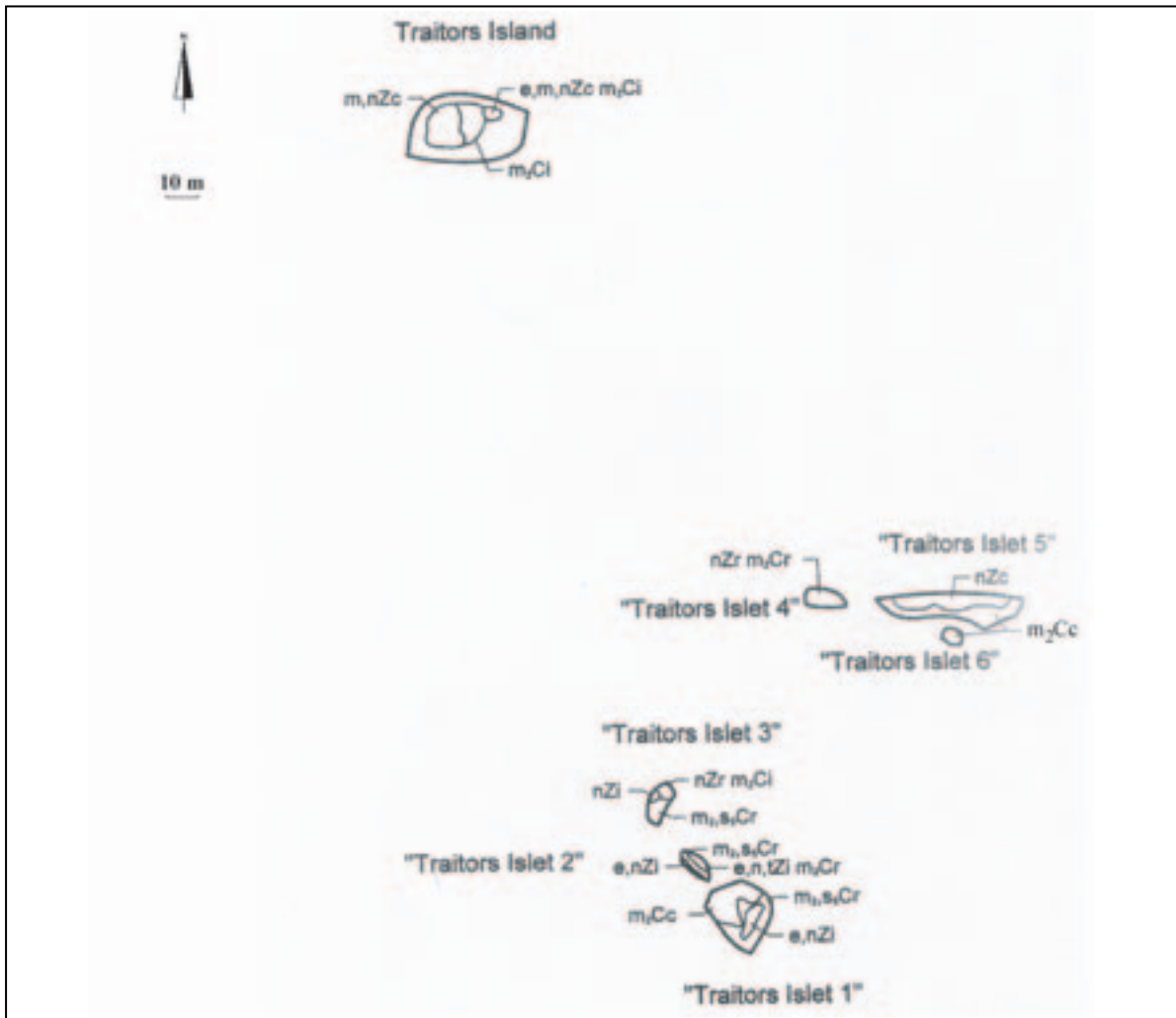


Fig. 4.22. Vegetation map of Traitors Island, “Traitors Islet 1”, “Traitors Islet 2”, “Traitors Islet 3”, “Traitors Islet 4”, “Traitors Islet 5”, “Traitors Islet 6” – Wallabi Group.

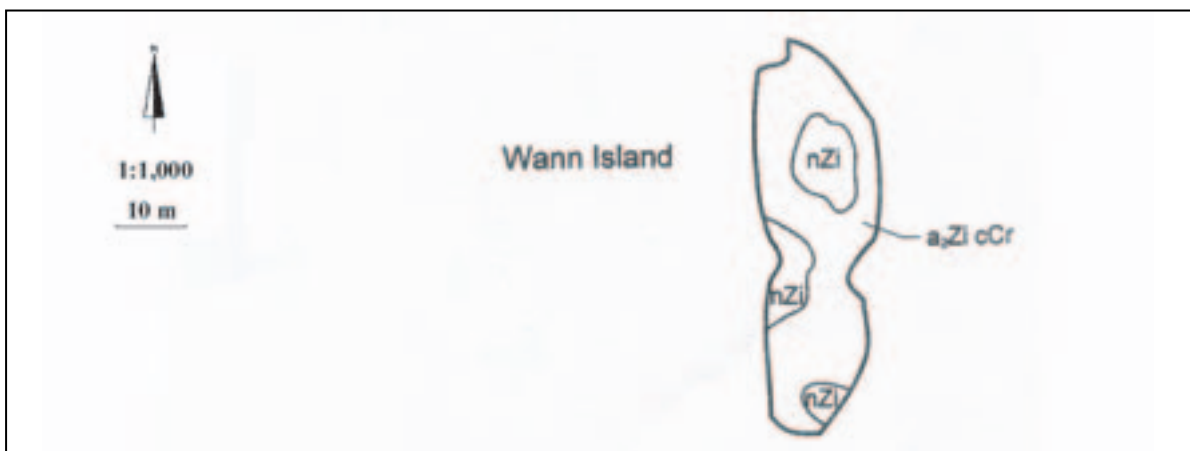
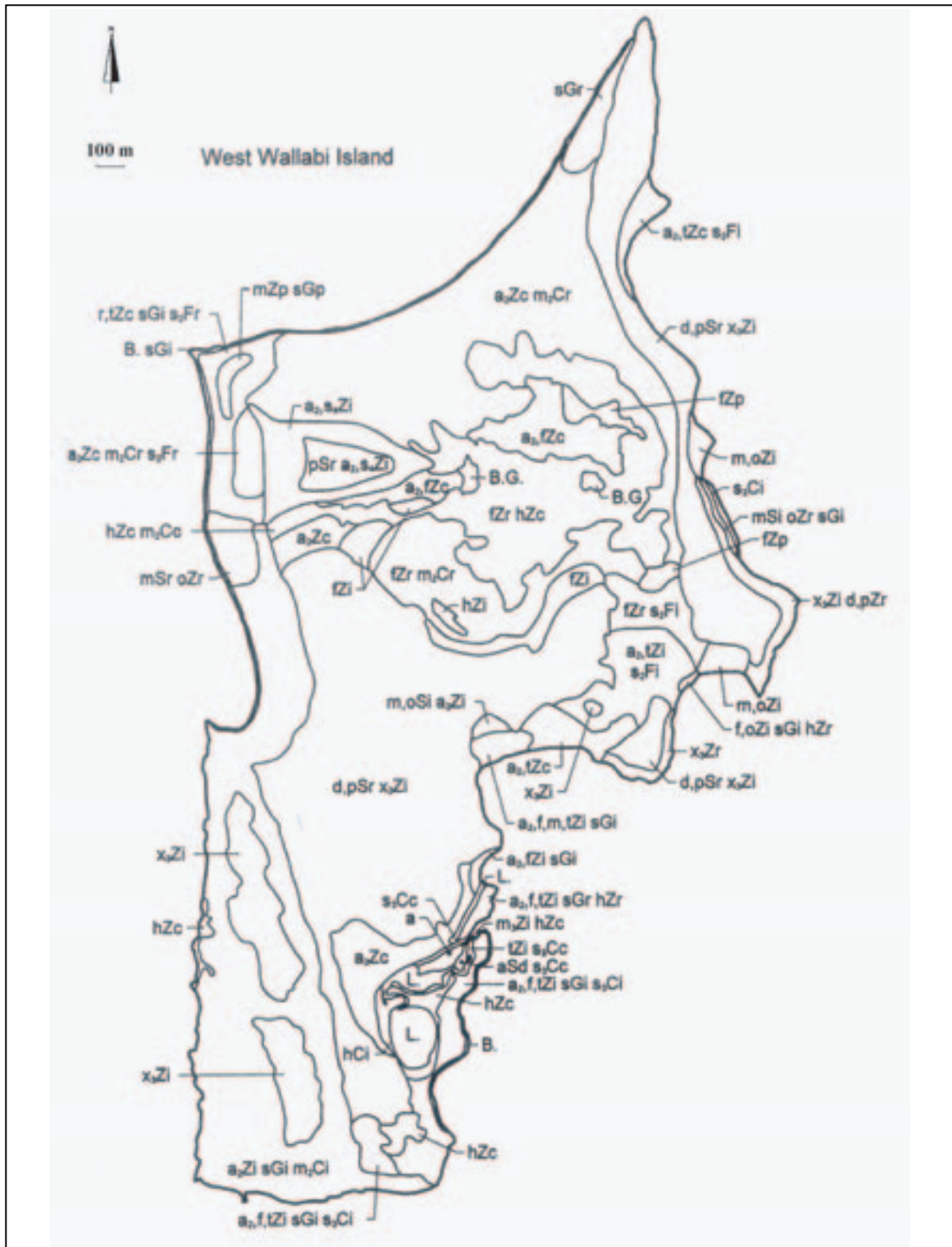


Fig. 4.23. Vegetation map of Wann Island – Wallabi Group.



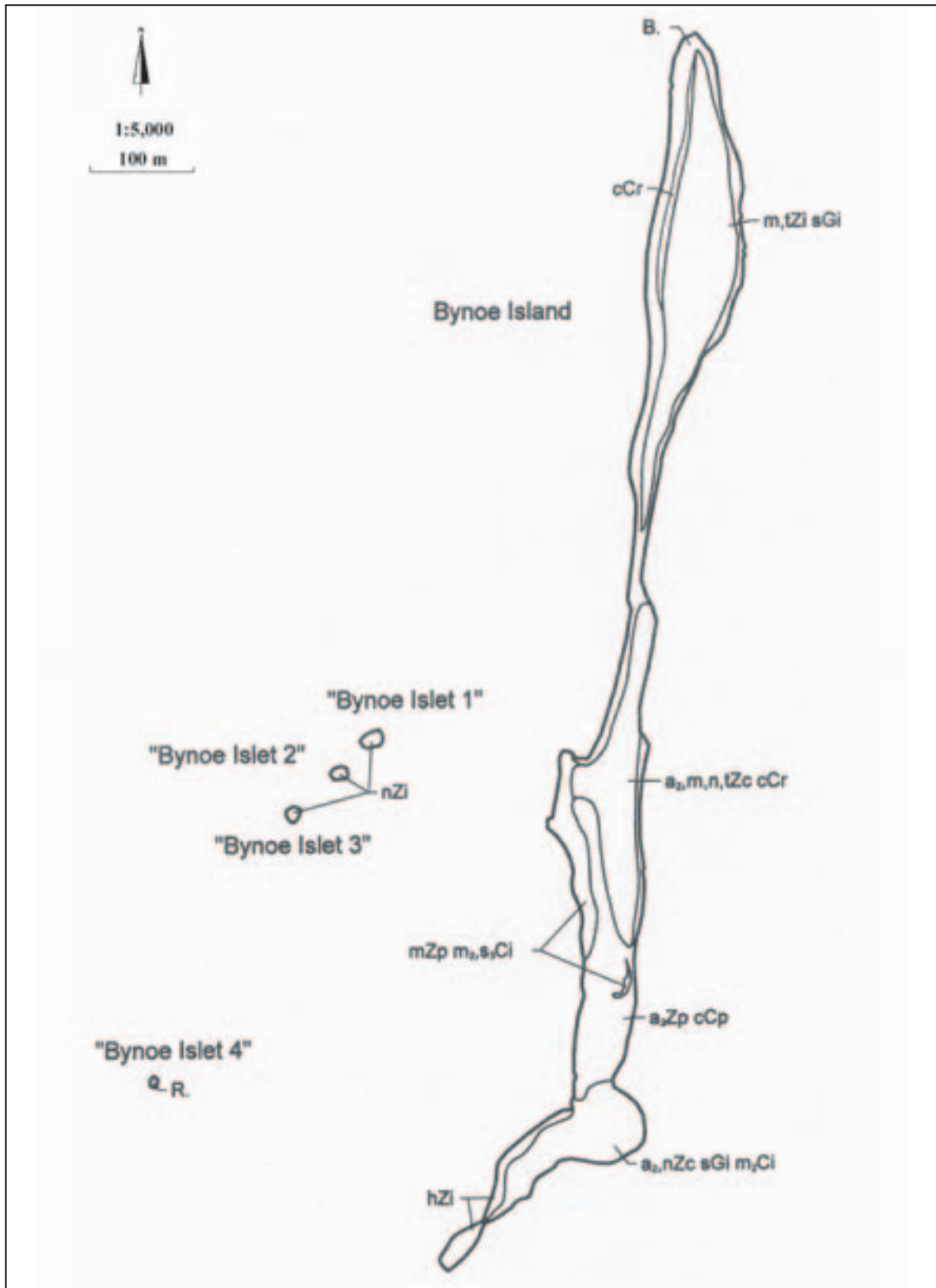
**Fig. 4.24.** Vegetation map of West Wallabi Island – Wallabi Group.

On West Wallabi Island: x3 denotes pavement limestone species (*Beyeria viscosa*, *Capparis spinosa*, *Exocarpos aphyllus*, *Grevillea argyrophylla*, *Hibbertia racemosa*, *Olearia axillaris*, *Pimelea microcephala*, *Westringia dampieri*).

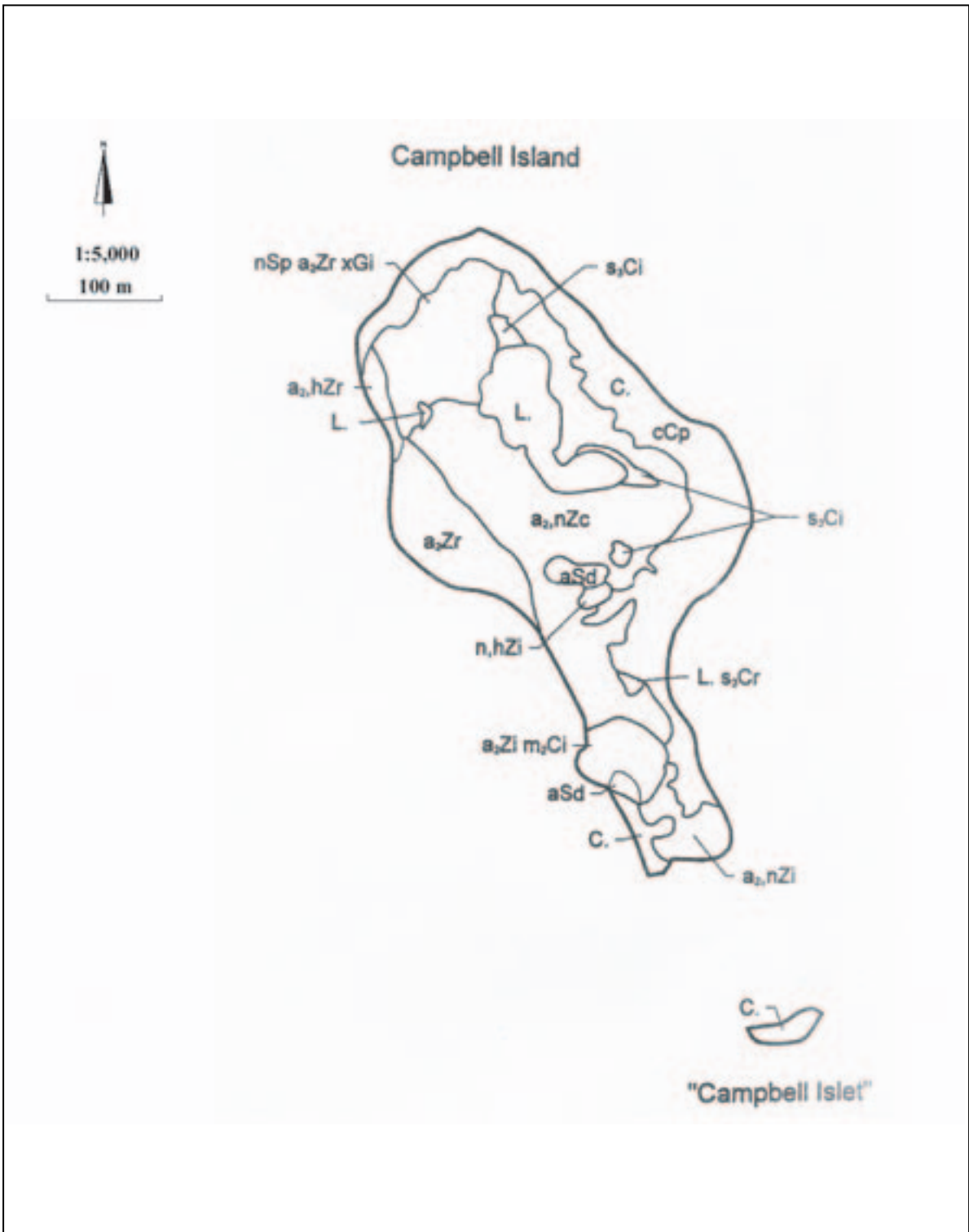


**Fig. 4.25.** Vegetation map of Alexander Island, "Alexander Islet 1", "Alexander Islet 2", Gilbert Island, "Gilbert Islet 1", "Gilbert Islet 2", "Gilbert Islet 3", "Gilbert Islet 4" – Easter Group.

For Alexander Island: x of xGi includes *Bromus* sp., \**Ehrharta longiflora*, *Setaria dielsii*.



**Fig. 4.26.** Vegetation map of Bynoe Island, “Bynoe Islet 1”, “Bynoe Islet 2”, “Bynoe Islet 3”, “Bynoe Islet 4” – Easter Group.



**Fig. 4.27.** Vegetation map of Campbell Island, “Campbell Islet” – Easter Group. For Campbell Island: x of xGi denotes mixed grasses (species not specified).

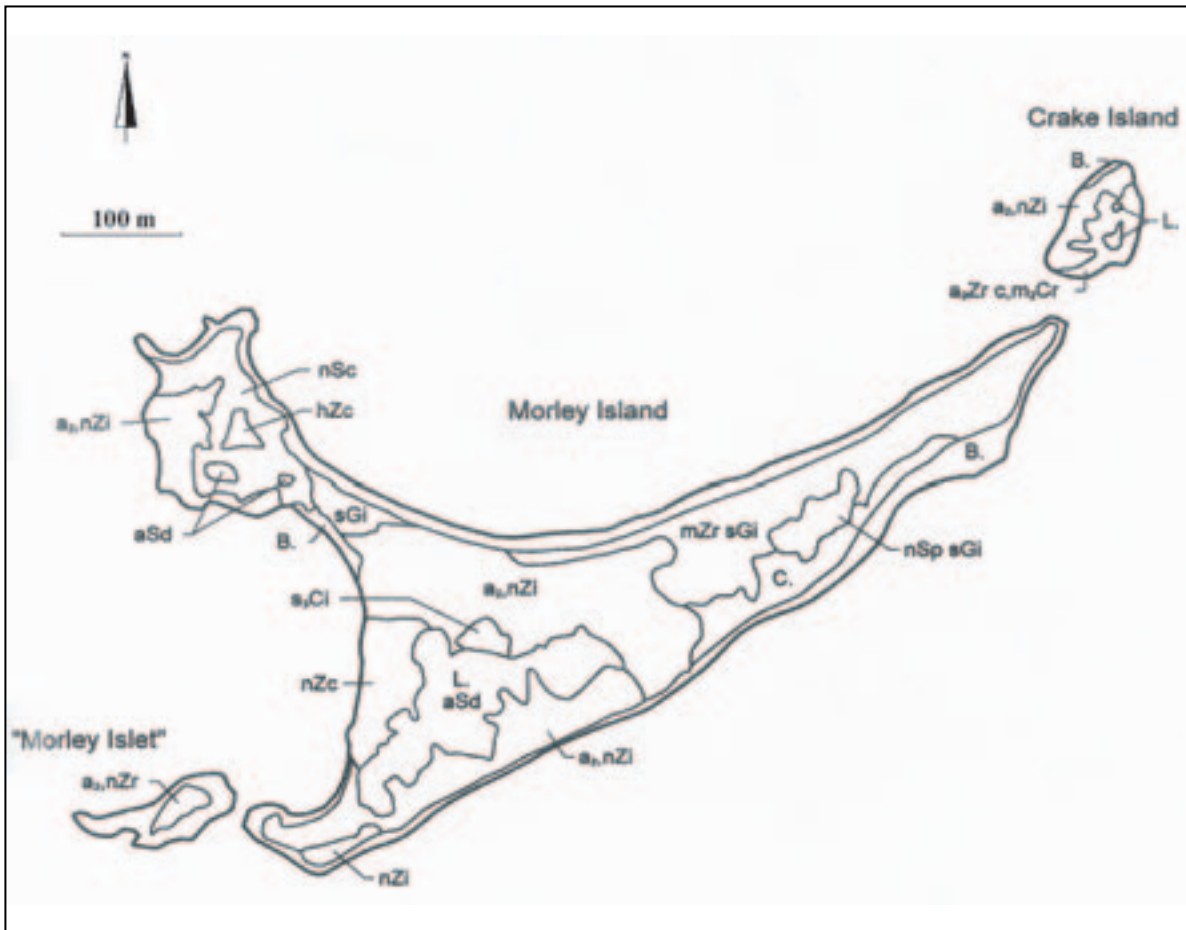


Fig. 4.28. Vegetation map of Crake Island, Morley Island, "Morley Islet" – Easter Group.

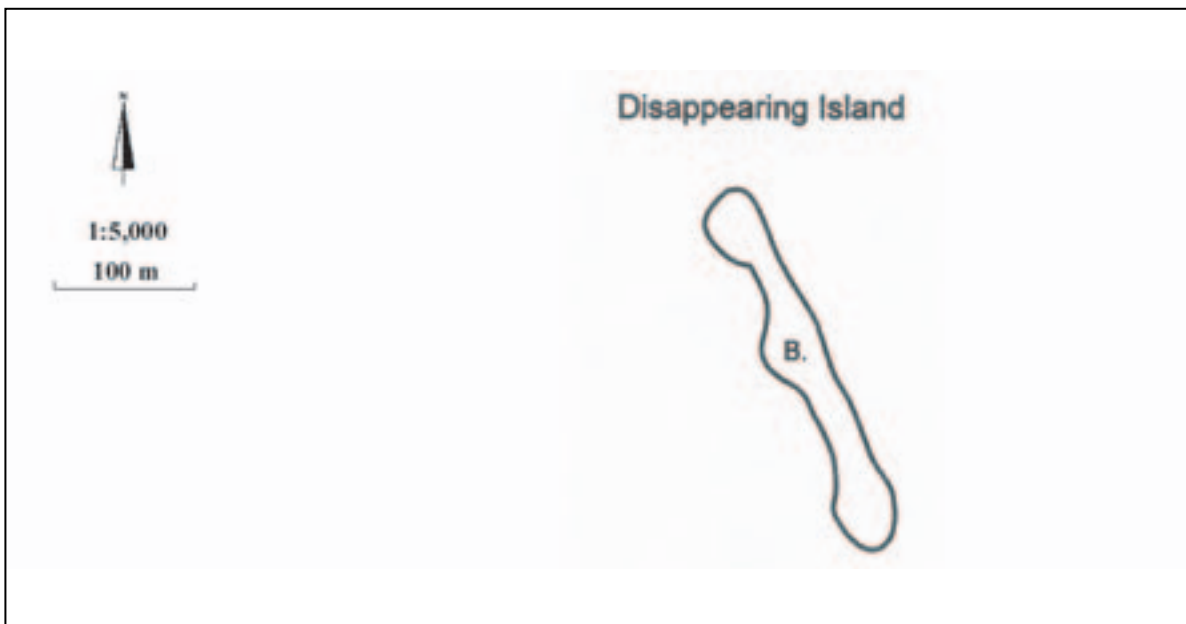
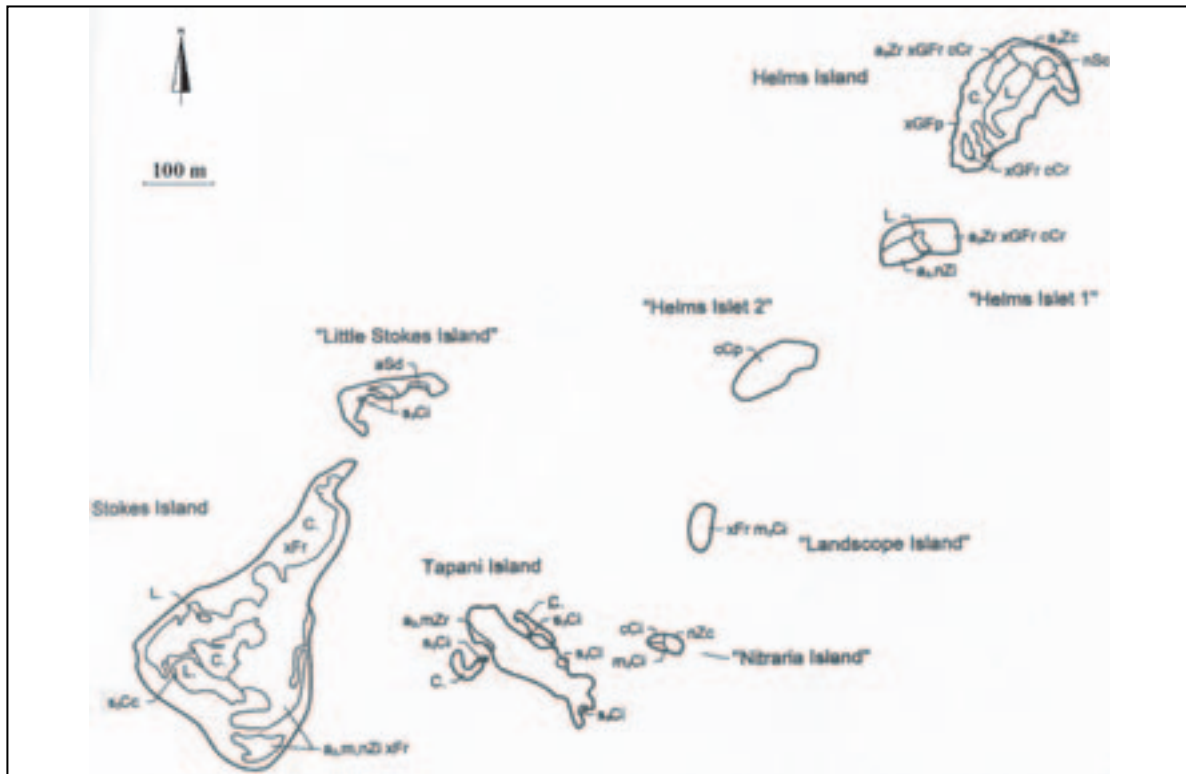


Fig. 4.29. Vegetation map of Disappearing Island – Easter Group.



**Fig. 4.30.** Vegetation map of Gibson Island, Serventy Island, “Serventy Islet 1”, “Serventy Islet 2”, “Serventy Islet 3” – Easter Group.

For Serventy Island: x of xFp includes *Sencio lautus*, \**Sonchus oleraceus*, \**Urospermum picroides*.



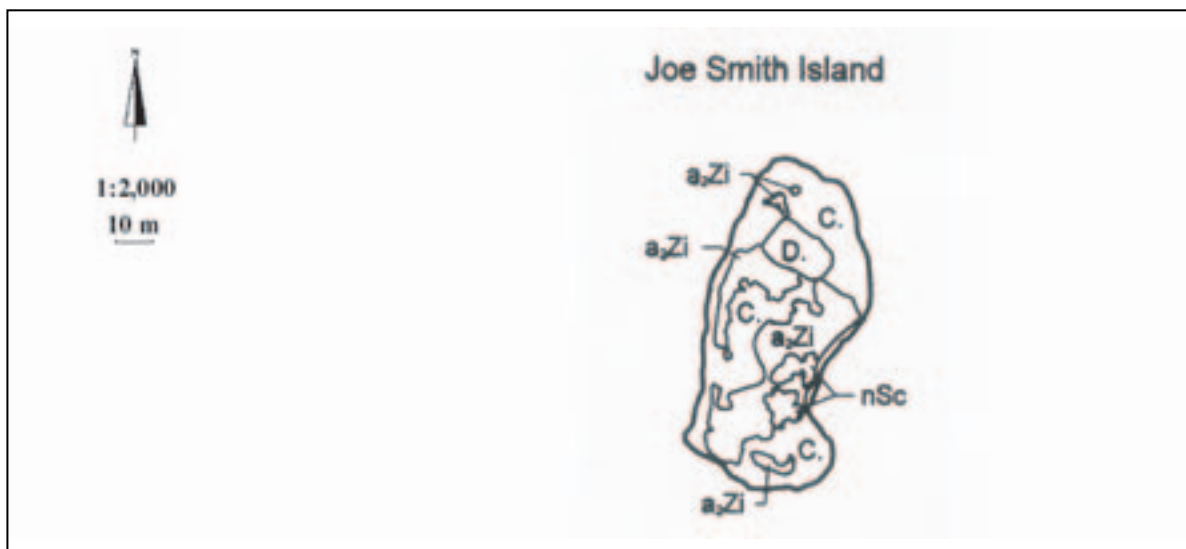
**Fig. 4.31.** Vegetation map of Helms Island, “Helms Islet 1”, “Helms Islet 2”, “Landscape Island”, “Little Stokes Island”, “Nitraria Island”, Stokes Island, Tapani Island – Easter Group.

For Helms Island: x of xGFp and xGFr denotes *Senecio lautus* and other mixed grasses and forbs (species not specified).

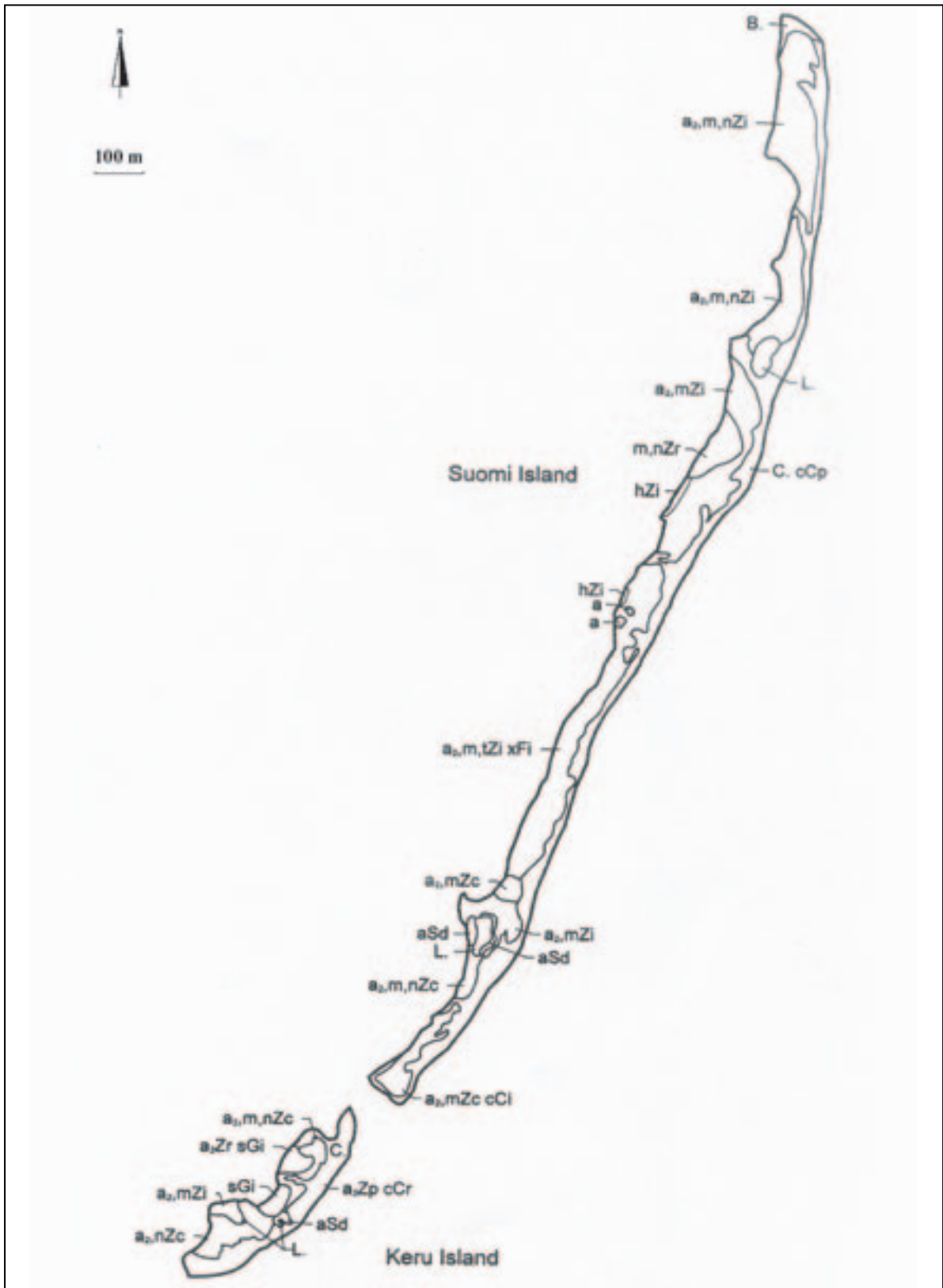
For “Helms Islet 1”: x of xGFr denotes mixed grasses and forbs (species not specified).

For “Landscape Island”: x of xFr includes *\*Chenopodium murale*, *Lavatera plebeia*, *\*Sonchus oleraceus*.

For Stokes Island: x of xFr includes *Senecio lautus* and other forbs (species not specified).



**Fig. 4.32.** Vegetation map of Joe Smith Island – Easter Group.



**Fig. 4.33.** Vegetation map of Keru Island, Suomi Island – Easter Group.  
 For Suomi Island: x of xFi denotes mixed forbes (species not specified).

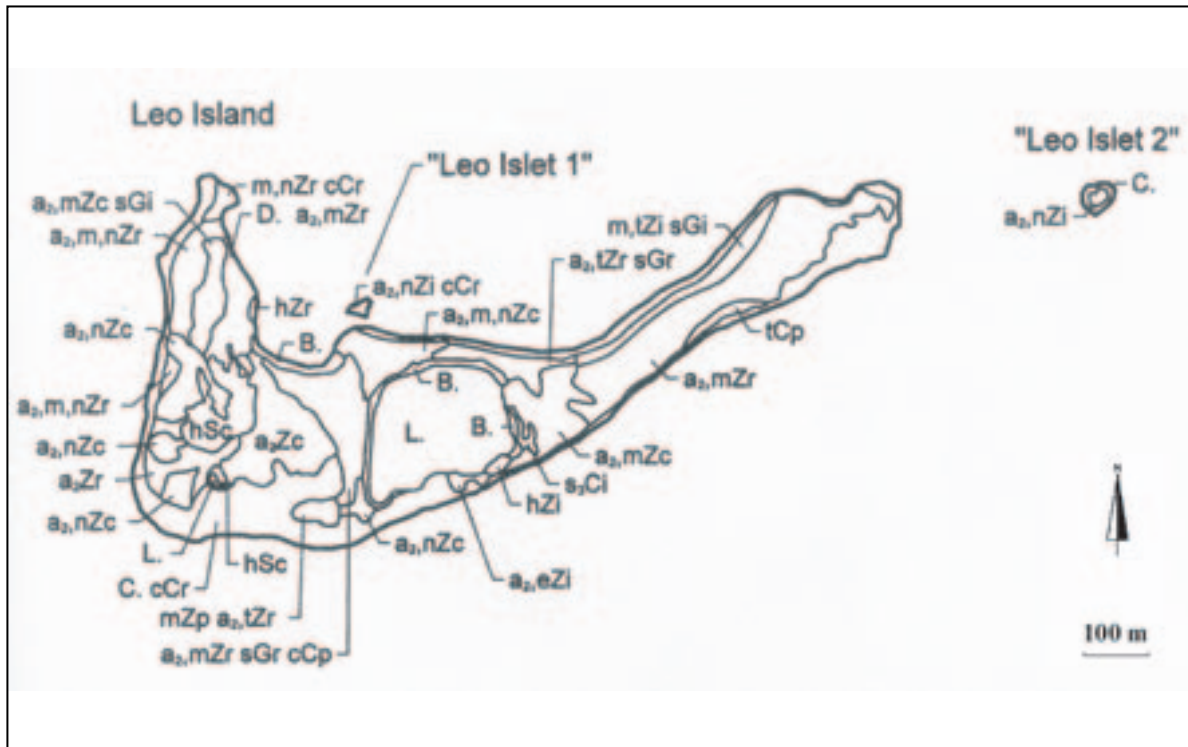


Fig. 4.34. Vegetation map of Leo Island, "Leo Islet 1", "Leo Islet 2 – Easter Group.

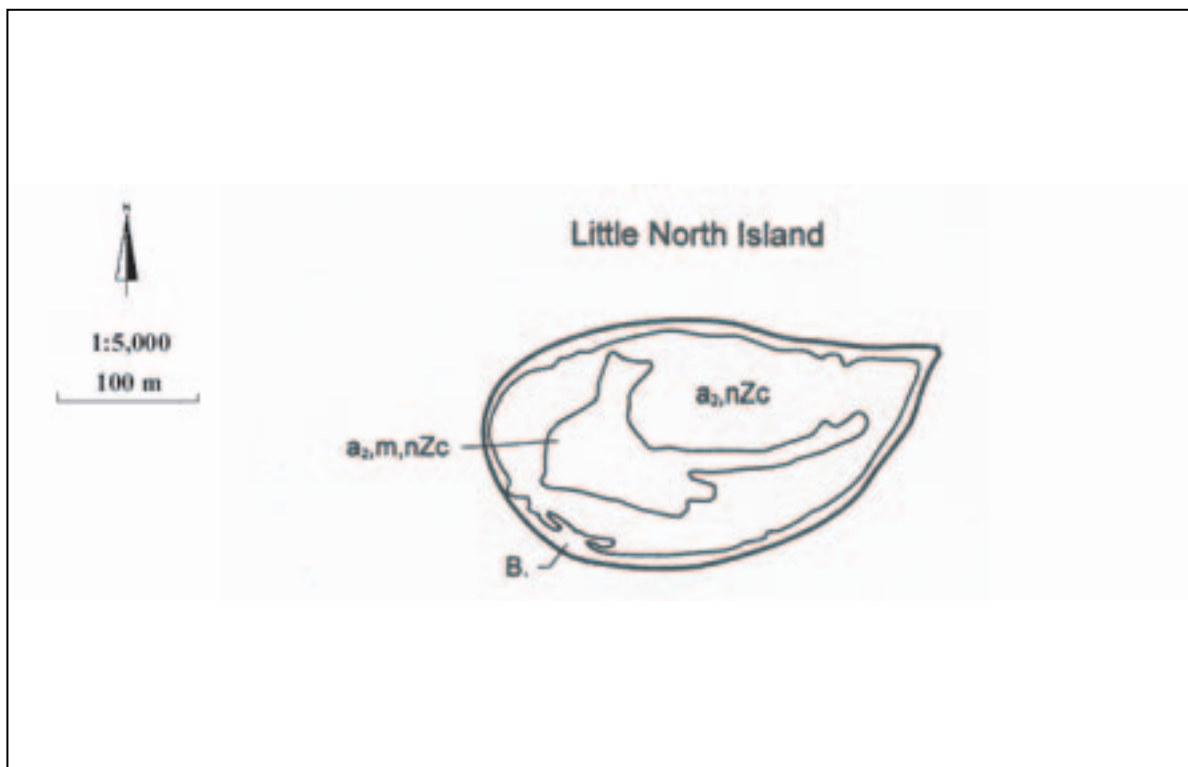
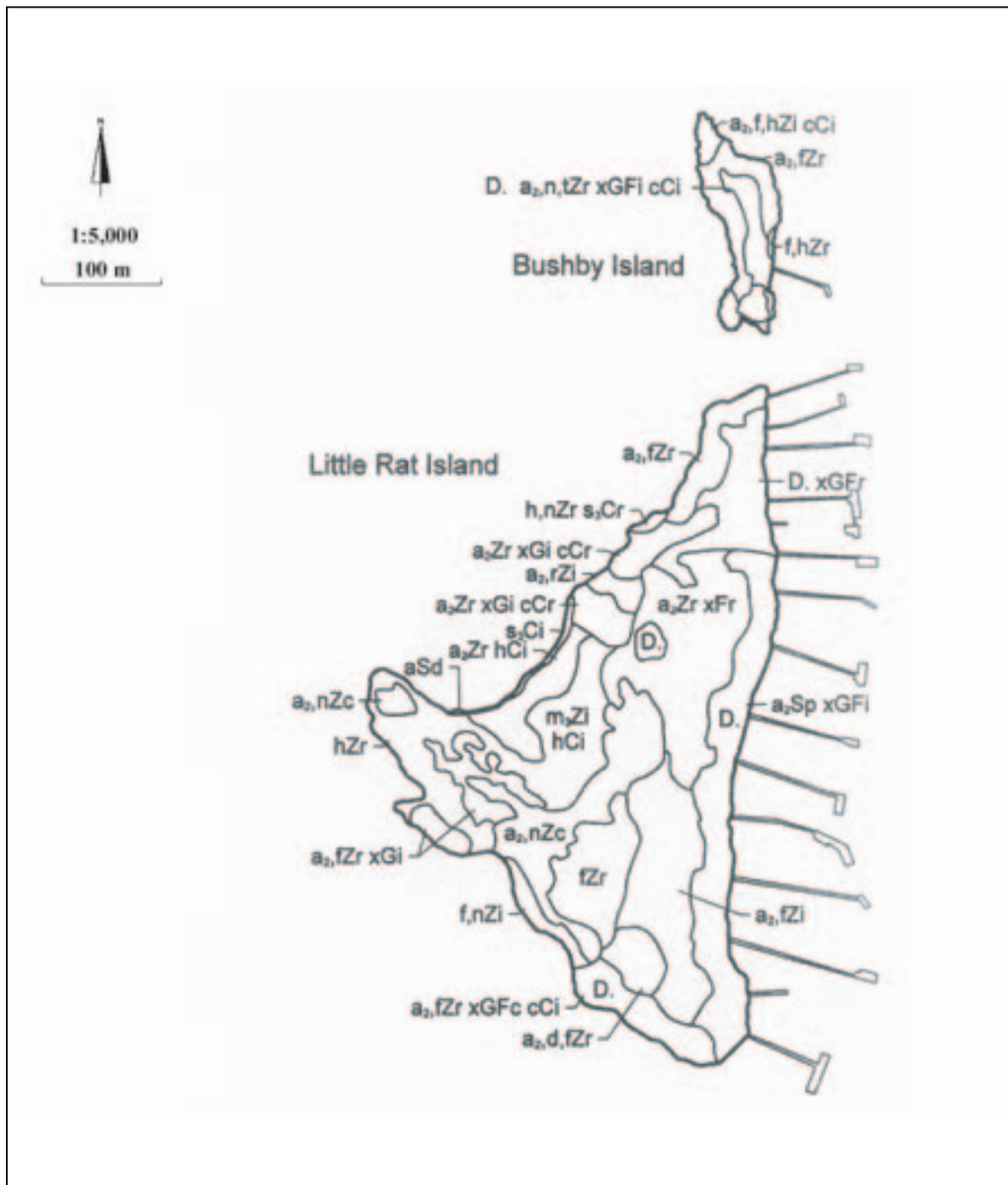


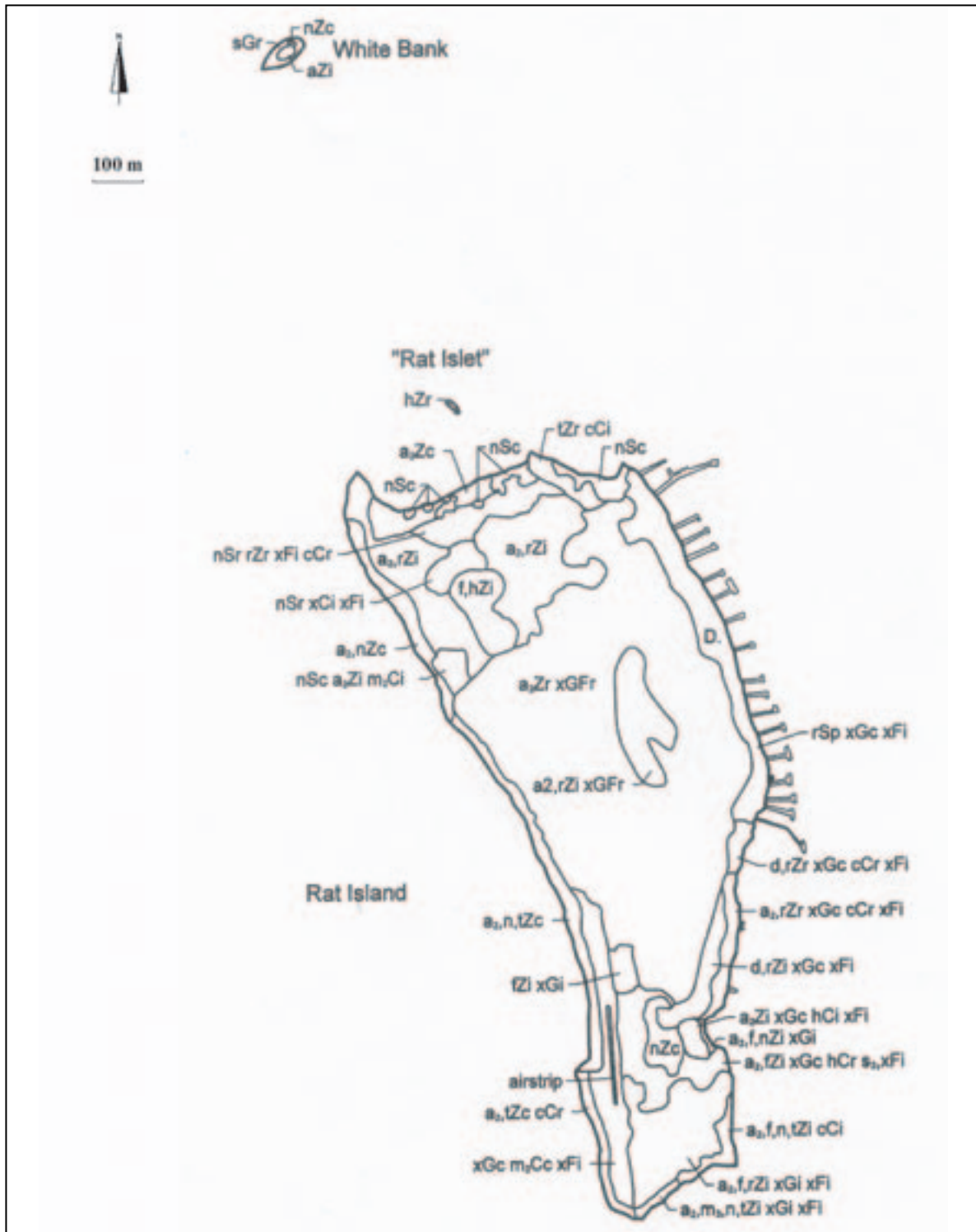
Fig. 4.35. Vegetation map of Little North Island – Easter Group.



**Fig. 4.36.** Vegetation map of Bushby Island, Little Rat Island – Easter Group.

For Bushy Island: x of xGFi denotes naïve and introduced grasses, garden plants and weeds including *\*Anagallis arvensis*, *\*Avena barbata*, *\*Conyza bonariensis*, *\*Ehrharta longiflora*, *\*Melilotus indicus*, *Setaria dielsii*, *\*Sonchus oleraceus*, *\*Urospermum picroides*.

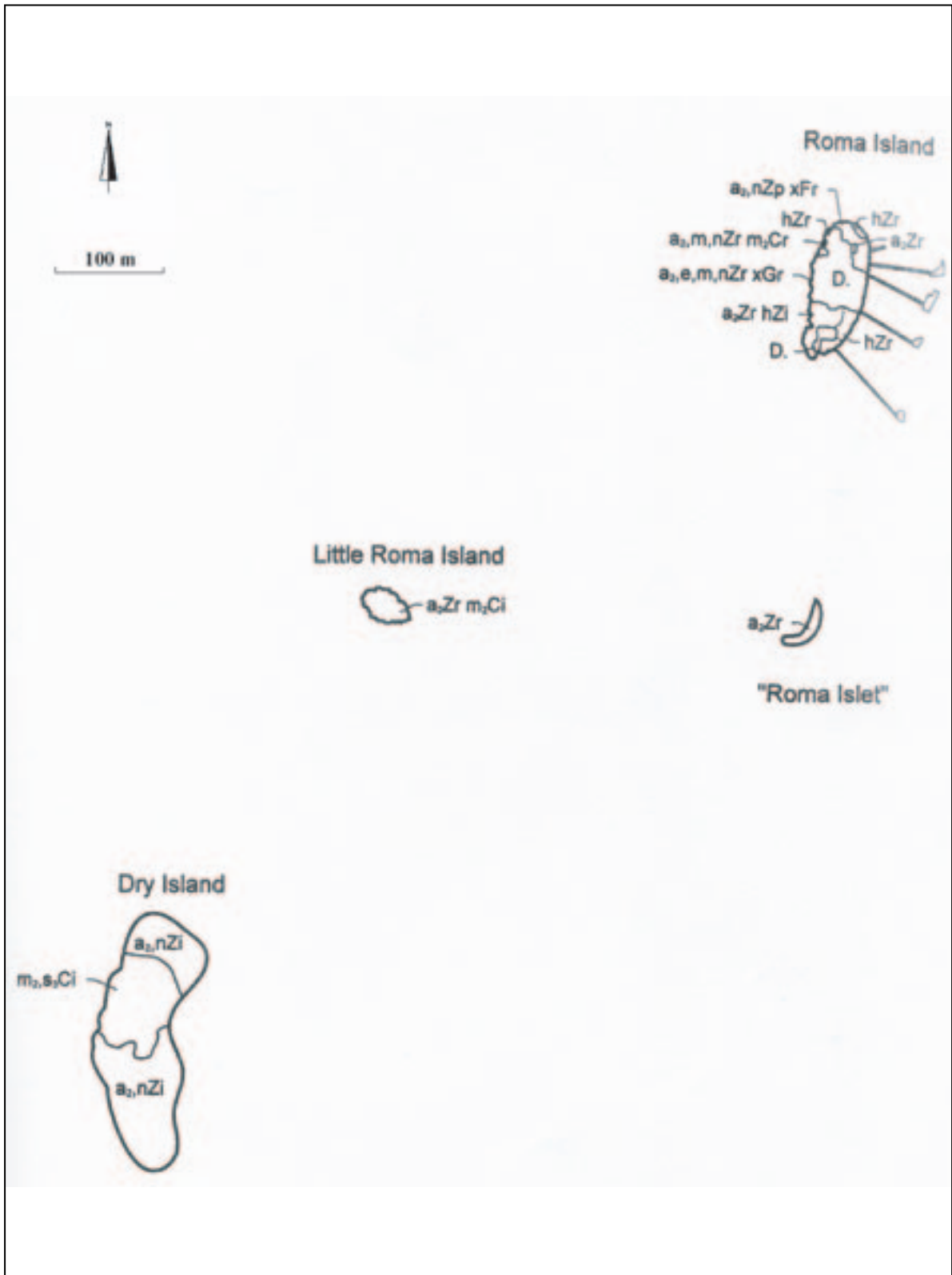
For Little Rat Island: x of xGi, xGFi and xGFc denotes naïve and introduced grasses, garden plants and weeds including *\*Conyza bonariensis*, *\*Ehrharta longiflora*, *\*Euphorbia* spp., *Ipomoea cairica*, *Lavatera plebeia*, *\*Melilotus indicus*, *\*Petroselinum crispum*, *\*Pseudognaphalium luteoalbum*, *\*Raphanus raphanistrum*, *Setaria dielsii*, *\*Sisymbrium orientale*, *\*Solanum nigrum*.



**Fig. 4.37.** Vegetation map of Rat Island, “Rat Islet”, White Bank – Easter Group.

For Rat Island: x of xFi, xGi, xGc and xGFr denotes naïve and introduced grasses, garden plants and weeds including *\*Aster subulatus*, *\*Bryophyllum* sp., *\*Euphorbia terracina*, *\*Malva parviflora*, *\*Melilotus indicus*, *\*Pseudognaphalium luteoalbum*, *\*Raphanus raphanistrum*, *Setaria dielsii*, *\*Solanum nigrum*.

For Rat Island: x of xCi is mixed succulents (species not specified).



**Fig. 4.38.** Vegetation map of Dry Island, Little Roma Island, Roma Island, "Roma Islet" – Easter Group.

For Roma Island: x of xFr, xGr denotes introduced grasses, garden plants and weeds, including *\*Conyza bonariensis*, *Lavatera plebeia*, *\*Lycopersicon esculentum*, *\*Petroselinum crispum*, *\*Sonchus oleraceus*.

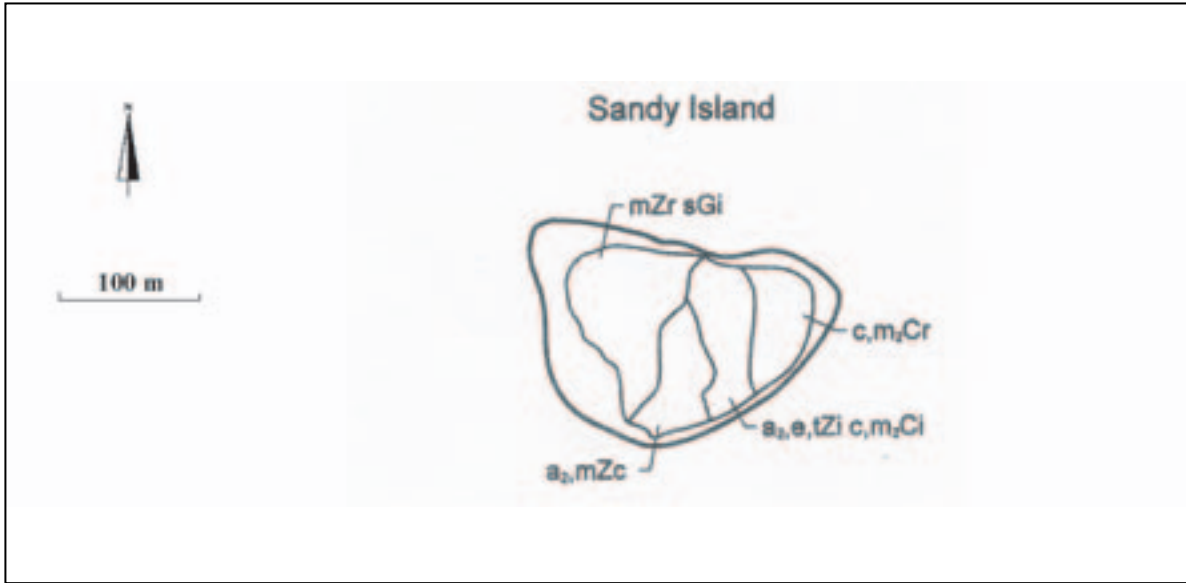


Fig. 4.39. Vegetation map of Sandy Island – Easter Group.

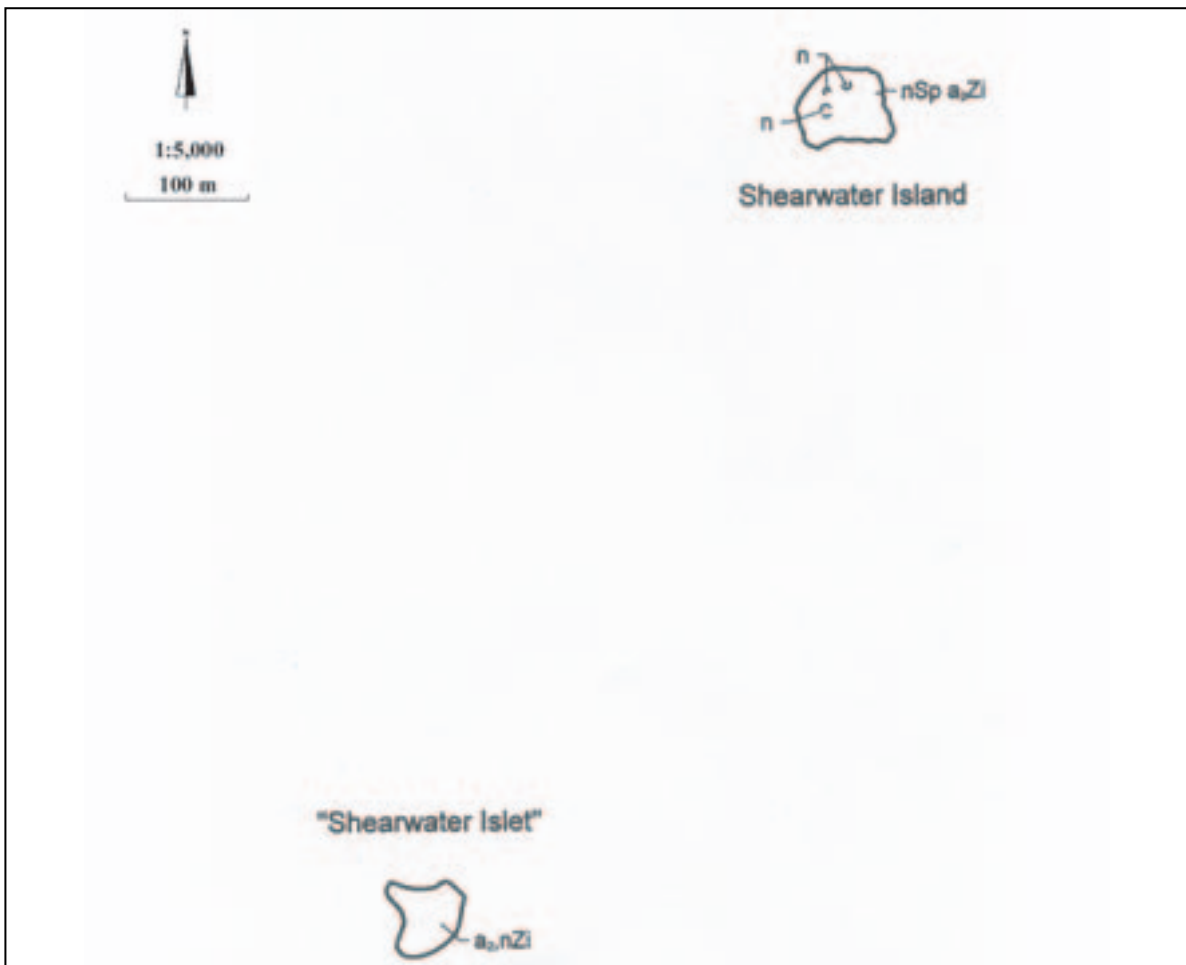
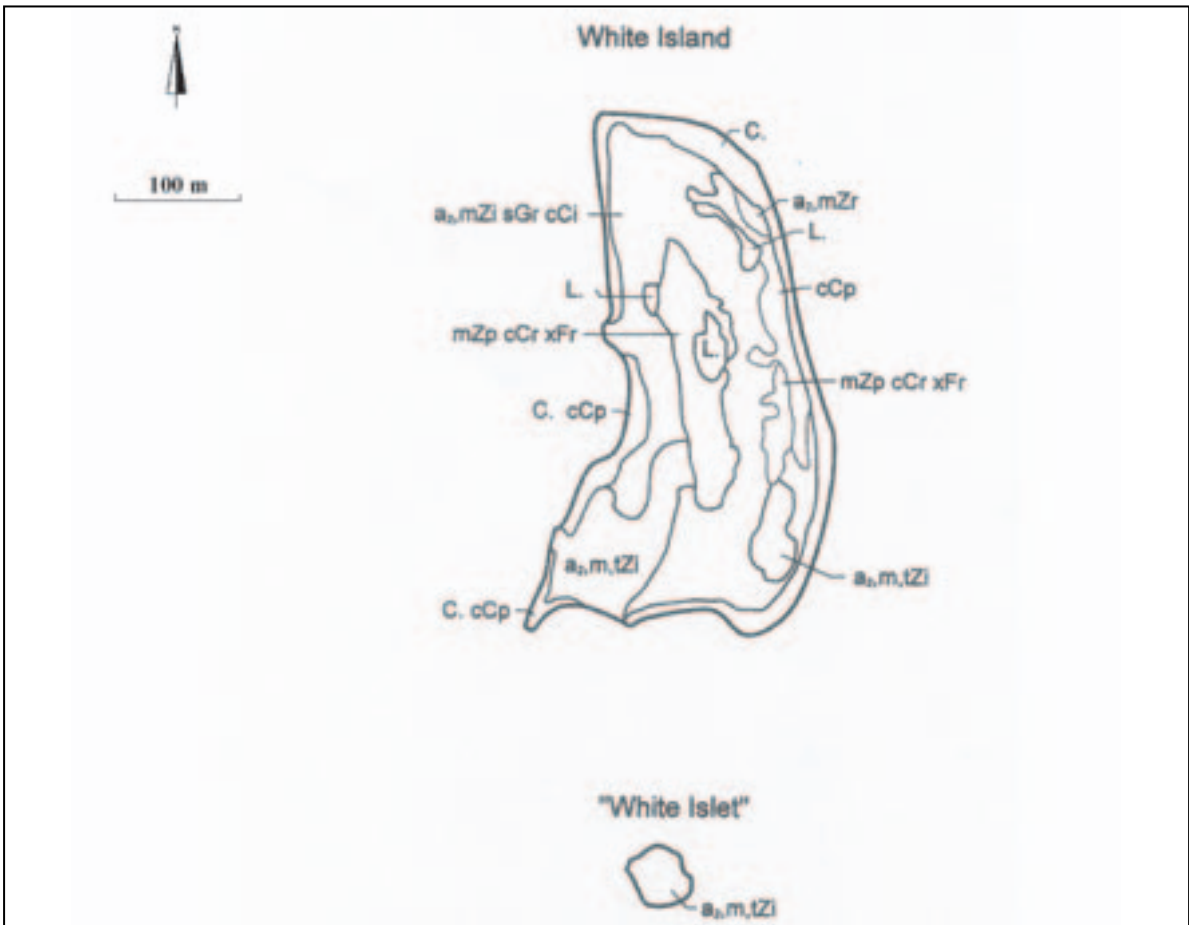
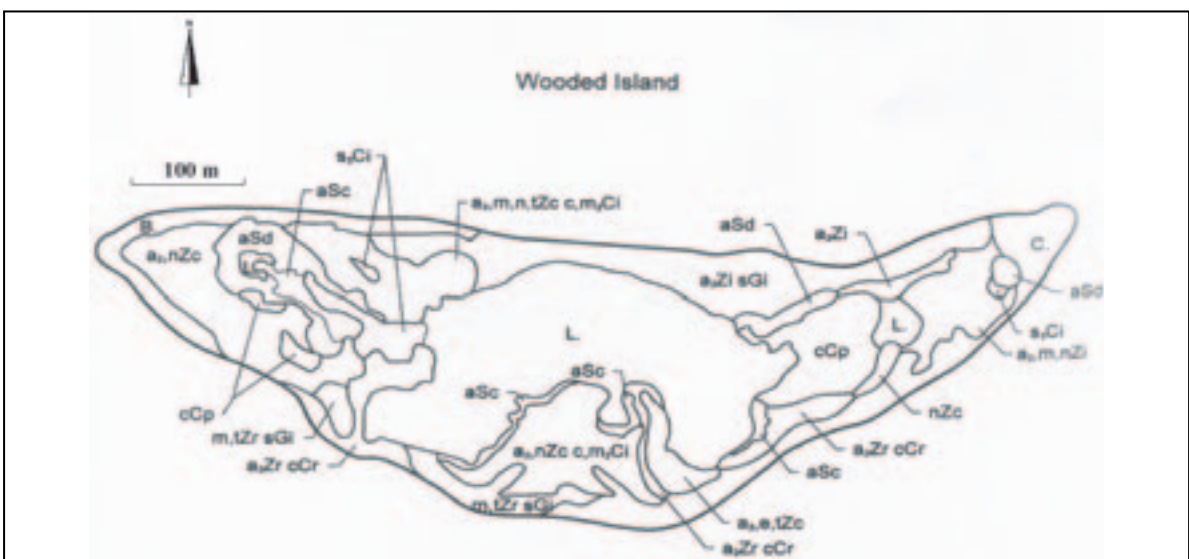


Fig. 4.40. Vegetation map of Shearwater Island, "Shearwater Islet" – Easter Group.



**Fig. 4.41.** Vegetation map of White Island, “White Islet” – Easter Group.  
For White Island: x of xFr denotes mixed forbs (species not specified).



**Fig. 4.42.** Vegetation map of Wooded Island – Easter Group.

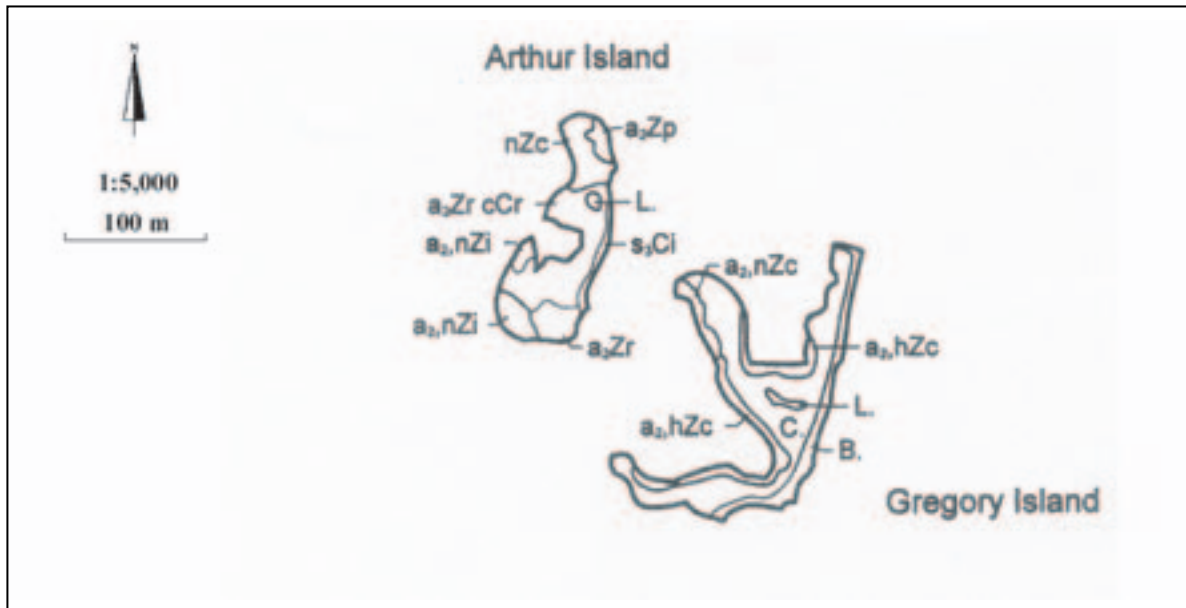
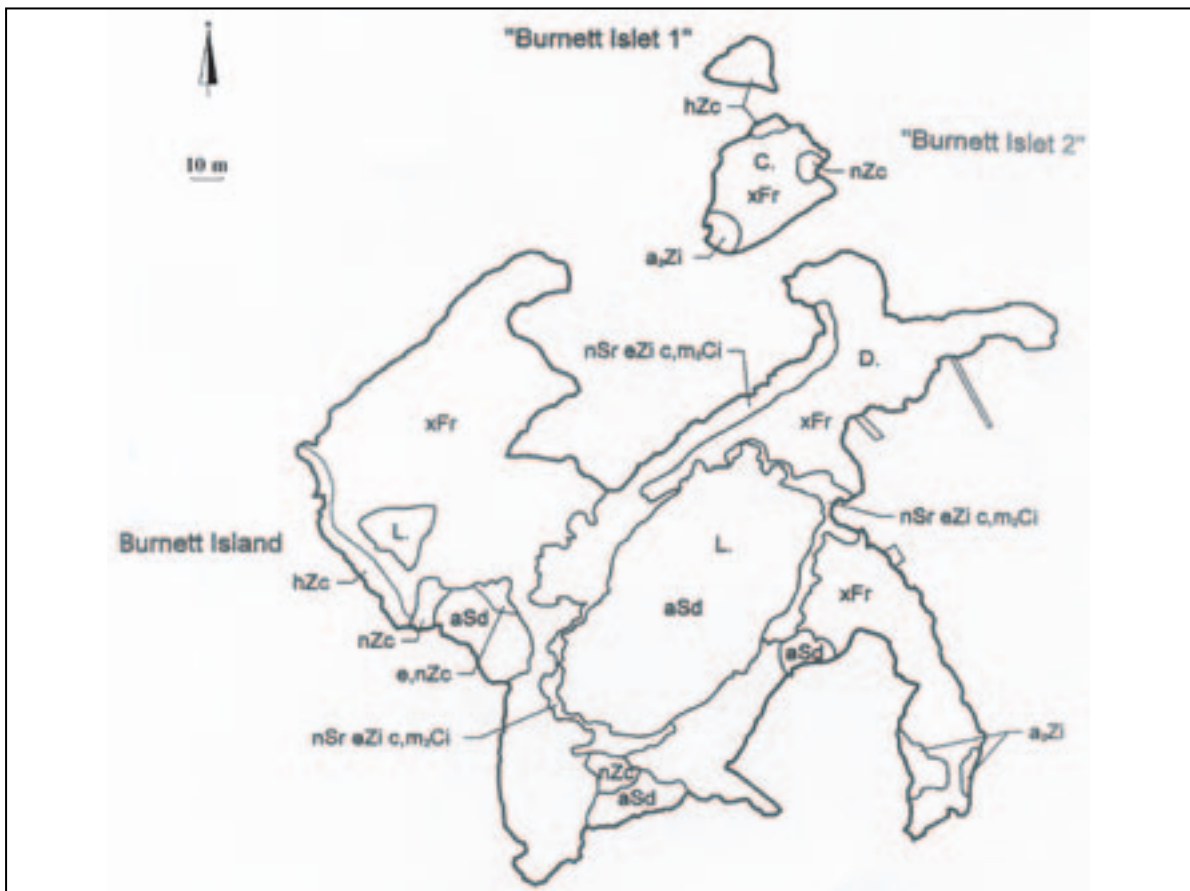


Fig. 4.43. Vegetation map of Arthur Island, Gregory Island – Pelsaert Group.



Fig. 4.44. Vegetation map of Basile Island – Pelsaert Group.

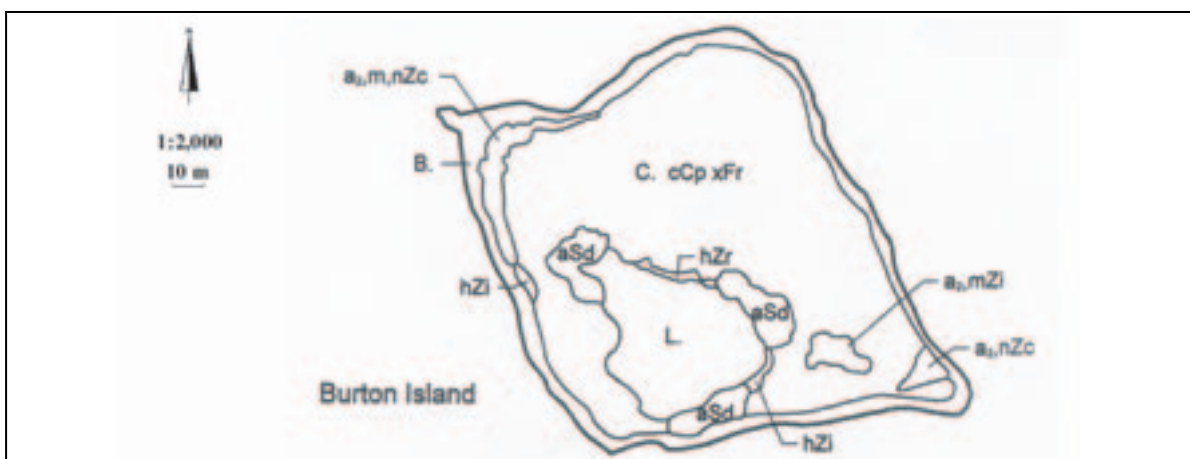
For Basile Island: x of xFr and xGFr denotes native and introduced grasses, garden plants and weeds including \*Avena spp., \*Bromus spp., \*Ehrharta spp., \*Hordeum leporinum, Lavatera plebeia, \*Melilotus indicus, \*Phalaris minor, \*Raphanus spp., \*Sonchus oleraceus, \*Ursinia anthemoides.



**Fig. 4.45.** Vegetation map of Burnett Island, “Burnett Islet 1”, “Burnett Islet 2” – Pelsaert Group.

For Burnett Island: x of xFr includes *Parietaria debilis*, *Raphanus sativus*, *Senecio lautus*, *Sonchus oleraceus*, *Urospermum picroides*.

For “Burnett Islet 2”: x of xFr denotes mixed forbs (species not specified).



**Fig. 4.46.** Vegetation map of Burton Island – Pelsaert Group.

For Burton Island: x of xFr includes *Lavatera plebeia*, *Parietaria* spp., *Senecio lautus*, *Sonchus* spp., *Urospermum picroides*.

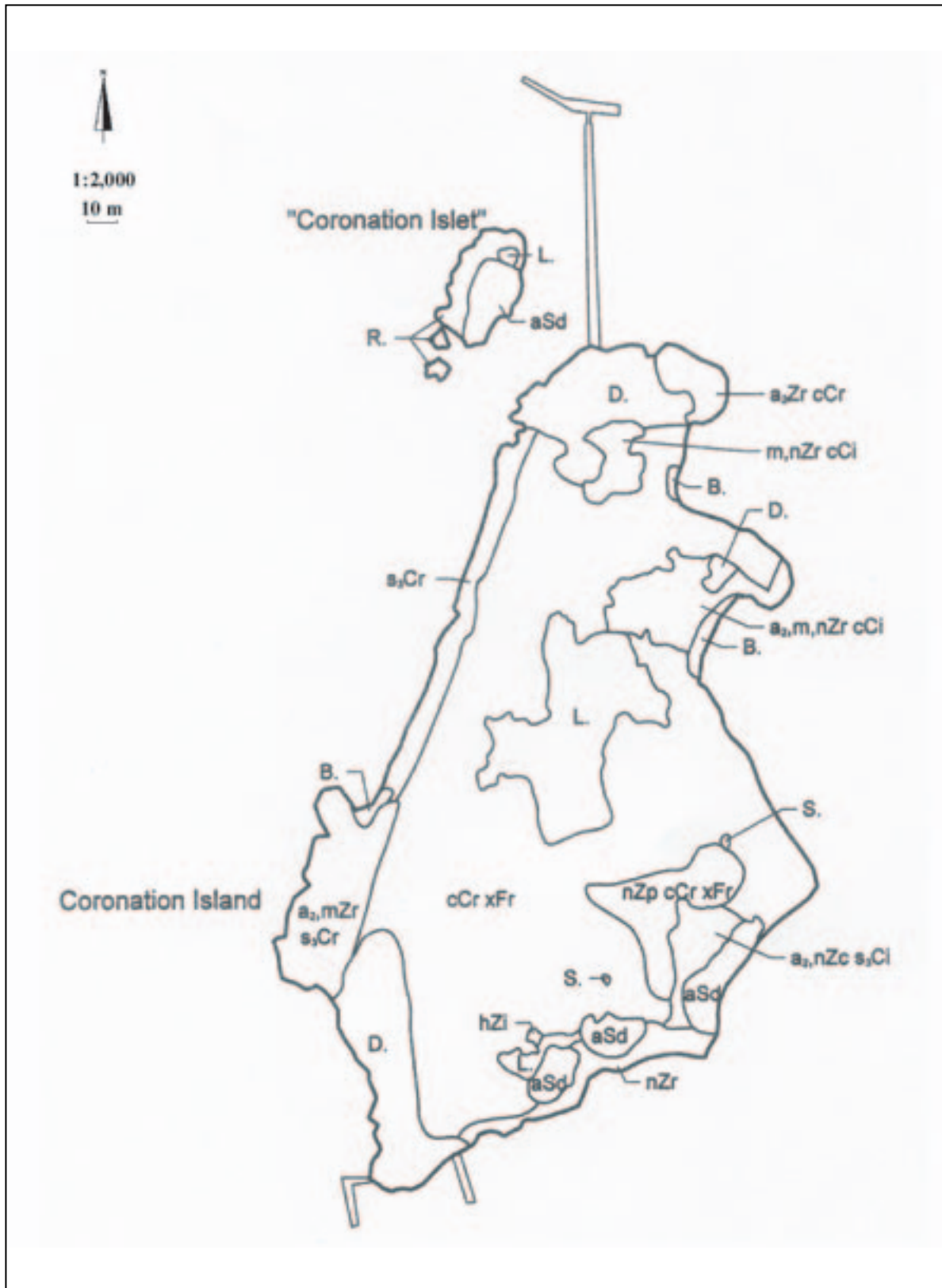
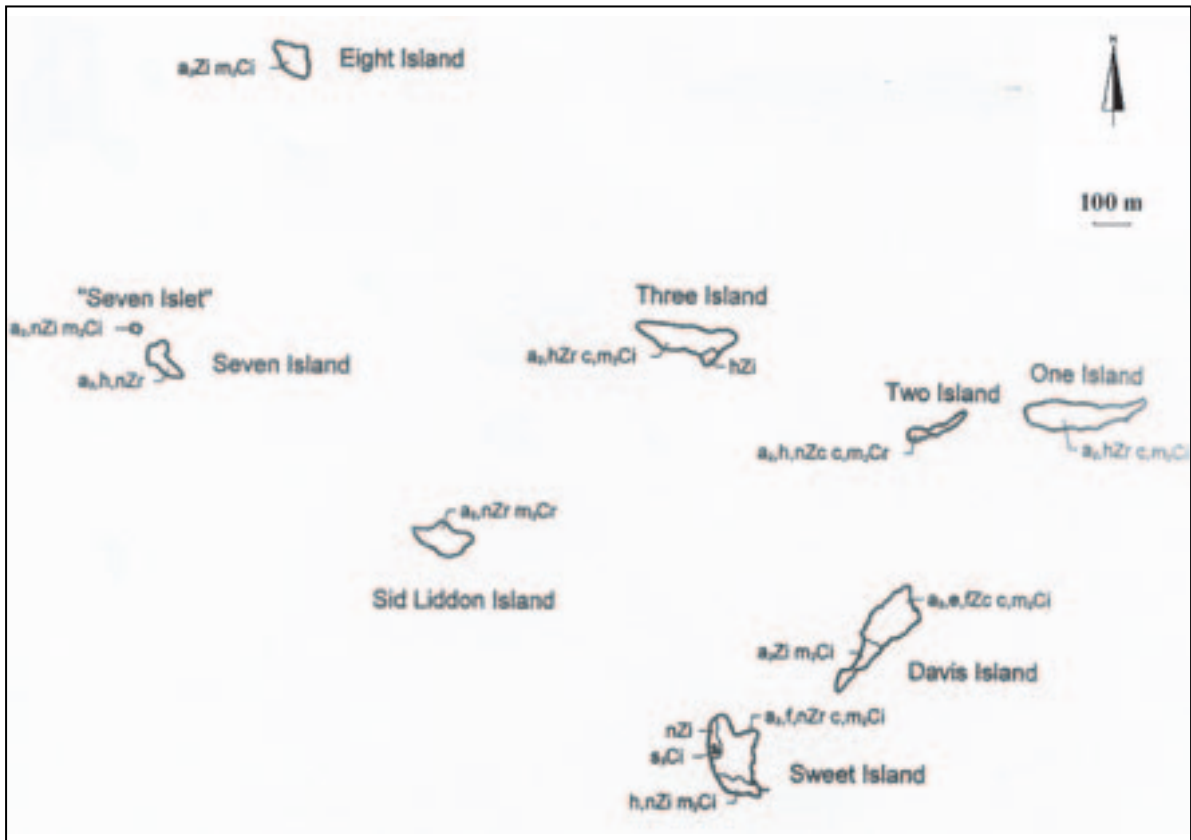
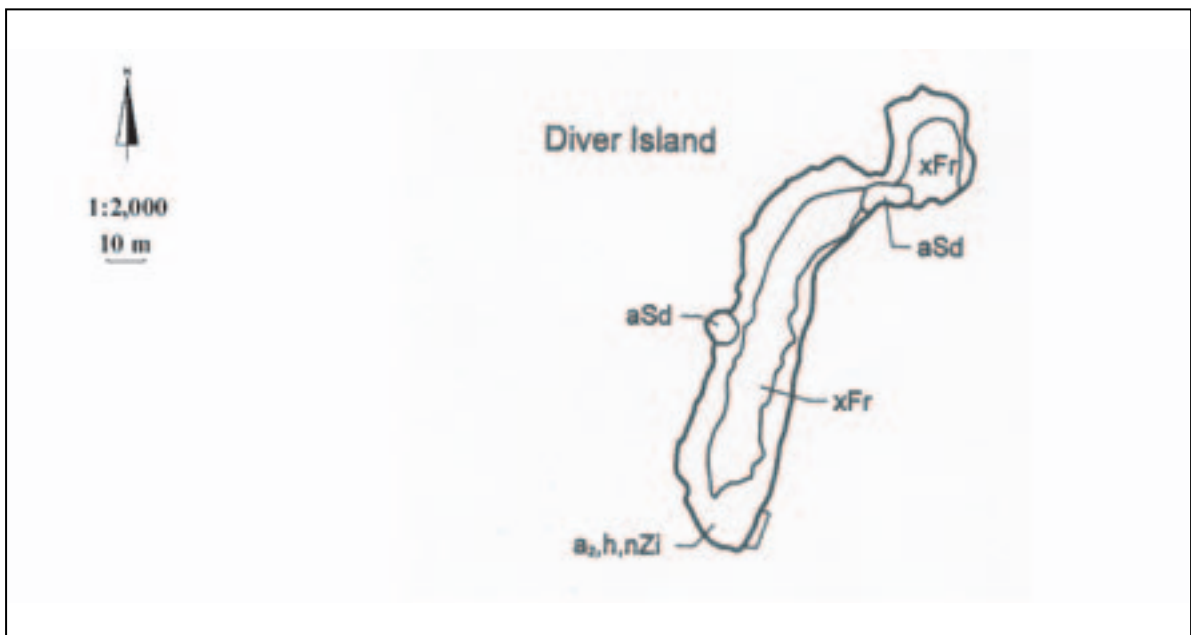


Fig. 4.47. Vegetation map of Coronation Island, "Coronation Islet" – Pelsaert Group.

For Coronation Island: x of xFr includes *Parietaria debilis*, *Senecio lautus*, \**Sonchus oleraceus*.

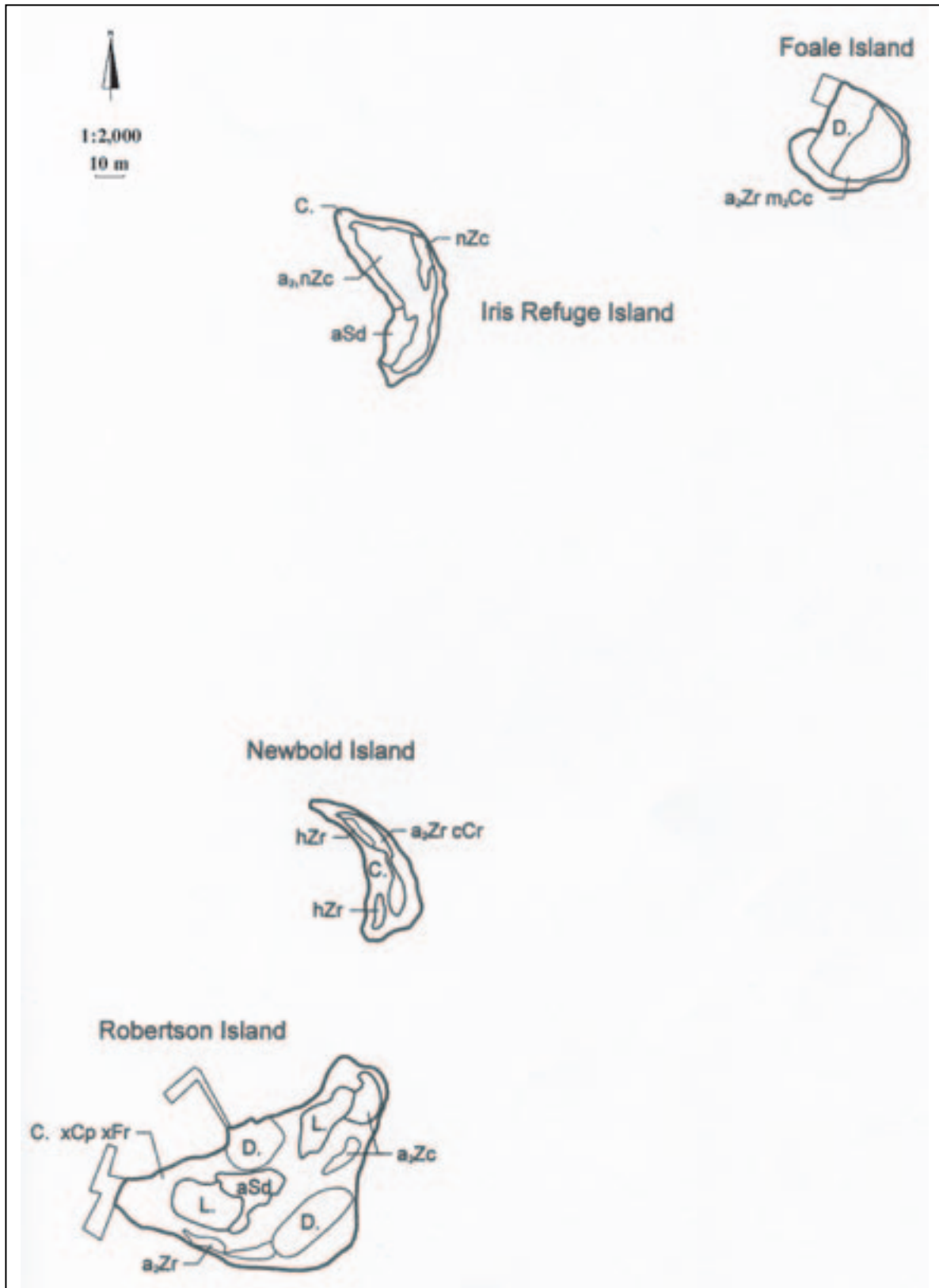


**Fig. 4.48.** Vegetation map of Davis Island, Eight Island, One Island, Seven Island, “Seven Islet”, Sid Liddon Island, Sweet Island, Three Island, Two Island – Pelsaert Group.

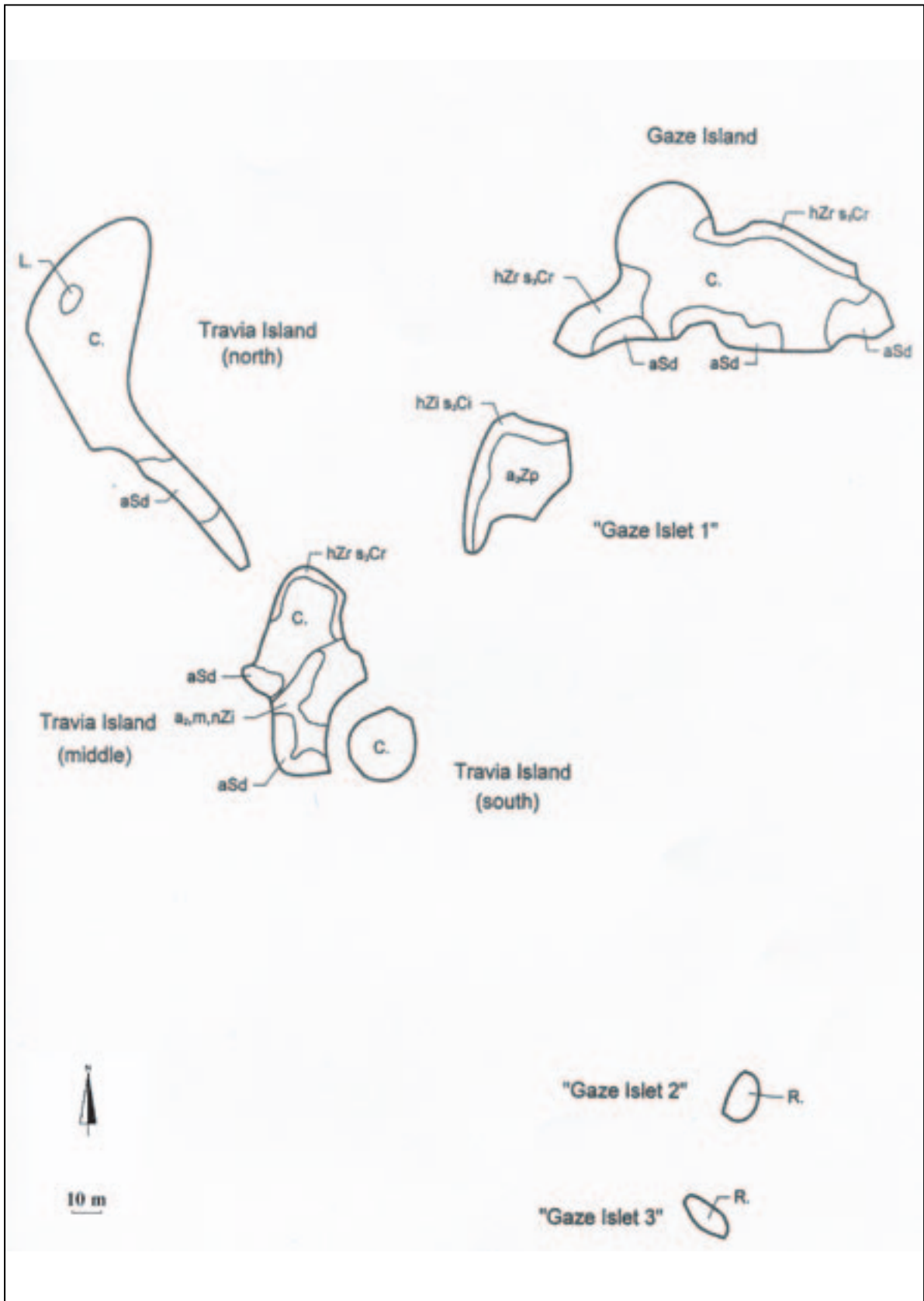


**Fig. 4.49.** Vegetation map of Diver Island – Pelsaert Group.

For Diver Island: x of xFr denotes mixed forbs (species not specified).



**Fig. 4.50.** Vegetation map of Foale Island, Iris Refuge Island, Newbold Island, Robertson Island – Pelsaert Group. For Robertson Island: x of xCp and xFr are mixed succulents and forbs (species not specified).



**Fig. 4.51.** Vegetation map of Gaze Island, "Gaze Islet 1", "Gaze Islet 2", "Gaze Islet 3", Travia Island – Pelsaert Group.

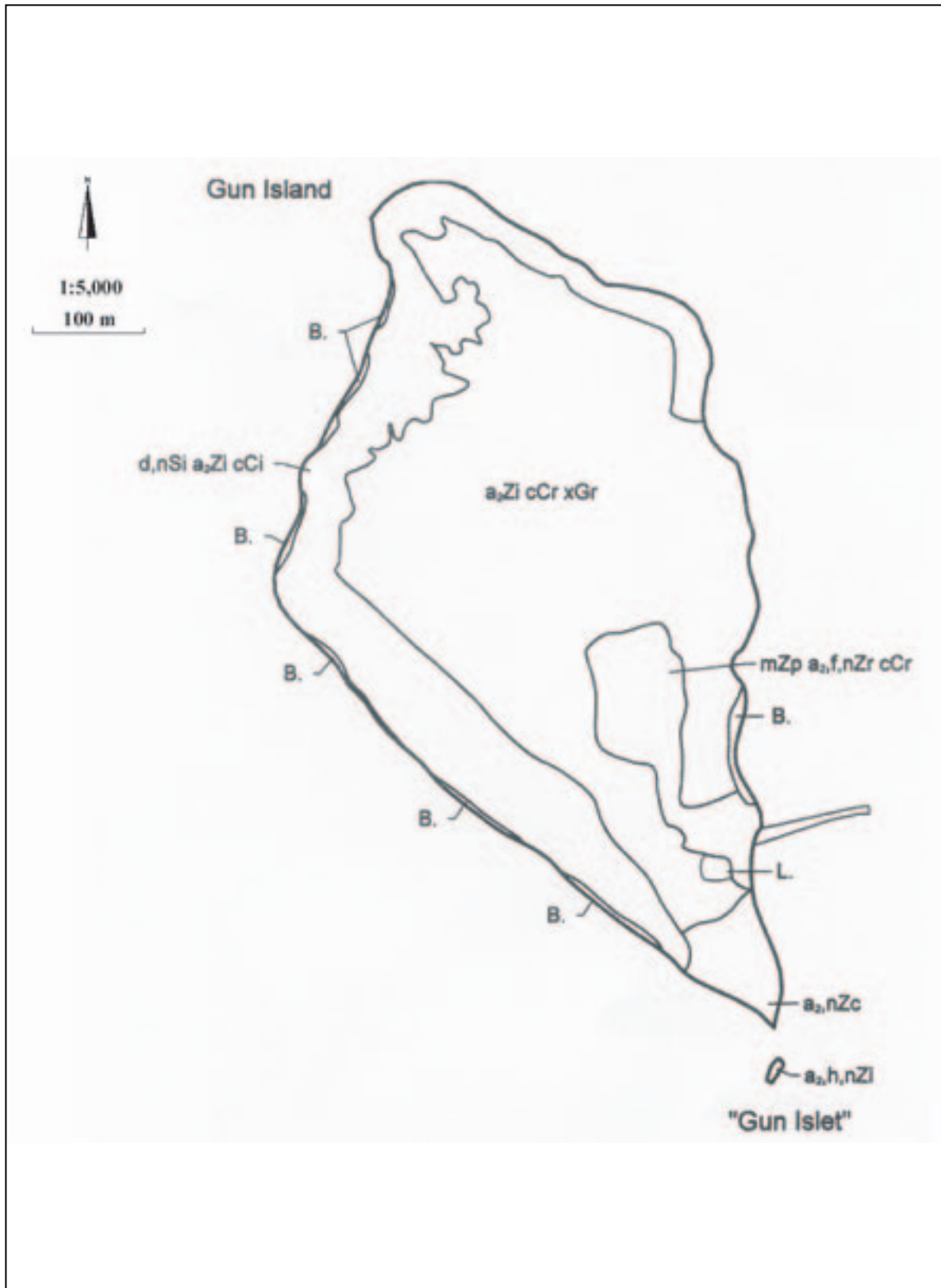


Fig. 4.52. Vegetation map of Gun Island, “Gun Islet” – Pelsaert Group.

For Gun Island: x of xGr includes *Bromus* sp., \**Phleum pratensis*, *Setaria dielsii*.

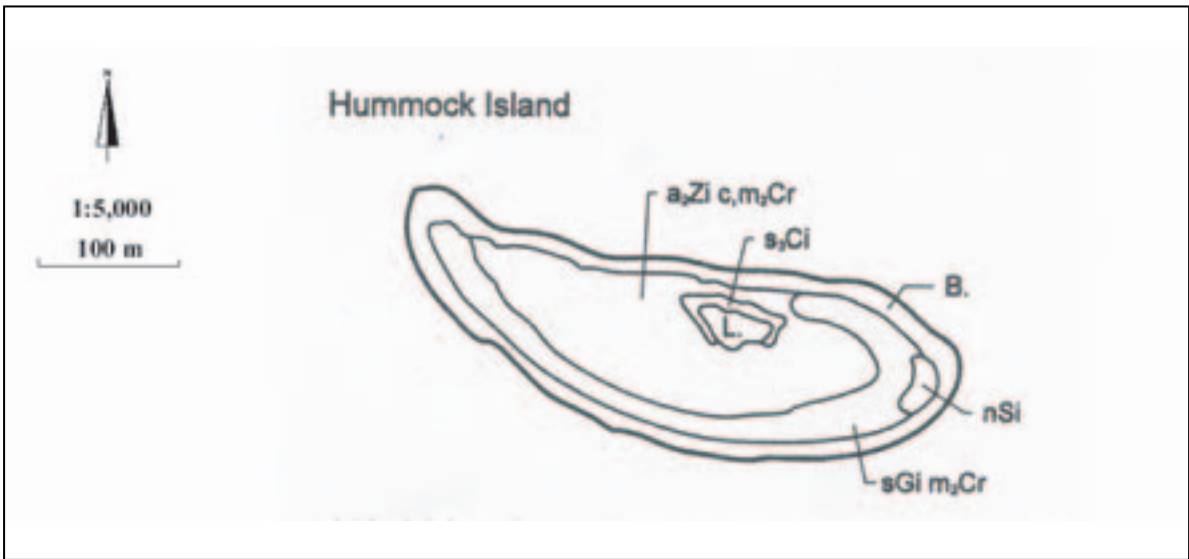


Fig. 4.53. Vegetation map of Hummock Island – Pelsaert Group.

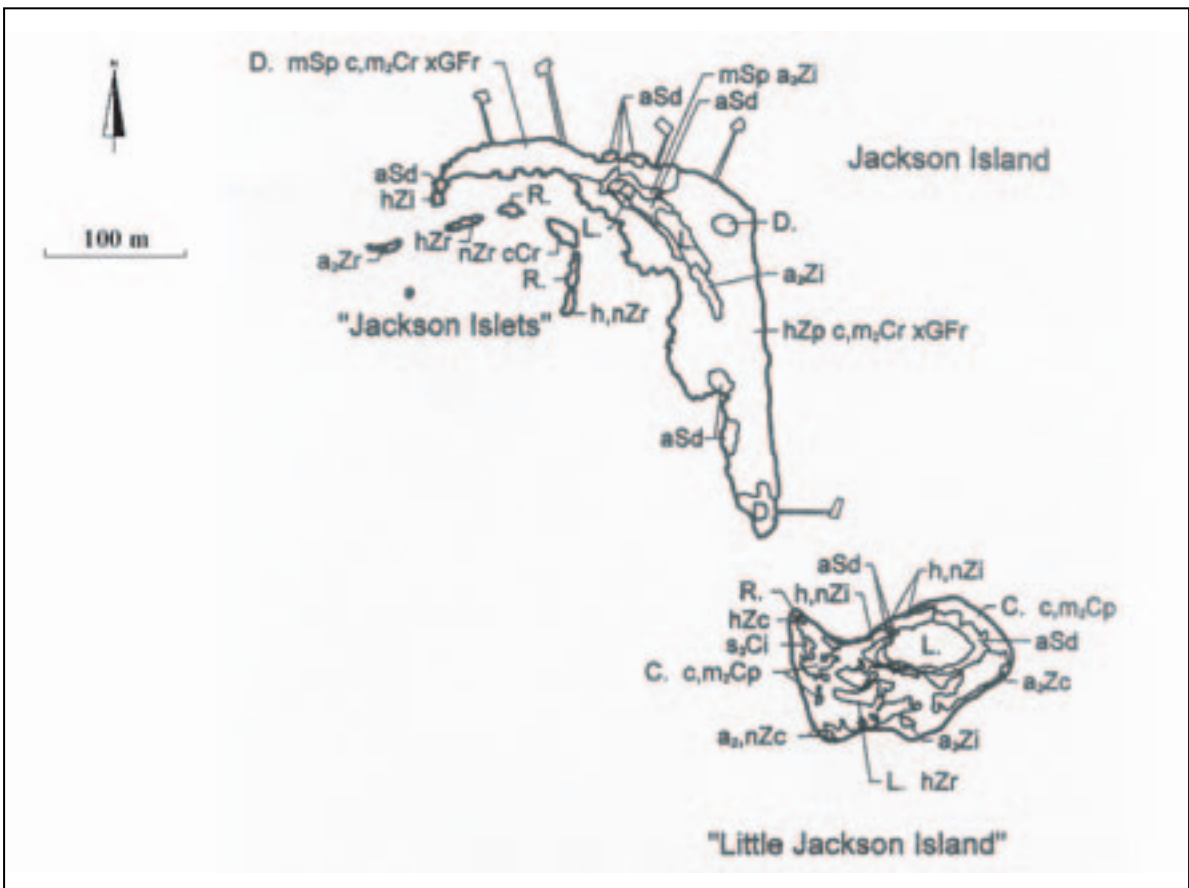


Fig. 4.54. Vegetation map of Jackson Island, “Jackson Islets”, “Little Jackson Island” – Pelsaert Group.  
 For Jackson Island: x of xGFr includes \**Ehrharta longiflora*, *Lavatera plebeia*, \**Lycopersicon esculentum*, *Parietaria debilis*, *Senecio lautus*, \**Sonchus oleraceus*.

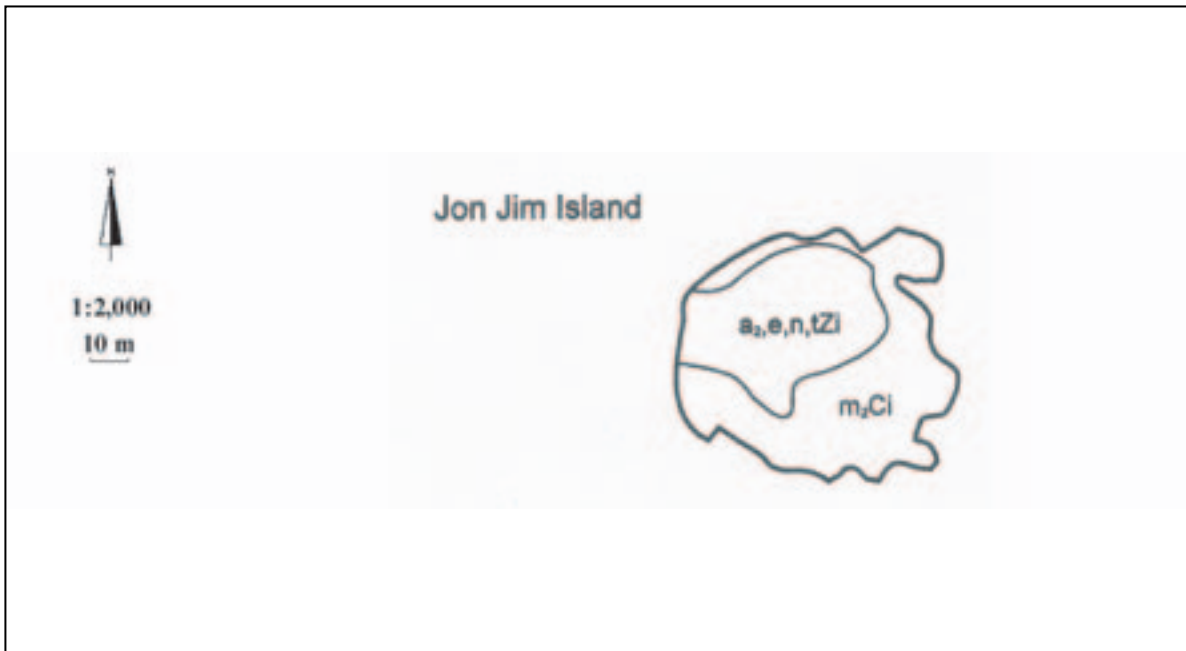


Fig. 4.55. Vegetation map of Jon Jim Island – Pelsaert Group.

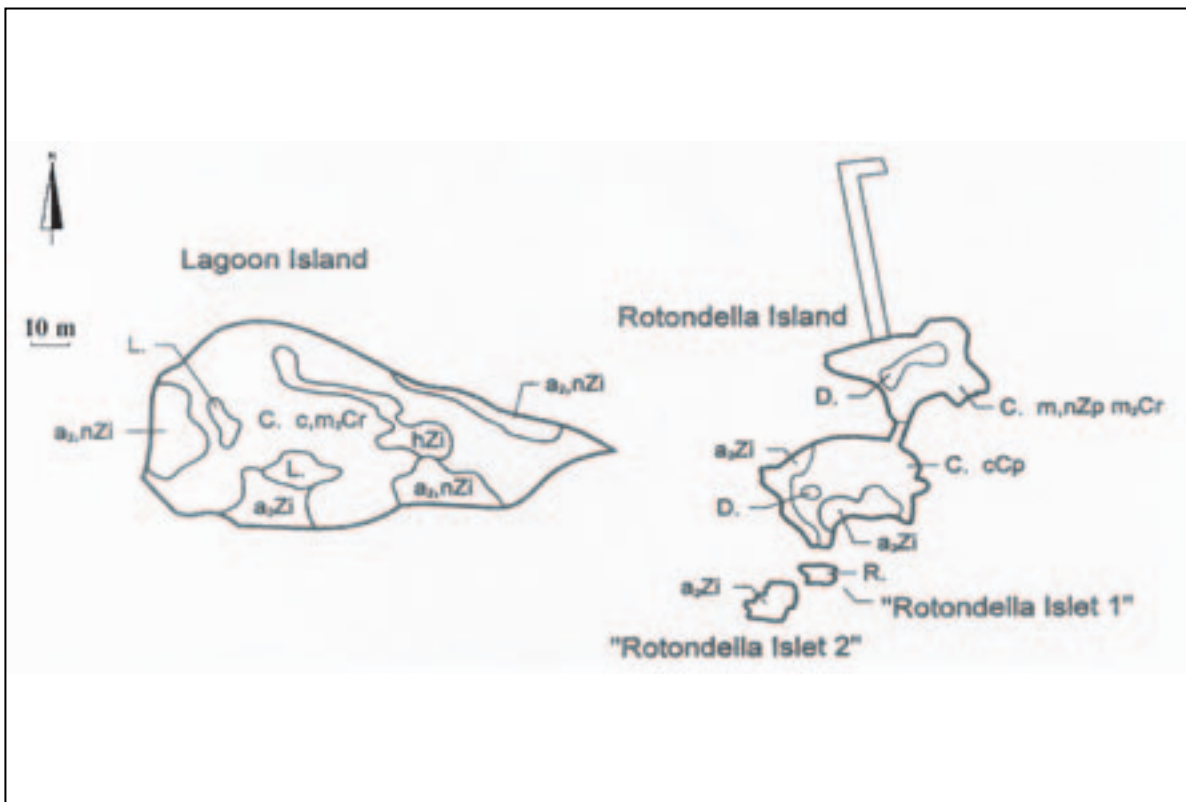
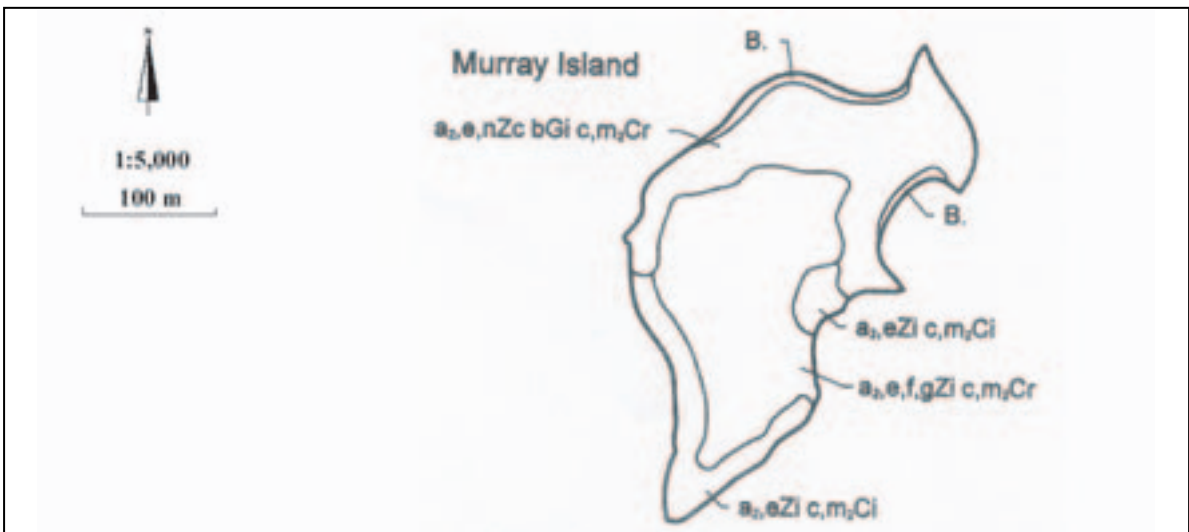


Fig. 4.56. Vegetation map of Lagoon Island, Rotondella Island, “Rotondella Islet 1”, “Rotondella Islet 2” – Pelsaert Group.

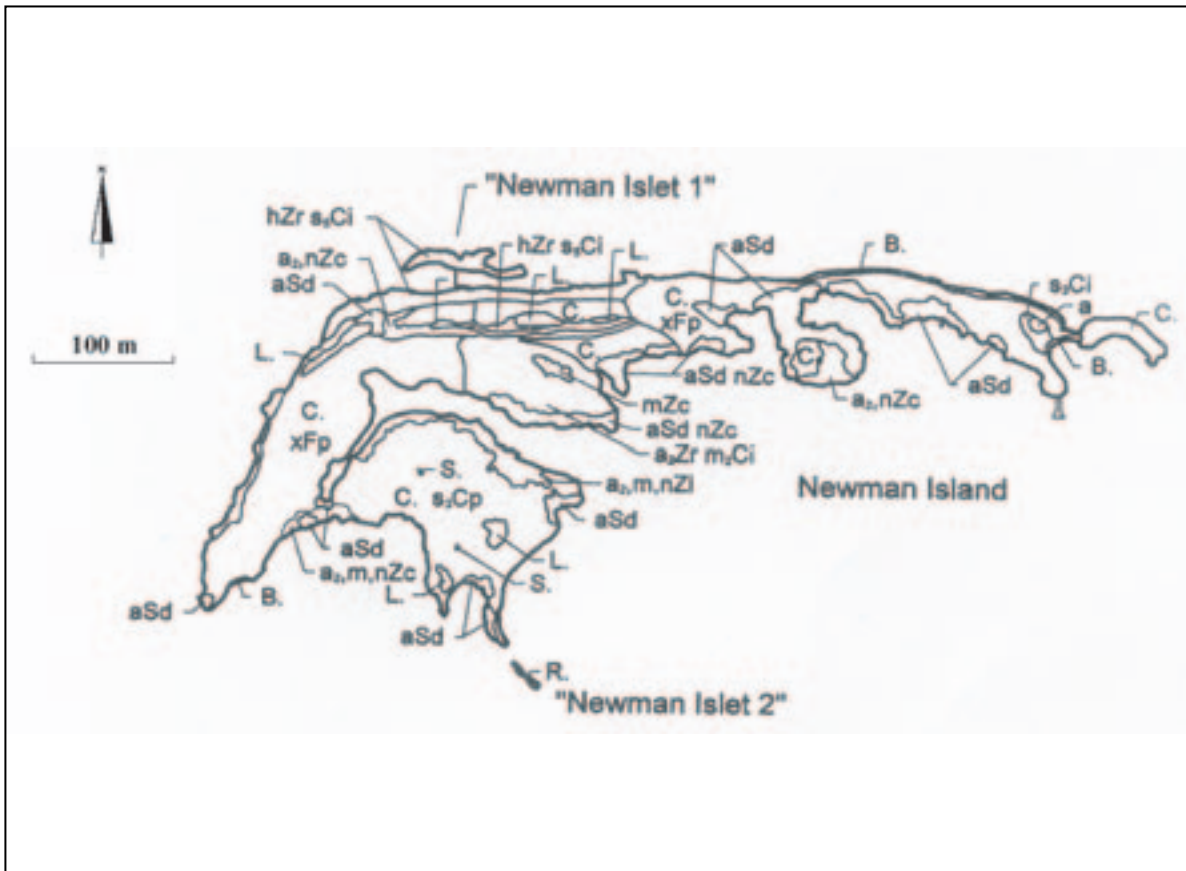


**Fig. 4.57.** Vegetation map of Middle Island – Pelsaert Group.

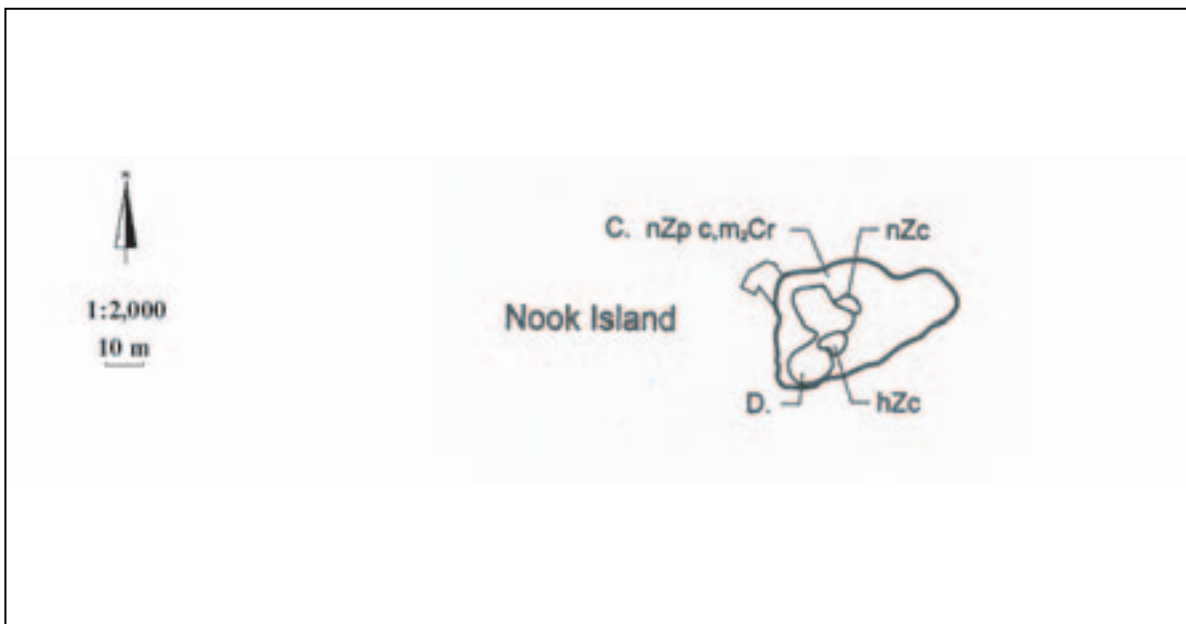
For Middle Island: x of xGr includes *Austrostipa elegantissima*, *\*Bromus* sp., *Setaria dielsii*, *Sporobolus virginicus*.



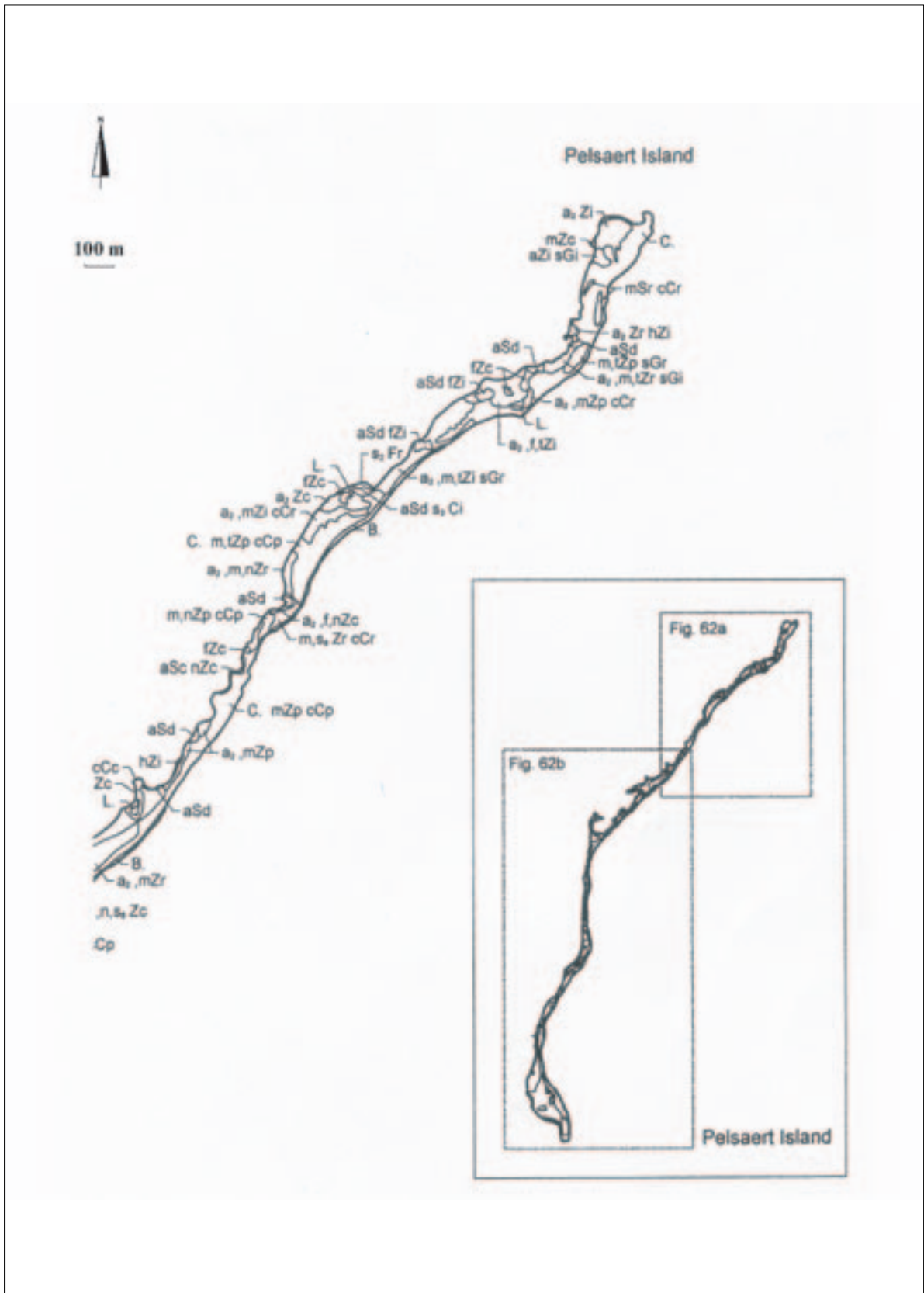
**Fig. 4.58.** Vegetation map of Murray Island – Pelsaert Group.



**Fig. 4.59.** Vegetation map of Newman Island, “Newman Islet 1”, “Newman Islet 2” – Pelsaert Group.  
 For Newman Island: x of xFp includes *Senecio lautus*, \**Sonchus oleraceus*.



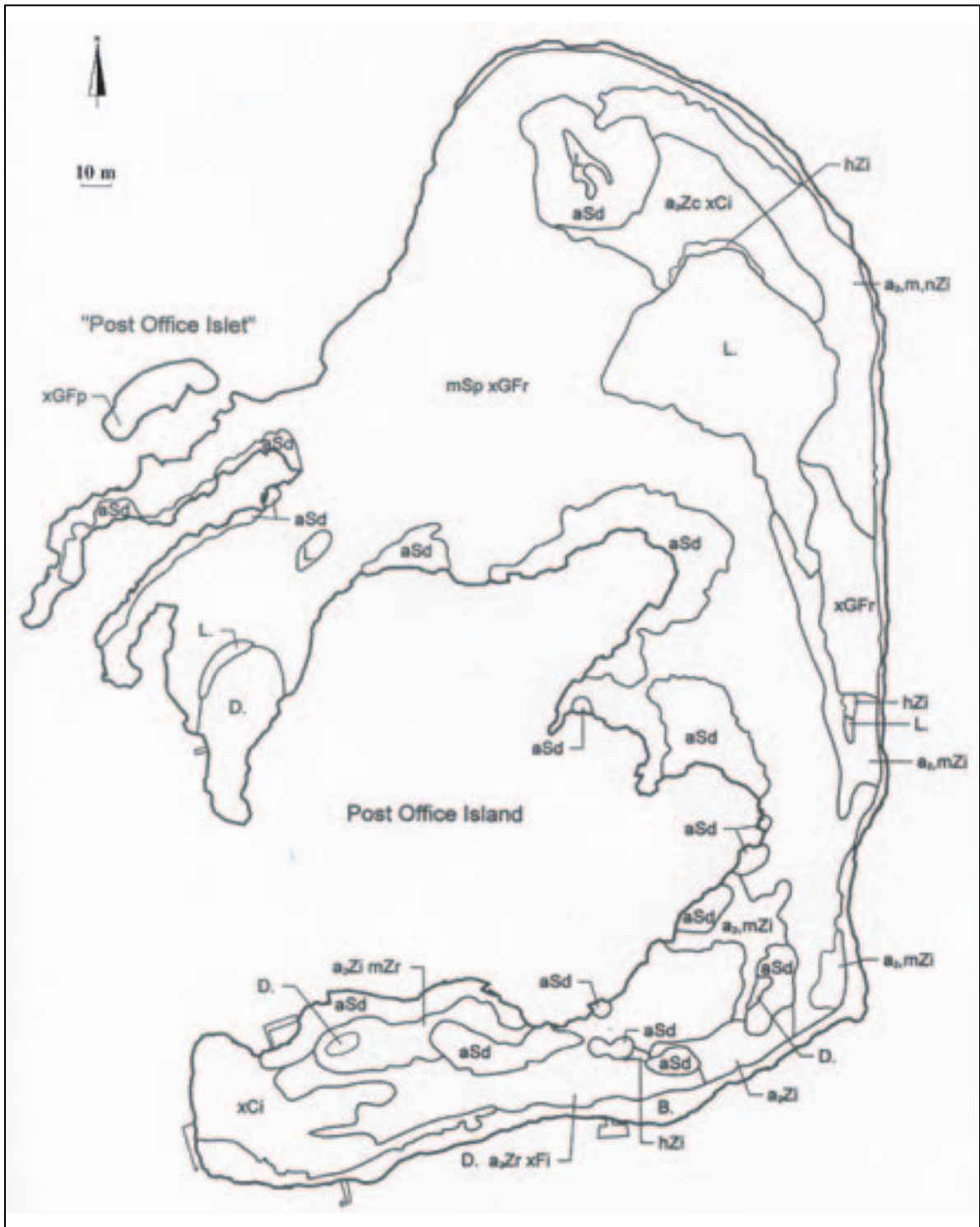
**Fig. 4.60.** Vegetation map of Nook Island – Pelsaert Group.



**Fig. 4.61a.** Vegetation map of Pelsaert Island (north) – Pelsaert Group.



Fig. 4.61b. Vegetation map of Pelsaert Island (south) – Pelsaert Group.



**Fig. 4.62.** Vegetation map of Post Office Island, “Post Office Islet” – Pelsaert Group.

For Post Office Island: x of xCi is mixed succulents (species not specified).

For Post Office Island: x of xFi and xGFr include *Bromus arenarius*, *Melilotus indicus*, *Parietaria debilis*, *Phalaris* spp., *Raphanus raphanistrum*, *Senecio lautus*, *Sonchus oleraceus*, *Urospermum picroides*.

For Post Office Island: x of xGFi includes mixed grasses and forbs (species not specified).

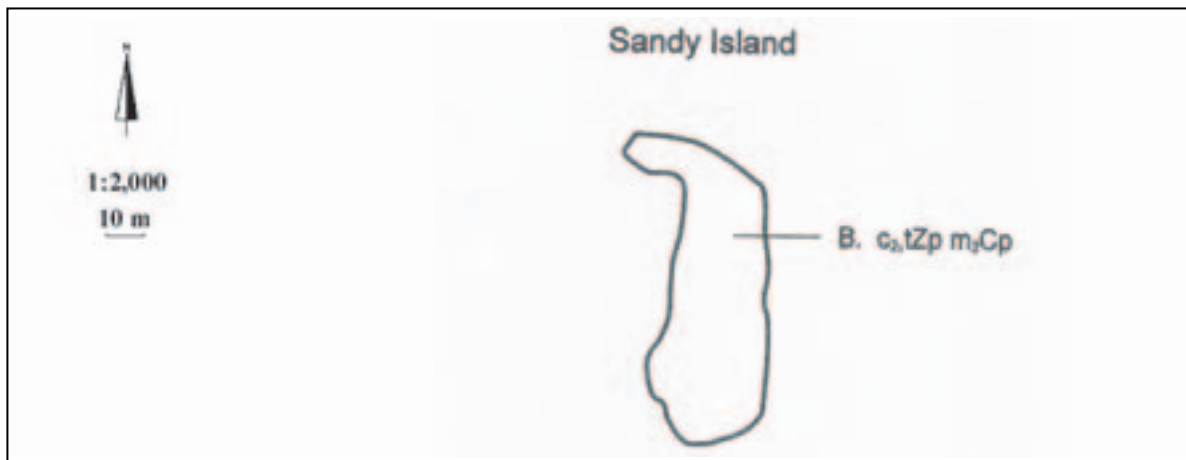


Fig. 4.63. Vegetation map of Sandy Island – Pelsaert Group.

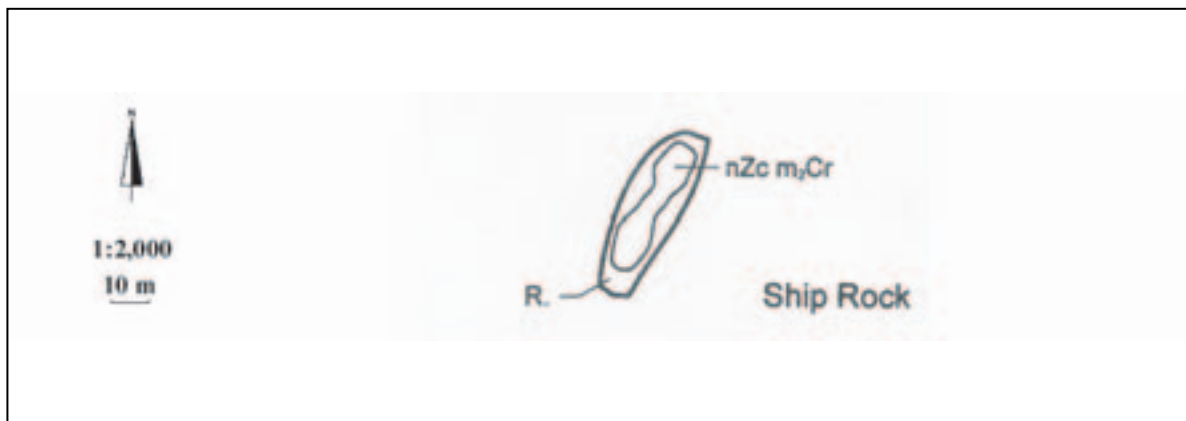


Fig. 4.64. Vegetation map of Ship Rock – Pelsaert Group.

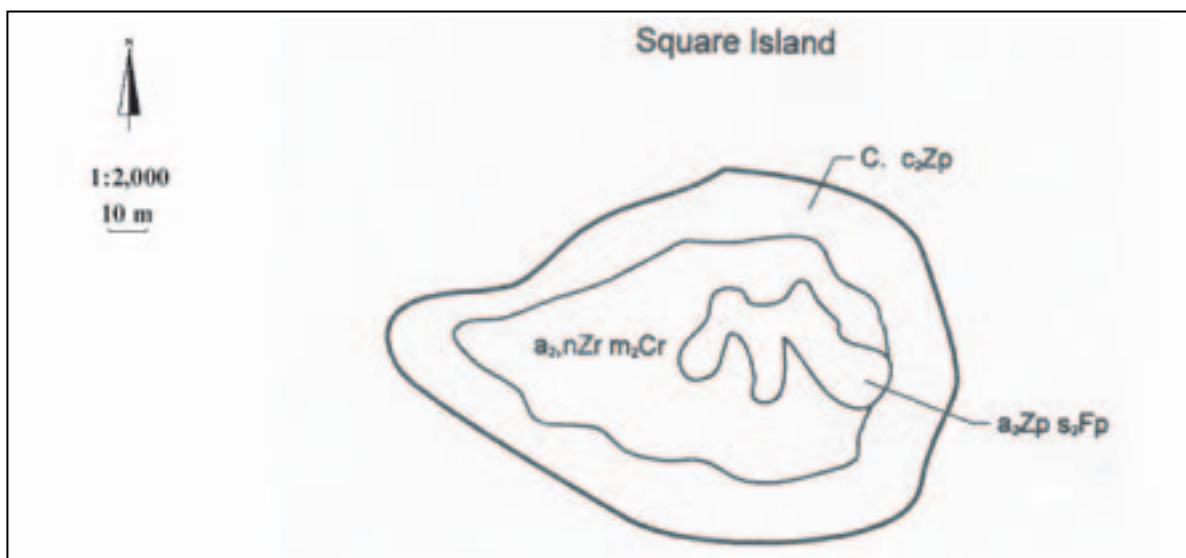


Fig. 4.65. Vegetation map of Square Island – Pelsaert Group.

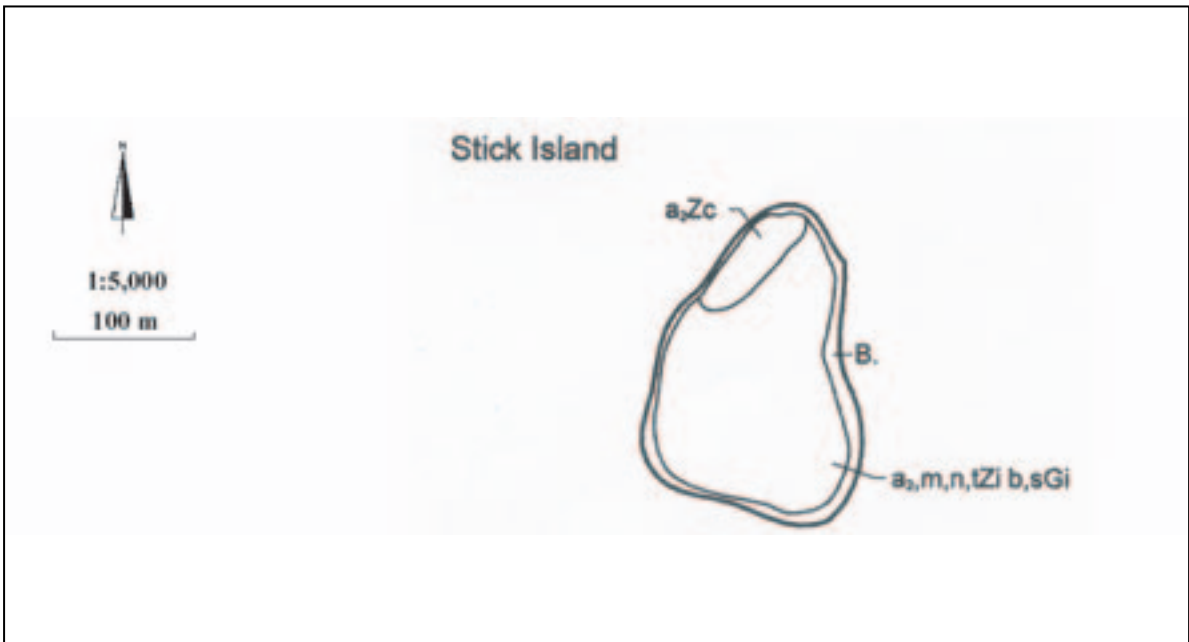


Fig. 4.66. Vegetation map of Stick Island – Pelsaert Group.

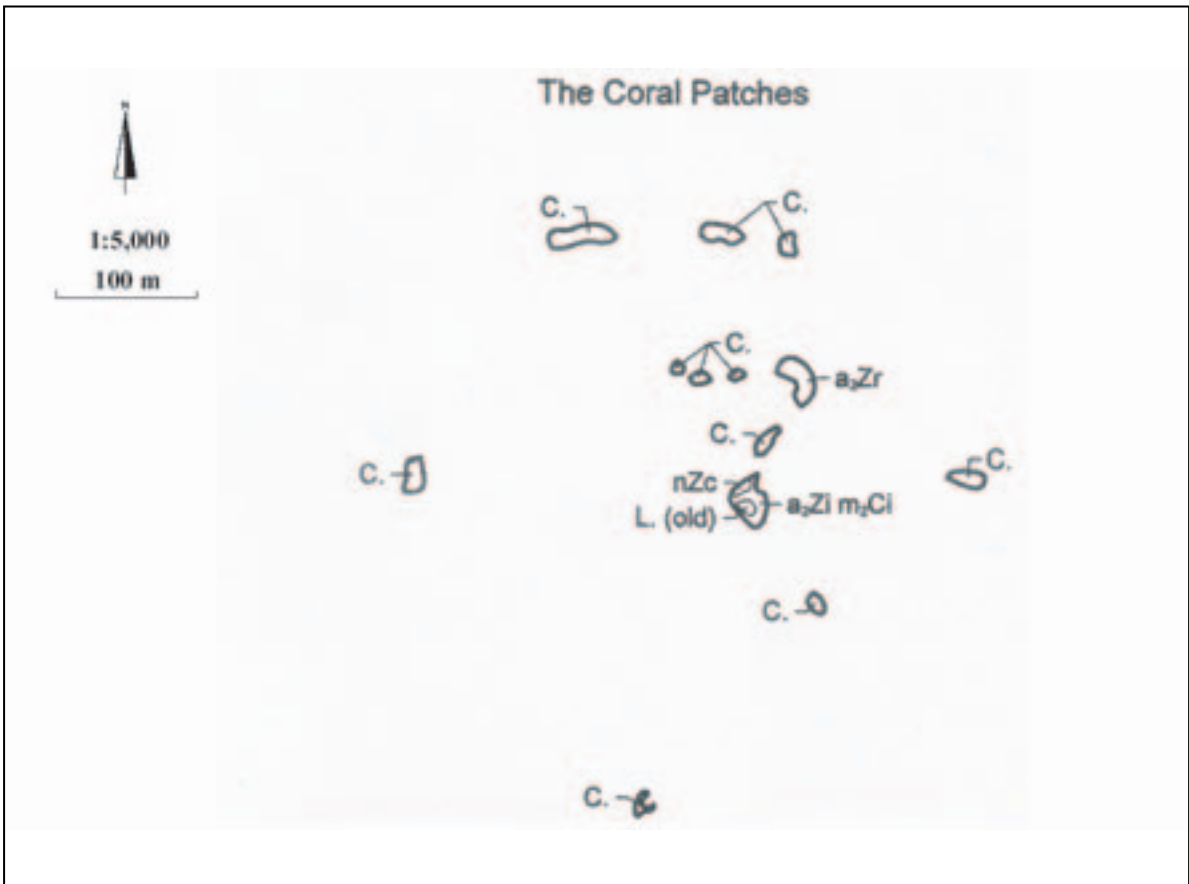
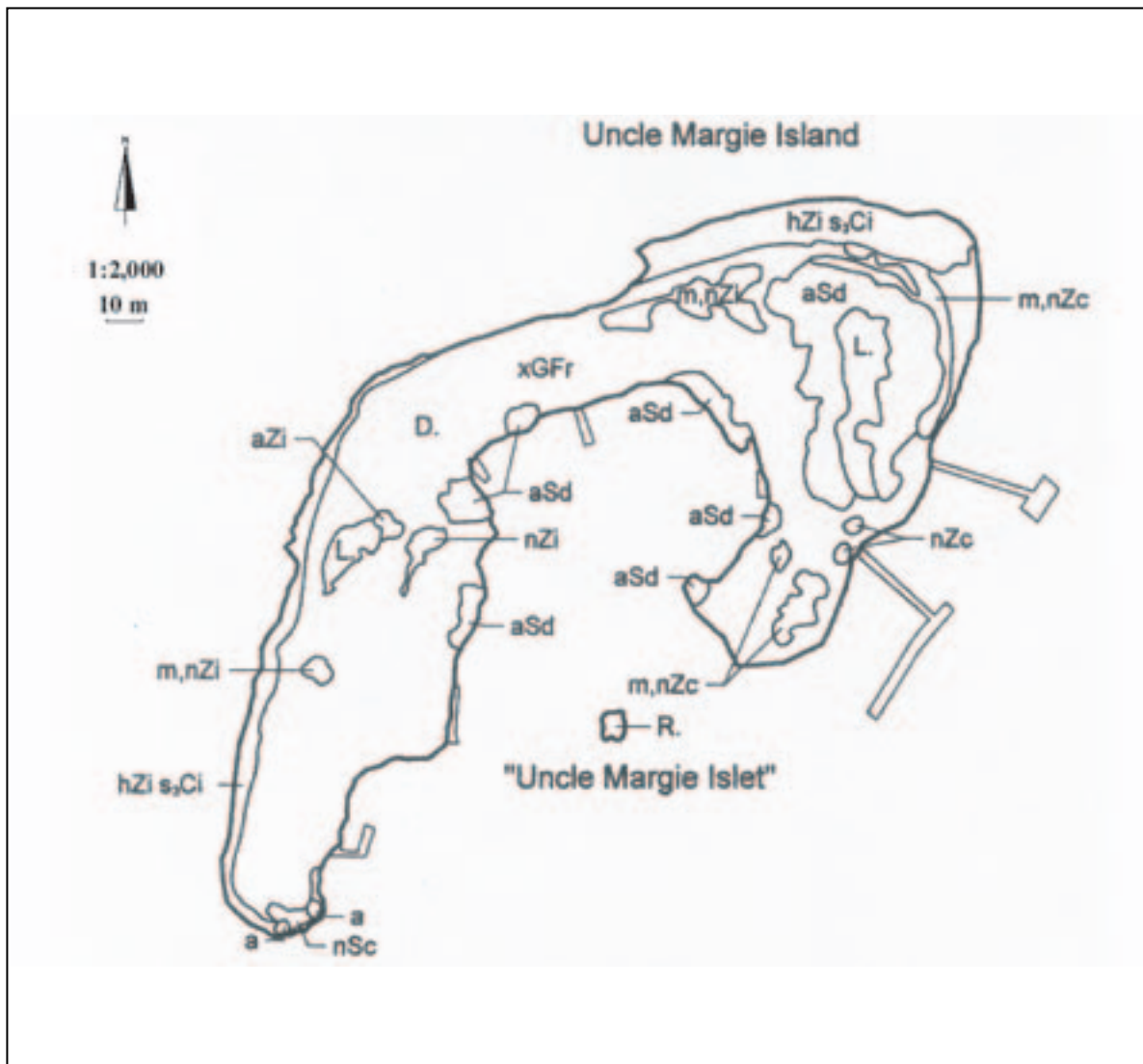
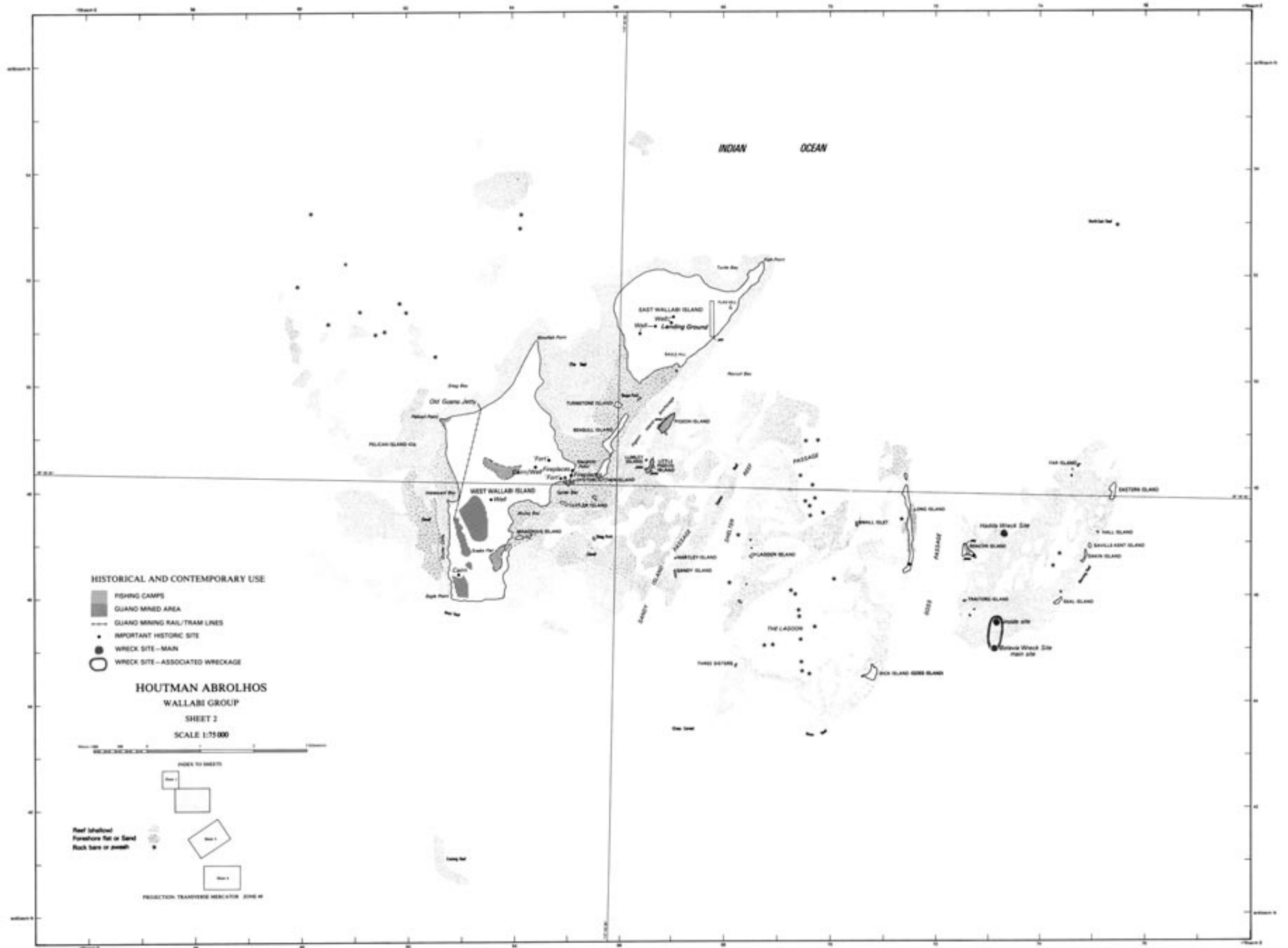


Fig. 4.67. Vegetation map of The Coral Patches – Pelsaert Group.

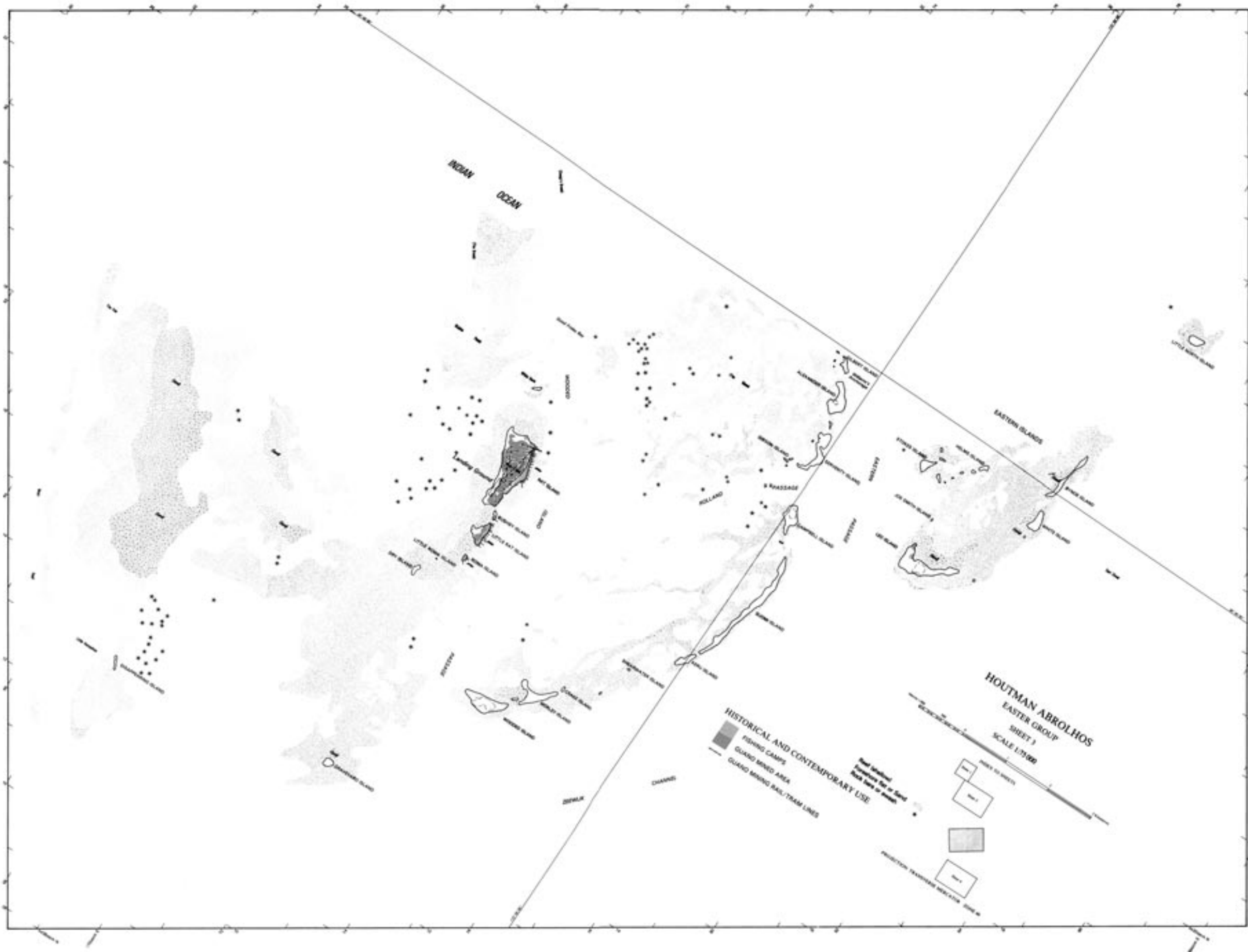


**Fig. 4.68.** Vegetation map of Uncle Margie Island, “Uncle Margie Islet” – Pelsaert Group.

For Uncle Margie Island: x of xGFr includes *\*Avena* sp., *\*Bromus* sp., *\*Ehrharta longiflora*, *\*Parapholis incurva*, *\*Phalaris minor*, *\*Sonchus oleraceus*, *\*Urospermum picroides*.



**Fig. 5a.** Location of historic sites, guano mined areas and guano mining rail/tram lines of the Wallabi Group of the Abrolhos Islands (Abrolhos Island Consultative Committee/Abrolhos Islands Task Force, 1989).



**Fig. 5b.** Location of historic sites, guano mined areas and guano mining rail/tram lines of the Easter Group of the Abrolhos Islands (Abrolhos Island Consultative Committee/Abrolhos Islands Task Force, 1989).

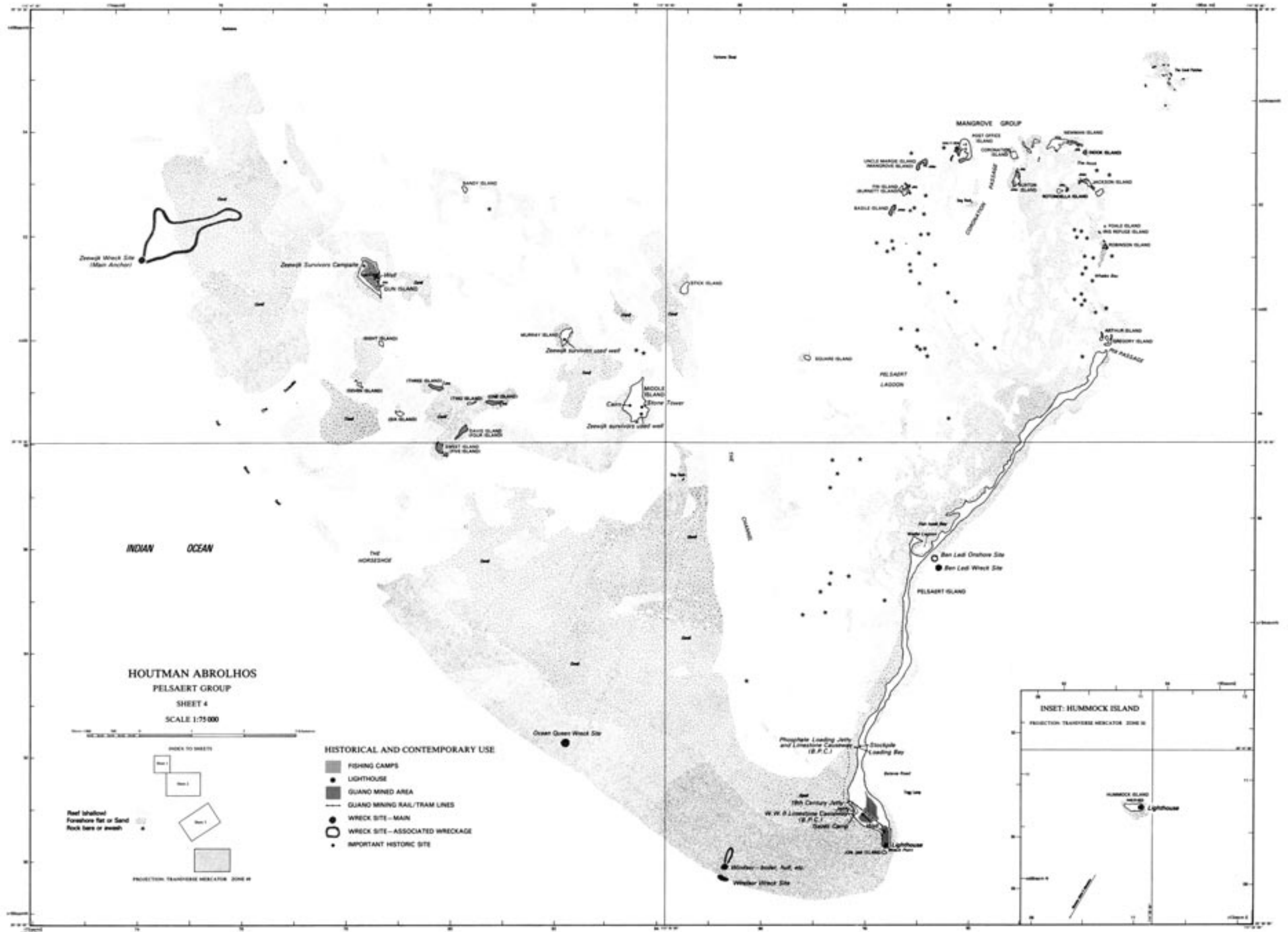


Fig. 5c. Location of historic sites, guano mined areas and guano mining rail/tram lines of the Pelsaert Group of the Abrolhos Islands (Abrolhos Island Consultative Committee/Abrolhos Islands Task Force, 1989).



## Appendix A

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### Stakeholders consulted by individual meetings were:

Department of Fisheries, Perth	Colin Chalmers, Randall Owens, Jo Bunting
Department of Fisheries, Geraldton	Kim Nardi
CALM, Geraldton	Mike Minema
Geraldton Fishermen's Co-operative	Leith Pritchard
Geraldton RFAC	Laurie Robinson, Trevor Beaver, Bob Urquhart
WA Tourism Commission, Geraldton	Lesleigh Clarke
CALM, Woodvale	Andrew Burbidge, Greg Keighery, Vanda Longman & Judith Harvey
Conservation Council of WA	Rachel Siewert
RECFISHWEST	Frank Prokop
WA Maritime Museum	Myra Stanbury
Murdoch University, Biological Sciences	Chris Surman

### Stakeholders contacted by phone interview were:

CALM, Como	Nick Gales
Friends of the Abrolhos Islands	Leonie Noble
MPRA	Barry Wilson, Chair
Department of Mineral and Petroleum Resources	Bill Carr
Murdoch Seabird Group	Nick Dunlop, Ecologist
Department of Planning and Infrastructure	Wayne Winchester
Marine and Coastal Community Network	Edwina Davies-Ward
WALIS	Katherine Tobin

## Appendix B

Table of Conservation Features of the Abrolhos Islands

EASTER ISLAND GROUP							
	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
EG	Alexander Island	Fauna	Sea lion breeding	High. In need of special protection.	High risk from disturbance	Visitors should avoid breeding sea lions.	Gales <i>et al.</i> , 1992; R.Owens pers. comm.
EG	Alexander Island	Flora	Mangrove community & Priority 4 Flora	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment. No sewage at present.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> , In prep.
EG	Campbell Island	Flora	Mangrove community & Priority 4 Flora	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> , In Prep.
EG	Dry Island	Historic	Cairn	To be assessed. Historic cairn established by surveyor A.J. Wells to survey guano deposits.	Preservation. Include in interpretive material. Follow code of conduct.	No restrictions apply.	Stanbury, 1993
EG	Dry Island	Seabirds	White-faced storm petrel	High. Northern limit of the breeding range in the Eastern Indian Ocean. Breeds October to end of February.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	See code of conduct.	Fuller <i>et al.</i> , 1994
EG	Gibson Island	Fauna	Sea lion breeding	High. In need of special protection.	High risk from disturbance. Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should avoid breeding sea lions.	N.Gales pers. comm.
EG	Gilbert Island	Fauna & Priority 4 Flora	Sea lion breeding	High. In need of special protection.	High risk from disturbance. Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should avoid breeding sea lions.	Gales <i>et al.</i> , 1992

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
EG	Keru Island	Fauna	Sea lion breeding	High. In need of special protection.	High risk from disturbance. Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should avoid breeding sea lions.	N. Gales pers. comm.
EG	Keru Island	Flora & Priority 4 Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
EG	Keru Island	Seabirds	Little shearwaters, sooty terns	High	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Centre of the island and vegetated sections should be avoided to prevent damage to seabird burrows.	Owens, 1996
EG	Leo Island	Flora & Priority 4 Flora	Mangrove community, Large patch of very old and woody <i>Halosarcia</i> shrubs	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat. <i>Halosarcia</i> shrubs unique in Abrolhos.	Threats include direct clearing, weed infestation, trampling by tourists, grazing by feral animals, fire, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment.	Visitors should not enter mangroves and <i>Halosarcia</i> shrubs as these are habitats which are highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
EG	Leo Island	Seabirds	Little shearwater, bridled tern, crested tern, sooty tern, Caspian tern	High – important for seabird conservation. Largest colony of Caspian tern known in an offshore island in Western Australia.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Visitors are requested to stick to the path or shingle ridges and avoid the sandy vegetated areas which contain seabird burrows.	Fuller <i>et al.</i> , 1994; (Owens 1996)
EG	Little North Island	Seabirds & Priority 4 Flora	Burrowing seabirds and sometimes sizeable breeding colonies of sooty terns	High	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Avoid landing because of difficult access. If onshore visitors should avoid vegetated and sandy areas.	(Owens, 1996)

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
EG	Morley Island	General	Various	High	Specific management plan for Morley Island is needed. Need to consider all conservation features, possible reserve status, information, interpretation and signage, and access.	Determine as part of Management Plan.	
EG	Little Rat Island	Historic	Timber and iron shed, stone hut (craypots, iron stove; tin hut).	Not yet established. Craypots probably evidence of early types of equipment used in the rock lobster industry.	Pending valuation. Preservation. Further documentation required. Consider whether they should be set aside for preservation and restoration, as part of an assessment of sites of the Abrolhos fishing industry with heritage value. Threats to stone hut are further deterioration. Threats to tin hut are demolition and/or development.	Public access: restricted. Community is aware of the need to preserve camps.	Stanbury, 1993, R.Owens pers. comm.
EG	Morley Island	Fauna	Sea lions	Medium – High. Important haul-out beach.	Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should not approach sea lions closely.	N.Gales pers. comm.
EG	Morley Island	Flora	Mangrove community & Priority 4 Flora	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment. Adjacent to important recreational anchorage.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times	Longman <i>et al.</i> – in prep., R.Owens pers. comm.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
EG	Morley Island	Seabirds	Lesser noddy, bridled and sooty terns, little shearwaters, white-faced storm petrels (largest colony in Abrolhos). Large colony of fairy terns was mixed with a large colony of roseate terns in 1996.	High – important for seabird conservation.	Needs a high level of protection, particularly during seabird breeding season. Adjacent to important recreational anchorage.	Visitors should remain on the perimeter of the island. Lesser noddy reside on the island at all times, but the most critical time in terms of disturbance by visitors is during the breeding season from August – March.	Surman, pers. comm.; Geraldton Mid-West Regional Development Committee, 1982; AICC, 1992; Storr <i>et al.</i> , 1986; Fuller <i>et al.</i> , 1994; Burbidge pers comm.; R.Owens pers. comm.
EG	Rat Island	Fauna	Mouse ( <i>Mus musculus</i> ); black rat ( <i>Rattus rattus</i> ); cats.	Mouse present many years before 1987, rat present 1840 & poisoned 1991. Cat introduced circa 1900.	Ensure that predators such as foxes and cats are not introduced to the Abrolhos Islands, and on-going eradication of existing feral animal species should occur.	Not restricted.	Abbott and Burbidge, 1995
EG	Rat Island	Flora	Introduced species	Prickly pear, “double gees” (Owens 1996).	On-going eradication is required.		
EG	Rat Island	Historic	Graves	Not yet established.	Further documentation required.	Threats physical disturbance. Public access: restricted.	Stanbury, 1993
EG	Rat Island	Historic	Guano mining – stone jetty, bollard	Not yet determined.	Not known.	Erosion. Public use: restricted.	Stanbury, 1993
EG	Rat Island	Historic	Guano mining – stone landing	Medium – High. Historically significant.	Register on State Heritage List. Include in interpretive material, further surveys. Preservation. Visitors should follow code of conduct for visiting historic areas (Stanbury 1991).	Threats to stone landing are erosion, further development of wharves and jetties. Public access: restricted (WAM). Difficult to restrict usage, significantly damaged by storms in recent years (R.Owens).	Stanbury, 1993; R. Owens pers. comm.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
EG	Rat Island	Historic	Guano mining – tramway embankments, tramline, bale straps	Medium – High. Historically significant, demonstrates part of the infrastructure of the guano extraction industry.	Include as part of Rat Island Historic Precinct. Include in interpretive material. Preservation.	Public access: unrestricted.	Stanbury, 1993
EG	Rat Island	Historic	Historic settlement Area (northeast)	Medium. Occupied more or less continuously 1883 to 1904.	Include as part of Rat Island Historic Precinct. Include in interpretive material. Further surveys. Preservation.	Threats digging and/or development. Public access: restricted.	Stanbury, 1993
EG	Rat Island	Historic	Stone foundations, stone walls	Medium – High. Historically significant.	Register stone foundations on State Heritage List and/or include as part of Rat Island Historic Precinct. Stone walls and stone hut pending significance evaluation. Include in interpretive material, further surveys. Preservation.	Threats are digging or other physical interference. Public access: restricted.	Stanbury, 1993
EG	Rat Island	Historic	Well (northeast point), deep rock hole, Wells' cairn (a 19th Century surveyor)	Medium – High. Well historically significant – demonstrates constraints imposed on communities.	Include well as part of Rat Island Historic Precinct. Register cairn on State Heritage List. Include in interpretive material. Preservation.	Public access: restricted. Threats to cairn are physical disturbance	Stanbury, 1993
EG	Rat Island	Historic	Wreck (north beach)	Medium	Referred to WAM Maritime Archaeology Department for assessment.	Threats corrosion and deterioration. Public access: restricted.	Stanbury, 1993
EG	Roma (Travia) Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times	Longman <i>et al.</i> – in prep.
EG	Serventy Island	Fauna	Sea lion breeding	High. In need of special protection. Whelping sea lions may be encountered in mangroves.	Visitors should not closely approach sea lions. Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should avoid breeding sea lions	Gales <i>et al.</i> , 1992

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
EG	Serventy Island	Flora & Priority 4 Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
EG	Stokes Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times	Longman <i>et al.</i> – in prep.
EG	Stokes Island	Seabirds	Sooty tern, Bridled tern	Medium	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Visitors should avoid landing on this due to difficulties in access and seabird burrows.	Owens, 1996
EG	Suomi Island	Fauna	Sea lion breeding	High. In need of special protection.	High risk from disturbance. Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should avoid breeding sea lions.	Gales <i>et al.</i> , 1992
EG	Suomi Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
EG	Suomi Island	Seabirds	Bridled tern, sooty tern	High	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Visitors should avoid vegetated and sandy areas.	Fuller <i>et al.</i> , 1994; Owens, 1996
EG	White Island	Seabirds & Priority 4 Flora	Sooty tern and burrowing seabirds.	High	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Visitors should avoid vegetated and sandy areas.	Owens, 1996
EG	Wooded Island	General	Various	High	Specific Management Plan for Wooded Island is needed. Needs to consider all conservation features, possible reserve status, information, interpretation and signage, and access.	Visitors should avoid vegetated and sandy areas. Determine as part of Management Plan.	Owens, 1996

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
EG	Wooded Island	Fauna	Sea lions	Medium – High. Important haul-out beach.	Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should not closely approach sea lions.	N.Gales pers. comm.
EG	Wooded Island	Flora	Mangrove community.	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat. Grow along a large lagoon. Mangroves also provide habitat for the pied cormorant.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment. Adjacent to important recreational anchorage.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep., R.Owens pers. comm.
EG	Wooded Island	Seabirds	Lesser noddy, bridled and sooty terns, little shearwaters, little pied cormorant (mangroves in lagoon only breeding site in Abrolhos); pied cormorant (largest colony in Abrolhos)	High – important for seabird conservation.	Needs a high level of protection, particularly during the breeding season. Pied Cormorant very sensitive to disturbance. Adjacent to important recreational anchorage.	Generally recommended that visitors only walk around perimeter. Lesser noddy reside on the island at all times but the most critical time in terms of disturbance by visitors is during the breeding season from August – November. Pied cormorant colony located near the lagoon should not be approached within 200 metres.	Surman, pers. comm.; Geraldton Mid-West Regional Development Committee, 1982; AICC, 1992; Storr <i>et al.</i> , 1986; Fuller <i>et al.</i> , 1994; AICC, 1995; R.Owens pers. comm.

PELSAERT GROUP							
	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Basile Island	Flora	Mangrove community	Low. Only minimal mangroves.	General threats to mangrove communities.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Harvey <i>et al.</i> – in prep., Chris Surman, Randall Owens pers. comm.
PG	Basile Island	Historic	Fishing camps, church	To be assessed. Whole island has fishing heritage value as it is representative of decades of migrant fishing traditions.	Consider whether camps and church should be set aside for preservation and restoration, as part of an assessment of sites of the Abrolhos fishing industry with heritage value.	Currently accessed by fishing industry.	Owens, 1996
PG	Basile Island	Seabirds	Pacific gulls	High. Nest on ground, substantial constructions made from seaweed and grasses. Chicks threatened by trampling during October.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Visitors should avoid areas with nests.	Chris Surman pers. comm.
PG	Burton Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal (causing nutrient enrichment).	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
PG	Coral Patches	Fauna	Sea-lions	Medium. Haul-out area.	Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should not closely approach sea lions.	Chris Surman pers. comm.
PG	Coral Patches	Seabirds	Roseate terns, Pacific gulls, Osprey	High. Roseate terns regularly use one of the islets as a nesting site.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	See code of conduct.	Surman, 1998
PG	Coronation Island	Flora	Mangrove community	Low. Minimal mangrove community.	General threats to mangrove communities apply.	Not usually visited.	Longman <i>et al.</i> , in prep.; R.Owens pers. comm.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Burnette Island (Fin)	Flora	Mangrove community	High. Important potential breeding sites for the Lesser noddy if mangroves on Pelsaert Group. Wooded Islands were lost.	Removal of rubbish is required. Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Chris Surman pers. comm., Longman <i>et al.</i> – in prep.
PG	Burnette Island (Fin)	Seabirds	Occasionally small colonies of fairy terns, bridled tern, Pacific gull. roseate terns nest from November to January	High. Pacific gulls at the Abrolhos are the largest successful breeding colony in WA. Only one or two chicks on each island, threatened by trampling during October.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller). Nest on ground, substantial constructions made from seaweed and grasses.	Visitors should avoid areas with nests.	Storr <i>et al.</i> , 1986; Surman 1998
PG	Gaze Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
PG	Gun Island	Historic	Guano mining – occupation site, quarry, causeway and jetty, tramline foundations, rock piles	Medium – High. Major guano settlement in late 1800s. The site is significant in terms of the historical pattern of landuse and economic development in the Houtman Abrolhos.	The guano mining areas should be included in the overall protection of the island (see recommendations for sites associated with <i>Zeewijk</i> on this island). Visitors should follow code of conduct for visiting historic areas (Stanbury 1991).	Permit access, include information with notices relating to historic sites associated with the shipwreck.	Green and Stanbury, 1988
PG	Gun Island	Historic	<i>Zeewijk</i> (1727) survivors' camps (artefacts, camp sites, burial site or graveyard, rock-holes or 'wells')	High. Historically significant at a national and international level. It is the site where the first ocean-going vessel in Australia was built.	The island should be declared a protected zone under section 9. (1) of the (State) <i>Maritime Archaeology Act 1973</i> . The whole of the island should be protected as maritime archaeological sites under section 4. (1) (b) and 4. (1) of the (State) <i>Maritime Archaeology Act 1973</i> .	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991; Green and Stanbury, 1988

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Gun Island	Seabirds	Large colony of bridled terns and wedge-tailed shearwaters.	High – important for seabird conservation. Nest October – March.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Visitors should keep to the perimeter, avoid sandy areas and back off if terns are flushed from their nests.	Storr <i>et al.</i> , 1986; Surmank, 1998, Fuller <i>et al.</i> , 1994
PG	Hummock Island	Historic	Possible association with wreck of the <i>Zeewijk</i> (1727).	To be assessed. Possibly where two survivors were put ashore as punishment (possibly happened at Mangrove Island).	Visitors should follow code of conduct for visiting historic areas (Stanbury 1991). Include in any interpretive material.	No restrictions.	M.Stanbury pers. comm.
PG	Hummock Island	Seabirds	Shearwaters	Medium. Burrows in sandy areas.	Avoid walking on sand and sandier vegetated areas.	Landing on the island is dangerous and should not be attempted.	Owens, 1996
PG	Islet west of Rotendella Island	Seabirds	Roseate terns, crested terns	High – important for seabird conservation.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	See code of conduct.	Storr <i>et al.</i> , 1986; Surman pers. comm.
PG	Jackson (islet adjacent)	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal (causing nutrient enrichment).	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
PG	Jackson Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal (causing nutrient enrichment).	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
PG	Jon-Jim Island	Seabirds	Large numbers of roseate terns irregularly nest.	High – important for seabird conservation. threatened species.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	See code of conduct.	Fuller <i>et al.</i> , 1994; Surman, 1998
PG	Mangrove (Uncle Margie) Island	Cultural Heritage	Coral shingle hut	To be assessed. Unknown origin, at least there since 1930s and probably much longer.	Warrants assessment and appropriate conservation and management. Visitors should follow code of conduct for visiting historic areas (Stanbury, 1991).		Gray, 1993

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Mangrove Is (Uncle Margie)	Flora	Mangrove community	Medium – High. Important potential breeding sites for the lesser noddy if mangroves on Pelsaert, Wooded Islands were lost. Island has a land-locked lagoon with mangroves, would become an important refuge in the event of an oil spill.	Removal of rubbish is required. Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Chris Surman pers. comm.; Longman <i>et al.</i> – in prep.
PG	Mangrove Island (Uncle Margie)	Seabirds	Pacific gulls	High.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller). Substantial constructions made from seaweed and grasses. Chicks threatened by trampling during October.	Visitors should avoid areas with nests.	Chris Surman pers. comm.
PG	Middle Island	Flora	Pavement limestone community (largest in Pelsaert Group. 29 native species)	High. Highly sensitive to disturbance, slow rates of regeneration.	Threats include weed infestation, clearing, landfill, fire, trampling by tourists, grazing by feral animals, dumping of rubbish.	Access to pavement limestone communities should be restricted. Consider use of designated tracks (day use only) where appropriate, and provide information/interpretation. Tourism is not appropriate as the island is undisturbed (C.Surman).	Longman <i>et al.</i> – in prep., Surman, pers. comm.

PG	Middle Island	Historic	Feature	Conservation Significance	Management Implications	Land Access	Source
			<p>Stone structures, non-European burial, Shipwreck survivors refuge and burial site – <i>Venus</i> (1851). Exact origin of the remains of a limestone structure and a stone “tower” is uncertain.</p>	<p>Medium – High. Historically and culturally significant in terms of its use as a refuge and burial place by shipwrecked mariners of the <i>Venus</i>. Significant in terms of maritime history of Abrolhos, and to the broader colonial history of WA.</p>	<p>The whole of the island should be protected as a maritime archaeological site under section 4. (1) (b) and 4. (1) of the (State) <i>Maritime Archaeology Act</i> 1973 and the two stone structures be specifically protected within a protected zone of 100 metres radius under section 9.(1) of the (State) <i>Maritime Archaeology Act</i> 1973, with particular reference to the restriction of digging and/or any major earthworks without Museum approval. The island should be declared a protected zone under section 9. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. No digging and/or major earthworks be undertaken on the island without approval from the Executive Director, (WA Museum). No metal detecting devices be used for the purpose of locating archaeological material with approval from the Executive Director (WAM). Visitors should follow code of conduct for visiting historic areas (Stanbury, 1991).</p>	<p>Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.</p>	<p>Stanbury, 1991, Green and Stanbury, 1988.</p>

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Middle Island	Historic	Well (south eastern end of island) used by <i>Zeewijk</i> (1727) survivors, sailmaker's scissiors reported to be found by <i>Zeewijk</i> survivors.	High. Historically significant at a national and international level.	The well be specifically protected within a protected zone of 100 metres radius under section 9. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. The whole of the island should be protected as a maritime archaeological site under section 4. (1) (b) and 4. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. No digging and/or major earthworks be undertaken on the island without approval from the Executive Director, (WAM). No metal detecting devices be used for the purpose of locating archaeological material without approval from the Executive Director (WAM). It is one of the few islands of the Pelsaert Group that doesn't appear to have been mined for guano.	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991, Green and Stanbury, 1988
PG	Middle Island	Seabirds	Wedge-tailed Shearwaters	High – important for seabird conservation.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Visitors should avoid sandy areas.	Storr <i>et al.</i> , 1986; Surman, pers. comm.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Murray Island	Historic	Well used by <i>Zeewijk</i> (1727) survivors	High. Historically significant at a national and international level.	The well be recognised as an area of historic interest. No digging and/or major earthworks be undertaken on the island without approval from the Executive Director, (WAM). No metal detecting devices be used for the purpose of locating archaeological material with approval from the Executive Director, (WAM). Visitors should follow code of conduct for visiting historic areas (Stanbury 1991).	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991, Green and Stanbury, 1988
PG	Murray Island	Seabirds	Wedge-tailed shearwaters	High – important for seabird conservation.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Tourism is not appropriate as the island is undisturbed (Surman pers. comm.).	Fuller <i>et al.</i> , 1994. Surman, pers. comm.
PG	Newbold Island	Seabirds	Roseate terns	High – important for seabird conservation.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	See code of conduct.	Surman, 1998
PG	Newman Island	Flora	Mangrove community	Medium. Important potential breeding sites for the lesser noddy.	Removal of rubbish is required. Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep., Chris Surman pers. comm.
PG	Newman Island	Seabirds	Autumn breeding colonies of roseate terns, mid April to end of June. Also autumn nesting bridled terns.	High – important for seabird conservation. Only known autumn/winter breeding of bridled terns.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	See code of conduct.	Surman, 1998

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Number One, Number Three, Number Eight, Sweet and Davis Island	Historic	Guano Mining – artefacts, railway lines	The islands are historically and culturally significant in as much as they demonstrate the historical pattern of land use and economic development in the Houtman Abrolhos.	The small islands in the Pelsaert Group lagoon should be recognised as places of historic interest and considered for protection under <i>Heritage Act</i> if appropriate.	The numbered islands are difficult and dangerous to approach and support no landing.	Green and Stanbury, 1988, R. Owens pers. comm.
PG	Pelsaert Island	General	Various	Very High.	Specific management plan for Pelsaert Island is needed to consider all conservation features, possible reserve status, information, interpretation and signage, and access. Pelsaert Island is an important anchorage so will always attract visitors for this reason, together with its natural and historic features. Need to provide a mooring stake or system for the north end lagoon to avoid anchors being walked up on beach causing nesting disturbance.	Determine as part of Management Plan.	R.Owens pers. comm.
PG	Pelsaert Island	Flora	Mangrove community, <i>Atriplex cinerea</i> dwarf shrubland	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat. <i>A.cinerea</i> provides breeding habitat for burrowing seabirds.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal (causing nutrient enrichment), weed infestation, fire, trampling by tourists. Pelsaert Island is an important anchorage so people will visit.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times. Visitors should not enter <i>Atriplex Cinerea</i> communities due to the unstable nature of the soil and the possible damage to seabird burrows.	Longman <i>et al.</i> – in prep.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Pelsaert Island	Historic	Settlement site, guano fields, guano loading bay and chute, phosphate loading wharf, jetties, limestone causeway, quarry, wooden punt.	Medium. Guano mining – occupation site. Pattern of land use and economic development in 19th and 20th Century (WWII).	The area of Pelsaert island including and southward of the 20th century phosphate loading jetty be considered for protection under the <i>Heritage Act 1991</i> . Interpretation required. Needs sign stating rubbish disposal, lighting of fires and camping is not permitted. Island is an important anchorage so people will visit.	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991, Green and Stanbury, 1988, Surman, pers. comm.
PG	Pelsaert Island	Historic	Shipwreck survivors encampment: <i>Marten</i> (1878) and <i>Ben Ledi</i> (1879).	Historically significant in terms of maritime history of Abrolhos, and to the broader colonial history of WA.	Northern end of Pelsaert Island. The <i>Ben Ledi</i> survivors encampment be protected as a maritime archaeological site under section 4. (1) (b) of the (State) <i>Maritime Archaeology Act 1973</i> within a protected zone of 100 metres radius under section 9.(1) of the Act with the restriction that no digging be undertaken without Museum approval.	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991, Green and Stanbury, 1988
PG	Pelsaert Island	Historic	Temporary encampment site of shipwreck survivors from the <i>Ocean Queen</i> (1842).	Medium. Significant in terms of maritime history of Abrolhos, and to the broader colonial history of WA.	The southern end of Pelsaert Island be recognised as an area of historic interest.	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991, Green and Stanbury, 1988

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Pelsaert Island	Historic	Used by survivors of <i>Zeewijk</i> (1727). Sawn-off mangrove tree stumps, artefact deposit, wreckage deposit.	High. Historically significant at a national and international level.	The southern end of Pelsaert Island, the mangrove area on the west side of Pelsaert Island and an area of shoreline on the west side of the island, 10 metres wide and extending 100 metres to the north of the HMAS <i>Moresby</i> bench mark be protected as a maritime archaeological site under section 4. (1) (b) of the (State) <i>Maritime Archaeology Act</i> 1973 The island should be declared a protected zone under section 9. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. No digging and/or major earthworks be undertaken on the island without approval from the Executive Director, (WAM). No metal detecting devices be used for the purpose of locating archaeological material without approval from the Executive Director (WAM). Visitors should follow code of conduct for visiting historic areas – (Stanbury, 1991).	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991, Green and Stanbury, 1988
PG	Pelsaert Island	Seabirds	Thirteen species of seabird breed regularly on Pelsaert Group Island.	Very High – important for seabird conservation. Supports the most diverse number of breeding seabirds in the Abrolhos.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	See code of conduct.	Surman, 1998

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Pelsaert Island (south of lesser noddy lakes)	Seabirds	Always used for seabird breeding. Largest colony of Lesser noddy, Sooty terns and Brown noddies at the Abrolhos. Second largest colony of Wedge-tailed shearwaters in the Abrolhos. Colony of Caspian terns nest at Big Lagoon.	Very High. Australasian subspecies of the lesser noddy ( <i>Anous tenuirostris melanops</i> ) breeds only at the Abrolhos.	Suggested as a conservation reserve.	Visitors should be prohibited from mid-August to late January, when the majority of seabirds are with eggs and nest-bound young. Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times. Visitors should avoid vegetated and sandy areas. No-fly zone between the middle of August and the end of April. Most of the problems are with fixed wing aircraft. When disturbed by a plane, all of the birds (including nesting birds) fly off and leave the nests, leaving the eggs and chicks vulnerable. Also birds regurgitate their food when scared. Areas that are off limits to aircraft are enforced by the Civil Aviation Authority or could be enforced by the Department of Fisheries. Float plane landing at Pelsaert Island should land further out from the island and motor in slowly (float plane currently lands directly in their flight path).	Surman, 1998; Storr <i>et al.</i> , 1986; Burbidge & Fuller, 1996; Surman pers. comm; Fuller <i>et al.</i> , 1994
PG	Pelsaert Island, Gaze's Camp	Seabirds	Brown noddies and sooty terns	High – important for seabird conservation.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Approach to beaches needs to be made slowly and quietly by power boats to avoid disturbance.	Surman, pers. comm.
PG	Pelsaert Island, small rocky beach,	Seabirds	Osprey nest	Medium.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Restrict access when ospreys are breeding, incubating and raising young (late July to mid October).	Surman, pers. comm.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Pelsaert Island, southern end	Seabirds	Red-tailed tropic-bird. Breeding was regular during 1940s and 1950s but irregular since then. The last recorded attempts were in 1988 and 1996. Roseate tern (a globally threatened species) breeds around the perimeter.	High. Largest colony of roseate terns nests regularly at Wreck Point in the southern end of the island, other colonies in different locations each year, any part of the island is suitable for breeding.	The most important areas of the island for seabird breeding are the mangroves and the sandy southern four kilometres or so. No area of the island could be said to be not used for seabirds for breeding because many species do not have fixed breeding sites and may move their breeding place each year.		Fuller <i>et al.</i> , 1994; Fuller and Burbidge, 1981; Surman, 1998
PG	Post Office Island	Flora	Mangrove community	High. Important potential breeding sites for the lesser noddy.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal causing nutrient enrichment.	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Surman pers. comm.
PG	Post Office Island	Historic	Fishing camps	To be assessed. Parts of camps 1 and 2 are very old, material came from guano industry and tourist camps on Pelsaert Group Island. Fishing camp on west side and jetty on SW islet – possible fishing heritage value.	Consider whether camps and church should be set aside for preservation and restoration, as part of an assessment of sites of the Abrolhos fishing industry with heritage value.	Currently accessed by fishing industry.	Owens, 1996
PG	Post Office Island	Seabirds	Autumn breeding colonies of roseate terns recorded nesting from 1995 – 1999, mid April to end of June, Pacific gull.	High – important for seabird conservation.	Chicks threatened by trampling during October.	See code of conduct.	Storr <i>et al.</i> , 1986; Surman, 1998

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Rotendella Island	Seabirds	Roseate terns (not every year)	High – important for seabird conservation.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).		Surman, 1998
PG	Square Island	Fauna	Sea lion breeding (observed by C. Surman since 1993).	High. In need of special protection.	Visitors should not closely approach sea lions. Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should avoid breeding sea lions.	C. Surman, pers. comm.
PG	Square Island	Seabirds	Nesting roseate terns (recorded since 1993; pair of Osprey, shearwaters and some Bridled terns.	High – important for seabird conservation.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Main activity early November to end of January. Visitors should avoid sandy areas and avoid interior of the island. Restrict access in breeding season as point of entry to Island may be highly disruptive to roseate tern colony.	Fuller <i>et al.</i> , 1994; Surman, 1998; R. Owens pers. comm.
PG	Stick (Jubilee) Island	Fauna	Sea lion breeding	High. In need of special protection.	High risk from disturbance. Develop a code of conduct for visitors to follow to ensure sea-lions are not disturbed.	Visitors should avoid breeding sea lions	(Abbott and Burbidge, 1995)
PG	Stick (Jubilee) Island	Reptiles	Spiny-tailed skink	High. Spiny-tailed skink gazetted “rare or otherwise in need of special protection”. Pair observed by Chris Surman in 1997.	Ensure the habitat of the reptiles is protected from threats, such as fire and clearing. Ensure that predators, such as foxes and cats, are not introduced to the Abrolhos Islands, and ongoing eradication of existing feral animal species should occur.	Human visitation needs to be managed, through the development of guidelines included in interpretive material.	C. Surman, pers. comm.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
PG	Stick (Jubilee) Island	Seabirds	Crested tern, white-faced storm petrel, osprey, little shearwaters	High. Autumn nesting crested terns occasionally breed on this island. Significant colony of white faced storm petrels.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Avoid sandy areas, keep to the perimeter of the island.	Surman, 1998; C. Surman, pers. comm.
PG	Sweet Island	Historic	Guano mining – encampment site, transportation facilities, causeway and jetty, manmade rock walls	Medium. Particularly good example of the alteration of landscape features resulting from historic patterns of landuse and economic development.	Island should be recognised as a place of historic interest and considered for protection under <i>Heritage Act</i> if appropriate. Visitors should follow code of conduct for visiting historic areas (Stanbury, 1991).	See code of conduct.	Green and Stanbury, 1988)

WALLABI – NORTH ISLAND GROUP							
	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	Akerstrom Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal (unlikely causing nutrient enrichment).	Not normally visited	Longman <i>et al.</i> , In prep.); R.Owens pers. comm.
WG	Beacon Island	General	Various	High	Specific management plan for Beacon Island is needed. Needs to consider all conservation features, possible reserve status, information, interpretation and signage, and access.		Determine as part of management plan.
WG	Beacon Island	Historic	<i>Battavia</i> (1629) shipwreck survivors' encampments, burial or 'graveyard' site, cannon, artefacts. Also <i>Hadda</i> (1877) survivors.	Very High. Historically significant at a national and international level in terms of the <i>Battavia</i> incident. Also the <i>Hadda</i> shipwreck.	The island should be declared a protected zone under section 9. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. The whole of the island should be protected as maritime archaeological site under section 4. (1) (b) and 4. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. No digging and/or major earthworks be undertaken on the island without approval from the Executive Director (WA Museum). No metal detecting devices be used for the purpose of locating archaeological material with approval from the Executive Director (WAM). Visitors should follow code of conduct for visiting historic areas (Stanbury, 1991).	No further occupation or dwellings should be permitted on the island. In the longer term (10-20 years), the existing camps should be removed. Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations. Camp alterations which require excavation need approval from WA Museum.	Green and Stanbury, 1988; Stanbury, 1991

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	Beacon Island	Historic	Southeast promontory. <i>Battavia</i> (1629) Cornelisz' prison – coral/limestone structure	High. Historically significant at a national and international level.	Visitors should follow code of conduct for visiting historic areas (Stanbury 1991). Has been subject to interference since 1963.	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Green and Stanbury, 1988
WG	East Wallabi Island	General	Various	High	Specific Management Plan for East Wallabi Island is needed. Needs to consider all conservation features, possible reserve status, information, interpretation and signage, and access.		Determine as part of Management Plan.
WG	East Wallabi Island	Fauna	Tammar wallaby, bush rat, spiny-tailed skink, carpet python, bearded dragon	High. Tammar wallaby, carpet python and spiny-tailed skink gazetted "rare or otherwise in need of special protection". The subspecies of spiny-tailed skink and bearded dragon are endemic to the Abrothos Islands. Wildlife density is low by comparison with West Wallabi.	Ensure the habitat of the mammals and reptiles is protected from threats such as fire and clearing. Ensure that predators such as foxes and cats are not introduced to the Abrothos Islands, and on-going eradication of existing feral animal species should occur. Monitor population status of the tammar wallaby and the southern bush rat.	Human visitation needs to be managed, though the development of guidelines included in interpretive material.	Storr, 1965; FWA, 1998; R.Owens pers. comm.
WG	East Wallabi Island	Flora & Priority 3 Flora	<i>Eucalyptus oraria</i> , pavement limestone community, dunes and consolidated dunes	High. No eucalypts occur on other offshore islands between Barrow Island and Albany. Pavement community highly sensitive to disturbance, slow rates of regeneration.	Threats include weed infestation, clearing, landfill, fire, trampling by tourists, grazing by feral animals, dumping of rubbish.	Access to pavement limestone communities and dunes and consolidated dunes should be restricted. Consider use of designated tracks (day use only) where appropriate, and provide information/interpretation.	Longman <i>et al.</i> , in prep.; AICC 1992

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	East Wallabi Island	Geology	Turtle Bay. A small but conspicuous headland of coralline limestone is a fossil site of international significance	High	Need further research to identify appropriate management recommendations. Need to contact WA Museum.	Need to determine appropriate land uses and whether access should be restricted.	Fisheries WA, 1998
WG	East Wallabi Island	Historic	<i>Batavia</i> (1629) wells, slaughter site	High. Historically significant at a national and international level.	The wells should be protected as maritime archaeology sites under section 4 (1) of the (State) <i>Maritime Archaeology Act</i> 1973 within a protected zone of 100m radius of each well. The island should be declared a protected zone under section 9. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. Visitors should follow code of conduct for visiting historic areas – (Stanbury, 1991).	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations. Walkways from the landings could be considered.	Green and Stanbury, 1988; Stanbury, 1991; Green and Stanbury, 1988
WG	East Wallabi Island	Land-birds	Abrolhos painted button-quail, brush bronzewing	High. Painted button-quail sub-species is endemic to the Abrolhos Islands, mainland populations of brush bronzewing are decreasing.	Consider in management plan. Ensure habitat is protected, and feral animals are not introduced.	Visitors should avoid walking in vegetated areas.	Storr, 1960; Storr <i>et al.</i> , 1986.
WG	Long Island	Geology and Geomorphology	Tidal ponds	Not yet assessed.	Undertake further research on tidal ponds: determine their location, assess their conservation significance and develop appropriate protection strategies.	Determine after further research.	Black and Johnson, 1997

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	Long Island	Historic	<i>Battavia</i> (1629) survivors' occupation and slaughter site, gallows site of mutineers, mutineers' prison.	High. Historically significant at a national and international level.	The whole of the island should be protected as maritime archaeological sites under section. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. The island should be declared a protected zone under section 9. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. Any digging be restricted to bona fide archaeological researchers with the permission of the Executive Director, WA Museum (WAM). No digging and/or major earthworks be undertaken on the island without approval from the Executive Director (WAM). No metal detecting devices be used for the purpose of locating archaeological material with approval from the Executive Director (WAM). Visitors should follow code of conduct for visiting historic areas (Stanbury, 1991).	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991; Green and Stanbury, 1988
WG	Long Island	Seabirds	Fairy terns, eagles, Pacific gulls, roseate terns breeding colonies	Medium. Important for seabird conservation. Does not have the same rookery significance as other islands (R.Owens pers. comm.).	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Visitors should avoid vegetated and sandy areas and remain on perimeter of the island,	Storr <i>et al.</i> , 1986; Owens, 1996

WG	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	Morning Reef islets	Historic	<p><i>Batavia</i> (1629) survivors' occupied island. No archaeological evidence located.</p>	<p>High. Historically significant at a national and international level.</p>	<p>The small islands of the Morning Reef complex should be protected as maritime archaeological sites under section. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. The island should be declared a protected zone under section 9. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. No digging and/or major earthworks be undertaken on the island without approval from the Executive Director WA Museum. No metal detecting devices be used for the purpose of locating archaeological material with approval from the Executive Director (WAM). Visitors should follow code of conduct for visiting historic areas (Stanbury, 1991).</p>	<p>Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.</p>	<p>Stanbury, 1991; Green and Stanbury, 1988</p>
WG	North Island	Fauna	<p>Tammar wallaby, house mouse (<i>Mus musculus</i>)</p>	<p>Medium. Wallaby introduced ex Wallabi Islands circa 1950. Re-introduced 1987. Mouse introduced 1970s.</p>	<p>Ensure the habitat of the mammals and reptiles is protected from threats such as fire and clearing. Ensure that predators, such as foxes and cats, are not introduced to the Abrolhos Islands, and ongoing eradication of existing feral animal species should occur. Monitor population status of the tammar wallaby and the southern bush rat.</p>	<p>Human visitation needs to be managed, though the development of guidelines included in interpretive material.</p>	<p>Storr, 1965; Abbott and Burbidge, 1995</p>

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	North Island	Flora	Pavement limestone community, salt lake and low saltbush flats, dunes and consolidated dunes	High. Highly sensitive to disturbance, slow rates of regeneration. Salt lake community rare on offshore islands.	Threats include weed infestation, clearing, landfill, fire, trampling by tourists, grazing by feral animals, dumping of rubbish.	Access to pavement limestone communities and dunes and consolidated dunes should be restricted. Consider use of designated tracks (day use only) where appropriate, and provide information/interpretation. Possible restrictions on access for salt lakes and low saltbush flats.	Longman <i>et al.</i> – in prep.
WG	North Island	Historic	Record Hill – artefacts (pine post, bottle containing paper)	To be assessed. Paper with date of visit left by Stokes and Wickham ( <i>HMS Beagle</i> ) on June 3, 1841.	Not known.	No restrictions.	WA Maritime Museum
WG	North Island	Land birds	Brush bronze-wing.	High. In 1960, Storr wrote that this species was extinct on North Island but included it in 1986 paper as being common, with the population estimated <i>circa</i> 100 in 1985. Mainland populations are decreasing.	Ensure habitat is protected, and feral animals are not introduced.	Visitors should avoid walking in vegetated areas.	Storr, 1960; Storr <i>et al.</i> , 1986
WG	North Island	Land birds	Painted button-quail.	High (potentially). Sub-species is endemic to the Abrolhos Islands. In 1960, Storr wrote that this species was extinct on North Island but included it in 1986 paper, no records of sightings were provided.		Need to determine whether this bird is still present on North Island and, if so, develop management policies.	Storr, 1960; Storr <i>et al.</i> , 1986
WG	Oystercatcher Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal (causing nutrient enrichment).	Visitors should not enter mangroves as it is a habitat highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	Pigeon Island	Historic	Guano mining – rock wall	To be assessed. Associated with guano mining.	Pending evaluation. Preservation. Further documentation required. Threats to stone landing are erosion, further development of wharves and jetties. Visitors should follow code of conduct for visiting historic areas (Stanbury, 1991).	Public access: restricted.	Stanbury, 1993
WG	Pigeon Island	Land-birds	Painted button-quail, brush bronzewing	High. Painted button-quail sub-species is endemic to the Abrothos Islands.	Consider in management plan. Ensure habitat is protected, and feral animals are not introduced.	Visitors should avoid walking in vegetated areas.	Storr 1960; Storr <i>et al.</i> , 1986.
WG	Pigeon Island	Reptiles	Spiny-tailed skink	High. Spiny-tailed skink gazetted “rare or otherwise in need of special protection”.	Ensure the habitat of the reptiles is protected from threats, such as fire and clearing. Ensure that predators, such as foxes and cats, are not introduced to the Abrothos Islands, and ongoing eradication of existing feral animal species should occur.	Human visitation needs to be managed, though the development of guidelines included in interpretive material.	Storr, 1965
WG	Seagull Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal (causing nutrient enrichment).	Visitors should not enter mangroves as it is a habitat highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
WG	Seagull Island	Land-birds	Brush bronzewing	High. Sub-species is endemic to the Abrothos Islands.	Consider in management plan. Ensure habitat is protected, and feral animals are not introduced.	Visitors should avoid walking in vegetated areas.	Storr <i>et al.</i> , 1986.
WG	Tattler Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal (causing nutrient enrichment).	Visitors should not enter mangroves as it is a habitat highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	Tattler Island	Land birds	Brush bronzewing	High. Mainland populations are decreasing.	Breeding in late April and from late July to mid-November. Nests sheltered in foliage.		Storr <i>et al.</i> , 1986
WG	Tattler Island	Reptiles	Spiny-tailed skink	High. Spiny-tailed skink gazetted "rare or otherwise in need of special protection".	Ensure the habitat of the reptiles is protected from threats, such as fire and clearing. Ensure that predators, such as foxes and cats, are not introduced to the Abrolhos Islands, and ongoing eradication of existing feral animal species should occur.	Human visitation needs to be managed, though the development of guidelines included in interpretive material.	Storr, 1965
WG	Traitors Island	Historic	<i>Battavia</i> (1629) survivors' occupied island. No archaeological evidence located.	High. Historically significant at a national and international level.	The whole of the island should be protected as maritime archaeological sites under section. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. The island should be declared a protected zone under section 9. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. No digging and/or major earthworks be undertaken on the island without approval from the Executive Director WA Museum. No metal detecting devices be used for the purpose of locating archaeological material with approval from the Executive Director (WAM). Visitors should follow code of conduct for visiting historic areas (Stanbury, 1991).	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991; Green and Stanbury, 1988

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	Turnstone Island	Flora	Mangrove community	High. Rare and special plant community. Highly productive, support food chains, provide breeding habitat.	Threats include direct clearing, landfill, oil spills, dumping of rubbish, sewage disposal (causing nutrient enrichment).	Visitors should not enter mangroves as it is a habitat which is highly prone to disturbance at all times.	Longman <i>et al.</i> – in prep.
WG	West Wallabi	General	Various	Very High.	Specific management plan for West Wallabi Island is needed to consider all conservation features, possible reserve status, information, interpretation and signage, and access.	Determine as part of management plan.	
WG	West Wallabi	Seabirds	Largest colonies of wedge-tailed shearwaters (November to April) at the Abrolhos, little shearwaters (winter and spring breeders)	Very High – important for seabird conservation.	Visitors should follow code of conduct for visiting seabird breeding colonies (Burbidge and Fuller).	Visitors should avoid sandy areas. All shearwater areas should be avoided all year round.	Storr <i>et al.</i> , 1986; Fuller <i>et al.</i> , 1994.
WG	West WG Island	Fauna	Tammar wallaby, bush rat, spiny-tailed skink, carpet python, bearded dragon	Very High. Tammar wallaby, carpet python and spiny-tailed skink gazetted “rare or otherwise in need of special protection”. Bush rats mostly found in sandy areas covered with <i>Spinifex longifolius</i> . The sub-species of spiny-tailed skink and bearded dragon are endemic to the Abrolhos Islands.	Ensure the habitat of the mammals and reptiles is protected from threats, such as fire and clearing. Ensure that predators, such as foxes and cats, are not introduced to the Abrolhos Islands, and ongoing eradication of existing feral animal species should occur. Monitor population status of the tammar wallaby and the southern bush rat.	Human visitation needs to be managed, though the development of guidelines included in interpretive material.	Storr, 1965; FWA, 1998

WG	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
	West Wallabi Island	Flora & Priority 3 and 2 Flora	Pavement limestone community, dunes and consolidated dunes, mangrove community, <i>Atriplex cinerea</i> dwarf shrubland, salt lake and low salt bush flats	Very High. Pavement community highly sensitive to disturbance, slow rates of regeneration. Mangroves a rare and special plant community. Highly productive, support food chains, provide breeding habitat. <i>A. cinerea</i> provides breeding habitat for burrowing seabirds. Salt lake community rare on offshore islands.	Threats include weed infestation, clearing, landfill, fire, trampling by tourists, grazing by feral animals, dumping of rubbish, oil spills, sewage disposal causing nutrient enrichment. Existing "weeds" indicate areas used by guano miners (e.g. horse fodder, wild tomatoes etc.).	Access to pavement limestone communities and dunes and consolidated dunes should be restricted. Consider use of designated tracks (day use only) where appropriate, and provide information/interpretation. Visitors should not enter mangroves as it is a habitat highly prone to disturbance at all times. Visitors should not enter <i>Atriplex</i> communities due to the unstable nature of the soil and the possible damage to seabird burrows. Possible restrictions on access for salt lakes and low saltbush flats. No new huts should be built.	Longman <i>et al.</i> – in prep., Director of Fisheries (1966); M. Stanbury pers. comm.

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	West Wallabi Island	Historic	<i>Batavia</i> (1629). Slaughter Point. Limestone structure 1 (Weibbe-Hayes encampment). Limestone structure 2 (could have been built by Weibbe-Hayes or guano miners)	Very High. Historically significant at a national and international level.	The two limestone structures should be protected as maritime archaeology sites under section 4 (1) (b) of the (State) <i>Maritime Archaeology Act</i> 1973, each site within a protected zone of 100m radius. The island should be declared a protected zone under section 9. (1) of the (State) <i>Maritime Archaeology Act</i> 1973. Any interferences with the structures and/or removal of material from within the zones be prohibited. No digging and/or major earthworks be undertaken on the island without approval from the Executive Director WA Museum. No metal detecting devices be used for the purpose of locating archaeological material with approval from the Executive Director (WAM). Visitors should follow code of conduct for visiting historic areas – (Stanbury, 1991).	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations. Fort access should always be from one point to minimise trample damage in sensitive areas (see Owens, 1996) for details). Include this information in a management plan for the island.	Stanbury, 1991; Green and Stanbury, 1988; R. Owens pers. comm.
WG	West Wallabi Island	Historic	Fireplaces (3; Middens, Wells, artefacts	Medium – High. Fireplaces possibly relate to the <i>Batavia</i> incident.	No digging and/or major earthworks be undertaken on the island without approval from the Executive Director (WAM). No metal detecting devices be used for the purpose of locating archaeological material with approval from the Executive Director (WAM).	Access to the site should be permitted, but suitable markers and notices should be erected in order to make known to the public the management recommendations.	Stanbury, 1991; Green and Stanbury, 1988

	Island	Category	Feature	Conservation Significance	Management Implications	Land Access	Source
WG	West Wallabi Island	Historic	Guano mining – remains of a jetty (rock piles); tram line and horse yard are located on the western side of the island). Crayfish cannery established in 1931.	Medium – High. Historically significant in terms of the pattern of land use and economic development of the Houtman Abrolhos.	Areas of the island formerly associated with guano mining should be recognised as being historically significant. Appropriately mark site of crayfish cannery and guano operations with interpretive signage.	Potential for walking trail from the cannery site to the guano workings and to explore the island's flora and fauna.	Geraldton Mid-West Regional Development Committee, 1982; Green and Stanbury, 1988; Gray, 1993
WG	West Wallabi Island	Land-birds	Painted button-quail, brush bronzewing	Very High. Painted button-quail sub-species is endemic to the Abrolhos Islands. Mainland populations of brush bronzewing are decreasing.	Consider in management plan. Ensure habitat is protected, and feral animals are not introduced.	Visitors should avoid walking in vegetated areas.	Storr, 1960; Storr <i>et al.</i> , 1986.

## Appendix C

### List of Islands in the Houtman Abrolhos, and seabirds recorded breeding on them (Fuller & Burbidge, 1994)

September, 1994 From: P J Fuller *et al.*: Breeding seabirds of Houtman Abrolhos

#### Islands in the Houtman Abrolhos, and seabirds recorded breeding on them

Wallabi Group – 1992		Seal	Little Shearwater	c 250
Akerstrom	Little Shearwater		White-faced Storm-Petrel	c 70
	White-bellied Sea-Eagle		Pacific Gull	1
	Bridled Tern	c 40	Second Sister	Osprey
Alcatraz	Bridled Tern	c 8	(= Lagoon)	Crested Tern
(=Lumley)			Shag Rock	Little Shearwater
Beacon	Little Shearwater	c 5 000		Pied Cormorant
	White-faced Storm-Petrel	no estimate		Bridled Tern
	Osprey	1	Tattler	Little Shearwater
	Bridled Tern	c 700		White-bellied Sea-Eagle
Dakin	Little Shearwater	c 700		Bridled Tern
	Pacific Gull	1	Third Sister	Roseate Tern
Dicks	White-faced Storm-Petrel	c 400	Traitors	White-faced Storm-Petrel
	Osprey	1		Pacific Gull
	Bridled Tern	c 300		Roseate Tern
East Wallabi	Osprey	1		Bridled Tern
	Caspian Tern	1	Traitors	Pied Cormorant
	Fairy Tern	58	(Islet 1)	Bridled Tern
Eastern	Little Shearwater	c 70	Traitors	Bridled Tern
	White-faced Storm-Petrel	c 100	(Islet 2)	
	Bridled Tern	c 5	Traitors	Pied Cormorant
Far	Roseate Tern	297	(Islet 3)	
First Sister	White-faced Storm-Petrel	c 300	Traitors	Pacific Gull
First Sister	White-faced Storm-Petrel	17	(Islet 5)	Roseate Tern
(Islet 2 to N)	Bridled Tern	2		
First Sister	Pied Cormorant	11	Wann	White-faced Storm-Petrel
(Islet 3 to N)	Osprey	1		Eastern Reef Egret
	Pacific Gull	1		Osprey
Hall	Little Shearwater	c 20		Bridled Tern
Little Pigeon	Eastern Reef Egret	1	West Wallabi	Wedge-tailed Shearwater
	Bridled Tern	c 50		Little Shearwater
Long	Little Shearwater	c 700		Osprey
	Eastern Reef Egret	1		
	White-bellied Sea-Eagle	1	Easter Group – 1991	
	Pacific Gull	1	Alexander	Wedge-tailed Shearwater
	Bridled Tern	c 700		Sooty Tern
	Crested Tern	c 60	Alexander	Bridled Tern
Long	Osprey	1	(Islet to S)	
(Islet to NE)			Bushby	Pacific Gull
Marinula	Little Shearwater	c 40	Bynoe	Little Shearwater
	Roseate Tern	10		White-faced Storm-Petrel
	Bridled Tern	c 20		Eastern Reef Egret
Marinula	Roseate Tern	490		Bridled Tern
(Islet to NE)			Campbell	Fairy Tern
north	Osprey	3		Little Shearwater
	Crested Tern	343		Bridled Tern
Oystercatcher	White-bellied Sea-Eagle	1	Campbell	Roseate Tern
Pelican	White-bellied Sea-Eagle	1	(Islet to S)	
	Bridled Tern	c 30	Crake	Little Shearwater
Pigeon	Osprey	1		Bridled Tern
	Bridled Tern	c 300	Dry	White-faced Storm-Petrel
Plover	Osprey	1		Silver Gull
	Silver Gull	2		Bridled Tern
	Pacific Gull	1	Gibson	Silver Gull
	Bridled Tern	4		Roseate Tern
Saville-Kent	White-faced Storm-Petrel	c 300		Bridled Tern
	Osprey	1		
	Pacific Gull	1		

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### Islands in the Houtman Abrolhos, and seabirds recorded breeding on them – continued

Easter Group – 1991 (continued)			Sandy	White-faced Storm Petrel	c 300
Gilbert	White-bellied Sea-Eagle	1	(= Graveyard)	White-bellied Sea-Eagle	1
	Silver Gull	c 8	Serventy	Eastern Reef Egret	1
	Pacific Gull	1		Osprey	1
	Bridled Tern	c 10		Silver Gull	4
Gilbert	Roseate Tern	98		Roseate Tern	3
(Islet to NW)	Pacific Gull	1		Bridled Tern	c 40
	Bridled Tern	1	Serventy	Osprey	1
Helms	White-faced Storm-Petrel	c 100	(Islet to N)		
	Pacific Gull	1	Shearwater	Little Shearwater	c 100
	Bridled Tern	8		Osprey	1
	Fairy Tern	c 8		Silver Gull	c 5
Helms	Bridled Tern	6		Caspian Tern	1
(Islet 1 to SE)				Crested Tern	c 35
Helms	Eastern Reef Egret	1	Shearwater	Little Shearwater	c 40
(Islet 2 to SE)	Pacific Gull	1	(Islet to S)	Bridled Tern	10
	Bridled Tern	2	Stokes	Sooty Tern	1 000-1 500
Helms	Bridled Tern	2		Bridled Tern	c 40
(Islet 3 to SE)			Suomi	Little Shearwater	c 1 500
Helms	Osprey	1		Eastern Reef Egret	1
(Islet 4 to SE)				Osprey	1
Joe Smith	Silver Gull	8		White-bellied Sea-Eagle	1
	Pacific Gull	1		Pacific Gull	2
	Bridled Tern	3		Sooty Tern	3 000-5 000
Keru	Little Shearwater	c 700		Bridled Tern	c 1000
	Pacific Gull	1	Tapani	Pacific Gull	1
	Caspian Tern	1		Bridled Tern	5
	Sooty Tern	2 000-3 000		Fairy Tern	32
	Bridled Tern	c 250	White	Little Shearwater	c 500
Leo	Little Shearwater	c 3 000		Sooty Tern	5 000-6 000
	Osprey	1		Bridled Tern	c 10
	Sooty Oystercatcher	1	White	Pacific Gull	1
	Caspian Tern	70	(Islet to S)	Roseate Tern	42
	Sooty Tern	c 20	Wooded	Little Shearwater	c 2 000
	Bridled Tern	c 200		Pied Cormorant	c 1 000
	Crested Tern	600		Little Pied Cormorant	11
Leo	Bridled Tern	1		Pacific Gull	2
(Islet to N)				Sooty Tern	c 500
Little North	White-faced Storm-Petrel	c 200		Bridled Tern	c 500
	Pacific Gull	1		Lesser Noddy	5 325
	Roseate Tern	552			
	Sooty Tern	c 200	Pelsaert Group – 1993		
	Bridled Tern	c 300	Arthur	Osprey	1
	Fairy Tern	128		Bridled Tern	2
Little Rat	Eastern Reef Egret	1	Basile	Bridled Tern	c 4
	Osprey	1	Burnett	Bridled Tern	c 6
	Bridled Tern	c 25	(= Fin)		
Little Roma	White-faced Storm-Petrel	c 50	Burnett	Bridled Tern	1
	Bridled Tern	2	(Islet to N)		
Morley	Little Shearwater	c 3 000	Coronation	Bridled Tern	c 4
	Pacific Gull	1	Coronation	Caspian Tern	1
	Bridled Tern	c 50	(2nd Islet NE)		
	Lesser Noddy	11 745	Davis	White-bellied Sea-Eagle	1
Rat	Osprey	2		Bridled Tern	c 20
Rat	White-faced Storm-Petrel	c 35	Diver	Pacific Gull	1
(Islet to N)	Osprey	1		Bridled Tern	c 3
	Crested Tern	4	Eight	Pied Cormorant	35
Robertson	Bridled Tern	1		Pacific Gull	1
Roma	Bridled Tern	c 5		Bridled Tern	c 70

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## Islands in the Houtman Abrolhos, and seabirds recorded breeding on them – continued

Pelsaert Group – 1993 (continued)		Pelsaert	Caspian Tern	2
Fairbridge	Osprey		Roseate Tern	365
(= Jackson)	Silver Gull		Bridled Tern	c 1 000
	Pacific Gull		Sooty Tern	246 000
	Fairy Tern		Fairy Tern	38
Gaze	Osprey		Crested Tern	1 013
(Islet to S)			Common Noddy	130 000
Gregory	Eastern Reef Egret		Lesser Noddy	34 870
	Roseate Tern	Post Office	Bridled Tern	c 15
	Fairy Tern		Fairy Tern	5
Gun	Wedge-tailed Shearwater	Seven	Osprey	1
	Bridled Tern		Pacific Gull	1
Gun	Osprey		Bridled Tern	4
(Islet adjacent)		Seven	Pied Cormorant	9
Hummock	Little Shearwater	(Islet adjacent)		
	White-bellied Sea-Eagle	Ship Rock	Silver Gull	1
	Little Shearwater		Pacific Gull	1
Iris Refuge	Pacific Gull	Six	Osprey	1
	Silver Gull	Square	White-bellied Sea-Eagle	1
Jackson	Osprey		Pacific Gull	1
Jon Jim	Silver Gull		Roseate Tern	497
	Roseate Tern	Stick	Little Shearwater	c 1 000
	Osprey	White-faced Storm-Petrel		c 500
Lagoon	Wedge-tailed Shearwater		Osprey	1
Murray	Silver Gull		Pacific Gull	1
	Pacific Gull		Bridled Tern	c 50
	Fairy Tern	Sweet	Wedge-tailed Shearwater	c 200
Newbold	Osprey		Pied Cormorant	33
Newman	Silver Gull		Osprey	2
	Fairy Tern		Silver Gull	4
One	Wedge-tailed Shearwater		Roseate Tern	11
	Pied Cormorant		Bridled Tern	c 15
	Eastern Reef Egret	The Coral	Osprey	1
	Osprey	Patches	Pacific Gull	1
	Pacific Gull		Roseate Tern	311
	Bridled Tern		Fairy Tern	12
Pelsaert	Wedge-tailed Shearwater		Crested Tern	95
	Little Shearwater	Three	Pacific Gull	2
	White-faced Storm-Petrel		Bridled Tern	4
	Eastern Reef Egret	Two	Wedge-tailed Shearwater	20
	Osprey		Bridled Tern	5
	White-bellied Sea-Eagle	Uncle Margie	Pacific Gull	1
	Silver Gull	(= Mangrove)	Bridled Tern	c 6
	Pacific Gull		Fairy Tern	3

## Appendix C

From: P J Fuller *et al.*: Breeding seabirds of Houtman Abrolhos Corella 18(4)

### Counts and Estimates of Breeding Pairs by Species

Wedge-tailed Shearwater <i>Puffinus pacificus</i>		Pied Cormorant <i>Phalacrocorax varius</i>	
Alexander	700	Eight	35
Davis	c 50	First Sister (Islet 3 to north)	11
Gregory	8	One	25
Gun	c 5 000	Seven (Islet Adjacent)	9
Middle	120	Shag Rock	12
Murray	2 000	Sweet	33
One	c 30	Traitors (Islet 1)	23
Pelsaert	75 460	Traitors (Islet 3)	28
Sweet	c 200	Wooded	c 1 000
Two	20	TOTAL	c 1 176
West Wallabi	1 022 250		
TOTAL	c 1 117 816		
Little Shearwater <i>Puffinus assimilis</i>		Little Pied Cormorant <i>Phalacrocorax melanoleucos</i>	
Akerstrom	40	Wooded	11
Beacon	5 000	TOTAL	11
Bynoe	1 200		
Campbell	200	Eastern Reef Egret <i>Egretta sacra</i>	
Crake	30	Bynoe	1
Dakin	700	Gregory	1
Eastern	70	Helms (Islet 2 to south-east)	1
Hall	20	Little Pigeon	1
Hummock	c 400	Little Rat	2
Iris Refuge	35	Long	1
Keru	700	One	1
Leo	c 3 000	Pelsaert	1
Long	c 700	Serventy	1
Marinula	c 40	Suomi	1
Morley	c 3 000	Wann	1
Pelsaert	c 50	TOTAL	12
Seal	c 200		
Shag Rock	20	Osprey <i>Pandion haliaetus</i>	
Shearwater	100	Arthur	1
Shearwater (Islet to south)	40	Beacon	1
Stick	c 1 000	Burnett	1
Suomi	c 1 500	Dick	1
Tattler	c 50	East Wallabi	1
West Wallabi	c 9 000	Eastern	1
White	c 500	Fairbridge	1
Wooded	c 3 000	Far	1
TOTAL	c 30 555	First Sister (Islet 3 to north)	1
		Gaze (Islet to south)	1
		Gregory	1
		Gun (Islet Adjacent)	1
		Helms (Islet 4 to south-east)	1
		Jon Jim	1
		Lagoon	1
		Leo	1
		Little Rat	1
		Long (Islet to north)	1
		Newbold	1
		North	3
		One	1
		Pelsaert	3
		Pigeon	1
		Plover	1
		Rat	2
		Rat (Islet to north)	1
		Saville-Kent	1
		Second Sister (Lagoon)	1
		Serventy	1
White-faced Storm-Petrel <i>Pelagodroma marina</i>			
Beacon	no estimate		
Bynoe	c 1 000		
Dick	c 400		
Dry	c 1 000		
Eastern	c 300		
First Sister	c 300		
First Sister (Islet to north)	10		
Pelsaert	12		
Sandy	c 300		
Saville-Kent	c 300		
Seal	c 60		
Stick	c 500		
Traitors	20		
Wann	25		
TOTAL	c 4 227		

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## Counts and Estimates of Breeding Pairs by Species – continued

Osprey (continued)				
Serventy (Islet to north)	1	Gilbert		1
Seven	1	Gilbert (Islet to south-west)		1
Shearwater	1	Gregory		1
Six	1	Gun		1
Square	1	Helms		1
Stick	1	Helms (Islet 2 to south-east)		1
Suomi	1	Iris Refuge		1
Sweet	1	Joe Smith		1
The Coral Patches	2	Keru		1
Three	1	Little North		1
Wann	1	Long		1
West Wallabi	1	Morley		1
TOTAL	47	Murray		1
		One		1
White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i>		Pelsaert		8
Akerstrom	1	Plover		1
Arthur	1	Saville-Kent		1
Davis	1	Seal		1
Gilbert	1	Seven		1
Hummock	1	Ship Rock		1
Long	1	Square		1
Middle	1	Stick		1
Oystercatcher	1	Suomi		2
Pelican	1	Tapani		1
Pelsaert	2	The Coral patches		1
Sandy	1	Three		2
Square	1	Traitors		1
Suomi	1	Traitors (Islet 5)		1
Tattler	1	Traitors (Islet to south)		1
TOTAL	15	Uncle Margie (= Mangrove)		1
		White (Islet to south)		1
Sooty Oystercatcher <i>Haematopus fuliginosus</i>		Wooded		4
Leo	1	TOTAL		51
TOTAL	1	Caspian Tern <i>Hydroprogne caspia</i>		
Silver Gull <i>Larus novaehollandiae</i>		Coronation (2nd Islet NE)		1
Dry	4	Foale		1
Fairbridge	4	Keru		1
Gibson	2	Leo		70
Gilbert	4	North		3
Gun	4	Pelsaert		2
Jackson	4	Shearwater		1
Joe Smith	8	Stick		1
Jon Jim	4	Sweet		1
Middle	4	TOTAL		81
Murray	4	Roseart Tern <i>Sterna dougallii</i>		
Newman	c 15	Campbell (Islet to south)		386
Pelsaert	c 90	Fairbridge		12
Plover	2	Far		297
Serventy	4	Gibson		10
Shearwater	4	Gibson (Islet to north)		98
Ship Rock	1	Gregory		30
Sweet	4	Jon Jim		105
TOTAL	c 162	Little North		552
Pacific Gull <i>Larus pacificus</i>		Marinula		10
Bushby	1	Marinula (Islet to north east)		490
Bynoe	1	Pelsaert		365
Dakin	1	Serventy		3
Diver	1	Square		497
Eight	1	Sweet		11
Fairbridge	1	The Coral Patches		311
First Sister (Islet 3 to north)	1			

## Appendix C

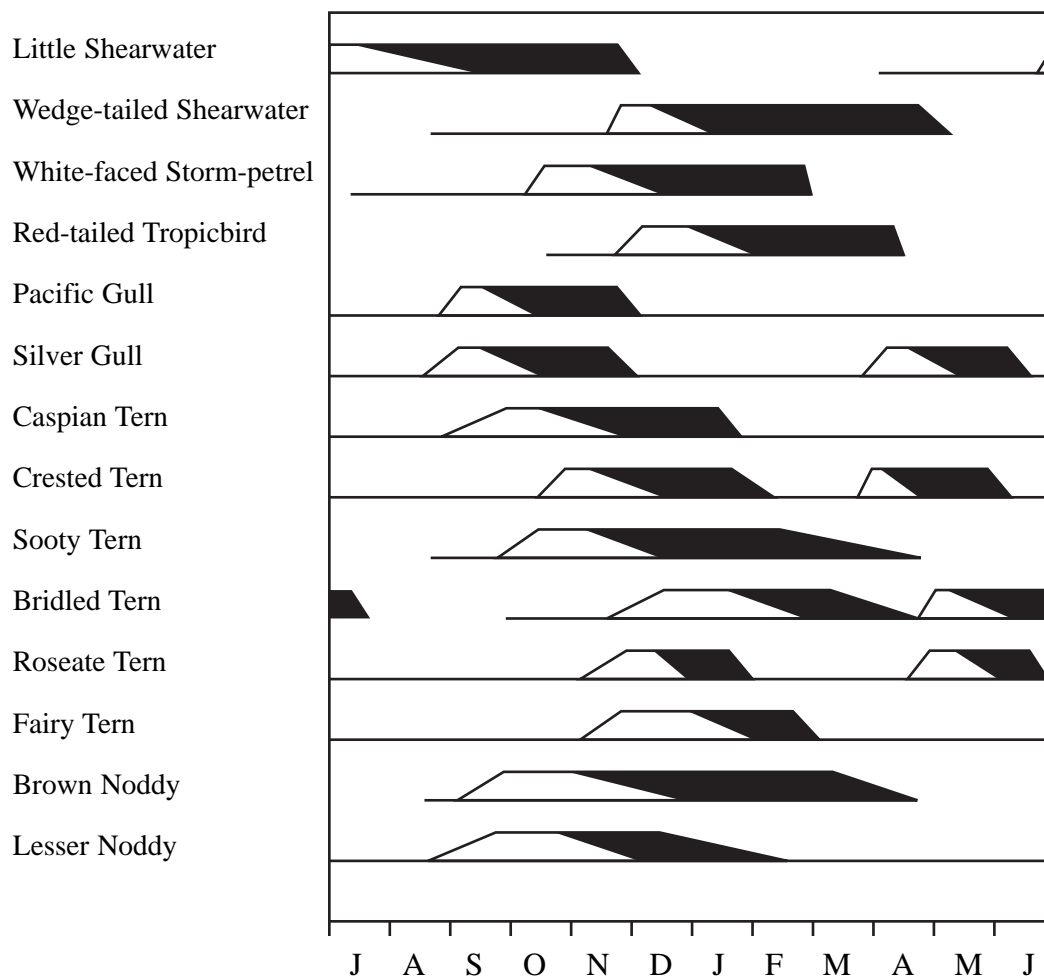
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### Counts and Estimates of Breeding Pairs by Species – continued

Roseate Tern (continued)			Robertson	1
Third Sister	139		Roma	4
Traitors	81		Serventy	50
Traitors (Islet to south)	2		Seven	4
White	42		Shag Rock	5
TOTAL	3 441		Shearwater (Islet to south)	10
Sooty Tern <i>Sterna fuscata</i>			Square	4
Alexander	c 40 000		Stick	50
Keru	c 2 000		Stokes	50
Leo	c 20		Suomi	c 1 000
Little North	c 200		Sweet	c 15
Pelsaert	208 700		Tapani	5
Stokes	c 1 000		Tattler	2
White	c 5 000		Three	5
Wooded	c 400		Traitors	4
Suomi	c 3 000		Traitors (Islet 1)	1
TOTAL	c 260 320		Traitors (Islet 2)	2
Bridled Tern <i>Sterna anaethetus</i>			Traitors (Islet 5)	2
Akerstrom	c 50		Two	5
Alcatraz	1		Uncle Margie (= Mangrove)	c 6
Alexander (Islet to south)	4		Wann	2
Arthur	2		White	4
Basile	4		Wooded	c 300
Beacon	c 700		TOTAL	C 7 046
Burnett	6		Fairy Tern <i>Sterna nereis</i>	
Burnett (Islet to N)	1		Bynoe	11
Bynoe	c 200		East Wallabi	58
Campbell	50		Fairbridge	9
Coronation	4		Gregory	10
Crake	1		Gun	94
Davis	20		Helms	4
Dick	c 300		Little North	128
Diver	3		Murray	57
Dry	4		Newman	20
Eastern	4		Pelsaert	38
Eight	c 50		Post Office	5
Fairbridge	4		Tapani	32
Gibson	1		The Coral Patches	12
Gilbert	c 40		Uncle Margie (= Mangrove)	3
Gilbert (Islet to south-west)	1		TOTAL	481
Gun	c 1 000		Crested Tern <i>Sterna bergii</i>	
Helms	8		Leo	600
Helms (Islet 2 to south-east)	2		Long	60
Helms (Islet 3 to south-east)	2		North	343
Joe Smith	3		Pelsaert	1 013
Keru	300		Rat (Islet to north)	4
Leo	200		Second Sister	4
Leo (Islet to north)	1		Shearwater	35
Little North	300		Sweet	5
Little Pigeon	50		The Coral Patches	95
Little Rat	50		TOTAL	2 159
Little Roma	2		Common Noddy <i>Anous stolidus</i>	
Long	c 700		Pelsaert	132 000
Marinula	20		TOTAL	132 000
Morley	50		Lesser Noddy <i>Anous tenuirostris</i>	
One	c 50		Morley	7 665
Pelican	10		Pelsaert	34 895
Pelsaert	c 1 000		Wooded	6 325
Pigeon	c 300		TOTAL	48 885
Plover	4			
Post Office	c 15			

## Appendix D

### Breeding Chronology of 14 Seabirds which breed in the Pelsaert Group (Surman, 1998)



Breeding chronology of seabirds of the Pelsaert Group, Houtman Abrolhos, Western Australia. The figure summarises trends observed since 1993 and from data compiled from Warham (1956), Tarr (1949) and Surman (1994b). The presence of eggs is shown by the hollow bar, the presence of chicks by the solid bar, and the presence of adults without chicks by a line.

## Appendix E

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Code of conduct for human visitation to Houtman Abrolhos seabird breeding colonies  
(Abrolhos Islands Consultative Council, 1995)

### Notes on Impact of Human Visitation to Houtman Abrolhos Seabird Breeding Colonies

by Andrew Burbidge and Phil Fuller, CALM, WA Wildlife Research Centre

Seabirds that breed in colonies can suffer significant detrimental impact from inappropriate human access, unless it is properly controlled or rules are followed by visitors. Conversely, human visitation can have little or no impact under some conditions and be a valuable experience for visitors.

Many species can tolerate brief (not more than one minute – the one-minute rule) visitations by small groups of people to nesting sites. Long visits can lead to eggs becoming too cold or too hot, or chicks not being fed, or being abandoned by their parents. When visiting a colony or walking near a colony, visitors should take care they do not remain so close that adult birds will not return to nests. Some species are particularly susceptible to interference (see below).

Possible effects of people on seabirds breeding at the Houtman Abrolhos are:

**BURROW NESTERS:** Wedge-tailed shearwater, little shearwater, white-faced stormpetrel. The burrows of these species can be easily collapsed (with the possible death of the adult or chick, or destruction of the egg) by people walking through colonies. These species fly in the area of the colony only at night and can be attracted to strong lights (there are a few deaths every year of wedge-tailed shearwaters at the Pelsaert Island lighthouse) or fly into objects they are not familiar with (e.g. windmills).

The basic rule for visitors should be never to walk into areas with burrows.

**COLONIALY NESTING TERNS GROUP A** (nest in open): Caspian tern, crested tern, roseate tern, fairy tern. These species are little affected by short visits to colonies when breeding is at the egg or very small chick stage: however, gulls may predate eggs or small chicks once adults fly from nest. If gull predation a possibility, the colonies should not be approached within 'lift-off' distance. Once the chicks are larger (at the runner stage) they panic easily and will run off cliff edges and into the ocean, where they may drown or be taken by predators such as gulls. Caspian terns nest colonially only at Leo Island. Elsewhere only single nests occur. The same rules apply to single nests as to colonies.

Fairy tern colonies are often hard to see; the eggs and chicks are well camouflaged. Their presence is often indicated by adult birds diving on visitors while calling loudly. Fairy tern adults will often flush from nests when people approach within about 200 or even 300 metres.

The basic rule is never to approach (within 200m) a colony with runners. Unless the party includes an experienced ornithologist, who can competently judge the stage of breeding from a considerable distance, visitors should never approach within 200m (or further if adults flush from nests) of a colony. Move quickly away once birds flush from nests if runners are sighted.

**COLONIAL TERNS GROUP B** (nest in vegetation or under rock): Common noddy, lesser noddy, sooty tern, bridled tern. Adults of these species are little affected by brief visitation to the edge of colonies (within 20m of nests). However, once visitors come close enough to cause the nesting birds to fly off the nest, eggs and small chicks will be taken by gulls, so the closeness of approach needs careful monitoring. Retreat if birds are flushed from the nest. Obey the one-minute rule at all times.

**CORMORANTS:** Pied cormorant, little pied cormorant. Cormorant colonies are very susceptible to interference and should never be approached within 200m unless breeding is only at the egg and very small chick stage. The large pied cormorant colony at the edge of the lagoon at Wooded Island is badly affected by visitors at times. Little pied cormorants breed only at Wooded Island Lagoon in mangroves. The Australian pelican (not recorded breeding at the Abrolhos, but may do so in the future) is also very susceptible to interference and colonies should never be approached within 300m at any time.

**RAPTORS:** White-bellied sea-eagle, osprey. Brief visits to sea-eagle and osprey nests usually have negligible impact. If eggs are present, the adults will fly off, so visits must be kept short (not more than 1 minute). If chicks are present they will usually 'freeze' in a prone position, allowing close approach. However, if the chick shows signs of panic visitors must move away from the nest immediately.

**GULLS:** Pacific gull, silver gull. Gull colonies may usually be approached for short times. Adults will fly off nests when the approach is too close. When small chicks are present they will usually hide in vegetation or 'freeze' near the nest. Again, do not stay in the area for long. Large chicks will sometimes run into the ocean (similar to Group A terns) – if this happens visitors should immediately move away from the area.

**OYSTERCATCHERS:** Pied oystercatcher, sooty oystercatcher. Oystercatchers have almost invisible nests on beaches (sand or rocks). If people note frantic adult oystercatchers, it usually denotes a nest or chick nearby. If this happens, leave the area.

**LARGE WADERS:** Eastern reef egret. This species builds large nests from sticks on a cliff ledge or in mangroves. It will readily flush from the nest. If this happens, visitors should move away from the area.

## Appendix F

### Summary of “Guidelines for Managing Visitation to Seabird Breeding Islands” (Great Barrier Reef Marine Park Authority, 1997)

Summary of Guidelines for Managing Visitation to Seabird Breeding Islands (Great Barrier Reef Marine Park Authority, 1997)

The table below is a summary of the relevant sections of tables contained in *Guidelines for Managing Visitation to Seabird Breeding Islands* (Great Barrier Reef Marine Park Authority, 1997) based on seabird species that the Abrolhos Islands are important for conservation. This table provides information on attributes of seabird breeding biology, together with accounts of incidents of human disturbance of the species and their consequences for seabird breeding.

This information was prepared for seabirds of the Great Barrier Reef and should be used as a management guide only as difference in behaviour and breeding may exist.

Seabird Group	Information
Petrels, Prions and Shearwaters	<ul style="list-style-type: none"> <li>• Disturbance should be minimised during the colony establishment phase.</li> <li>• Feral animals and birds have caused significant impacts through to extinctions.</li> <li>• Devegetation of colonies can eliminate nesting sites and lead to soil erosion which destroys burrows.</li> <li>• Fires have destroyed colonies.</li> <li>• Wedge-tailed shearwater susceptible to trampling and predation. Burrows in generally level ground.</li> <li>• Wedge-tailed shearwater breeding numbers have been significantly reduced by cats and rats.</li> <li>• Little shearwater numbers affected by introduced predators. Nests in burrows, crevices and rock cavities.</li> </ul>
Storm-Petrels	<ul style="list-style-type: none"> <li>• Disturbance should be minimised during the colony establishment phase.</li> <li>• Most serious threats are the introduction of rats, cats and other predators.</li> <li>• Birds have been known to be attracted to lights.</li> <li>• White-faced storm-petrel shallow burrow in dense vegetation.</li> <li>• Burrows at risk of trampling by humans.</li> </ul>
Cormorants and Shags	<ul style="list-style-type: none"> <li>• Pied cormorant are susceptible to disturbance by people, boating and sailing. Impacts include adults leaving nests, adults standing on eggs and predation by gulls.</li> <li>• Little Pied cormorant usually nest in trees on a platform of sticks and debris.</li> <li>• Little Pied cormorant chicks &gt; 2 weeks old are more likely to jump from nests and drown, fall or predated than younger chicks which cling to the nest.</li> </ul>
Tropicbirds	<ul style="list-style-type: none"> <li>• Rats and other predators are reported to have eaten nesting adults, eggs and young in some places.</li> <li>• Red-tailed tropicbird nesting generally requires adequate shade, although have been recorded nesting in the open.</li> <li>• Red-tailed tropicbird have been recorded breeding successfully near tourist infrastructure.</li> </ul>
Gulls	<ul style="list-style-type: none"> <li>• A number of gull species suffer from intraspecific predation when disturbed by humans.</li> <li>• Pacific gull generally solitary nesting, nest on ground or grass and seaweed.</li> <li>• Islands holding more than five breeding pairs should be closed during the breeding season.</li> <li>• Pacific gulls inhabit gently shelving beaches protected from ocean waves.</li> <li>• Disturbance by humans and attacks from other gulls in mixed colonies are the most significant factors contributing to Pacific gull mortality.</li> </ul>

Seabird Group	Information
Terns and Noddies	<ul style="list-style-type: none"> <li>• Rats and cats have wiped out many tern colonies.</li> <li>• Distances to which people can approach before the first terns took flight varies between species, but can be as little as 300m.</li> <li>• Some tern species feed their chicks about once per hour.</li> <li>• Roseate terns usually nest on the ground in slight depression in sand or coral.</li> <li>• Roseate terns disturbed during nesting can lead to abandonment.</li> <li>• Sooty terns form large colonies on islands on ground under low vegetation.</li> <li>• Sooty terns have been known to desert colonies in response to helicopter landings and breed elsewhere.</li> <li>• Sooty terns have been recorded to not fly up in response to the presence of large catamarans within 200m, but took flight in response to the landing and departure of a seaplane within 400m.</li> <li>• Fairy tern breed in small colonies, eggs laid on sand.</li> <li>• Fairy tern threatened by encroaching vegetation, disturbance expanding, Silver gull colonies.</li> <li>• Fairy terns have a high rate of natural nest failure which is believed to be due to flooding from high tides and smothering from shifting sands. Disturbance by people and domestic animals allows predation by gulls and corvids, and in some instances may cause abandonment of the colony.</li> <li>• Crested terns ground nest in large colonies in sand or on shingle and suffer from disturbance and predation by gulls.</li> <li>• A study has found crested tern reaction to aircraft noise increases, with increasing noise.</li> <li>• The habit of crested tern chicks forming groups on the beach almost immediately they are mobile, makes them more vulnerable to the impact of human visitation, as visitors usually drive the birds before them as they walk along the shore.</li> <li>• Common noddy build seaweed and stick nests on ground or on a low shrub. Preyed upon by lizards and silver gulls and eastern reef egrets. Disturbed by humans.</li> <li>• Common noddy have been recorded to not fly up in response to the presence of large catamarans within 200m, but took flight in response to landing and departure of a seaplane within 400m.</li> <li>• Lesser noddy nest in trees; seaweed cemented by excreta. Preyed upon by silver gulls and eastern reef egrets. Disturbed by humans.</li> <li>• Lesser noddy relies on local fish stocks so will be susceptible to any changes associated with the fisheries.</li> <li>• Lesser noddy population has very limited distribution, so is susceptible to catastrophic destruction by cyclones, oil spills or similar events.</li> </ul>





Plant name	Akerstorm Island	Alcatraz Island	Barge Rock	Beacon Island	Dakin Island	Dick Island	"Eagle Point Islet"	Eastern Island	"East Mangrove Island"	East Wallabi Island	Far Island	First Sister	"First Sister Islet"	"G Island"	Hall Island	Little Pigeon Island	Long Island	Mangrove Island	Marinula Island	"Naturalist Island"	North Island	Oystercatcher Island	Pelican Island	Pigeon Island	Plover Island	Saville-Kent Island	Seagull Island	Seal Island	Second Sister	Shag Rock	Shag Rock	"Short Island"	Tattler Island	"Tectus Island"	Third Sister	Traitors Island	"Traitor Islet 1"	"Traitor Islet 2"	"Traitor Islet 3"	"Traitor Islet 4"	"Traitor Islet 5"	"Traitor Islet 6"	Turnstone Island	Wann Island	West Wallabi Island										
<b>AVICENNIACEAE</b> <i>Avicennia marina</i>	✓								✓									✓					✓																																
<b>BORAGINACEAE</b> <i>Cynoglossum australe</i> * <i>Echium plantagineum</i> <i>Trichodesma</i> <i>zeylanicum</i>										✓											✓																																		
<b>BRASSICACEAE</b> * <i>Brassica rapa</i> * <i>Cakile maritima</i> * <i>Hornungia</i> <i>procumbens</i> * <i>Hymenolobus</i> <i>procumbens</i> <i>Lepidium lyratogynum</i> <i>Lepidium</i> <i>pseudoruderale</i> <i>Lepidium puberulum</i> * <i>Raphanus</i> <i>raphanistrum</i> * <i>Sisymbrium orientale</i>			✓	✓	✓	✓		✓	✓	✓		✓					✓	✓			✓	✓							✓																										
<b>CAPPARACEAE</b> <i>Capparis spinosa</i>							✓																✓																																
<b>CARYOPHYLLACEAE</b> * <i>Polycarpon</i> <i>tetraphyllum</i> * <i>Sagina apetala</i> * <i>Spergularia rubra</i> * <i>Stellaria media</i>	✓	✓	✓	✓						✓						✓					✓	✓	✓	✓																															



Plant name	Akerstorm Island	Alcatraz Island	Barge Rock	Beacon Island	Dakin Island	Dick Island	"Eagle Point Islet"	Eastern Island	"East Mangrove Island"	East Wallabi Island	Far Island	First Sister	"First Sister Islet"	"G Island"	Hall Island	Little Pigeon Island	Long Island	Mangrove Island	Maraula Island	"Naturalist Island"	North Island	Oystercatcher Island	Pelican Island	Pigeon Island	Plover Island	Saville-Kent Island	Seagull Island	Seal Island	Second Sister	Shag Rock	"Shag Rock"	"Short Island"	Tattler Island	"Tectus Island"	Third Sister	Traitors Island	"Traitor Islet 1"	"Traitor Islet 2"	"Traitor Islet 3"	"Traitor Islet 4"	"Traitor Islet 5"	"Traitor Islet 6"	Turnstone Island	Wann Island	West Wallabi Island									
<b>CUNONIACEAE</b> <i>Aphanopetalum clematideum</i>									✓																																													
<b>CYPERACEAE</b> <i>*Isolepis marginata</i> <i>Isolepis nodosa</i>									✓																																													
<b>DASYPOGONACEAE</b> <i>Acanthocarpus preissii</i>																																																						
<b>DILLENIACEAE</b> <i>Hibbertia racemosa</i>																																																						
<b>EPACRIDACEAE</b> <i>Leucopogon instularis</i>																																																						
<b>EUPHORBIACEAE</b> <i>Beyeria viscosa</i> <i>Euphorbia boophitona</i> <i>Euphorbia drummondii</i> <i>Euphorbia tannensis</i> <i>*Euphorbia terracina</i> <i>Phyllanthus calycinus</i>																																																						
<b>FRANKENIACEAE</b> <i>Frankenia pauciflora</i>	✓																																																					
<b>GENTIANACEAE</b> <i>*Centaurium maritimum</i> <i>*Centaurium spicatum</i>																																																						
<b>GERANIACEAE</b> <i>*Erodium cicutarium</i> <i>Erodium cygnorum</i> <i>Pelargonium littorale</i>			✓																																																			



Plant name	Akerstorm Island	Alcatraz Island	Barge Rock	Beacon Island	Dakin Island	Dick Island	"Eagle Point Islet"	Eastern Island	"East Mangrove Island"	East Wallabi Island	Far Island	First Sister	"First Sister Islet"	"G Island"	Hall Island	Little Pigeon Island	Long Island	Mangrove Island	Marinula Island	"Naturalist Island"	North Island	Oystercatcher Island	Pelican Island	Pigeon Island	Plover Island	Saville-Kent Island	Seagull Island	Seal Island	Second Sister	Shag Rock	Shag Rock	"Short Island"	Tattler Island	"Tectus Island"	Third Sister	Traitors Island	"Traitor Islet 1"	"Traitor Islet 2"	"Traitor Islet 3"	"Traitor Islet 4"	"Traitor Islet 5"	"Traitor Islet 6"	Turnstone Island	Wann Island	West Wallabi Island					
<b>MYRTACEAE</b> <i>Eucalyptus oraria</i>									✓																																									
<b>ONAGRACEAE</b> <i>Epilobium billardierianum</i>									✓																																									
<b>OROBANCHACEAE</b> <i>*Orbanche minor</i>										✓																																								
<b>ORCHIDACEAE</b> <i>Microtis media</i> <i>Microtis sp.</i>										✓																																					✓			
<b>OXALIDACEAE</b> <i>*Oxalis corniculata</i>										✓																																								
<b>PAPILIONACEAE</b> <i>Bossiaea spinescens</i> <i>*Medicago polymorpha</i> <i>*Melilotus indicus</i> <i>Mirbelia ramulosa</i>										✓																																								
<b>PHORMIACEAE</b> <i>Dianella revoluta</i>										✓																																								
<b>PITOSPORACEAE</b> <i>Pitosporum phylliracoides</i>	✓									✓																																								
<b>PLANTAGINACEAE</b> <i>Plantago debilis</i>										✓																																								
<b>PLUMBAGINACEAE</b> <i>Muellerolimon salicorniaceum</i>	✓									✓																																								



## Appendix G

Plant name	Akerstorm Island	Alcatraz Island	Barge Rock	Beacon Island	Dakin Island	Dick Island	"Eagle Point Islet"	Eastern Island	"East Mangrove Island"	East Wallabi Island	Far Island	First Sister	"First Sister Islet"	"G Island"	Hall Island	Little Pigeon Island	Long Island	Mangrove Island	Marinula Island	"Naturalist Island"	North Island	Oystercatcher Island	Pelican Island	Pigeon Island	Plover Island	Saville-Kent Island	Seagull Island	Seal Island	Second Sister	Shag Rock	"Shag Rock"	"Short Island"	Tattler Island	"Tectus Island"	Third Sister	Traitors Island	"Traitor Islet 1"	"Traitor Islet 2"	"Traitor Islet 3"	"Traitor Islet 4"	"Traitor Islet 5"	"Traitor Islet 6"	Turnstone Island	Wann Island	West Wallabi Island											
<i>Setaria dielsii</i>	✓		✓			✓	✓			✓		✓										✓																																		
<i>Setaria sp.</i>						✓																																																		
<i>Spinifex longifolius</i>						✓		✓		✓		✓																																												
<i>Sporobolus virginicus</i>						✓																																																		
* <i>Triticum aestivum</i>																																																								
* <i>Vulpia myuros</i>	✓									✓																																														
<b>POLYGONACEAE</b>																																																								
* <i>Emex australis</i>																																																								
<b>PORTULACACEAE</b>																																																								
<i>Calanдрinia calypttrata</i>																																																								
<b>PRIMULACEAE</b>																																																								
* <i>Anagallis arvensis</i>																																																								
<b>PROTEACEAE</b>																																																								
<i>Grevillea argyrophylla</i>																																																								
<b>RANUNCULACEAE</b>																																																								
<i>Ranunculus sessiliflorus</i>																																																								
<b>RHAMNACEAE</b>																																																								
<i>Spyridium globulosum</i>																																																								
<b>RUBIACEAE</b>																																																								
<i>Galium migrans</i>																																																								
<i>Opercularia vaginata</i>																																																								
<b>RUTACEAE</b>																																																								
<i>Diplolaena grandiflora</i>																																																								
<b>SANTALACEAE</b>																																																								
<i>Exocarpos apophyllus</i>																																																								
<i>Exocarpos sparticus</i>																																																								

Plant name	Akerstorm Island	Alcatraz Island	Barge Rock	Beacon Island	Dakin Island	Dick Island	"Eagle Point Islet"	Eastern Island	"East Mangrove Island"	East Wallabi Island	Far Island	First Sister	"First Sister Islet"	"G Island"	Hall Island	Little Pigeon Island	Long Island	Mangrove Island	Martinula Island	"Naturalist Island"	North Island	Oystercatcher Island	Pelican Island	Pigeon Island	Plover Island	Saville-Kent Island	Seagull Island	Seal Island	Second Sister	Shag Rock	"Shag Rock"	"Short Island"	Tattler Island	"Tectus Island"	Third Sister	Traitors Island	"Traitor Islet 1"	"Traitor Islet 2"	"Traitor Islet 3"	"Traitor Islet 4"	"Traitor Islet 5"	"Traitor Islet 6"	Turnstone Island	Wann Island	West Wallabi Island														
<b>SAPINDACEAE</b>																																																											
<i>Dodonaea aptera</i>																																																											
<i>Dodonaea inaequifolia</i>																																																											
<i>Dodonaea viscosa</i>																																																											
<b>SCROPHULARIACEAE</b>																																																											
* <i>Dischisma arenarium</i>																																																											
<b>SOLANACEAE</b>																																																											
* <i>Nicotiana glauca</i>																																																											
<i>Nicotiana occidentalis</i>																																																											
subsp. <i>hesperis</i>																																																											
* <i>Solanum laciniatum</i>																																																											
* <i>Solanum nigrum</i>																																																											
<i>Solanum symonii</i>																																																											
<b>STACKHOUSIACEAE</b>																																																											
<i>Stackhousia sp.</i>																																																											
<i>Stackhousia viminea</i>																																																											
<i>Tripterococcus brunonis</i>																																																											
<b>STERCULIACEAE</b>																																																											
<i>Lasiopetalum angustifolium</i>																																																											
<b>TAMARICACEAE</b>																																																											
* <i>Tamarix sp.</i>																																																											
<b>THYMELAEACEAE</b>																																																											
<i>Pimelea microcephala</i>																																																											
<b>URTICACEAE</b>																																																											
<i>Parietaria cardiostegia</i>																																																											
<i>Parietaria debilis</i>																																																											
* <i>Urtica urens</i>																																																											
<b>ZYGOPHYLLACEAE</b>																																																											
<i>Nitaria billardieri</i>																																																											
<i>Zygothallum simile</i>																																																											

Table 1b. List of vascular plants found in the Easter Group of the Abrolhos islands, showing occurrence on each island. An asterisk denotes introduced/naturalized (weed) species. (Information based on Table 11, p. 559 in Harvey et al., 2001).

Plant name	Alexander Island	Bushby Island	Bynoe Island	Campbell Island	Crake Island	Dry Island	Gibson Island	Gilbert Island	Helms Island	"Helms Islet 2"	Joe Smith Island	Keru Island	"Landscape Island"	Leo Island	"Leo Islet 1"	"Leo Islet 2"	Little North Island	Little Rat Island	Little Roma Island	"Little Stokes Island"	Morley Island	"Nitará Island"	Rat Island	Roma Island	Sandy Island	Serventy Island	Shearwater Island	"Shearwater Islet"	Stokes Island	Suomi Island	Tapani Island	White Bank	White Island	Wooded Island			
<b>AIZOACEAE</b>																																					
<i>Carpobrotus</i> sp.																																					
<i>Carpobrotus</i> <i>virescens</i>	✓	✓	✓	✓	✓		✓																														
<i>Disphyma</i> <i>crassifolium</i> subsp. <i>clavellatum</i>						✓																															
* <i>Mesembryanthemum</i> <i>crystallinum</i>	✓	✓	✓	✓	✓																																
<i>Sesuvium</i> <i>portulacastrum</i>				✓	✓																																
* <i>Tetragonia</i> <i>decumbens</i>																																					
<b>AMARANTHACEAE</b>																																					
<i>Ptilotus</i> <i>gaudichaudii</i>																																					
<b>APIACEAE</b>	✓																																				
<i>Apium</i> <i>annuum</i>																																					
<i>Daucus</i> <i>glochidiatus</i>																																					
<i>Hydrocotyle</i> <i>diantha</i>																																					
* <i>Petroselinum</i> <i>crispum</i>																																					
<b>ASPHEDELACEAE</b>																																					
<i>Bulbine</i> <i>semibarbata</i>																																					
<b>ASTERACEAE</b>																																					
* <i>Cakile</i> <i>maritima</i>																																					
<i>Brachyscome</i> <i>ciliaris</i>																																					
* <i>Coryza</i> <i>albida</i>																																					
* <i>Coryza</i> <i>bonariensis</i>		✓																																			
<i>Euchiton</i> <i>sphaericus</i>																																					
<i>Gnaphalium</i> <i>indutum</i>																																					
<i>Olearia</i> <i>axillari</i>																																					

Plant name	Alexander Island	Bushby Island	Bynoe Island	Campbell Island	Crake Island	Dry Island	Gibson Island	Gilbert Island	Helms Island	"Helms Islet 2"	Joe Smith Island	Keru Island	"Landscape Island"	Leo Island	"Leo Islet 1"	"Leo Islet 2"	Little North Island	Little Rat Island	Little Roma Island	"Little Stokes Island"	Morley Island	"Nitratia Island"	Rat Island	Roma Island	Sandy Island	Serventy Island	Shearwater Island	"Shearwater Islet"	Stokes Island	Suomi Island	Tapani Island	White Bank	White Island	Wooded Island				
<i>*Pseudognaphalium luteoalbum</i>																																						
<i>*Reichardia tingitana</i>																																						
<i>Senecio latus</i>																																						
<i>*Sonchus oleraceus</i>																																						
<i>*Sonchus tenerrimus</i>																																						
<i>*Urospermum picroides</i>																																						
<i>*Ursinia anthemoides</i>																																						
<b>AVICENNIACEAE</b>																																						
<i>Avicennia marina</i>																																						
<b>BRASSICACEAE</b>																																						
<i>*Cakile maritima</i>																																						
<i>*Hornungia procumbens</i>																																						
<i>Lepidium lyratogynum</i>																																						
<i>Lepidium puberulum</i>																																						
<i>*Raphanus raphanistrum</i>																																						
<i>*Raphanus sativus</i>																																						
<i>*Sisymbrium irio</i>																																						
<i>*Sisymbrium orientale</i>																																						
<b>CACTACEAE</b>																																						
<i>*Opuntia stricta</i>																																						
<b>CAMPANULACEAE</b>																																						
<i>Wahlenbergia gracilis</i>																																						
<i>Wahlenbergia multicaulis</i>																																						
<b>CARYOPHYLLACEAE</b>																																						
<i>*Petrophagia velutina</i>																																						
<i>*Polycarpon tetraphyllum</i>																																						
<i>*Silene gallica</i>																																						
<i>*Silene nocturna</i>																																						
<i>Spergularia nesophila</i>																																						

Plant name	Alexander Island	Bushby Island	Bynoe Island	Campbell Island	Crake Island	Dry Island	Gibson Island	Gilbert Island	Helms Island	"Helms Islet 2"	Joe Smith Island	Keru Island	"Landscape Island"	Leo Island	"Leo Islet 1"	"Leo Islet 2"	Little North Island	Little Rat Island	Little Roma Island	"Little Stokes Island"	Morley Island	"Nitara Island"	Rat Island	Roma Island	Sandy Island	Serventy Island	Shearwater Island	"Shearwater Islet"	Stokes Island	Suomi Island	Tapani Island	White Bank	White Island	Wooded Island		
<i>*Spergularia rubra</i>																																				
<b>CHENOPODIACEAE</b>																																				
<i>Atriplex bumburyana</i>																																				
<i>Atriplex cinerea</i>																																				
<i>Atriplex paludosa</i>																																				
subsp. <i>baudinii</i>																																				
<i>Atriplex</i> sp.																																				
<i>*Chenopodium album</i>																																				
<i>*Chenopodium murale</i>																																				
<i>Enchylaena tomentosa</i>																																				
<i>Halosarcia</i>																																				
<i>halocnemoides</i>																																				
<i>Halosarcia indica</i>																																				
subsp. <i>bidens</i>																																				
<i>Rhagodia</i> sp.																																				
<i>Rhagodia preissii</i>																																				
subsp. <i>obovata</i>																																				
<i>*Salsola kali</i>																																				
<i>Sarcocornia quinqueflora</i>																																				
<i>Suaeda australis</i>																																				
<i>Threlkeldia diffusa</i>																																				
<b>COLCHICACEAE</b>																																				
<i>Wurmbea monantha</i>																																				
<b>CONVOLVULACEAE</b>																																				
<i>*Ipomoea cairica</i>																																				
<b>CRASSULACEAE</b>																																				
<i>*Bryophyllum</i> sp.																																				
<i>Crassula colorata</i>																																				
<i>Crassula exserta</i>																																				

Plant name	Alexander Island	Bushby Island	Bynoe Island	Campbell Island	Crake Island	Dry Island	Gibson Island	Gilbert Island	Helms Island	"Helms Islet 2"	Joe Smith Island	Keru Island	"Landscape Island"	Leo Island	"Leo Islet 1"	"Leo Islet 2"	Little North Island	Little Rat Island	Little Roma Island	"Little Stokes Island"	Morley Island	"Nitraria Island"	Rat Island	Roma Island	Sandy Island	Serventy Island	Shearwater Island	"Shearwater Islet"	Stokes Island	Suomi Island	Tapani Island	White Bank	White Island	Wooded Island							
<b>CUCUBITACEAE</b> <i>*Cucurbita pepo</i>																																									
<b>EUPHORBIACEAE</b> <i>Euphorbia drummondii</i> <i>*Euphorbia terracina</i>																		✓	✓																						
<b>FRANKENIACEAE</b> <i>Frankenia pauciflora</i>		✓																✓	✓																						
<b>GENTIANACEAE</b> <i>*Centaurium erythraea</i>		✓																✓	✓																						
<b>GERANIACEAE</b> <i>*Erodium cicutarium</i> <i>Pelargonium zonale</i>																		✓	✓																						
<b>GOODENIACEAE</b> <i>Scaevola crassifolia</i>				✓																																					
<b>JUNCAGINACEAE</b> <i>Triglochin trichophorum</i>												✓																													
<b>MALVACEAE</b> <i>Lavatera cretica</i> <i>Lavatera plebeia</i> <i>Lavatera sp.</i> <i>*Matva parviflora</i>								✓																																	
<b>MYOPORACEAE</b> <i>Myoporum insulare</i>																																									
<b>PAPILIONACEAE</b> <i>*Medicago polymorpha</i> <i>*Medicago sp.</i> <i>*Melilotus indicus</i>																																									

Plant name	Alexander Island	Bushby Island	Bynoe Island	Campbell Island	Crake Island	Dry Island	Gibson Island	Gilbert Island	Helms Island	“Helms Islet 2”	Joe Smith Island	“Landscape Island”	Leo Island	“Leo Islet 1”	“Leo Islet 2”	Little North Island	Little Rat Island	Little Roma Island	“Little Stokes Island”	Morley Island	“Nirara Island”	Rat Island	Roma Island	Sandy Island	Serventy Island	Shearwater Island	“Shearwater Islet”	Stokes Island	Suomi Island	Tapani Island	White Bank	White Island	Wooded Island																								
<b>PLANTAGINACEAE</b> <i>Plantago coronopus</i>																																																									
<b>PLUMBAGINACEAE</b> <i>Muelleroiimon salicorniaceum</i>																	✓	✓					✓																																		
<b>POACEAE</b> <i>Auistrostipa variabilis</i>																																																									
* <i>Avena barbata</i>																																																									
* <i>Avena fatua</i>																																																									
* <i>Avena sp.</i>																																																									
<i>Bromus arenarius</i>																																																									
* <i>Bromus diandrus</i>																																																									
<i>Bromus sp.</i>																																																									
* <i>Cynodon dactylon</i>																																																									
* <i>Cynodon sp.</i>																																																									
* <i>Ehrharta longiflora</i>																																																									
<i>Eragrostis dielsii</i>																																																									
* <i>Hordeum leporinum</i>																																																									
* <i>Lolium temulentum</i>																																																									
* <i>Parapholis incurva</i>																																																									
* <i>Pennisetum clandestinum</i>																																																									
* <i>Phalaris minor</i>																																																									
* <i>Rostraria cristata</i>																																																									
<i>Setaria dielsii</i>																																																									
<i>Spinifex longifolius</i>																																																									
* <i>Vulpia myuros</i>																																																									
<b>POLYGONACEAE</b> * <i>Emex australis</i>																																																									
<b>PRIMULACEAE</b> * <i>Anagallis arvensis</i>																																																									





Plant name	Arthur Island	Basile Island	Burnett Rock	Burton Island	Coronation Island	Davis Island	Eight Island	Foale Island	Gaze Island	"Gaze Islet 1"	Gregory Island	Gun Island	"Gun Islet"	Hummock Island	Iris Refuge Island	Jackson Island	Jon Jim Island	Lagoon Island	"Little Jackson Island"	Middle Island	Murray Island	Newman Island	Nook Island	One Island	Pelsaert Island	Post office Island	Robertson Island	Rotondella Island	Sandy Island	Seven Island	"Seven Islet"	Ship rock	Sid Liddon Island	Square Island	Stick Island	Sweet Island	The Coral Patch	Three Island	Travia island	Two Island	Uncle Margie Island													
<b>BRASSICACEAE</b>																																																						
* <i>Cakile maritima</i>	✓																																																					
* <i>Hornungia procumbens</i>			✓																																																			
<i>Lepidium pseudoruderale</i>			✓																																																			
* <i>Raphanus raphanistrum</i>		✓										✓																																										
* <i>Raphanus sativu</i>		✓																																																				
* <i>Sisymbrium orientale</i>			✓																																																			
<b>CACTACEAE</b>		✓																																																				
* <i>Opuntia stricta</i>																																																						
<b>CARYOPHYLLACEAE</b>																																																						
* <i>Cerastium glomeratum</i>							✓																																															
* <i>Polycarpon tetraphyllum</i>		✓														✓																																						
* <i>Spergularia diandra</i>												✓																																										
* <i>Spergularia rubra</i>																																																						
<b>CHENOPODIACEAE</b>																																																						
<i>Atriplex amnicola</i>																																																						
<i>Atriplex cinerea</i>																																																						
<i>Atriplex sp</i>	✓																																																					
* <i>Chenopodium murale</i>																																																						
<i>Enchylaena tomentosa</i>		✓																																																				
<i>Halosarcia haloenemoides</i>		✓																																																				
<i>Halosarcia indica</i> subsp. <i>Bidens</i>																																																						
* <i>Salsola kali</i>		✓																																																				
<i>Sarcocornia quinqueflora</i>	✓																																																					
<i>Sclerostegia arbuscula</i>		✓																																																				
<i>Suaeda australis</i>																																																						
<i>Threlkeldia diffusa</i>		✓																																																				

Plant name	Arthur Island	Bastie Island	Burnett Rock	Burton Island	Coronation Island	Davis Island	Eight Island	Foale Island	Gaze Island	"Gaze Islet 1"	Gregory Island	Gun Island	"Gun Islet"	Hummock Island	Iris Refuge Island	Jackson Island	Jon Jim Island	Lagoon Island	"Little Jackson Island"	Middle Island	Murray Island	Newman Island	Nook Island	One Island	Pelsaert Island	Post office Island	Robertson Island	Rondella Island	Sandy Island	Seven Island	"Seven Islet"	Ship rock	Sid Liddon Island	Square Island	Stick Island	Sweet Island	The Coral Patch	Three Island	Travia island	Two Island	Uncle Margie Island														
<b>CRASSULACEAE</b> <i>Crassula colorata</i>	✓		✓																	✓				✓																															
<b>EUPHORBIACEAE</b> <i>Euphorbia drummondii</i> <i>Euphorbia tannensis</i>											✓	✓	✓							✓		✓																																	
<b>FRANKENIACEAE</b> <i>Frankenia pauciflora</i>						✓														✓					✓											✓																			
<b>GENTIANACEAE</b> <i>*Centaurium spicatum</i>												✓													✓																														
<b>GERANIACEAE</b> <i>*Erodium cicutarium</i>																				✓														✓																					
<b>GOODENIACEAE</b> <i>Scaevola crassifolia</i>																				✓																																			
<b>JUNCAGINACEAE</b> <i>Triglochin mucronatum</i> <i>Triglochin trichophorum</i>												✓								✓																																			
<b>MALVACEAE</b> <i>Lavatera plebeia</i> <i>*Malva parviflora</i>		✓	✓													✓				✓		✓																																	
<b>MYOPORACEAE</b> <i>Eremophila glabra</i> <i>Myoporum insulare</i>		✓	✓																	✓		✓																																	
<b>PAPILIONACEAE</b> <i>*Medicago polymorpha</i> <i>*Melilotus indicus</i>		✓																																																					
<b>PITTIOSPORACEAE</b> <i>Pittosporum phylliraeoides</i>																																																							



Plant name	Arthur Island	✓																	✓
	Basile Island	✓	✓																✓
	Burnett Rock	✓																	✓
	Burton Island	✓											✓						✓
	Coronation Island	✓																	✓
	Davis Island	✓																	✓
	Eight Island	✓																	✓
	Foale Island																		
	Gaze Island																		
	"Gaze Islet 1"																		
	Gregory Island	✓																	✓
	Gun Island	✓			✓				✓										✓
	"Gun Islet"																		✓
	Hummock Island																		✓
	Iris Refuge Island																		✓
	Jackson Island																		✓
	Jon Jim Island																		✓
	Lagoon Island																		✓
	"Little Jackson Island"	✓																	✓
	Middle Island	✓	✓						✓	✓									✓
	Murray Island		✓																✓
	Newman Island																		✓
	Nook Island																		✓
	One Island	✓																	✓
	Pelsaert Island																		✓
	Post office Island																		✓
	Robertson Island																		✓
	Rondeletia Island																		✓
	Sandy Island																		✓
	Seven Island																		✓
	"Seven Islet"																		✓
	Ship rock																		✓
	Sid Liddon Island																		✓
	Square Island																		✓
	Stick Island																		✓
	Sweet Island																		✓
	The Coral Patch																		✓
	Three Island																		✓
	Travia Island																		✓
	Two Island																		✓
	Uncle Margie Island																		✓

## APPENDIX H

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Code of conduct for visitors to Historical Sites at the Abrolhos Islands (Abrolhos Islands Consultative Council, 1995)

### Code of Conduct for Visitors To Historical Sites at the Abrolhos Islands

Prepared by The Western Australian Maritime Museum

#### Summary

Do's and don'ts for code of conduct for visitors to the Houtman Abrolhos in respect to Historic Areas: the 'look but don't touch' approach:

#### DO

- visit the area;
- enjoy the uniqueness of the site/area;
- appreciate the historic significance of the site/area;
- inform the appropriate authorities of new discoveries;
- inform the appropriate authorities of any observed alteration or damage to historic sites/areas whether by natural and/or other interference;
- provide information on any new find and help the delegated authority (Director, Western Australian Museum) in following up the matter;
- provide information on the whereabouts of relics or articles from a declared shipwreck if they or their present whereabouts have not been notified previously;
- co-operate with an inspector authorised to carry out enquiries and site supervision under the *State Maritime Archaeology Act 1973*, and *Commonwealth Historic Shipwrecks Act 1976*;
- notify appropriate authorities (i.e. Department of Maritime Archaeology, Western Australian Maritime Museum or Branch Curator, Geraldton Maritime Museum) of intention to visit the following sites:
  1. *Batavia* wreck site
  2. Beacon Island
  3. West Wallabi Island – Slaughter Point sites *Zeewijk* wreck site
  4. Gun Island; and
- ensure that you seek advice regarding anchorages for large and small boats in the vicinity of wreck sites so that the wreck site, associated relics, physical and environmental features (reefs etc.) are not disturbed or damaged by boat anchors, mooring lines (etc.).

#### Note: MOORINGS

**Large boats:** Pleasure and/or charter boat operators should be given advice on appropriate (or designated) moorings sites in the vicinity of wreck sites such that the wreck site, associated relics, physical and

environmental features (reefs etc.) are not disturbed or damaged. [This also applies to submerged jetty sites, e.g. Pelsaert Island *et al.*, (see Appendix I).]

**Small boats:** Small boat operators should be given advice on appropriate (or designated) mooring sites in the vicinity of wreck sites in shallower, more sheltered waters (e.g. *Hadda*), such that the wreck site, associated relics, physical and environmental features (reefs etc.) are not disturbed or damaged.

- ensure that persons diving on wreck sites are familiar with the protective legislation
- ensure that boat operators/divers are familiar with the dangers at particular wreck sites

**Note:** It should be stressed that all wreck sites in exposed reef locations i.e. *Batavia*, *Zeewijk*, *Ocean Queen*, *Windsor* and *Ben Ledi* are dangerous for divers and boat operators.

In parts of Europe, particularly where boating and/or diving may be hazardous, where accidents repeatedly occur, and where search and rescue is dependant on volunteer organisations, large public notices display local diving and boating restrictions. For example, divers using SCUBA and/or surface air supply must be able to produce on demand from a delegated authority evidence of certification to dive; must wear regulatory diving and safety equipment (e.g. wet/dry-suits, buoyancy compensators etc.); must not dive alone; may only dive in certain locations during restricted daylight hours so that search and rescue organisations are not put at risk; and so on. In some places e.g. the Swiss lakes, there are also restrictions related to minimum air and water temperatures recommended for diving.

If the Abrolhos Islands are to be opened up for regular tourism, it may be feasible to liaise with appropriate diving/boating authorities to devise a public notice relating to recommended diving standards and boating safety so that potential risks are minimised.

- Ensure that divers are competent to dive on particular wreck sites.
- Ensure that adequate safety provisions have been made for diving/boating (e.g. dive flags, flares, first-aid/oxy-viva resuscitation equipment etc.).
- Ensure that adequate supplies of fresh water are carried on board boats and/or taken ashore.
- Ensure that someone (e.g. OTC, volunteer rescue, etc.) is informed of your intended boating/diving movements.
- Ensure all personal litter is taken with you when you leave.
- Watch where you are walking on land so that relics (and natural fauna/flora) are not disturbed or damaged.

### DO NOT

- remove relics or articles, interfere with or damage declared historic wreck sites or sites not yet assessed; or
- enter without a permit a declared prohibited zone round a wreck site;
- take on to any wreck site spearfishing or salvage equipment unless permitted to do so;
- remove relics or articles, interfere with or damage declared maritime archaeological sites (on land) or sites not yet assessed; or
- carry out any digging or major earthworks within protected zones round declared maritime archaeological sites unless permitted to do so.

Sites in the following areas have ‘protected zone’ restrictions:

**WALLABI GROUP**

- Beacon Island;
- Long Island;
- Traitors Island and other small islands of Morning Reef; and
- West Wallabi.

**PELSAERT GROUP**

- Gun Island;
- Middle Island;
- Pelsaert Island; and
- Do not take metal-detecting devices into any of the designated historic areas without approval from the Director, Western Australian Museum.

**PLEASE HELP TO PROTECT OUR MARITIME HERITAGE FOR ALL TO ENJOY**

- No. 1** The Report of the Southern Western Australian Shark Working Group. Chairman P.Millington (1986).
- No. 2** The Report of the Fish Farming Legislative Review Committee. Chairman P.Rogers (1986).
- No. 3** Management Measures for the Shark Bay Snapper 1987 Season. P. Millington (1986).
- No. 4** The Esperance Rock Lobster Working Group. Chairman A. Pallot (1986).
- No. 5** The Windy Harbour - Augusta Rock Lobster Working Group. Interim Report by the Chairman A. Pallot (1986).
- No. 6** The King George Sound Purse Seine Fishery Working Group. Chairman R. Brown (1986).
- No. 7** Management Measures for the Cockburn Sound Mussel Fishery. H. Brayford (1986).
- No. 8** Report of the Rock Lobster Industry Advisory meeting of 27 January 1987 . Chairman B. Bowen (1987).
- No. 9** Western Rock Lobster Industry Compensation Study. Arthur Young Services (1987).
- No. 10** Further Options for Management of the Shark Bay Snapper Fishery. P. Millington (1987).
- No. 11** The Shark Bay Scallop Fishery. L. Joll (1987).
- No. 12** Report of the Rock Lobster Industry Advisory Committee to the Hon Minister for Fisheries 24 September 1987. (1987)
- No. 13** A Development Plan for the South Coast Inshore Trawl Fishery. (1987)
- No. 14** Draft Management Plan for the Perth Metropolitan Purse Seine Fishery. P. Millington (1987).
- No. 15** Draft management plan, Control of barramundi gillnet fishing in the Kimberley. R. S. Brown (1988).
- No. 16** The South West Trawl Fishery Draft Management Plan. P. Millington (1988).
- No. 17** The final report of the pearling industry review committee . F.J. Malone, D.A. Hancock, B. Jeffriess (1988).
- No. 18** Policy for Freshwater Aquaculture in Western Australia. (1988)
- No. 19** Sport Fishing for Marron in Western Australia - Management for the Future. (1988)
- No. 20** The Offshore Constitutional Settlement, Western Australia 1988.
- No. 21** Commercial fishing licensing in Western Australia. (1989)
- No. 22** Economics and marketing of Western Australian pilchards. SCP Fisheries Consultants Pty Ltd (1988).
- No. 23** Management of the south-west inshore trawl fishery. N. Moore (1989)
- No. 24** Management of the Perth metropolitan purse-seine fishery. N. Moore (1989).
- No. 25** Rock Lobster Industry Advisory Committee report to the Minister for Fisheries November 1988. (1989)
- No. 26** A report on marron fishing in Western Australia. Chairman Doug Wenn MLC (1989).
- No. 27** A review of the Shark Bay pearling industry. Dr D.A.Hancock, (1989).
- No. 28** Southern demersal gillnet and longline fishery. (1989)
- No. 29** Distribution and marketing of Western Australian rock lobster. P. Monaghan (1989).
- No. 30** Foreign investment in the rock lobster industry. (1989)
- No. 31** Rock Lobster Industry Advisory Committee report to the Hon Minister for Fisheries September 1989. (1989)
- No. 32** Fishing Licences as security for loans. P. Rogers (1989)
- No. 33** Guidelines for by-laws for those Abrolhos Islands set aside for fisheries purposes. N. Moore (1989).

- No. 34** The future for recreational fishing - issues for community discussion. Recreational Fishing Advisory Committee (1990).
- No. 35** Future policy for charter fishing operations in Western Australia. P. Millington (1990).
- No. 36** Long term management measures for the Cockburn Sound restricted entry fishery. P. Millington (1990).
- No. 37** Western rock lobster industry marketing report 1989/90 season. MAREC Pty Ltd (1990).
- No. 38** The economic impact of recreational fishing in Western Australia. R.K. Lindner, P.B. McLeod (1991).
- No. 39** Establishment of a registry to record charges against fishing licences when used as security for loans. P. Rogers. (1991)
- No. 40** The future for Recreational Fishing - Forum Proceedings. Recreational Fishing Advisory Committee (1991)
- No. 41** The future for Recreational Fishing - The Final Report of the Recreational Fishing Advisory Committee. Recreational Fishing Advisory Committee (1991).
- No. 42** Appendix to the final report of the Recreational Fishing Advisory Committee. (1991)
- No. 43** A discussion of options for effort reduction. Southern Gillnet and Demersal Longline Fishery Management Advisory Committee (1991).
- No. 44** A study into the feasibility of establishing a system for the buy-back of salmon fishing authorisations and related endorsements. (1991)
- No. 45** Draft Management Plan, Kimberley Prawn Fishery. (1991)
- No. 46** Rock Lobster Industry Advisory Committee, Chairman's report to the Minister (1992)
- No. 47** Long term management measures for the Cockburn Sound restricted entry fishery. Summary of submissions and final recommendations for management. P. Millington (1992).
- No. 48** Pearl oyster fishery policy guidelines (Western Australian Pearling Act 1990). Western Australian Fisheries Joint Authority (1992).
- No. 49** Management plan, Kimberley prawn fishery. (1992)
- No. 50** Draft management plan, South West beach seine fishery. D.A. Hall (1993).
- No. 51** The west coast shark fishery, draft management plan. D.A. Hall (1993).
- No. 52** Review of bag and size limit proposals for Western Australian recreational fishers. F.B. Prokop (May 1993).
- No. 53** Rock Lobster Industry Advisory Committee, Chairman's report to the Minister for Fisheries. (May 1993)
- No. 54** Rock Lobster Industry Advisory Committee, Management proposals for 1993/94 and 1994/95 western rock lobster season (July 1993).
- No. 55** Rock Lobster Industry Advisory Committee, Chairman's report to the Minister for Fisheries on management proposals for 1993/94 and 1994/95 western rock lobster seasons (September 1993).
- No. 56** Review of recreational gill, haul and cast netting in Western Australia. F. B. Prokop (October 1993).
- No. 57** Management arrangements for the southern demersal gillnet and demersal longline fishery 1994/95 season. (October 1993).
- No. 58** The introduction and translocation of fish, crustaceans and molluscs in Western Australia. C. Lawrence (October 1993).
- No. 59** Proceedings of the charter boat management workshop (held as part of the 1st National Fisheries Manager Conference). A. E. Magee & F. B. Prokop (November 1993).

- No. 60** Bag and size limit information from around Australia (Regulations as at September 1993) F. B. Prokop (January 1993).
- No. 61** Economic impact study. Commercial fishing in Western Australia Dr P McLeod & C McGinley (October 1994)
- No. 62** Management arrangements for specimen shell collection in Western Australia. J. Barrington, G. Stewart (June 1994)
- No. 63** Management of the marine aquarium fish fishery. J. Barrington (June 1994)
- No. 64** The Warnbro Sound crab fishery draft management plan. F. Crowe (June 1994)
- No. 65** Not issued
- No. 66** Future management of recreational gill, haul and cast netting in Western Australia and summary of submissions to the netting review. F.B. Prokop, L.M. Adams (September 1994)
- No. 67** Long term management strategies for the Western Rock Lobster Fishery. (4 volumes) Evaluation of management options Volume 1. B. K. Bowen (September 1994)
- No. 68** Long term management strategies for the Western Rock Lobster Fishery. (4 volumes) Economic efficiency of alternative input and output based management systems in the western rock lobster fishery, Volume 2. R.K. Lindner (September 1994)
- No. 69** Long term management strategies for the Western Rock Lobster Fishery. (4 volumes) A market-based economic assessment for the western rock lobster industry, Volume 3. Marec Pty Ltd (September 1994)
- No. 70** Long term management strategies for the Western Rock Lobster Fishery. (4 volumes) Law enforcement considerations, Volume 4. N. McLaughlan (September 1994)
- No. 71** The Rock Lobster Industry Advisory Committee Chairman's Report, October 1994, The Western Rock Lobster Fishery - Management proposals for the 1994/95 and 1995/96 seasons (November 1994)
- No. 72** Shark Bay World Heritage Area draft management plan for fish resources. D. Clayton (November 1994)
- No. 73** The bag and size limit review: new regulations and summary of submissions. F. Prokop (May 1995)
- No. 74** Report on future management options for the South West trawl limited entry fishery. South West trawl limited entry fishery working group (June 1995)
- No. 75** Implications of Native Title legislation for fisheries management and the fishing industry in Western Australia. P. Summerfield (February 1995)
- No. 76** Draft report of the South Coast estuarine fishery working group. South Coast estuarine fishery working group. (February 1995)
- No. 77** The Offshore Constitutional Settlement, Western Australia. H. Brayford & G. Lyon (May 1995)
- No. 78** The Best Available Information - Its Implications for Recreational Fisheries Management. Workshop at Second National Fisheries Managers Conference, Bribie Island Queensland. F. Prokop (May 1995)
- No. 79** Management of the Northern Demersal Scalefish Fishery. J. Fowler (June 1995)
- No. 80** Management arrangements for specimen shell collection in Western Australia, 1995. J. Barrington & C. Campbell (March 1996)
- No. 81** Management Options (Discussion Paper) for the Shark Bay Snapper Limited Entry Fishery. Shark Bay Snapper Limited Entry Fishery Working Group, Chaired by Doug Bathgate (June 1995)
- No. 82** The Impact of the New Management Package on Smaller Operators in the Western Rock Lobster Fishery R. Gould (September 1995)

- No. 83** Translocation Issues in Western Australia. Proceedings of a Seminar and Workshop held on 26 and 27 September 1994. F. Prokop (July 1995)
- No. 84** Bag and Size Limit Regulations From Around Australia. Current Information as at 1 July 1995. Third Australasian Fisheries Managers Conference, Rottneest Island. F. Prokop (July 1995)
- No. 85** West Coast Rock Lobster Fishery Management Plan 1995 - Draft for Public Comment. Edited by M. Moran (August 1995)
- No. 86** A Review of Ministerial Policy Guidelines for Rock Lobster Processing in Western Australia from the Working Group appointed by the Minister for Fisheries and chaired by Peter Rich (December 1995)
- No. 87** Same Fish - Different Rules. Proceedings of the National Fisheries Management Network Workshop held as part of the Third Australasian Fisheries Managers Conference. F. Prokop
- No. 88** Balancing the Scales - Access and Equity in Fisheries Management - Proceedings of the Third Australasian Fisheries Managers Conference, Rottneest Island, Western Australia 2 - 4 August 1995. Edited by P. Summerfield (February 1996)
- No. 89** Fishermen's views on the future management of the rock lobster fishery. A report. Prepared on behalf of the Rock Lobster Industry Advisory Committee by The Marketing Centre. (August 1995)
- No. 90** A report on the issues effecting the use of the Dampier Archipelago. Peter Driscoll, Landvision Pty Ltd (March 1996)
- No. 91** Shark Bay World Heritage Property - Management Paper for Fish Resources. Kevin A Francesconi (September 1996)
- No. 92** Pearling and Aquaculture in the Dampier Archipelago - Existing and Proposed Operations. A report for public comment. Compiled by Ben Fraser (September 1996)
- No. 93** Shark Bay World Heritage Property - Summary of Public Submissions to the Draft Management Plan for Fish Resources. Kevin A Francesconi (September 1996)
- No. 94** Rock Lobster Industry Advisory Committee Report - Management arrangements for the Western Rock Lobster Fishery for the 1997/98 season. Frank Prokop (May 1997)
- No. 95** Australian Salmon and Herring Resource Allocation Committee. P McLeod & F Prokop (in press)
- No. 96** Summary Report of the Freshwater Aquaculture Taskforce (FAT) by Chris Wells (in press)
- No. 97** (in press)
- No. 98** A Pricing Policy for Fisheries Agencies - Standing Committee on Fisheries and Aquaculture Management Committee. P Millington (March 1997)
- No. 99** Management of the South Coast Purse Seine Fishery. J Fowler, R Lenanton, Kevin Donohue, M Moran & D Gaughan.
- No. 100** The Aquaculture of non-endemic species in Western Australia - Redclaw crayfish (*Cherax quadricarinatus*). Tina Thorne (June 1997)
- No. 101** Optimising the worth of the catch - Options and Issues. Marec Pty Ltd (September 1997)
- No. 102** Marine farm planning and consultation processes in Western Australia. Dave Overall (August 1997)
- No. 103** Future management of the aquatic charter industry in Western Australia by the Tour Operators Fishing Working Group (September 1997).
- No. 104** Management of the Houtman Abrolhos System (draft). Prepared by the Abrolhos Islands Management Advisory Committee in conjunction with Fisheries Western Australia (October 1997)

- No. 105** Plan for the Management of the Houtman Abrolhos Fish Habitat Protection Area (draft). Prepared by the Abrolhos Islands Management Advisory Committee in conjunction with Fisheries Western Australia (October 1997)
- No. 106** The impact of Occupational Safety and Health on the management of Western Australian Fisheries. Cameron Wilson (in press)
- No. 107** The Aquaculture of non-endemic species in Western Australia - Silver Perch (*Bidyanus bidyanus*). Tina Thorne (June 1997)
- No. 108** Issues affecting Western Australia's inshore crab fishery - Blue swimmer crab (*Portunus pelagicus*), Sand crab (*Ovalipes australiensis*). Cathy Campbell (September 1997)
- No. 109** Abalone Aquaculture in Western Australia. Cameron Westaway & Jeff Norriss (October 1997)
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- No. 142** Fisheries Environmental Management Plan for the Gascoyne Region (June 2002)
- No. 143** Western Rock Lobster. Discussion paper for seasons 2001/2002 and 2002/2003 (July 2000)
- No. 144** The Translocation of Brown Trout (*Salmo trutta*) and Rainbow Trout (*Oncorhynchus mykiss*) into and within Western Australia. Prepared by Jaqueline Chappell, contributions from Simon Hambleton, Dr Howard Gill, Dr David Morgan and Dr Noel Morrissy. (not published, superseded by MP 156)
- No. 145** The Aquaculture of non-endemic species in Western Australia - Silver Perch (*Bidyanus bidyanus*). As amended October 2000. Tina Thorne. This replaces Fisheries Management Paper No. 107.
- No. 146** Sustainable Tourism Plan for the Houtman Abrolhos Islands (February 2001)
- No. 147** Draft Bycatch Action Plan for the Shark Bay Prawn Managed Fishery (Full Report) (April 2002)
- No. 148** Draft Bycatch Action Plan for the Shark Bay Prawn Managed Fishery (Summary Report) (April 2002)
- No. 149** Final Plan of Management for the Lancelin Island Lagoon Fish Habitat Protection Area (March 2001)

- No. 150** Draft Plan of Management for the Cottesloe Reef Proposed Fish Habitat Protection Area (April 2001)
- No. 151** Inventory of the Land Conservation Values of the Houtman Abrolhos Islands (July 2003)
- No. 152** Guidelines for the Establishment of Fish Habitat Protection Areas (June 2001)
- No. 153** A Five-Year Management Strategy for Recreational Fishing on the West Coast of Western Australia. Final Report of the West Coast Recreational Fishing Working Group (August 2001).
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- No. 157** Policy for the Implementation of Ecologically Sustainable Development for Fisheries and Aquaculture within Western Australia. By W.J. Fletcher (May 2002)
- No. 158** Draft Plan of Management for the Miaboolya Beach Fish Habitat Protection Area (March 2002)
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- No. 160** The Introduction and Aquaculture of Non-endemic Species in Western Australia: the 'Rotund' Yabby *Cherax rotundus* and the All-male Hybrid Yabby. A Discussion Paper. (June 2002)
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- No. 165** Report to the Minister for Agriculture, Forestry and Fisheries by the Integrated Fisheries Management Review Committee (November 2002)
- No. 166** Fisheries Statutory Management Authority Inquiry. A background paper (February 2003)
- No. 167** Draft Fisheries Environmental Management Plan for the Northern Region (in press)
- No. 168** Aboriginal Fishing Strategy: Report to the Minister for Agriculture, Forestry and Fisheries by the Hon E. M. Franklyn QC, Chairman of the Aboriginal Fishing Strategy Working Group
- No. 169** Hardy Inlet discussion paper (in press)
- No. 170** Management of the proposed Geographe Bay Blue Swimmer and Sand Crab Managed Fishery. By Jane Borg and Cathy Campbell (August 2003)
- No. 171** Draft Aquaculture Plan for Shark Bay (in press)
- No. 172** Draft Aquaculture Plan for Exmouth Gulf (in press)
- No. 173** Draft Plan of Management for the proposed Point Quobba Fish Habitat Protection Area (August 2003)