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# SOUTH AUSTRALIA'S OFFSHORE ISLANDS

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DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

# South Australia's Offshore Islands

Tony Robinson, Peter Canty,
Trish Mooney and Penny Rudduck

BIOLOGICAL SURVEY
SOUTH AUSTRALIA

Resource Management Branch
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# Foreword

*Offshore* islands are special places, and South Australia is fortunate in having more than 150 islands spread around its coastline. This large number may come as a surprise to today's South Australians, who might also be surprised by the numbers and variety of plants and animals that can be found on these island sanctuaries.

Some of the State's most remote islands are almost unchanged since the arrival of Europeans; many of the larger islands are time-capsules of human influence on the Australian continent. During the most recent Ice Age, when sea-levels were lower, all of South Australia's islands were connected to the mainland and formed an important part of the hunting territories of the coastal Aboriginal people. Aboriginal tradition tells of a time when the seas rose to form our present-day islands, complete with their cargoes of plants and animals.

Pieter Nuyts—who, in 1627, was the first known European voyager to have reached the shores of South Australia—explored and named the islands of St Peter and St Francis, in what Matthew Flinders later named Nuyts Archipelago. Flinders also noted the vast concentrations of whales, fur-seals and sea-lions on and around the islands, and this brought lawless bands of tough sealers and whalers into these waters from the 1820s. European settlement of South Australia came later, and again the islands were important places where stock could be run and settlers could live secure from the pressures of the dingos and displaced Aboriginal groups that made settlement of the South Australian mainland so difficult in those early years.

The island settlers faced droughts, fluctuating commodity prices and spiralling transport costs, and most were forced to abandon their island homes. In the 1960s many of the islands were designated Fauna Conservation Reserves by the then Fisheries Department; a far-sighted move that was largely the work of Fauna Officer Lawrie Delroy. Today's island visitors owe him a large debt of gratitude.

For more than ten years Tony Robinson, Peter Canty and their colleagues in South Australia's government conservation agencies visited and studied the biology of our islands, and made many discoveries that reinforced the great conservation asset we have in our islands. Here are our breeding colonies of Cape Barren Geese, fascinating populations of Black Tiger Snakes, tens of thousands of Short-tailed Shearwaters and the last known population in the world of the Greater Stick-nest Rat.

The story of this long-running biological survey, set against the geological and human history researched and written by Trish Mooney and Penny Rudduck, has finally come together.

Since the biological survey was completed, an exciting initiative has been the use of some of our islands for the reintroduction of mammal species that have been extinct on the mainland of South Australia for many years. This program, run by my Department, has resulted in thriving populations of Brush-tailed Bettongs and Stick-nest Rats on a number of islands, with the exciting prospect of establishing these species in carefully selected areas of the mainland where effective fox, rabbit and feral cat control can be achieved. Properly managed island populations will be important sources of wild-adapted animals for future reintroduction programs.

The Australian Heritage Commission has supported the project philosophically and financially from the very earliest years of the island biological survey, through assistance with fieldwork, analysis of the masses of biological data and finally in the publication of this book—a fine and positive example of co-operation between State and Commonwealth Governments, and one that I hope will be an inspiration to the people of South Australia to ensure our offshore island heritage is appreciated and respected for future generations to enjoy.

*Hon. David Wotton MP*
*Minister for the Environment and Natural Resources*
*South Australia*

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# *Abbreviations and Acronyms*

Standard abbreviations used throughout the text are:
Hectare(s) ha
Kilometre(s) km
Metre(s) m
Centimetre(s) cm
Milliseconds ms

BP Before the Present
MA Million years ago
DENR Department of Environment and Natural Resources
SANPWS South Australian National Parks and Wildlife Service

# Preface

I am very pleased to be able to provide the preface to this book, a study of the natural and cultural history of the offshore islands of my home state, South Australia.

The appearance of *South Australia's Offshore Islands* is timely because of the interest shown by all governments in coastal issues. Our coasts and oceans are of tremendous importance to Australians and understandably the community expect governments to ensure that they are responsibly managed for both current and future generations.

While many people may think of our coastline in terms of its beaches and the surf, islands are, in fact, an integral part of Australia's coastal zone. South Australia's offshore islands are what is left of the larger continental landmass that existed about 17 000 years ago, during the most recent Ice Age.

Isolated since then by rising sea levels, many of the offshore islands covered in this study are the homes of native mammals that are extinct on the mainland. The offshore islands of South Australia are also very important areas for animals, such as seabirds and seals, which depend on the environmental conditions that they provide.

While the isolation of the islands has helped save these species, the islands are still fragile places which can be threatened by the activities of human beings and consequential problems like the introduction of weeds, feral animals and fire.

This very comprehensive biological survey of a large number of South Australia's offshore islands is an excellent example of how the Commonwealth and the States are working together. This joint venture has produced research about our natural and cultural heritage, made the results available for a wide range of audiences and recommended ways of ensuring this part of our heritage is conserved.

The Commonwealth Government is committed to working co-operatively with the States, Territories and Local Governments to achieve lasting solutions to Australia's environmental problems. A firm foundation in good and comprehensive science is an important part of that process and the results of detailed research such as *South Australia's Offshore Islands* adds significantly to our knowledge base.

*South Australia's Offshore Islands* not only draws together information on island natural and cultural history, but also contributes in a significant way to the dissemination of the research, much of it not previously published, not only to the scientific community, but to the interested public.

The study has dramatically increased the understanding of the biodiversity of the South Australian coastal environment and improved the ability of the South Australian Government to manage its offshore island conservation areas.

The Australian Heritage Commission has assisted the Resource Management Branch of the now South Australian Department of Environment and Natural Resources to publish *South Australia's Offshore Islands*, the culmination of many years of detailed, exacting study by the authors and the only island study of this kind conducted in South Australia.

National Estate grant funding was provided by the Commonwealth Government for fieldwork and analysis of biological survey data in the 1970s and 1980s. The Australian Heritage Commission has contributed funds towards the production costs of this book and has updated sections on Aboriginal and historical information as it relates to the Register of the National Estate—Australia's list of significant natural and cultural places.

Listing in the Register alerts governments, planners, decision-makers, researchers and the community to the heritage values of these places, so they can take action to conserve them. There were more than 11 000 cultural and natural places listed in the Register of the National Estate at 30 June 1996, 1249 of which are in South Australia.

Much of the draft material in the study was used by the Commission for the nomination of island conservation parks in South Australia for the Register of the National Estate. While many of the islands covered by this book were already entered in the Register, this research was used to update descriptions and statements of significance for the islands concerned.

This book now brings the national heritage importance of these islands to the notice of the Australian and international public. As a South Australian and as Commonwealth Minister for the Environment, I am delighted to be able to help pass on the message of how important they are and why ensuring that they are responsibly managed is so important for the future.

*Robert Hill*
*Leader of the Government in the Senate*
*Minister for the Environment*

*Canberra*
*December 1996*

# Acknowledgments

*Many* people have contributed to this study of South Australia's islands. There have been many and various forms of transport to the islands. Special thanks in this regard are due to Dick Leach who, with his boat *Tradewinds,* managed to transport our large group out to and around the Sir Joseph Banks Group in 1979. Officers of the South Australian Department of Primary Industries, Fisheries Division, have transported us to a number of other islands.

The help of Commonwealth Department of Transport and Communications in providing and paying for helicopter landings on Sibsey, South Page, North Neptune, Hart and Franklin Islands to examine possible sites for new lighthouses has enabled the senior author to gather some basic information on these islands.

Helicopter pilots from Lloyd Aviation have landed us wherever we wanted to go, often in very tricky weather, and we are very grateful for the skills of Tom Supple around the Whidbey and Investigator Groups, Bob Thompson in the Nuyts Archipelago, and John Lundh around the Port Lincoln islands and for an unforgettable helicopter ride around the coast of Kangaroo Island looking for seals.

Where islands were inhabited, we thank the following for the many ways in which they helped us when we were looking at their island homes: the Williams family and John Nicholls on St Peter Island; the Woolfords on Flinders Island; the Modras on Thistle Island; and the Growdens on Wedge Island. The two lighthouses still in operation also enabled us to meet and talk with the last people in South Australia engaging in this splendidly isolated way of life—Bill Bull and Denis Neyland on South Neptune and David Cinzio and Aubrey Strydom on Althorpe.

Many people have shared our island trips and risked life and limb landing in small boats. They helped collect much of the data that make up this survey, and other island visitors have contributed information since the main survey. Our thanks to Peter Aitken, Peter Alexander, Dave Armstrong, Brenton Arnold, Lindsay Best, Robert Brandle, Lothar Brasse, Keith Casperson, Geoff Chapman, Chris Chapman, Peter Cockerham, Neville Coleman, Peter Copley, John Cox, Lawrie Delroy, Terry Dennis, Tommy Dodd, Pearce Dougherty, Mick Dredge, Tim Fatchen, Tim Fraser, Mal Hansen, Mike Harper, Julia Haska, Rod Henderson, Mike Hewett, Larry Higgins, Peter Hornsby, John Howard, Eric Jackson, Bob Jenkins, Sam Jericho, Deborah Jordan, Alex McDonald, Peter Macrow, Katherine Moseby, Don Mount, Lyn Nelson, Ian Olsen, John Ottaway, Shane Parker, Lyn Pedler, Tom Power, Viv Read, Gary Richardson, Greg Rowberry, Terry Schwaner, Andy Spiers, Kathy Stephens, Robin Storr, Scoresby Shepherd, Mike Smyth, Chris Tidemann, Ifor and Pat Thomas, Fraser Vickery, Mike Young and Wolfgang Zeidler.

We are also grateful for all the help we received in the preparation of this report. The staff of the State Herbarium of South Australia and the South Australian Museum, in addition to helping in some of the island field trips, identified all the specimens we collected and some have also critically read and commented on parts of the manuscript. The chapter on the geology of the islands could not have been written without the help of a number of people in the Department of Mines and Energy, and particular thanks are due to Richard Flint who freely gave us access to much unpublished information. Yve Reynolds and Bill Jeffrey from the State Heritage Branch helped with the cultural history chapter. The computing problems of handling such an amount of information were large, and we are indebted to Pat Bennett, Peter Brooke-Smith, Alex Gunjko, Ian Musto and Tom Stubbs for their contributions.

Many people assisted with information on the history of the islands. Addie Borkus and Peter Koerber of the Federal Department of Transport and Communications gave us most of the information on lighthouses, and critically read the manuscript of this section. In addition to those people already mentioned who still lived on the islands at the time of our surveys, former island residents provided much interesting information. An early draft of the manuscript was extensively edited by Julia Haska, and Glenys Maeder and Jenny Rodrigues typed the many drafts of the manuscript. All the figures with the exception of the vegetation maps were prepared by Robyn Tregoweth. The vegetation maps were drafted by Christine Verporten and Darryl Wickham.

Finally, the survey could not have been completed without extra financial support to the South Australian National Parks and Wildlife Service (SANPWS), and we are grateful for grants to cover some of the fieldwork and the subsequent computer analysis from the Australian Heritage Commission and from the South Australian National Parks and Wildlife Service Wildlife Conservation Fund.

*Tony Robinson*
*Peter Canty*

# Introduction

*Islands* have a fascination for most people, and the experience of being on a small piece of land surrounded by ocean is difficult to describe. Tony Robinson and Peter Canty visited most of South Australia's offshore islands between 1971 and 1982: this publication is a compilation of the information collected on these surveys and selected previously published and unpublished information to produce, for the first time, a guide to most of South Australia's 150-odd offshore islands. The islands covered are listed in Table 8.

Several groups of islands are not covered in this publication; these include the islands in Pelican Lagoon, on Kangaroo Island, Kangaroo Island itself and the islands in the Coorong Lagoon. Torrens and Garden Islands, the mangrove- and saltmarsh-covered islands north of Port Adelaide and Entrance Island in Franklin Harbour, as they are better treated as part of the mangrove complex along the St Vincent Gulf and Spencer Gulf coasts.

The division of labour among the four authors is as follows: Tony Robinson and Peter Canty carried out most of the field work; Trish Mooney and Penny Rudduck visited only a small number of islands. Trish Mooney contributed *The Formation of the Islands*, while Penny Rudduck contributed the cultural history chapter, and Peter Canty compiled Chapters 4 to 11 and helped with the other biological chapters. Tony Robinson prepared the rest and, as senior author, compiled the publication and must accept the blame for any errors.

Because of the variety of islands visited, there were considerable differences in the amount of difficulty experienced in landing on them, from wading from the nearby mainland at low tide, to the use of a helicopter to reach otherwise inaccessible islands. Boats (used for day trips, returning to the mainland in the evening, or for overnight camps on the islands) meant that a large number of people and gear could be transported and a lot of survey work could be accomplished: the largest trip of this type was to the Sir Joseph Banks Group. The disadvantages of boat-based expeditions are that they depend on good weather and a relatively calm sea to permit a landing on most of the islands, and it takes a considerable time to travel between islands.

Helicopter-based expeditions, on the other hand, place severe limitations on both the number of people who can be involved and the amount of gear that can be carried. Two of these lightweight expeditions were carried out to the Whidbey and Investigator Groups, the islands off Yorke Peninsula, the Kangaroo Island coast and near Port Lincoln. The advantages of helicopter-based expeditions are that landings can be made in all but the most extreme weather conditions on islands inaccessible by any other method, and that travelling time between islands is reduced to a minimum, allowing maximum survey time: helicopter-based expeditions were made to Nuyts Archipelago and the Isles of St Francis, when a relatively large number of people and a large amount of gear were transported to two island base camps with subsequent day visits to surrounding islands.

Despite these problems, a standardised set of survey methods was used for each island, with data collected on the vegetation and vertebrate fauna; details of these methods can be found in Robinson and Canty (1984). Survey information was then combined with published information (listed in the Bibliography); in general, all references to the biology of the islands in this report relate to the authors' personal experiences during the field surveys, though some published and unpublished information has also been used to fill out the story.

There are two ways to use this book. If you have a general interest in South Australia's islands, start at the beginning and read the whole publication; if you have an interest in a particular island turn to Part Two: A Guide to the Islands, where you will find a useful summary and (for the larger islands) an island map.

# *How to Behave on your Island Visit*

**M*ost*** of South Australia's offshore islands are proclaimed as national or conservation Parks and many are remote and seldom visited. The sea approaches to many of them are hazardous and should not be attempted by the inexperienced or the unprepared.

All islands are valuable conservation areas and visitors should leave them as undisturbed as possible. Because of their restricted size, any visit to an island can cause some impact but this can be reduced by following minimal impact bushwalking and camping codes developed for natural areas of the mainland.

Following the ten commonsense rules set out below will allow you to enjoy and benefit from your island visit without spoiling it for future visitors.

1. *Before your visit,* contact the appropriate office of the Department of Environment and Natural Resources at Mount Gambier, Victor Harbor, Adelaide, Stenhouse Bay, Port Lincoln or Ceduna, for the latest information, particularly about prohibited areas and whether camping is permitted.

2. *All plants and animals are protected* and should not be damaged or disturbed.

3. *Island wildlife is particularly sensitive to disturbance* and some island species have already become extinct since the European settlement of South Australia. Please treat all island wildlife with respect.

*Sea-lions and fur-seals are particularly vulnerable to disturbance when breeding,* which can lead directly to increased deaths if females become separated from their young, which can then be trampled by larger animals.

*Particular care should also be taken not to approach nesting seabirds too closely.*

This can allow ever-present gulls to take eggs or chicks or, in some cases, cause all birds to abandon the nesting colony. Nesting Sea-eagles and Ospreys also should not be approached. Walking over areas where burrow-nesting seabirds have their colonies can cause destruction of burrows, eggs and chicks.

*Many of South Australia's offshore islands support large populations of venomous snakes* and extra caution should be taken. Be aware of the latest first aid recommendations for the treatment of snake bite.

4. *It is important to keep our islands free from introduced plants and animals.* Those that have already invaded have sometimes caused irreparable changes resulting in some island species become extinct. Many of our islands are free of introduced rats and mice. Weed seeds can be unintentionally carried on clothing. Please take particular care not to introduce these destructive pests from your boat or in material landed on the island. Please report any new introductions so they can be controlled at an early stage.

5. *Pets are not allowed on any islands.* Dogs and cats in particular, can kill large numbers of often very easily approachable island birds and animals and could introduce parasites and diseases.

6. *Islands are particularly vulnerable to fire.* Where possible, all cooking should be done on board on your boat. Wood fires are not permitted on any of the island national or conservation parks.

7. *Firearms are prohibited in all national and conservation parks.*

8. *The remains of past Aboriginal or European use of the islands are a significant part of our history.* Please leave these important sites as you find them.

9. *Island geology and landscape features are also protected.* Collection of samples, defacing and graffiti, or building cairns are not permitted.

10. *All rubbish must be taken away from the islands* and properly disposed of on the mainland. *Do not throw rubbish into the sea.*

This book provides a summary of island knowledge which is as up-to-date as possible. In many cases, however, the information was obtained from quite limited surveys, so there is considerable opportunity to expand on them.

Using this book as a guide, even the casual visitor can contribute to our knowledge of the islands by noting any species of plant or animal not previously recorded, making general observations of interest, or reporting overlooked local histories or personal experiences.

The authors would greatly appreciate any such feedback, not only to improve future editions of this book, but as a valuable contribution to island conservation and management.

South Australia's offshore islands are special places, and the conservation creed applies:

*Leave Only Footprints*

*Take Only Photographs*

# Part One

# Life On The Islands

*Chapter*

# 1 FORMATION OF THE ISLANDS

The islands off the coastline of South Australia are the eroded remnants of the continental landmass that formerly extended seaward from the present coastline. All were connected to the mainland at the height of the most recent glaciation (Ice Age) about 17000 years ago, and have been isolated by rising sea levels since then.

The morphology or physical form of the islands generally reflects their rock type and structure. The granite inselbergs of Pearson Island (Plate 1) display perfect sheet structure, with granite pavements sloping gently into the sea; the small dune or limestone islands and rocks of the south-east have irregular cliffed outlines etched by the action of wind and sea on these soft, sandy sediments; and elsewhere—for example, in the Nuyts Archipelago and Whidbey Isles—this younger dune calcarenite (Plate 2) forms a distinctive capping on ancient granite and volcanic rocks.

The continuing action of deposition and erosion along the coast underlines the changing nature of islands. Wave action over a long period can build up a sand spit, connecting a former island to the mainland: Wilson's Promontory on the southern coast of Victoria is an example of this landform, known as a tombolo. In other cases, the eroding force of the waves on relatively soft rocks has gradually severed the connection between a headland and the adjacent coast. Penguin Islet, near Beachport, has been isolated in this way since sea levels reached their present position, while Cape Northumberland south of Mount Gambier is still connected to the mainland by a narrow span of rock. Similarly, the kind of wave action to which islands are exposed influences the morphology they develop; many of the West Coast islands, for example, have a marked asymmetry, with strongly cliffed sides facing the westerly and south-westerly ocean swells.

**Plate 1.** Granite weathering on Pearson Island. Photo A.C. Robinson.

**Plate 2.** Layering in aeoleonite cliffs on St Francis Island. Photo P.D. Canty.

Chapters 4 to 11 refer to the major rock formations exposed on each island, as far as they are known.

The following pages are a brief summary of the geological history of the State with particular reference to its islands, and attempt to define the time and sequence of island formation during the Holocene sea level rise. Much of the material on the exposures of ancient Precambrian rocks on the West Coast islands is based on a 1974 helicopter survey by members of the South Australian Department of Mines and Energy.

## Geological Background

The rock types exposed on South Australia's offshore islands are closely related to those on the adjacent mainland (Figure 1). They represent a considerable period of geological time, from Archaean time more than 2500 million years ago (2500 Ma) when the foundation of the Australian continent was laid down, to the time of the great Pleistocene Ice Age, which waxed and waned from about 1.8 million to 17000 years ago.

The following outline of the geology of South Australia focuses on the events represented in the geology of the islands, and provides a framework for the understanding of these events.

### The ancient geological history of South Australia: 2500–150 Ma

Archaean (2500 Ma and older) and Proterozoic (2500 Ma–570 Ma) rocks on the islands of the West Coast form part of the Gawler Craton, a large region of very old continental crust covering much of South Australia. There is a great variety of rock types, including granites, gneisses, metamorphosed sediments and volcanics.

The oldest rocks so far dated in South Australia are Archaean–Early Proterozoic granites and gneisses from southern Eyre Peninsula and the Whidbey Isles, whose ages range from 2300 to 2600 Ma (Cooper et al. 1976; Webb et al. 1982). These crystalline rocks of the Sleaford Complex were formed by granite intrusion and intense folding and metamorphism of older Archaean sediments. The Whidbey Granite, whose known outcrops are restricted to Greenly Island, Rocky Island and the Four Hummocks was intruded during this period of deformation, known as the Sleafordian Orogeny. Rocks of Archaean age were first recognised in South Australia in the mid-1970s from the Whidbey Isles and Cape Carnot, near Port Lincoln (Webb et al. 1982).

For the next 500 million years these ancient fold ranges were slowly worn down by erosion. About 2000 Ma the sediments of the Hutchinson Group were deposited on Eyre Peninsula. Major folding and metamorphism of the Hutchinson Group (and underlying Sleaford Complex) occurred during the Kimban Orogeny (1820–1580 Ma), which converted the sediments into a complex of metamorphic gneisses, quartzites, schists and banded iron formations. The only offshore outcrops of the Hutchinson Group occur on Price Island and Golden Island south of Coffin Bay Peninsula —the westernmost occurrence of this unit.

Granites (called synorogenic granites) were also intruded during the Kimban Orogeny; the foliated and porphyritic granites of the Sir Joseph Banks Group, St Peter Island and Purdie Island belong to this group. Metamorphism and synorogenic granite emplacement ended about 1580 Ma. However, for the next 100 million years there was a succession of post-tectonic granite intrusion and volcanism over much of the Gawler Craton.

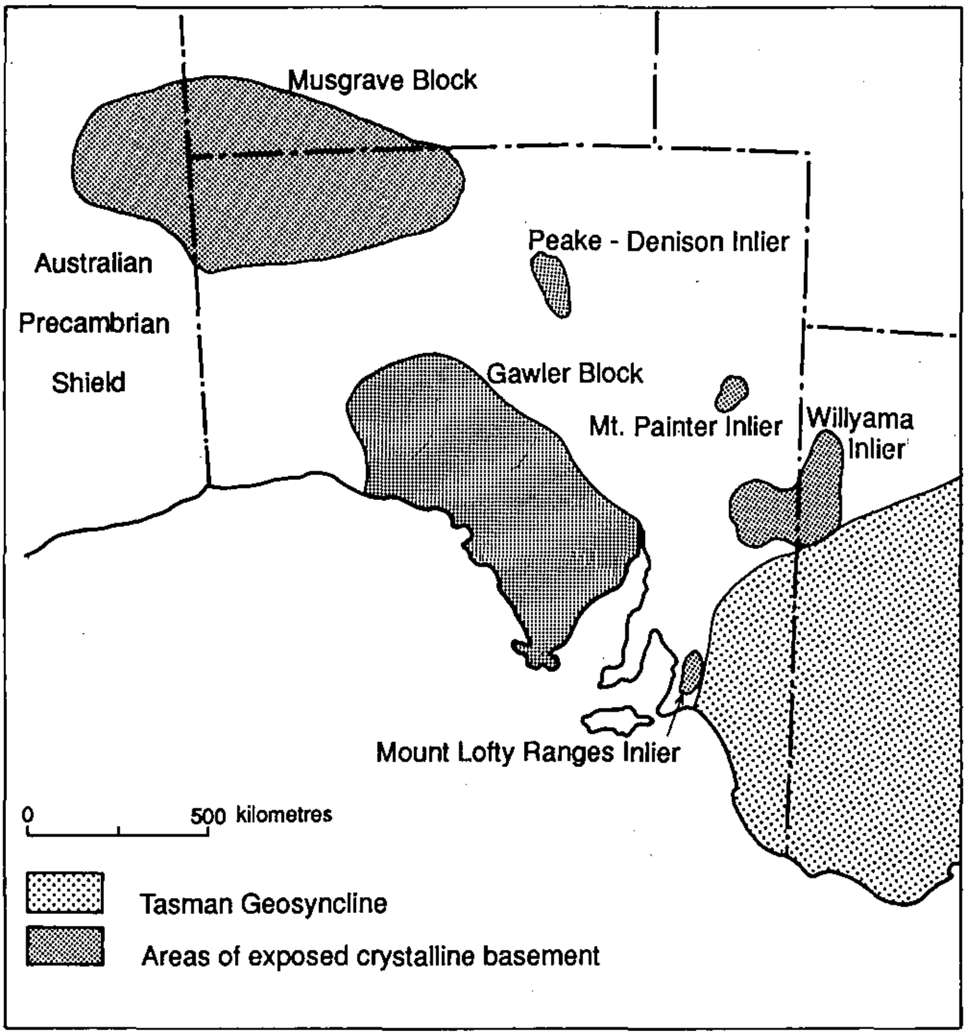



**Figure 1.** The Geological Provinces of South Australia (after Ludbrook 1980).

Granites on the mainland are relatively uniform in composition over large areas, similar to those of Pearson and Flinders Island in the Investigator Group. However, those granites in Nuyts Archipelago (for example, east St Francis Island, Masillon Island and Fenelon Island) have not been observed on the mainland.

About 1525 Ma there was a huge outpouring of acid lavas, centred on the Gawler Ranges and extending across the Gawler Craton from Nuyts Archipelago in the west to at least the western edge of the Adelaide Geosyncline (Webb et al. 1982). The flow-banded rhyolites and rhyodacites of west St Francis Island and Hart Island represent the most western occurrences of these ancient volcanic rocks.

After this final burst of activity the region became stabilised or 'cratonised', a craton being a part of the Earth's crust that has become stable and has been little deformed for a long period. The Gawler Craton has been tectonically stable for 1400 million years, and has only been subjected to minor block fault movements in this time.

Apart from the islands of Encounter Bay, off Kangaroo Island and the South-east, all the islands in this survey fall within the Gawler Craton or Province. A number of these West Coast island outcrops have contributed significantly to our understanding of this ancient geological period, and investigations are continuing.

Complexes of ancient crystalline rocks similar to some of those of the Gawler Craton but generally younger (2000–1500 Ma) are found in a number of regions, including the Musgrave Ranges, Olary Ranges and Mount Painter region. About 1100 Ma deposition began in a huge gradually subsiding marine trough termed the Adelaide Geosyncline (Mawson and Sprigg, 1950). This structure extends in a broad arc from Fleurieu Peninsula north into the Flinders Ranges, and in its thickest part contains thousands of metres of sediments. These strata include sandstones, siltstones and limestone that contain evidence of ancient plant and animal life, and several periods of glaciation.

Shallow marine deposition continued into the early Cambrian period, when the eastern and southern parts of the geosyncline collapsed to form the Kanmantoo Trough, a deep, rapidly subsiding structure that extended from the eastern Mount Lofty Ranges south-westward into Kangaroo Island. Deposition was very rapid, with a total thickness of about 9000 m in the Kanmantoo Group, now converted into a series of metasandstones and metasilt-stones, well exposed around the coastline of Kangaroo Island and southern Fleurieu Peninsula, including a number of islands off the Kangaroo Island coast—for example, Casuarina Islets off Cape du Couedic.

Deposition in the Kanmantoo Trough ended with an episode of folding and metamorphism known as the Delamerian Orogeny (Thompson, 1969). About 500 Ma the area became an extensive belt of folded and uplifted rocks, the forerunner of the modern Mount Lofty Ranges. The Encounter Bay Granites, about 506 million years old, were intruded into Kanmantoo Group sediments during the early stages of this orogeny (Milnes et al. 1977).

A long period of stability then prevailed, and erosion gradually levelled the land surface during the next 200 million years. At this time Australia formed part of the supercontinent Gondwana, which was drifting slowly southward.

About 280 Ma, in the Early Permian, South Australia lay about 40° south of its present position, and a considerable part of the State was covered by a thick sheet of ice moving slowly north-west.

Drilling for oil and gas in the north of the State has also revealed evidence of this glaciation and the warmer conditions that followed. Remains of ferns in swamp deposits match those found in other so-called Gondwanan continents—South America, Africa, Greater India, Australia and Antarctica. Gondwana became unstable and began to break up about 150 Ma, and the subsequent geological history of South Australia and especially the position of the ancient coastline is bound up with this event.

## The fragmentation of Gondwana: formation of the present coastline

About 150 Ma, during the late Jurassic Period, a deep rift opened in the Earth's crust along the edge of the present southern Australian continental shelf and the Australian and Antarctic continents began to separate (Daily et al. 1976). During the next 100 million years this southern rift widened slowly and the sea gained entry for short periods (Figure 2).

Australia finally separated from Antarctica and began to drift northward during the Early Tertiary Period, about 55 Ma. The waters of the newly formed Southern Ocean flooded into the Eucla, St Vincent, Murray and Otway Basins along the southern Australian coast. Australia's northward drift set up stresses in the crust that were relieved by block fault movements, which raised and lowered parts of the land surface.

By 20 Ma the sea had reached its maximum extent over the land surface and the South Australian coastline began to approximate its present form, except in its far western and south-eastern sections: During the Late Tertiary warm, shallow seas ebbed and flooded over the continental margin, due mainly to renewed fault movements, which resulted in uplift of the Mount Lofty and Flinders Ranges. Movement along some of these fault lines continues today.

About two to three million years ago, the sea again submerged the gulfs and the western part of the Murray Basin and the basic outline of the present coastline was established (Ludbrook, 1963).

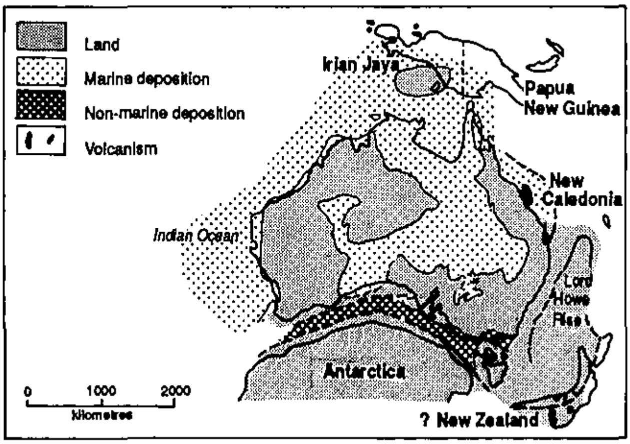
## The Pleistocene Ice Age: changing sea levels

At the beginning of the Pleistocene epoch the climate began to cool as large ice masses formed in the Northern Hemisphere and the Antarctic ice cap began to expand. For the next two million years (up to the present), the position of the coastline has been affected by cycles of changing climates and sea levels associated with the waxing and waning of polar ice masses (Figure 3). Glacial periods when the ice masses expanded, climates became colder and drier and sea levels fell, alternated with warmer interglacial intervals when the ice melted and sea levels rose.

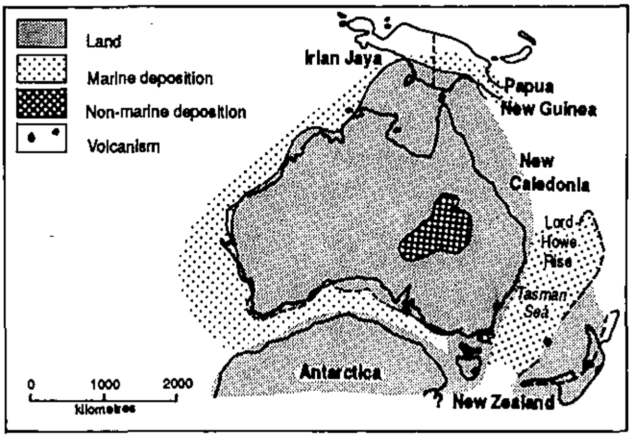
At various times the sea dropped far below its present levels and large areas of the continental shelf were exposed as a sloping alluvial plain. When sea levels rose again, thick coastal sand dunes were blown up as the shoreline advanced across the continental shelf. In the south-east of the State, a series of Pleistocene dune ridges between the coast and Naracoorte records at least 20 separate sea level stands between 690 000 years ago and today (Cook et al. 1977).

These calcareous sand dunes have since been hardened to calcarenite rock by the action of percolating rainwater. Many offshore islands have a capping layer of this Pleistocene dune calcarenite (Bridgewater Formation), which has subsequently been eroded to form steep cliffs. Large-scale cross bedding is often clearly visible in these cliffs, affirming their aeolian or windblown origin. These island exposures of Pleistocene dune rock are remnants of more extensive deposits that have been eroded and removed by the action of the sea. Many islands are still actively eroding and indeed, small islands composed entirely of this friable calcarenite—for example, Penguin Island in the south-east—will eventually disappear into the sea.

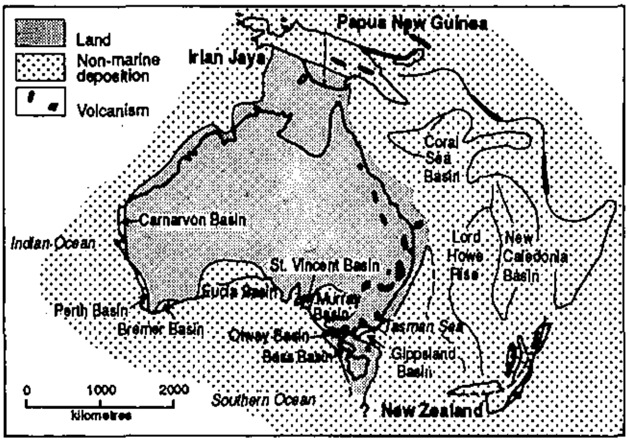
The alternately rising and falling Pleistocene seas would have severed and re-established links between various islands and island groups and the present mainland at a number of different stages. At the peak of the last glacial phase, about 17 000 years ago, the sea lay 150 m below its present levels (Belperio et al. 1983). All the islands currently surveyed off South Australia's coast would have formed part




Australia in the Early Cretaceous




Australia in the Late Cretaceous




Australia in the Early Tertiary

**Figure 2.** Changes to the Australian coastline from the Early Cretaceous to the Early Tertiary (after Ludbrook 1980).

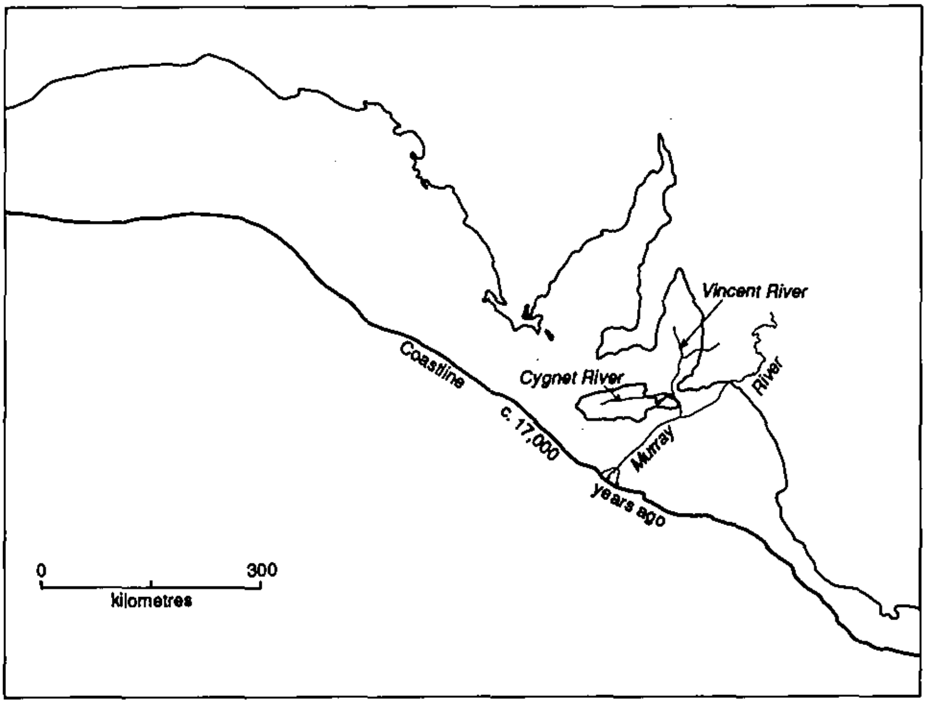



**Figure 3.** The South Australian coastline at the height of the last glaciation 17 000 years ago.

of the mainland and the River Murray, about 70 km longer than it is today, would have met the sea south of Kangaroo Island (Lampert, 1981).

During the past 17000 years the climate has warmed again, and the rising Holocene sea reached its present level around the Australian coast 6000 years ago (Thom and Chappell, 1975; Belperio, 1979).

## Sea level curves: a key to the age of the islands

As sea levels rose during the Holocene, islands were formed with those further out on the continental shelf generally being the first to be isolated. The basis for establishing sea level charges during the Pleistocene has improved greatly in recent years with the advent of radio-isotopic dating of fossil shorelines in coral reef areas. Data are recorded from areas of rapid tectonic uplift, where successions of stranded reefs and emerged coral terraces provide a datable record of rising and falling sea level superimposed on a steadily rising land surface, to form a sea level curve (Chappell and Thom, 1977); sea level changes over the past 17000 years can be readily translated into shoreline variation by comparing the curve (Figure 4) with the present topography of the sea bed.

The time of isolation of each island has been estimated by reading off, on the sea level curve, the time corresponding to the depth of the deepest channel isolating it (see Table 1). Island shorelines at any given time correspond to the bathymetric contour that relates to sea level at this time, though local and regional tectonic

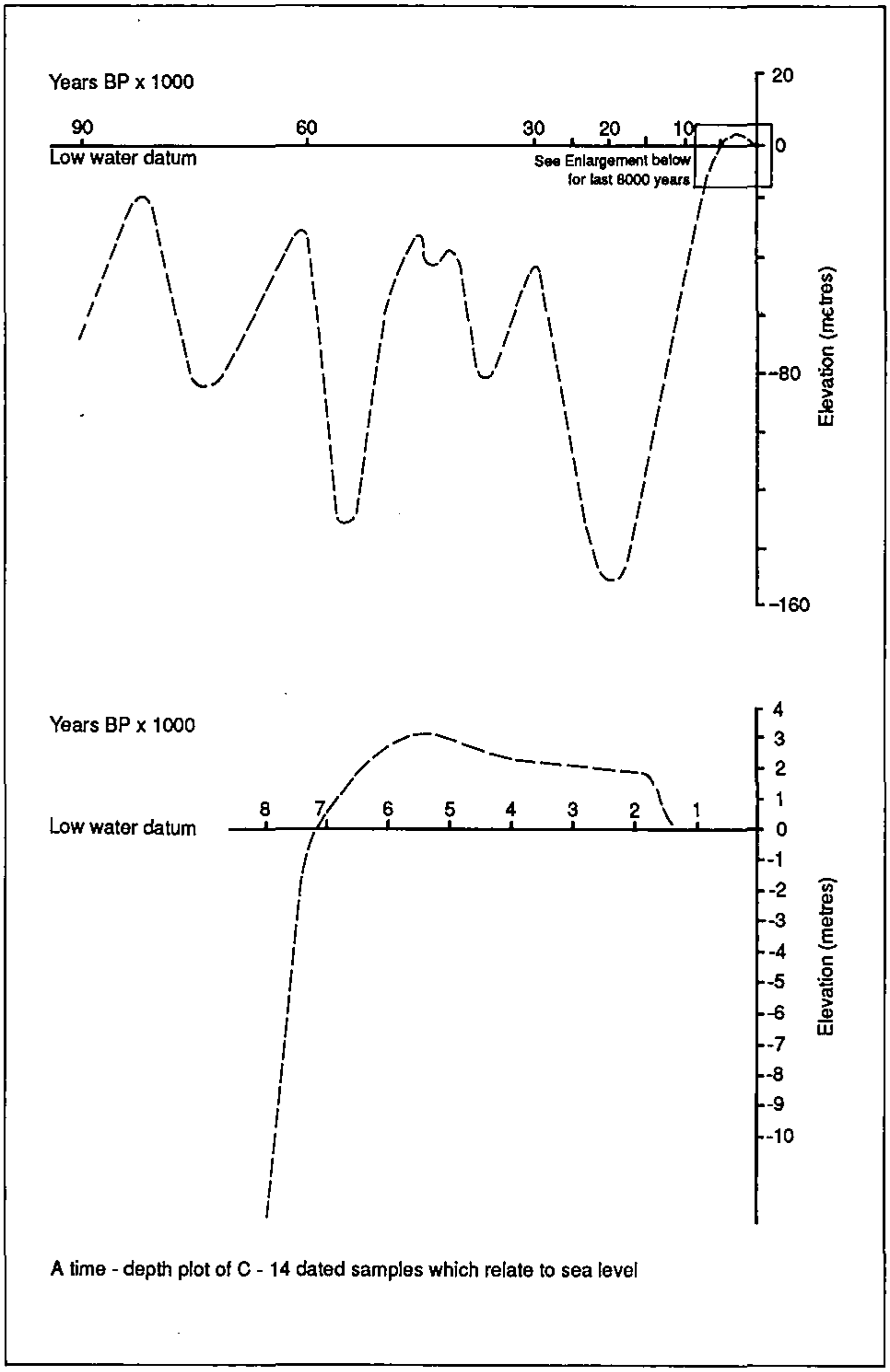



**Figure 4.** Sea level curves for the South Australian coastline : 90000–10000 after Chappell and Thom (1977); 8000–1000 after Thom and Chappell (1975).

movements and tidal range variations arising from changing coastline geometries must have affected shoreline position to some extent, as could scouring and filling since island formation.

Recent maritime charts produced by the British Admiralty and the Royal Australian Navy have been used to define the minimum water depths required to isolate each island and island group along the South Australian coast. The quality of detail of this information vary, since some areas—for example, the approaches to Thevenard (AUS 120)—have been subjected to recent detailed soundings while the south-eastern offshore regions have only been mapped on a larger scale (AUS 348).

As mentioned, when sea levels rose during the Holocene the islands furthest out on the continental shelf were isolated first; the Neptune Islands, Hart and Pearson Island, for example, were formed between 10800 and 12000 years ago. As sea levels rose further, more islands and island groups were isolated and remained so. Many of the small near-shore islands, and those of Venus and Coffin Bays and other semienclosed waterways, were only formed as sea levels reached their maximum—in other words, some time in the past 6000 years.

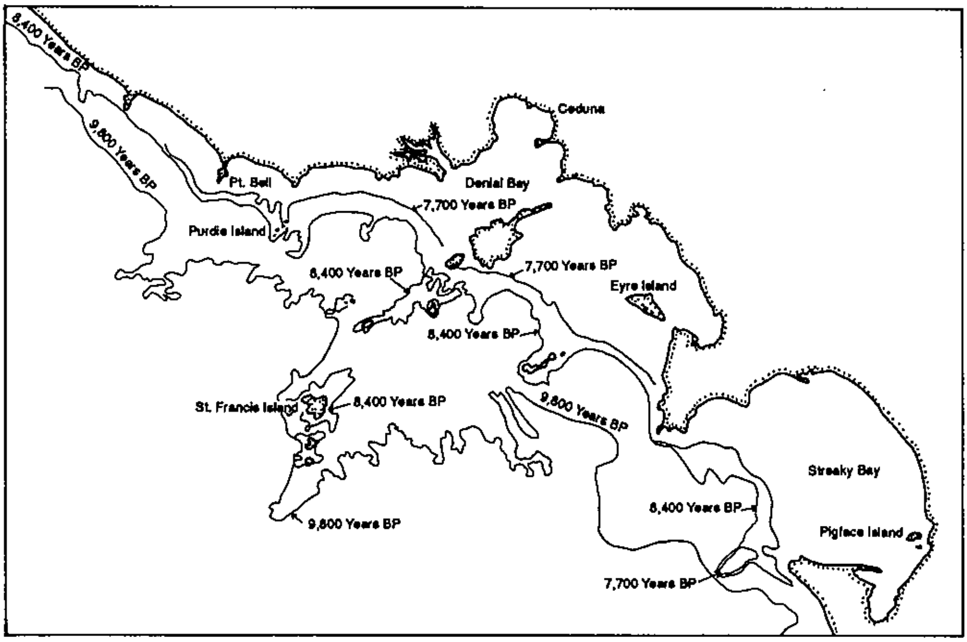
Table 1 lists islands and major island groups in order of their formation, while the changing coastline is shown in Figures 5–7.

**Table 1.** Sea level changes and dates of isolation of South Australian islands and island groups.

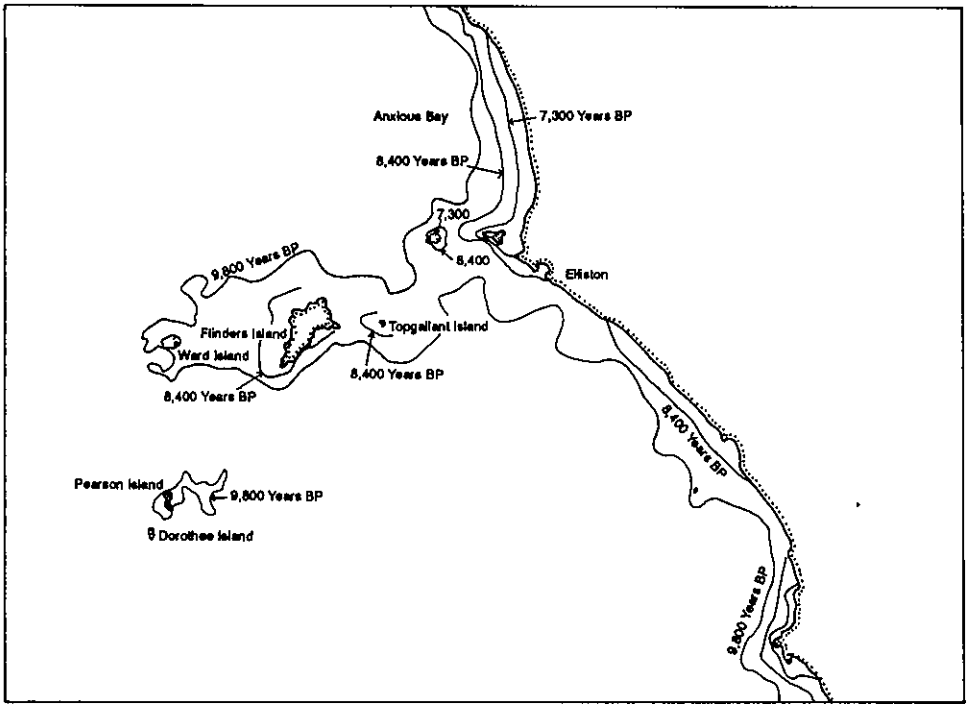
| Minimum water depth required for isolation (m) | Age of isolation (BP) | Island |
|---|---|---|
| –90 m | 12600 | South Rocky |
| –80 m | 11900 | South and North Neptune |
| –65 m | 10850 | Hart, Low Rocks |
| –60 m | 10500 | Pearson, Greenly |
| –55 m | 10150 | South-West Rock |
| –45 m | 9450 | Investigator Group formed, Cap, Ward |
| –40 m | 9100 | Isles of St Francis (from mainland), Four Hummocks–Perforated (from mainland), North Rocky, Gambier (from mainland), Williams, Smith, Buffalo Reef |
| –35 m | 8750 | Flinders, Topgallant |
| –30 m | 8400 | Lacy, Evans, Liguanea, Dangerous Reef, Hopkins–Thistle, Lewis, Little Althorpe, The Pages (from mainland) |
| –25 m | 8050 | Sir Joseph Banks Group (from mainland), Stickney, English–Sibsey |
| –20 m | 7700 | Franklin, Purdie, Olive, St Francis–West, Dog–Freeling, Smooth, Egg, Masillon, Fenelon, Spilsby–Boucaut, English, Sibsey, Dalby, Kirby, Winceby, Boston, Rabbit, Four Hummocks separate, Price, Golden, Perforated, The Pages separate |

**Table 1.** (cont'd) Sea level changes and dates of isolation of South Australian islands and island groups.

| Minimum water depth required for isolation (m) | Age of isolation (BP) | Island |
|---|---|---|
| –15 m | 7350 | Taylor, Grindal, Wedge–North, Haystack, Seal |
| –10 m | 7000 | Thistle–Hopkins–Albatross, Black Rocks |
| – 5 m | 6000 | St Peters, Goat, Eyre, Dog, Freeling, St Francis, West, Waldegrave, Owen |
| – 5 m | 6000 | Spilsby, Boucaut–Seal Rock, Roxby, Hareby, Langton, Blyth, Lusby, Partney, Marum, Reevesby, Tumby, Louth, Grantham, Bickers, Wardang, Penguin, Baudin Rocks, Venus Bay Islands, Baird Bay Islands, Islands of Mount Dutton and Coffin Bays |

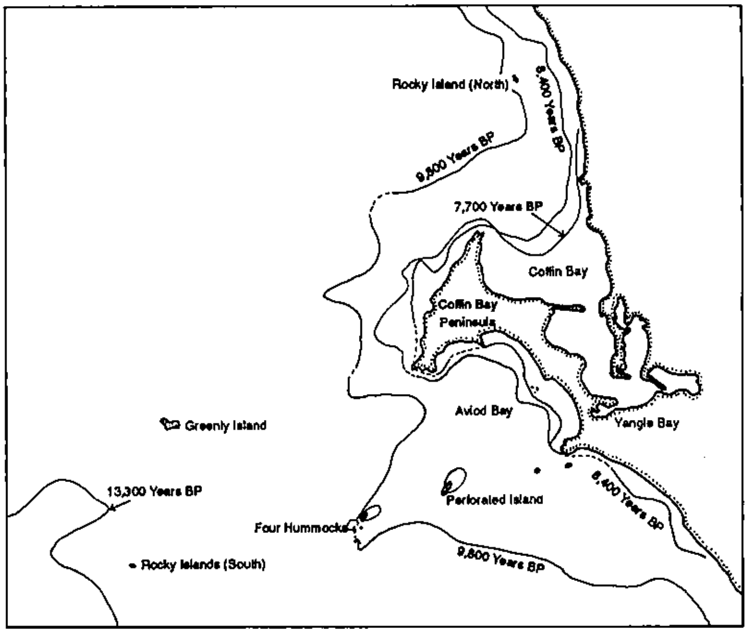



THE FORMATION OF NUYTS ARCHIPELAGO

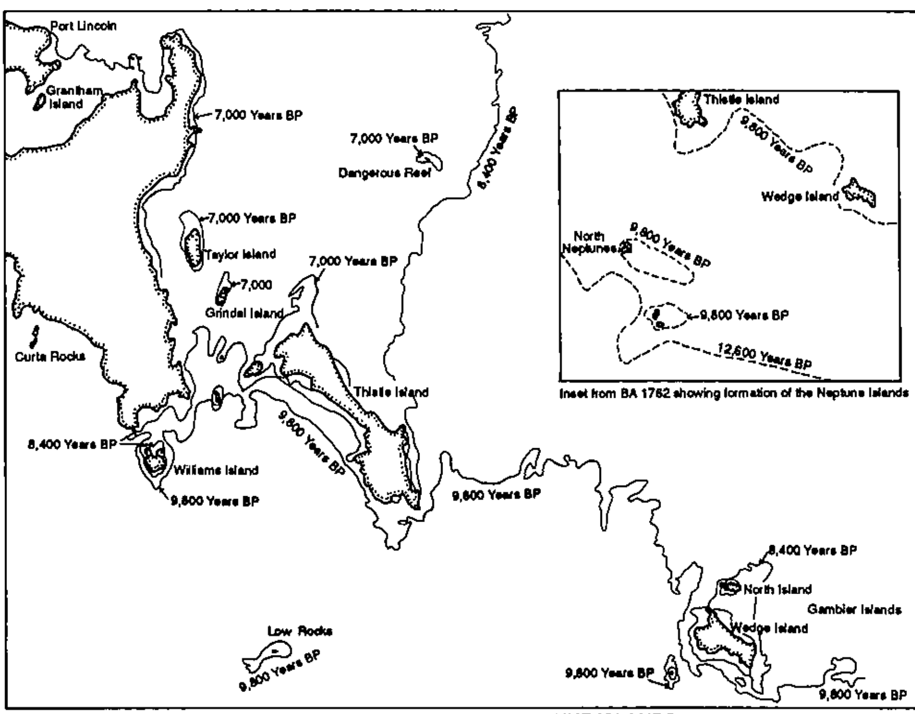



THE FORMATION OF THE INVESTIGATOR GROUP

**Figure 5.** The progressive formation of the islands of Nuyts Archipelago and the Investigator Group.

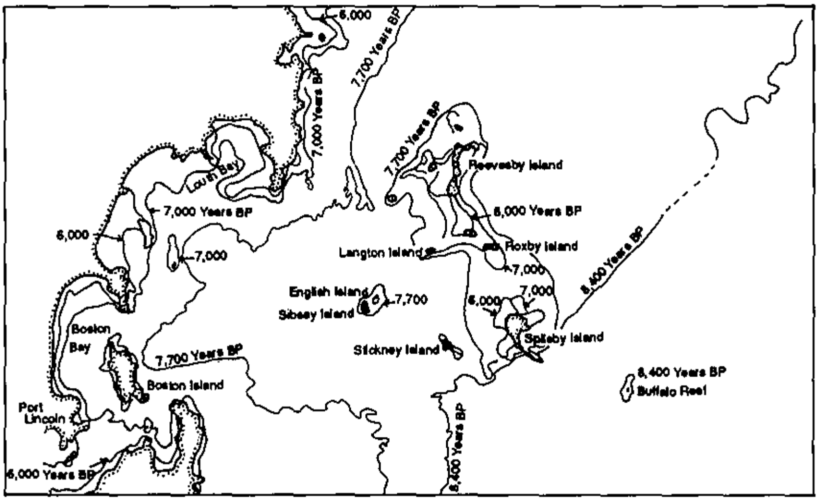



THE FORMATION OF THE WHIDBEY ISLES

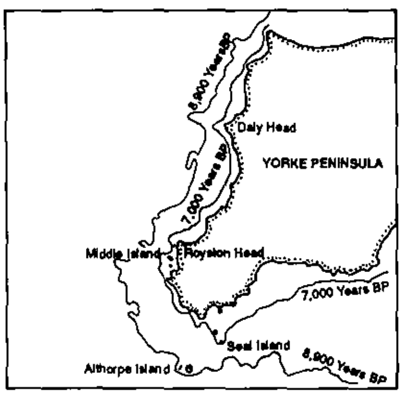



THE FORMATION OF THE PORT LINCOLN, GAMBIER AND NEPTUNE ISLANDS

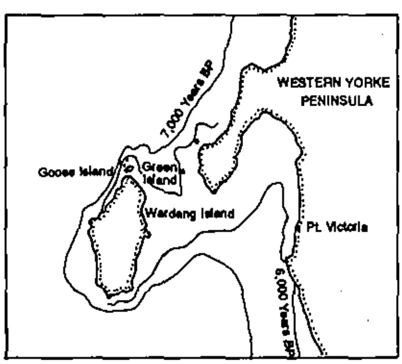
**Figure 6.** The progressive formation of the islands of the Whidbey Group, the Port Lincoln Islands and the Neptune Islands.




THE FORMATION OF THE SIR JOSEPH BANKS GROUP AND ISLANDS OF LOUTH AND BOSTON BAYS




THE FORMATION OF ISLANDS OFF S. W. YORKE PENINSULA




THE FORMATION OF WARDANG ISLAND

**Figure 7.** The progressive formation of the islands of the Sir Joseph Banks Group, the islands of Louth and Boston Bay and those off Yorke Peninsula.

# Chapter 2

# ISLAND NATURAL HISTORIES

Basic island geology and the development of soils are the building blocks that determine vegetation patterns and animal populations.

A number of characteristic vegetation types occur on islands in patterns shaped by the influences of island size and exposure to salt-laden winds. Large populations of animals such as seals and seabirds can themselves influence the vegetation by adding their nutrient-rich droppings to island soils.

This chapter begins with descriptions of island soils and vegetation, then considers how vegetation can change over time, either through natural events (such as plant succession or the effects of fire) or as a result of the introduction, since European settlement, of exotic plants and animals. We will also discuss examples from South Australia's offshore islands of how the animal populations of islands also change or evolve over time.

Finally, we will look at the natural history of a group of species that, though they are generally widespread on the islands, depend on islands for an important part of their life histories or, in some cases, for their survival in South Australia.

## Vegetation and Soils

The variety and patterns of vegetation an island can support depend on variables such as: size (in general, the larger the island the greater the variety of its vegetation); topographic variability (hills and valleys provide a wider range of sites for different vegetation types to develop); distance from the mainland (which can, to some extent, indicate how long the island has been isolated—islands close inshore or in enclosed bays are also not exposed to strong salt-laden winds to the same extent as islands surrounded by open ocean); basic geology; and the kind of soil development that has occurred (larger islands generally have more geological variability and soil types, and hence can support a more diverse range of vegetation types than smaller islands).

The geology of South Australia's offshore islands has been examined in Chapter 1, and individual island geology is described in more detail in Chapters 4 to 11. In general, three basic island geologies can be recognised:

- very ancient basement igneous rocks;
- aoleonite (windblown) deposits of the Bridgewater Formation; and
- calcrete developed within the sands of the Bridgewater formation.

### Soils

Soils derived from these three basic geological origins are also quite characteristic. Igneous rocks erode to form soils ranging from talus and rubble to coarse sands that have very low water-retaining capacity and low nutrient status. Aoleonite deposits erode to form white or yellow sands that can be blown into dune systems on larger islands. Much of this sand is also derived from offshore, when it is moved on to beaches and later incorporated into coastal dunes. These sands are generally the deepest soils to be found on islands. Soils developed from calcrete are fine, sandy loams, often with many particles and nodules of limestone spread through the profile. These loams are generally fewer than 2 m deep, underlain by solid calcrete. They are more structured and have a better water-holding capacity than the others mentioned above, and it is largely these soils that were cleared and cultivated for oats and barley on the larger islands during their agricultural use earlier this century.

Because islands are constantly exposed to salt-laden spray from the sea, salt load is likely to be the initial determinant of vegetation distribution on small islands. There will, however, be significant variations in salt load across even the smallest islands because of the very rapid reduction in the amount of airborne salt with increasing altitude and distance from the sea.

In addition, since most of the winds to which most South Australian islands are exposed blow from the west and south-west, a declining north-easterly gradient in soil salinity could be expected.

There is also a significant decrease in the average soil salinity of a variety of soil samples collected across an island as the island area increases.

Of the soil nutrients available for plant growth nitrogen, potassium and phosphorus have been analysed. The average values for nitrogen and potassium do not seem to show any particular pattern of variation with island size. They are, however, quite low—as is characteristic of many Australian soils—and certainly play their part in limiting the type of vegetation these islands can support. Ungrazed islands, however, are generally lower in nitrogen and potassium, with English and North Four Hummocks Islands forming interesting exceptions.

Soil phosphorus is of particular interest in the context of offshore islands because of the presence of large colonies of colonial nesting seabirds. The phosphorus-rich guano deposited by these birds interacts with the underlying limestone in a complex and incompletely understood way (Boothby, 1983) to produce deposits of phosphate rock. The soil beneath seabird rookeries is extremely high in phosphorus, as shown in Figure 8 for Sibsey and Winceby Islands, while mean phosphorus levels are clearly much higher for islands that support seabird breeding colonies. Cormorants, whose nesting colonies are densely packed, are by far the most effective producers of soil phosphorus. Gulls, Short-tailed Shearwaters and White-faced Storm-petrels are less significant.

## Vegetation

Twenty-two vegetation types have been recognised and mapped (Appendix F) for all of South Australia's offshore islands. The distribution of the most common of these vegetation types is shown in the following three-dimensional terrain models. They represent, in Greenly Island, a high island with a considerable amount of igneous rock exposure; Stickney Island has a thick cap of Bridgewater Formation; while Eyre Island is a mangrove and saltmarsh island in sheltered bay conditions. The vegetation descriptions begin with the tallest structural type, the woodlands, and continue to the ground-covering herbland.

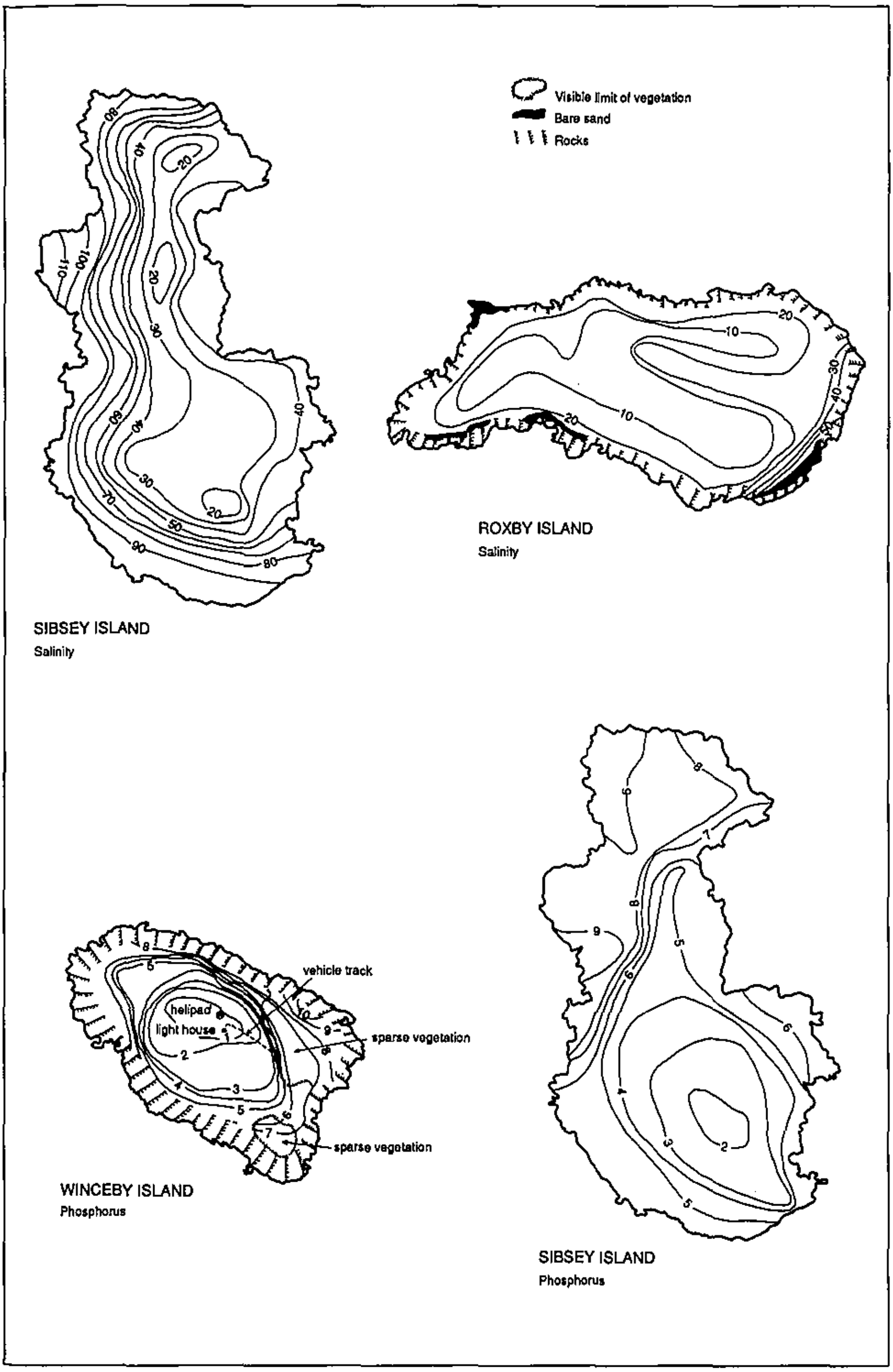



Figure 8. Approximate contours of soil salinity (ms/cm) on Sibsey and Roxby Islands and soil phosphorus (%) on Winceby and Sibsey Islands.

**Drooping She-oak**
***Allocasuarina verticillata* Woodland**
**(Plate 3)**

This vegetation type is confined to the larger islands with outcropping igneous rocks and coarse, sandy soils. It occurs on Pearson, Flinders, Greenly, Yangie Bay and Grindal Islands, and in very small pockets on Wedge Island; scattered she-oak trees on St Francis, Thistle, Spilsby and Reevesby and Boston Islands indicate that it may have once occurred there (though some of these may have been planted). It is easily damaged by sheep, horse or rabbit grazing and, while widespread on the mainland at the time of European settlement, particularly on southern Eyre Peninsula, can probably now be seen only in its untouched form on Pearson Island. There she-oaks grow to 3 m high when there is some soil depth, with an understorey of grass and scattered shrubs such as Bushy Groundsel and Common Fringe-myrtle. Where granite outcrops at the surface, species such as Rock Fern and Prickly Knawel are found.

**Grey Mangrove**
***Avicennia marina* Woodland (Plate 4)**

Eyre, St Peter, Germein and Bird Islands, within sheltered sandy bays with a strong tidal flow, provide conditions for the development of mangrove woodlands, which are also common and widespread on the shores of both St Vincent and Spencer Gulfs, and around a number of bays on the west coast of Eyre Peninsula. Mangrove woodlands grow on mud flats that are flooded by tides twice a day. They also line the edges of meandering tidal channels that penetrate the saltmarsh, which occurs inland from the mangrove fringe. Because the mud beneath the mangroves is regularly flooded by the tide, no other terrestrial plants grow here; a number of Samphire and Beaded Samphire species are found at the inland fringe.

**South Australian Swamp Tea-tree**
***Melaleuca halmaturorum***
**Closed Scrub (Plate 5)**

This is a very minor vegetation type on South Australia's offshore islands, being found only along the very saline soil of Main Creek on Pearson Island and surrounding saltmarshes on Flinders and Thistle Islands. It generally occurs as a closed canopy scrub on very saline soils. Occasionally Karkalla or other saltmarsh plants can be found beneath this formation.

**Dryland Tea-tree**
***Melaleuca lanceolata***
**Open Scrub (Plate 6)**

This vegetation type is confined to the larger islands, where it sometimes occurs almost as a woodland form. Large areas are found on Pearson, Flinders, Greenly, Wedge, Taylor and Boston Islands, and may also have occurred more widely on St Francis, St Peter and Thistle Islands before agricultural development. It occurs on shallow soils with granite or calcrete underlying them, and often in quite dense thickets. On islands that have been or are still being grazed, the understorey is considerably modified, with a variety of introduced grasses and Ruby Saltbush the main species found. On undisturbed areas such as Pearson Island, it shares the same understorey as the she-oak woodland.

Plate 3. Drooping She-oak *Allocasuarina verticillata* Woodland, Pearson Island. Photo A. C. Robinson.

Plate 4. Grey Mangrove *Avicennia marina* Woodland, St Peter Island. Photo P. D. Canty.

Plate 5. South Australian Swamp Tea-tree *Melaleuca halmaturorum* Closed Scrub, Thistle Island. Photo A. C. Robinson

Plate 6. Dryland Tea-tree *Melaleuca lanceolata* Open Scrub, Flinders Island. Photo A. C. Robinson

### Coastal White Mallee *Eucalyptus diversifolia* Open Scrub (Plate 7)

Mallee open scrub develops only on larger offshore islands; it cannot resist the impact of salt spray on smaller islands. However, islands close to shore in sheltered bays that have not been isolated from the mainland for very long still support mallee scrub comparable with that occurring on the adjacent mainland. An interesting exception to this is a small stand of mallee 'trees' on Fenelon Island; these ancient, windswept trees have trunks of 10–15 cm in diameter, and reach barely 50 cm in height—the same level as the surrounding low shrubland. There is no evidence that these trees have ever flowered or fruited and they may be very old; Fenelon has been isolated from the adjacent mainland for more than 9000 years.

Stands of mallee open scrub occur on Thistle, Taylor, Louth, Grantham, Boston, Tumby and Spilsby Islands, while remnant groups of trees, suggesting a possibly more widespread distribution before agriculture, occur on St Peter, Flinders and Reevesby Islands. On the larger islands a mallee vegetation type is found with Red Mallee, Ridge-fruited Mallee and Yorrell occurring in addition to Coastal White Mallee. Dryland Tea-tree is often found. Mixed with the mallee is a very variable shrub understorey comprising species such as Cockies Tongue and Wallowa Wattle, while Native Lilac and Dodder-laurels climb through the branches of the trees.

**Native Juniper or Boobialla**
***Myoporum insulare***
**Tall Shrubland (Plate 8)**
A complex vegetation type found on sandy soils or sometimes more loamy soils over shallow calcrete, Native Juniper may also indicate a relatively early stage of recovery from past disturbance such as guano mining or clearing for agriculture. It occurs on St Peter, Waldegrave, Wedge, Grindal, Bickers, Roxby, Reevesby and Island Point Islands.

On many islands this vegetation type merges with Coast Daisy-bush tall open shrubland, but a typical example on an island such as Roxby consists of regularly distributed shrubs of Native Juniper up to 2 m tall over a very variable understorey containing species such as Weeping Pittosporum, Felted Wallaby-bush and Sticky Hop-bush with frequent tussocks of Black-anther Flax Lily.

**Coast Daisy-bush**
***Olearia axillaris***
**Tall Open Shrubland (Plate 9)**
This is a typical vegetation type of the mainland coastal dune systems, and occurs on islands wherever deep white dunes develop behind sandy beaches or on older remnant dunes further inland. It is found on St Francis, Eyre, Eba, St Peter, Franklin, Germein, Flinders, Thistle, Wedge, North, Louth, Boston, Spilsby, Stickney, Lusby, Roxby, Blyth, Hareby, Reevesby, Bird, Wardang, Royston, Middle, South, Nobby and Penguin Islands, and is both structurally and floristically a relatively well-defined vegetation type with shrubs of Coast Daisy-bush up to 1.5 m tall dominating an understorey of Climbing Lignum, Coast Bonefruit, Bower Spinach, Thyme Riceflower and Black-anther Flax Lily. There are normally quite large areas of bare sand between individual bushes and sometimes extensive bare blowout areas where calcified roots are often exposed.

**African Boxthorn**
***Lycium ferocissimum***
**Tall Open Shrubland (Plate 10)**
A vegetation type of highly disturbed sites, either from land clearing and cultivation for farming or through colonially nesting seabirds, particularly cormorants. On many of these island sites boxthorn has replaced either partially or completely the native Nitre-bush. Islands with boxthorn infestations extensive enough to map as a separate vegetation type include St Francis, Waldegrave, Lewis, Rabbit, Winceby, Goose, Troubridge and Wright.

**Twiggy Daisy-bush**
***Olearia ramulosa***
**Open Heath (Plate 11)**
A formation found on shallow granitic soils with a floristic composition that varies somewhat between islands, but which has a very similar structural appearance. It is found on Pearson, North Veteran, Greenly, Dorothée, Wanna and North and South Neptune Islands. It generally occurs in small patches wedged in soil pockets up against granite boulders and includes characteristic species such as Common Correa, Shore Westringia, Narrow-leaved Spyridium and Austral Stork's Bill. On the Neptune Islands, where this formation is dominant, Coast Tussock Grass, Sticky Hop-bush and Climbing Lignum are also found.

**Nitre-bush**
*Nitraria billardierei*
**Low Shrubland (Plate 12)**

A very common vegetation type on many islands including Lounds, Purdie, Egg, Smooth, Masillon, Lacy, Evans, Franklin, Goat, Jones, Garden, Tank, Ward, Topgallant, Golden, North, Four Hummocks, Liguanea, Curta Rocks, Williams, Owen, Hopkins, Donnington, Lipson, Kirkby, Boucaut, Lusby, Duffield, Langton, Hareby, Reevesby, Marum, Dalby, Partney, Daly Head, Royston, Althorpe, Chinamans Hat, Busby, North Casuarina and Baudin Rocks.

In general, this vegetation type occurs at the edge of the calcrete capping overlying the igneous basement rock of the islands, where the rounded shrubs of Nitre-bush grow out of the accumulation of lime-rich loam at the base of the calcrete cap. On small islands exposed to the full force of the ocean, this formation tends to be confined to the more sheltered northern and eastern parts of the island, but surrounds the island if it is in a sheltered bay. Large, sprawling Nitre-bushes cover most of the surface of Franklin Island on quite deep sandy loam, a situation occupied by Marsh Saltbush and its associates on most other islands. Occurring as a narrow band on the edge of islands, this formation tends to merge with adjacent vegetation types and thus is associated with a variety of species including Bower Spinach, Common Ice-plant and Round-leaved Pigface. African Boxthorn bushes have similar habitat preferences, and are often found mixed with Nitre-bush clumps.

**Pointed Twinleaf**
*Zygophyllum apiculatum*
**Low Shrubland (Plate 13)**

This vegetation type has been mapped on Ward, Topgallant, Black Rocks, Price, Golden and Perforated Islands, and is generally associated with orange sandy aoleonite deposits rather than the calcrete-derived soils that support Nitre-bush. On these types of islands the island platform tends to crumble into more gentle slopes than on those with a hard calcrete cap, and it is on these slopes that Pointed Twinleaf occurs. It is associated with species such as Variable Groundsel, Coast Bonefruit, Ruby Saltbush and Round-leaved Pigface.

**Umbrella Bush**
***Acacia ligulata* Low Shrubland**
**(Plate 14)**

Characteristic of the more sheltered islands in the large bays on the west coast of Eyre Peninsula, this vegetation type is found on Eba, Jones and Unnamed Island in Baird Bay, and on Island A in Venus Bay. These islands are entirely composed of calcrete and, where there is some soil, a shrubland dominated by Umbrella Bush but including species such as Small Hop-bush, Port Lincoln Wattle, Felted Wallaby-bush and Turkey Bush is found.

**Austral Stork's Bill**
*Pelargonium australe*
**Low Open Shrubland (Plate 15)**

This vegetation type is closely related to Twiggy Daisy-bush open heath, but is found when granite outcrops on the surface where soil and vegetation are confined to cracks or small depressions. It is found (often in areas too small to map) on Pearson, Dorothée, Greenly, Avoid, Four Hummocks and Williams Islands. The only other species consistently found in association is Karkalla.

**Plate 7.** Coastal White Mallee *Eucalyptus diversifolia* Open Scrub, Taylor Island. Photo P. D. Canty

**Plate 8.** Native Juniper or Boobialla *Myoporum insulare* Tall Shrubland, Wedge Island. Photo A. C. Robinson

**Plate 9.** Coast Daisy-bush *Olearia axillaris* Tall Open Shrubland, Spilsby Island. Photo A. C. Robinson

**Plate 10.** African Boxthorn *Lycium ferocissimum* Tall Open Shrubland, Waldegrave Island. Photo A. C. Robinson

**Plate 11.** Twiggy Daisy-bush *Olearia ramulosa* Open Heath, Central Four Hummocks Island. Photo R. B. Jenkins

**Plate 12.** Nitre-bush *Nitraria billardierei* Low Shrubland, Partney Island. Photo A. C. Robinson

**Plate 13.** Pointed Twinleaf *Zygophyllum apiculatum* Low shrubland, Perforated Island. Photo R. B. Jenkins

**Plate 14.** Umbrella Bush *Acacia ligulata* Low Shrubland, Jones Island. Photo A. C. Robinson

**Plate 15.** Austral Stork's Bill *Pelargonium australe* Low Open Shrubland, Central Four Hummocks Islands. Photo R. B. Jenkins

**Plate 16.** Cushion-bush *Calocephalus brownii* Low Open Shrubland, Haystack Island. Photo P. D. Canty

### Cushion-bush
### *Calocephalus brownii*
### Low Open Shrubland (Plate 16)

On exposed calcrete cliff tops where cracks provide the only place for some soil development, a very similar habitat to that which supports the previous vegetation type is found. Again, it occurs in narrow bands and is difficult to map, only being widespread enough to be shown on Perforated, Thistle, Wedge, Althorpe and Haystack Islands. It is quite a floristically diverse community and includes species such as Stalked Ixiolaena, Creeping Brookweed, Sticky Goodenia, Shore Westringia, Coast Logania, Narrow-leaved Spyridium and Cockies Tongue.

### Shore Westringia
### *Westringia dampieri*
### Low Open Shrubland (Plate 17)

A vegetation type that seems to be confined to the islands of Nuyts Archipelago, where it occurs on St Francis, Egg, Smooth, Lacy and Fenelon Islands. It is very similar to Twiggy Daisy-bush open heath, but instead of occurring on granite-derived soils it is found on shallow soil over calcrete. It has a slightly different floristic composition between islands, but characteristic species include Spinifex (often as the dominant species such as on some parts of Lacy Island) Cockies Tongue, Tar-Bush, Sticky Hop-bush, Common Correa and Austral Stork's Bill.

**Marsh Saltbush**
***Atriplex paludosa***
**Chenopod Shrubland (Plate 18)**

The most common vegetation type on South Australia's islands, Marsh Saltbush is generally structurally very similar from island to island, but there are substantial differences in its floristic composition. It is found on Lounds, Purdie, Dog, Egg, St Francis, Masillon, West, Freeling, Lacy, Fenelon, Evans, Olive, St Peters, Goat, Garden, Tank, Waldegrave, Little Waldegrave, Pearson, Ward and South Ward, North Veteran, Black Rocks, Price, Golden, Perforated, Four Hummocks, Liguanea, Curta Rocks, Williams, South Neptune, North Neptune, Owen, Hopkins, Grindal, Bickers, Little, Lewis, Smith, Rabbit, Grantham, Tumby, Sibsey, Kirkby, Boucaut, Stickney, Lusby, Roxby, Duffield, Langton, Hareby, Reevesby, Marum, Winceby, Dalby, Island Point, Goose, Middle, South and West (Nuyts Archipelago) Islands.

This vegetation type, as with all the other chenopod shrublands, is found on fine sandy loams developed from the calcrete layer of the Bridgewater Formation that caps most South Australian islands. In its undisturbed state it supports enormous breeding populations of Short-tailed Shearwaters, and has adapted to a turnover of subsoil and top soil from September to April each year and an enormous input of phosphate. It was these shrublands on the rich sandy loam that were cleared and grazed on the islands developed for agriculture; on islands such as those of the Sir Joseph Banks Group, with a long history of grazing, introduced grasses and clover are now well established between the saltbush plants. In the deeper sandy loams, particularly in the Nuyts Archipelago, saltbush is replaced by Seaberry Saltbush to the point where on sandy islands such as Dog, the latter has become dominant. Because this vegetation type occurs on such a large number of islands, spread over a wide range of soils and climate, associated species are very variable but normally include Karkalla, Ruby Saltbush, Bower Spinach, Leafy Peppercress and Round-leaved Pigface.

**Plate 17.** Shore Westringia *Westringia dampieri* Low Open Shrubland, St Francis Island. Photo A. C. Robinson

**Plate 18.** Marsh Saltbush *Atriplex paludosa* Chenopod Shrubland, St Francis Island. Photo A. C. Robinson

**Grey Saltbush**
*Atriplex cinerea*
**Chenopod Shrubland (Plate 19)**
Grey Saltbush is commonly found as a coloniser of sand dunes at the top of relatively sheltered sandy beaches around the South Australian coast. A small number of islands including Pearson, Greenly, Dorothée, South Rocky, Curta Rocks, Williams and Smith support this vegetation type, generally as a pure stand (though it is mixed with Marsh Saltbush on Williams and Smith Islands). It seems to be associated with deeper and perhaps sandier soils than Marsh Saltbush, and is often exposed to disturbance from sea-lion or fur-seal colonies with their associated input of nutrients, or with very dense shearwater breeding colonies. Though it is often found as a pure stand other associated species include Seaberry Saltbush, Pointed Twinleaf and Leafy Peppercress.

**Heath Bluebush**
*Maireana oppositifolia*
**Chenopod Shrubland (Plate 20)**
This vegetation type is found on exposed south-western cliff tops where only the most salt tolerant species can survive. Occupying a similar situation to Cushion-bush low open shrubland, it occurs on many more islands than those (Fenelon, Topgallant, Price, Golden, Perforated, Wanna, South Neptune and Hopkins Islands) where it has been mapped. Associated salt-tolerant species include Sea-heath and Small-leaved Sea-heath, Creeping Brookweed, Bassia, Round-leaved Pigface and Grey Samphire.

**Grey Samphire**
*Halosarcia halocnemoides*
**Chenopod Shrubland (Plate 21)**
Adapted to the highest soil salinity levels on any of the islands, grey samphire shrubland occurs as a minor formation in depressions in areas generally dominated by Heath Bluebush on south-facing cliffs, as saltmarsh in internal drainage depressions on Flinders, Thistle, Wedge, Spilsby and Reevesby Islands, backing mangrove woodlands on islands in shallow bays where large areas are intermittently flooded by high tides, and as a tidal saltmarsh on Eyre, St Peter, Germein, Yangie Bay, Grantham, Bird, Wardang and Busby Islands. Though often occurring as a pure stand, Grey Samphire is also associated with Beaded Samphire, Austral Seablite, Sea-heath, Creeping Brookweed, Thorny Fan-leaf and Round-leaved Pigface.

**Coast Tussock Grass**
***Poa poiformis* Grassland (Plate 22)**
Areas of Coast Tussock Grass grassland are found on islands with shallow coarse sandy soil pockets over granite. This vegetation type appears to be confined to southern islands with higher rainfall, and only occurs extensively enough to be mapped as a separate vegetation type on Greenly, Liguanea, North Neptune, Hopkins and Nobby. Where it occurs, tussocks tend to grow closely together to form a dense mat. Other species associated include Variable Groundsel, Pointed Twinleaf, Coast Bonefruit, Leafy Peppercress, Wild Tobacco and Climbing Lignum.

**Introduced Grassland (Plate 23)**
This vegetation type results from the complete clearance of natural vegetation and the planting of introduced pasture grasses for sheep grazing, and is confined to the larger islands with a long history of farming.

**Plate 19**. Grey Saltbush *Atriplex cinerea* Chenopod Shrubland, Dorothée Island. Photo R. B. Jenkins

**Plate 20**. Heath Bluebush *Maireana oppositifolia* Chenopod Shrubland, Fenelon Island. Photo A. C. Robinson

**Plate 21**. Grey Samphire *Halosarcia halocnemoides* Chenopod Shrubland, Busby Island. Photo A. C. Robinson

**Plate 22**. Coast Tussock Grass *Poa poiformis* Grassland, Greenly Island. Photo A. C. Robinson

**Plate 23**. Introduced Grassland, Waldegrave Island. Photo A. C. Robinson

**Plate 24**. Round-leaved Pigface *Disphyma crassifolium* Herbland, West Franklin Island. Photo A. C. Robinson

**Round-leaved Pigface**
***Disphyma crassifolium* Herbland**
**(Plate 24)**

This vegetation type occurs on the most exposed portions of the smallest islands, and an otherwise bare, rocky islet will often support small patches. It is very salt-tolerant and will even grow on areas covered by waves during high seas. Though present on all islands examined, it occurs in areas large enough to map on Jones, Pearson, Greenly, Dorothée, Albatross, West Bay, North and South Casuarina, North and South Page and West (Encounter Bay) Islands and, while it normally occurs as a pure stand, it can also be associated with Grey Samphire and Southern Sea-heath.

Maps of the distribution of these vegetation types are shown in Appendix F.

## Changes in Vegetation

Much of the information appearing in this book relates to the vegetation of South Australia's offshore islands as it appeared in the 1980s. These vegetation patterns, however, are not static but change in both distribution and species composition over time. These changes can be slow, resulting from the deaths of plants and their replacement by others of the same or different species, or by the growth of canopies that shade out species needing sun to grow. Equally, the changes can be dramatic, and in the context of offshore islands these dramatic changes can occur naturally—due to the effects of fire—or through clearing or grazing of the natural vegetation.

At the same time as whole vegetation types are changing, new plant species are becoming established with or without help from humans; and, though there is little direct evidence, species are probably also becoming extinct. All these processes can occur in any patch of vegetation, but because islands are discrete patches of vegetation surrounded by sea they can be particularly good places to study these dynamic processes. This chapter examines some examples of the processes of vegetation change that have been studied on South Australia's islands.

### Pearson Island

From 5 to 12 January 1923, a party of South Australian biologists led by Professor Frederick Wood Jones visited Pearson Island. During the course of that expedition, Professor T.G.B. Osborn, the expedition's plant ecologist, took a series of 36 photographs of the island with notes on each photograph (Plate 25). Twelve of these photographs were published in the scientific paper describing the plant ecology of Pearson Island (Osborn, 1923). On 10–12 February 1960, the Royal Society of South Australia mounted an expedition to Pearson Island and, realising what a priceless record of vegetation change on an uninhabited island over a 50-year period would be provided by a comparison with Osborn's 1923 photographs, David Symon attempted to relocate and re-photograph as many of Osborn's sites as he could. Eight photographic comparisons were published as a result of this expedition (Symon, 1971). Since then, both Brian Gepp in February 1973, Tony Robinson in November 1976 and an expedition of the Australian and New Zealand Scientific Exploration Society (ANZSES) in December 1984 with access to all 36 of Osborn's original photographs (Figure 9) attempted to relocate and re-photograph these sites.

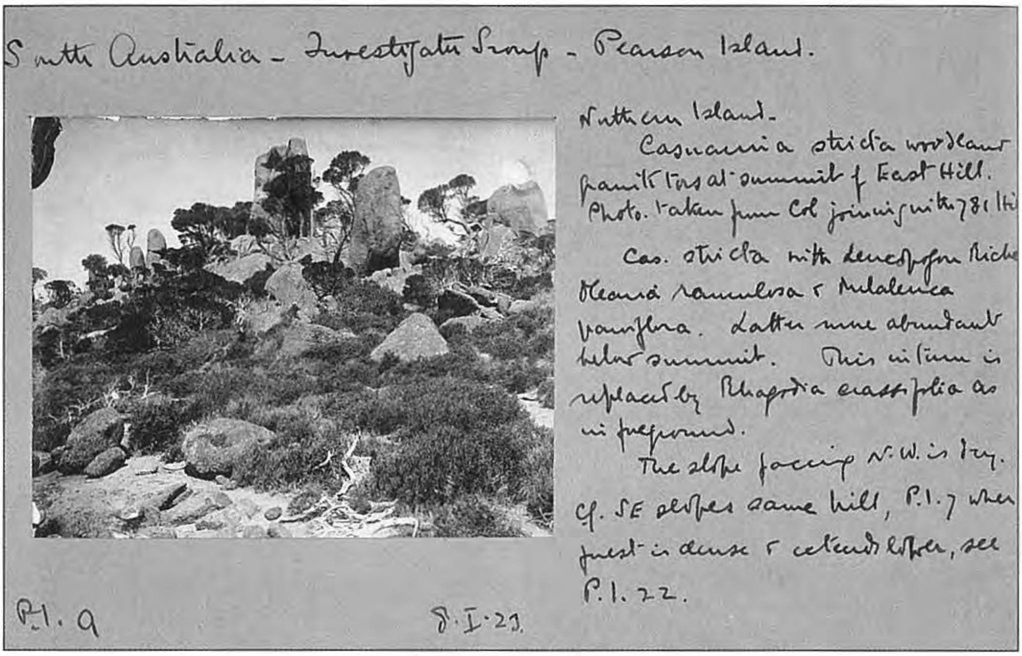



**Plate 25.** Photograph and vegetation notes made by Professor T.G.B. Osborn at site 9 on Pearson Island in 1923.

Because Pearson is so scenically spectacular, with granite tors and outcrops all over the island, it has been possible to relocate a large proportion of Osborn's original sites and now only 10 of the 36 have not been photographed at least once during 1969, 1973, 1976, 1984 and 1986. A complete series of this important photographic record for Osborn's Site 24 is shown in Plate 26.

In 1975 a lightning strike began a fire on the northern section that burned about a third of this part of the island. Realising the importance of following the recovery from fire in a systematic if fairly opportunistic fashion, four permanently marked photographic monitoring points were established within the burnt area on the 1976 expedition. These were re-photographed and re-sampled again during a brief helicopter stop on Pearson Island in May 1980, by the ANZSES expedition in December 1984, and again during a seal-counting expedition in January 1990.

In his discussions of the vegetation changes on Pearson Island in the period between 1923 and 1969, Symon (1971) notes:

- great reduction in dead wood and dying trees;
- considerable changes in Drooping She-oaks;
- widespread advance of dense saltbush stands at a number of sites;
- reduction in bare ground and in annual or short-lived species such as Variable Groundsel and Sea Celery; and
- reduction in medium-sized shrubs such as Coast Daisy-bush, Coast Beard-heath and saltbush.

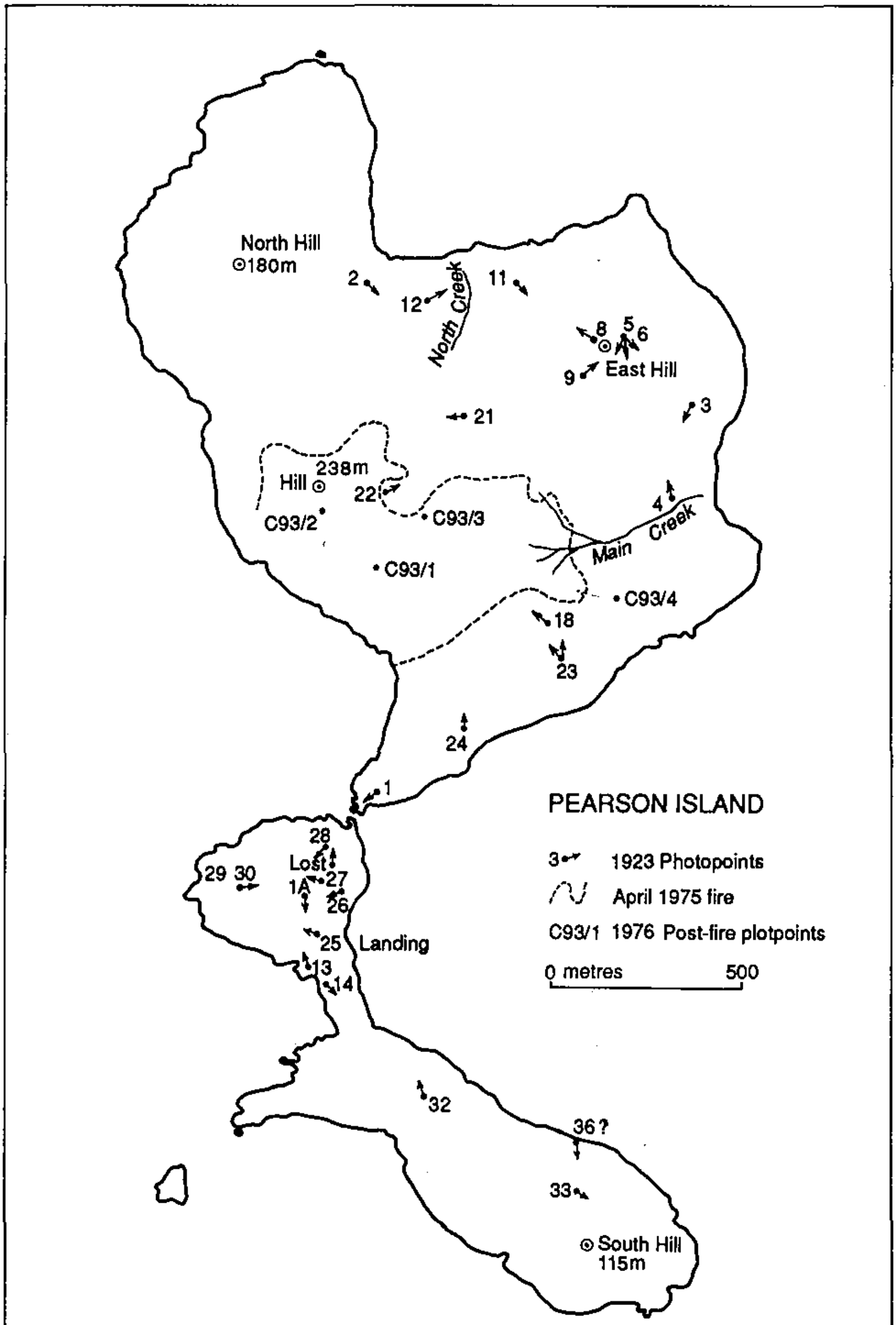



**Figure 9.** The location of all photographs on Pearson Island.

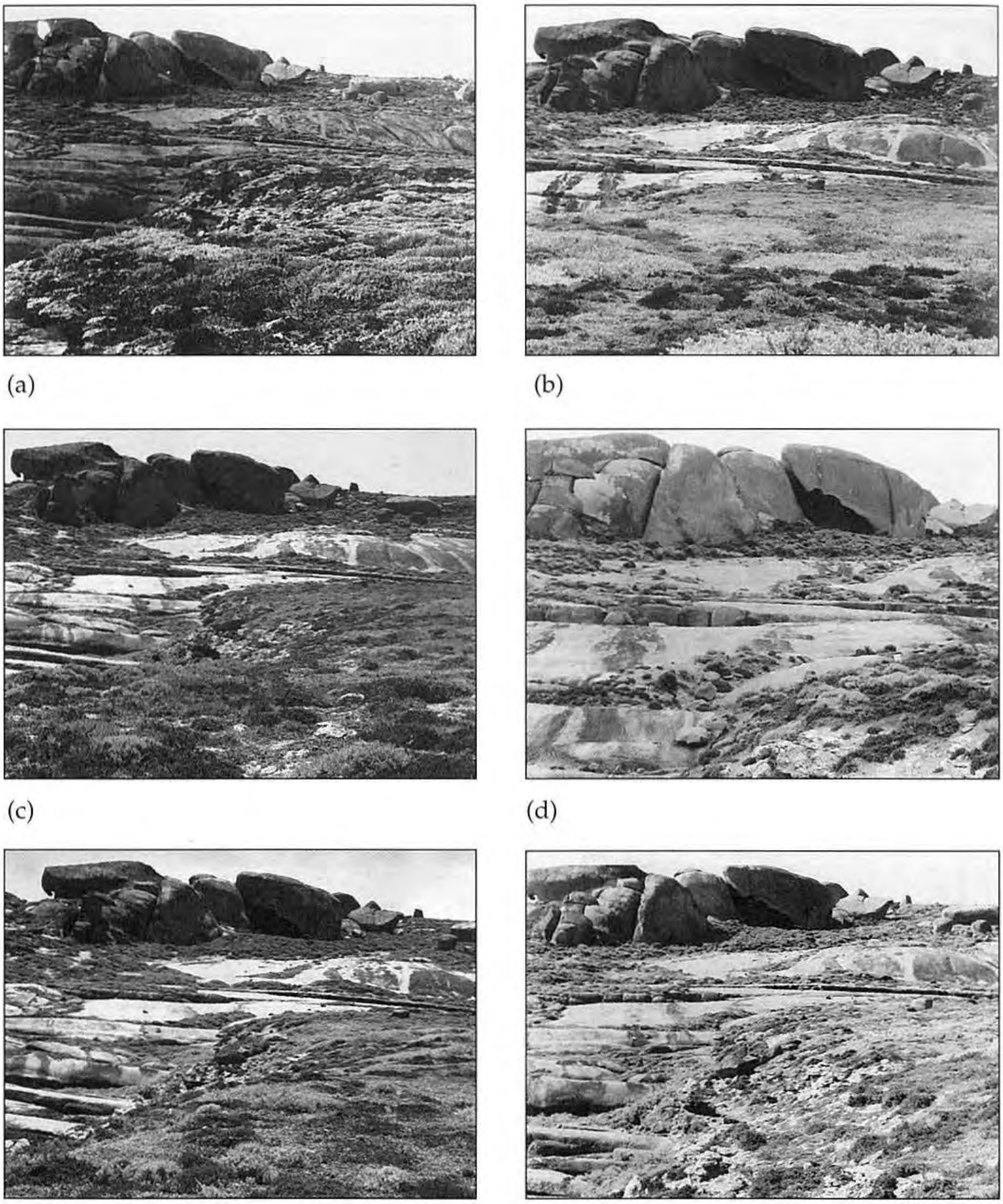



**Plate 26.** Complete photographic series from Osborn's site 24 on Pearson Island. Years are: (a) 1923; (b) 1969; (c) 1973; (d) 1976; (e) 1984; and (f) 1986.

Rather than republish the photographic comparisons already published by Symon, we show here a panorama taken from East Hill looking south and west (Plate 27) that graphically shows the reduction in bare ground from 1923–86, and three other sites that show the dramatic advance of saltbush (Plates 28–31). Osborn (1923) noted that some time before his visit in 1923 two fires had been started on Pearson Island by 'visiting vandals'. These fires almost destroyed the she-oaks south of Main Creek, but stated that 'elsewhere the burnt out flora has regenerated well'.

Unfortunately, Osborn did not map the exact extent of these fires and so, apart from those photographs taken in the area 'South of Main Creek', it is difficult to ascribe all the changes noted by Symon in 1969 as being due to successional changes following fire. Re-examination of these photographic comparisons, with the benefit of seeing the very early stages of succession from the 1975 fire on the island (Plate 31) has led to the postulation of a sequence of colonisation of burnt areas (Figure 10).

The sequence begins with a variety of annual plants such as Pink Purslane (*Calandrinia calyptrata*), Austral Stork's Bill (*Pelargonium australe*) and some Leafy Peppercress (*Lepidium foliosum*) followed by the growth of Twiggy Daisy-bush (*Olearia ramulosa*) and Karkalla (*Carpobrotus rossii*) to form a heathland, and eventually replacement of these heathland species by Marsh Saltbush (*Atriplex paludosa*), possibly through an intermediate stage involving Fleshy Saltbush (*Rhagodia crassifolia*).

If the root stocks of the South Australian Swamp Paper-bark (*M. halmaturorum*) and Dryland Tea-tree (*M. lanceolata*) scrub and Drooping She-oak (*A. verticillata*) woodlands are not killed by the fire, a relatively rapid vegetative regeneration occurs that will re-establish the woodland community. In cases where both the adult trees and the seed stocks of these communities were killed by a very intense fire these areas will be replaced by Daisy-bush heathland.

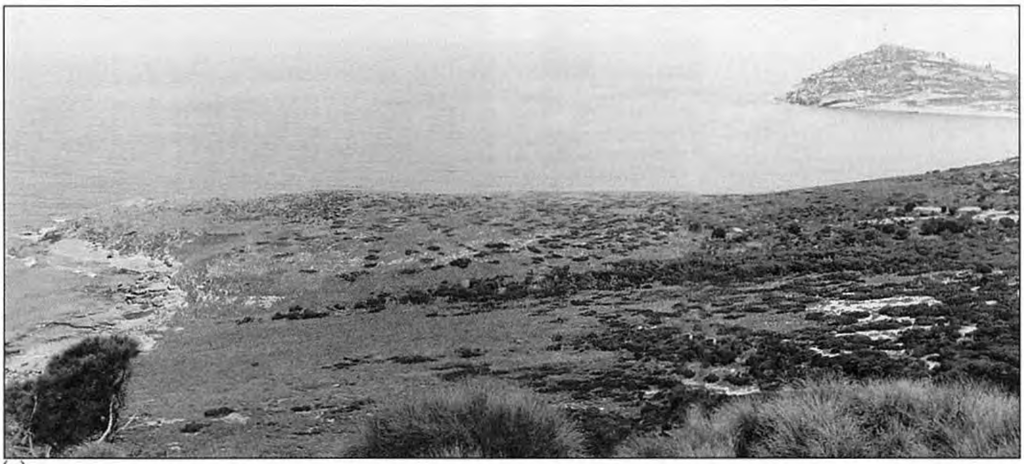
There is still a great deal of scope for additional research into vegetation change on other South Australian islands using these early photographic records. Professor Osborn visited and published vegetation photographs and descriptions of both Franklin Island in January 1922 and Flinders Island in January 1925, while the McCoy Society for Field Investigation and Research visited the Sir Joseph Banks Group in December 1936 and also published photographs and vegetation descriptions of Reevesby Island (Hayman and Henty, 1939).

All these old photographic sites are potentially locatable, though perhaps not as easily as on Pearson Island with its abundance of variously shaped granite boulders to use as landmarks. It may also be possible, with some historical research, to recover the original field notes from these other expeditions, as was done in the case of Osborn's 1923 visit to Pearson Island.

These changes in the vegetation of Pearson Island over 60 years represent one of the very rare records that spans this period in Australia, and are even more valuable because they show vegetation changes in the absence of the introduced grazing animals brought to most of the Australian mainland following European settlement.

(a)

(b)



(c)

**Plate 27.** A panorama looking south and west from East Hill, Pearson Island: (a) 1923; (b) 1981, and (c) 1986.

(a)
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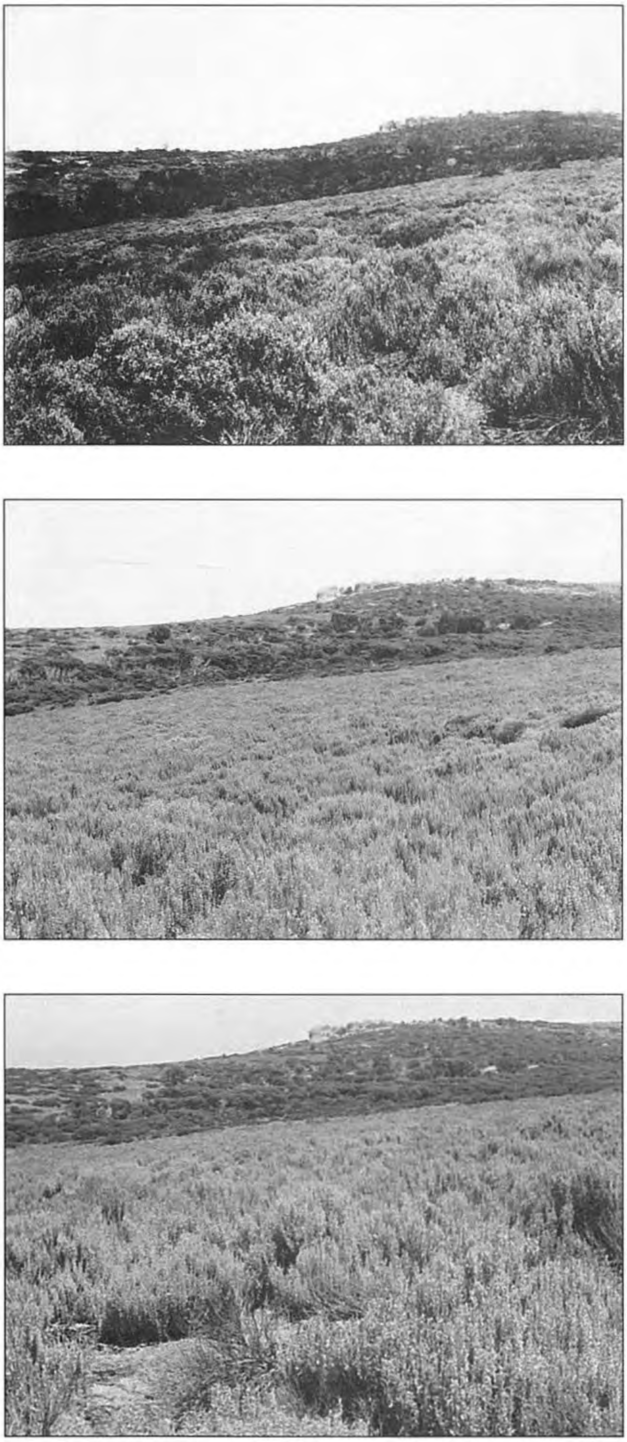


**Plate 28**. Osborn's site 3 on Pearson Island: (a) 1923; (b) 1976; and (c) 1986.

(a)
(b)
(c)

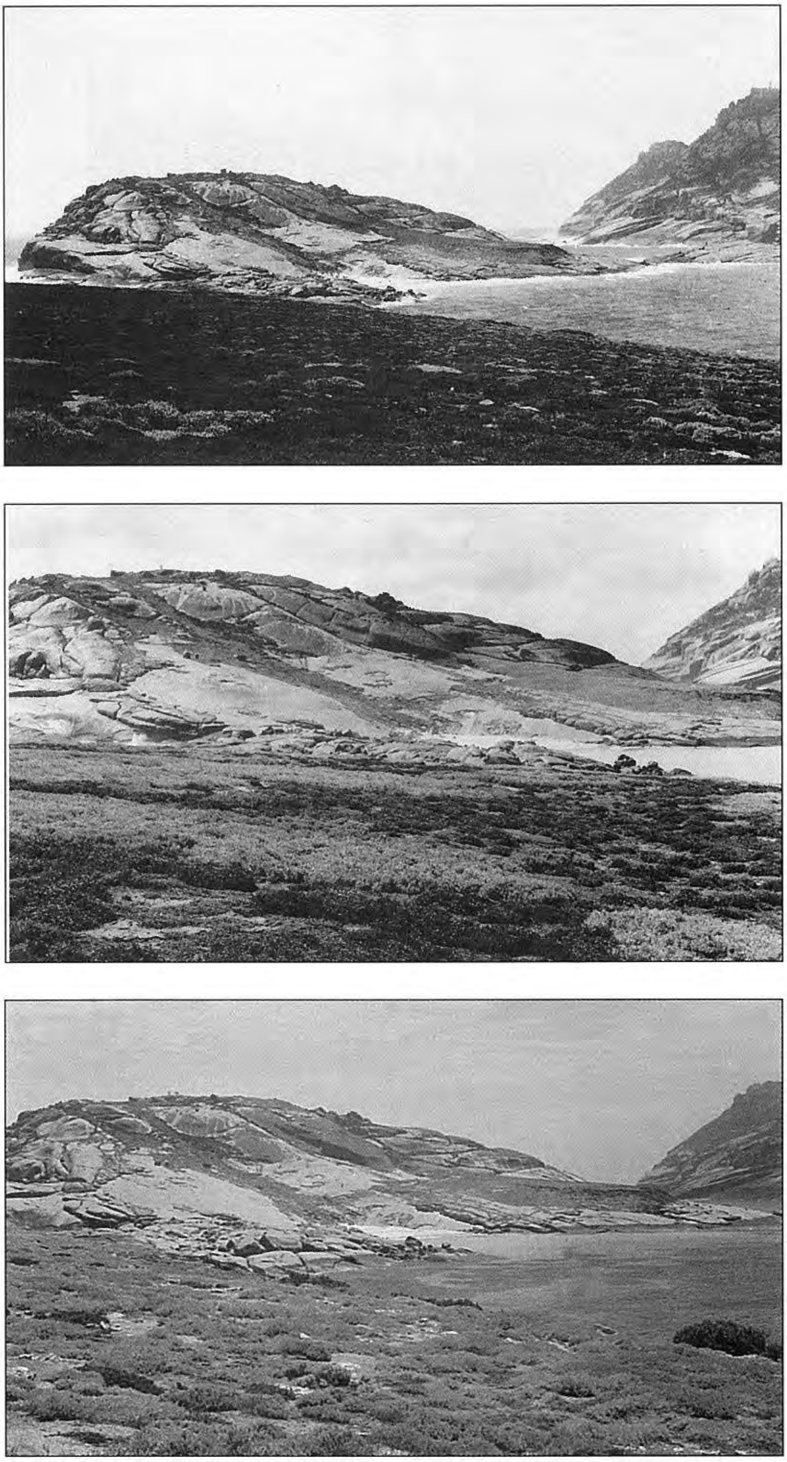


**Plate 29**. Osborn's site 32 on Pearson Island: (a) 1923; (b) 1976; and (c) 1986.

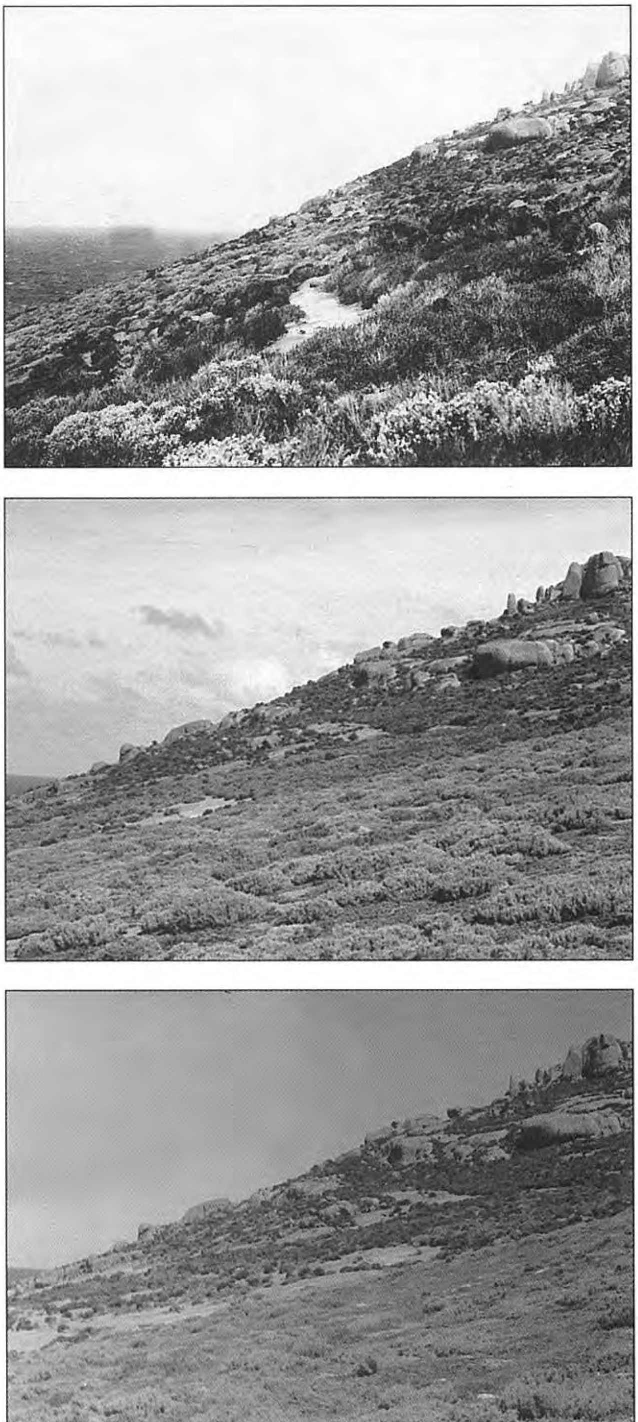
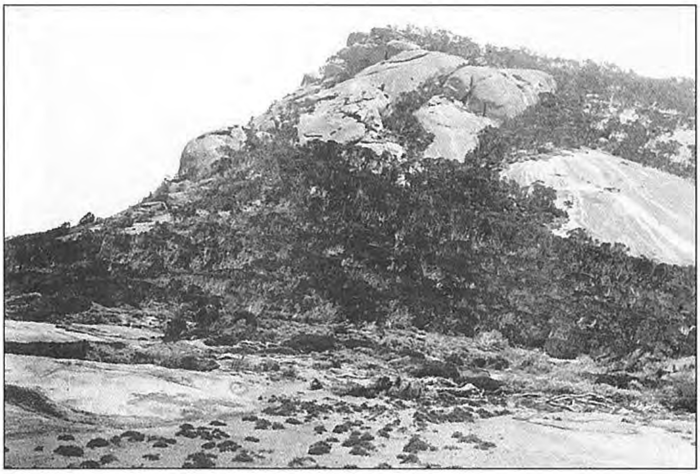
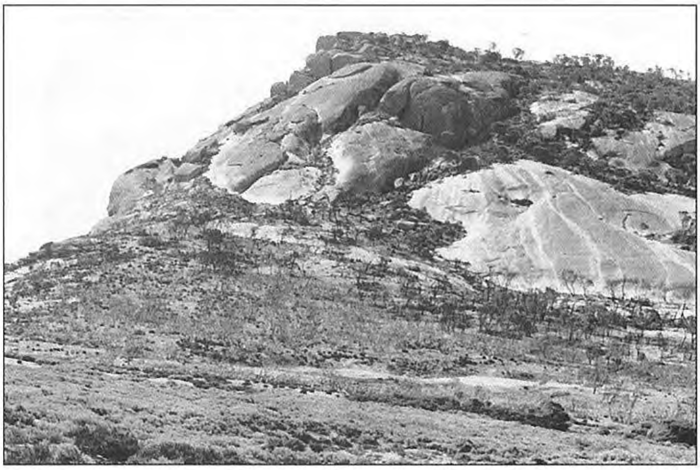



**Plate 30.** Osborn's site 33 on Pearson Island: (a) 1923; (b) 1976; and (c) 1986.

(a)



(b)



(c)

**Plate 31.** Osborn's site 18 on Pearson Island: (a) 1923; (b) 1976; and (c) 1986.

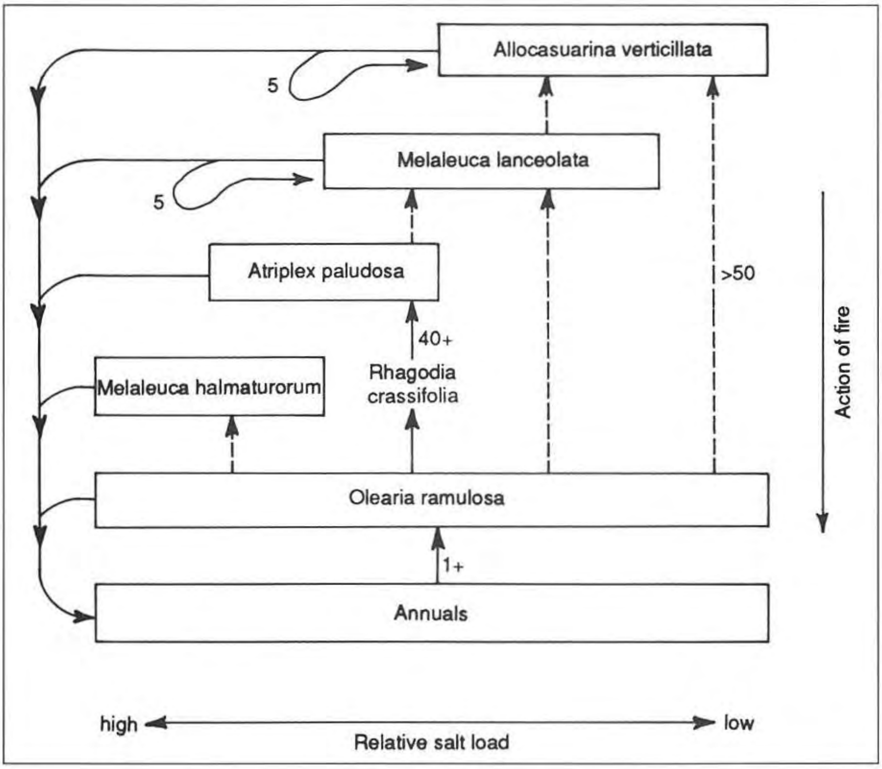



**Figure 10.** A diagrammatic representation of plant community succession on Pearson Island (after Fatchen 1982).

## Agriculture and the Spread of Boxthorn

Other South Australian islands have not remained in such a natural state as Pearson, but important vegetation changes are occurring that are only just beginning to be monitored. Reevesby Island in the Sir Joseph Banks Group has been farmed and grazed by sheep since before the turn of the century; where crops were planted, the native vegetation was completely cleared and the ground ploughed many times.

These clearings are still obvious, both on the ground and in aerial photographs, and even show up in the regular shaped patterns of introduced grassland on the island vegetation maps (Appendix F). On islands such as Reevesby and St Francis the early settlers, as was common practice in South Australia around the turn of the century, planted bushes of South African Boxthorn (Plate 32) as windbreaks and as hedges to keep sheep contained.

**Plate 32.** Boxthorn (*Lycium ferocissimum*). Photo A. C. Robinson

The bright red fruits of the boxthorn soon became a favoured food of both Silver and Pacific Gulls and, as starlings and feral pigeons spread through the islands, they also ate the fleshy berries. Boxthorn evolved in Africa to be dispersed by birds, so the hard seeds inside the berries can pass unaltered through a bird's digestive tract, having hitched a free ride to wherever the bird chose to fly before it defaecated. Boxthorn has now spread to a large number of islands in South Australia, and its present distribution is shown in Figure 11. The density of boxthorn is, however, very variable, ranging from a few isolated bushes to almost impenetrable thickets.

An indication of just how dramatic the boxthorn invasion has been can be illustrated for Winceby Island, which now has one of the worst boxthorn infestations of any of the islands. In 1939, CSIRO scientists took an aerial photograph of the north-eastern shore of Winceby Island (Figure 12) and, though they were interested in the nesting colony of Black-faced Shags there, this photograph can be compared with a 1979 aerial photograph of the same area.

The shags on Winceby Island now build nests in the boxthorn bushes and when attempts to control the boxthorn are discussed, concern is often expressed about loss of nesting sites for these birds. It is clear from this photographic comparison that as recently as 1939 Winceby Island supported a low chenopod shrubland with scattered Nitre-bushes and no boxthorn: then the shags nested on the ground, as they still do on other islands (such as Dangerous Reef) that have no vegetation at all. Unfortunately, boxthorn is a very good coloniser of bare ground and seems to be able to tolerate the very high soil nutrient levels in sea bird colonies. Rather than providing nesting sites for birds it may, in fact, be significantly reducing the area available for nesting.

## Common Iceplant

Common Iceplant (Plate 33) originated on the west coast of southern Africa but was an early introduction to the eastern Mediterranean, from where it was taken to Britain as an ornamental by 1725. It had been introduced to South Australia by 1851 (Kloot, 1983a) and had escaped in 1879, when it was noted as common at the Reedlands (near West Beach, Adelaide) and toward the top of Spencer Gulf. It has since spread widely around the coast of South Australia and further inland. It grows in a wide range of soils, from non-saline soils to those that support typical saltmarsh communities, and its distribution on South Australian offshore islands is shown in Figure 13.

**Plate 33.** Common Iceplant (*Mesembry-anthemum crystallinum*).
Photo P. D. Canty

As with the boxthorn on Winceby Island, there is a single piece of evidence available about the timing of the Iceplant invasion of one island, Franklin Island. The Franklin Islands were visited by T.G.B. Osborn in January 1922 and, as with his visit to Pearson, he took photographs and published a description of the island's vegetation (Osborn, 1922).

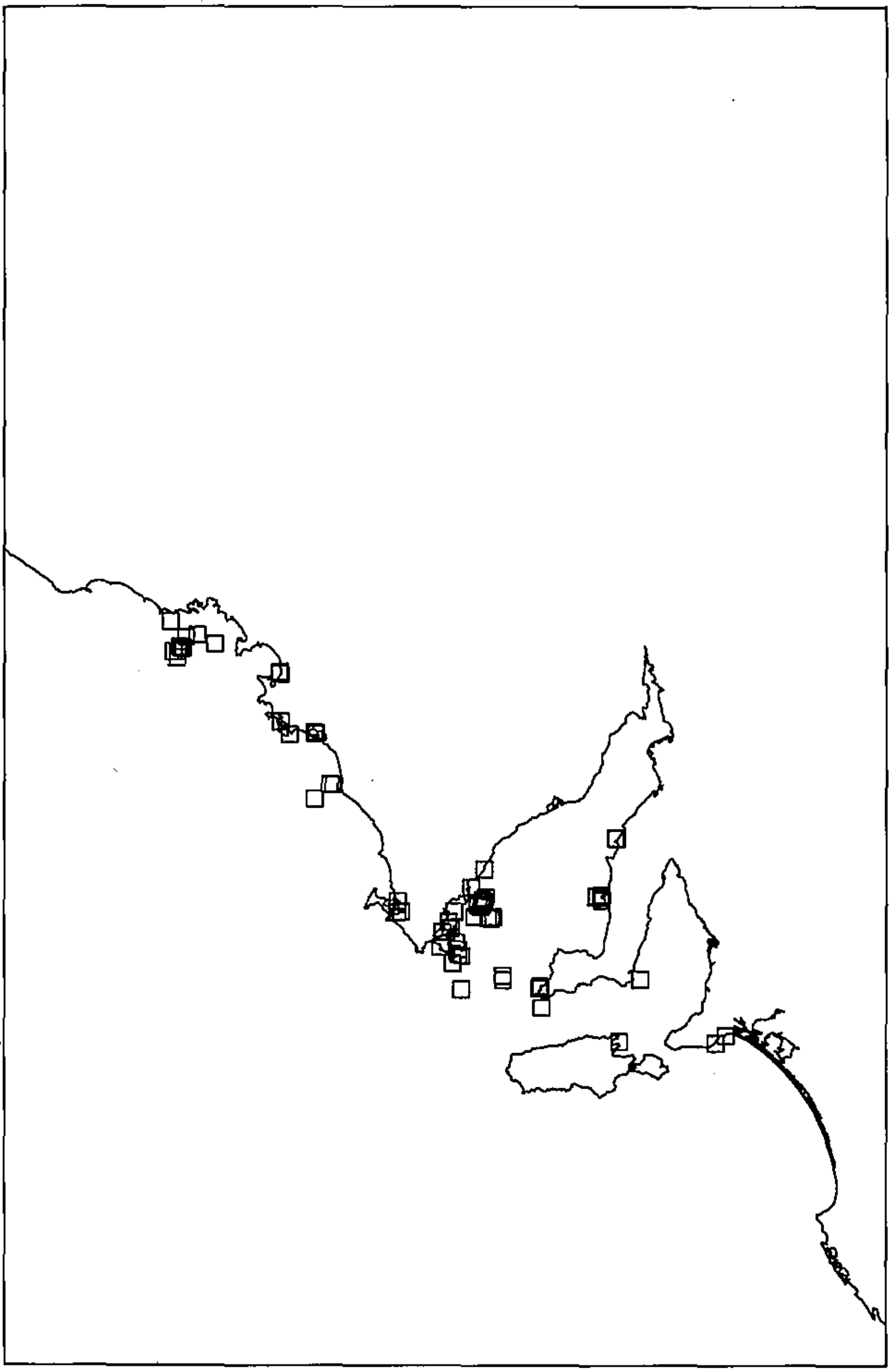


**Figure 11.** Map of offshore islands where Boxthorn (*Lycium ferocissimum*) has been recorded.

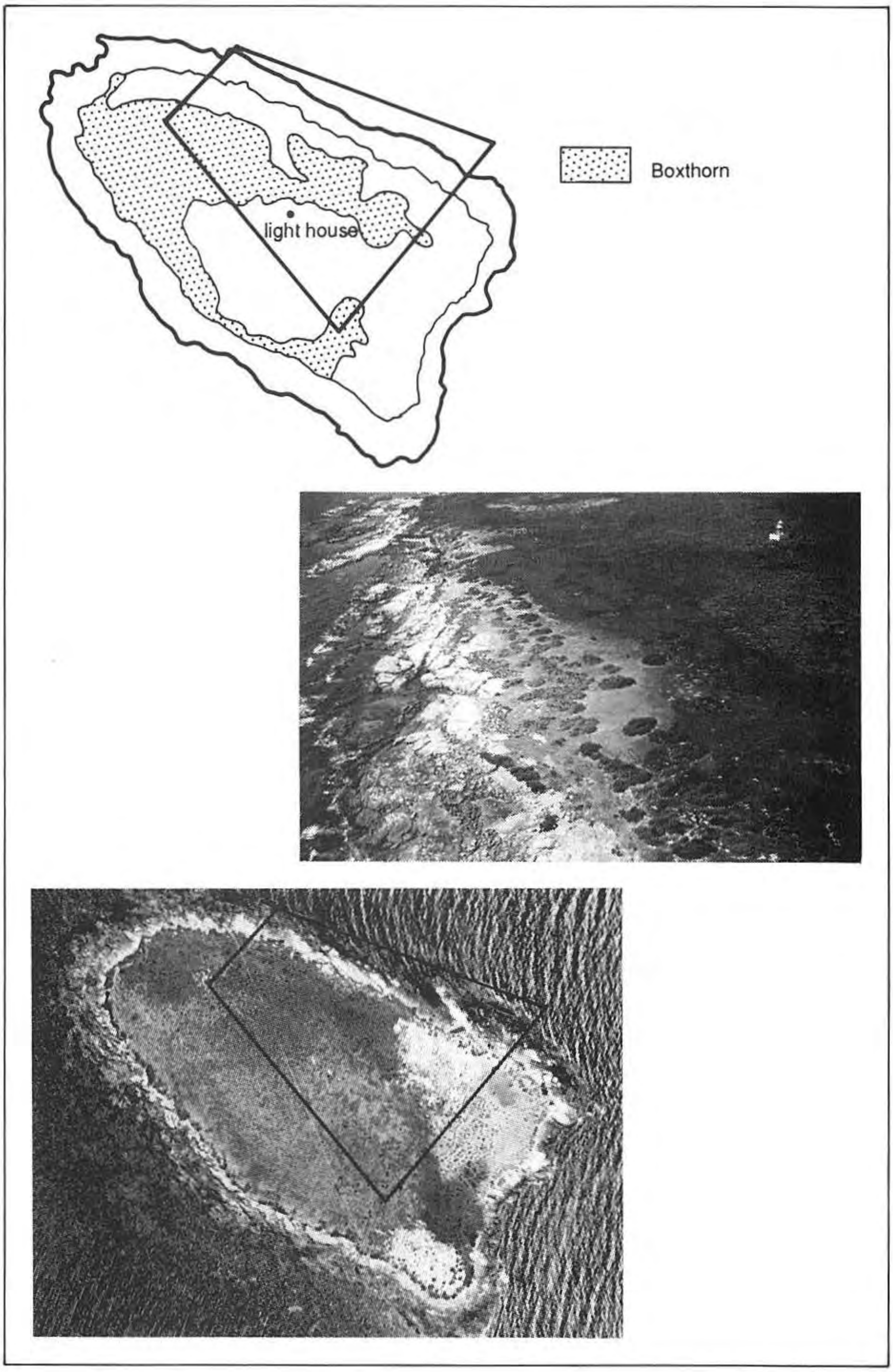



**Figure 12.** The spread of Boxthorn (*Lycium ferocissimum*) on Winceby Island. (a) The present distribution of dense stands of Boxthorn; (b) The northern shore of Winceby Island in 1939, the rounded bushes are *Nitraria billardierei*: not Boxthorn; and (c) A 1979 aerial photo showing the area covered by the 1939 oblique photograph.

Iceplant does not occur on his plant species list for the island, and its characteristic dried remains are not visible in any of his photographs. Iceplant is so abundant on both East and West Franklin Islands today that it is inconceivable Osborn would not have recorded it, so on this island at least we can date the appearance of Iceplant at some time after 1922.

Though Iceplant has long been known as a very successful coloniser of bare ground, Kloot (1983b) has suggested that a rather more complex mechanism is operating that may have significant implications for management of vegetation on islands. The 'crystalline' or 'icy' appearance of the plant's surface is caused by modified hairs filled with a watery solution. The plant can move excess salts from its cells into these external vesicles and is thus able to survive in areas that are much too saline for plants without this sort of adaptation. Iceplant can concentrate salt from the soils around its root zone into vesicles on the leaves and stems and, being an annual, does this each year during its growing season, returning these salty parts to the soil surface when it dies back in summer. Measurements of dead Iceplants show that they can contain up to 12 per cent sodium chloride, and adding this much salt to the topsoil over a period significantly increases its salinity, significantly inhibiting the growth of non salt-adapted plants (Kloot, 1983b). Beneath some dense Iceplant stands the surface soil salinity can rise too high even for new Iceplant seedlings to grow. In this case the ground remains bare until rainfall leaches the salts down into the subsoil; it is then almost always Iceplant that eventually re-establishes once surface salinity has been reduced. The accumulation of salt on the surface of the Iceplant is not simply a method of getting rid of excess salt from its cells, but is actually a competitive strategy to enable it to become the dominant plant in its environment.

These, then, are a few of the vegetation changes that are occurring on South Australian offshore islands. Some are quite natural, while others are the result of human disturbance. If the conservation value of the islands is to be maintained—and, in the case of severely degraded areas, enhanced—much more needs to be known about these dynamic processes.

## Introduced wallabies

At the time of European settlement natural populations of the Tammar Wallaby occurred on Kangaroo, Flinders, St Peter and Thistle Islands. The decline to extinction of the Flinders Island population is discussed in Chapter 2 and Chapter 6.

Bones of Tammar Wallabies have been found on Wedge and Reevesby Islands, but there are no records of their presence there when the first farms were established on these islands; it may be that the bones are all that remains of attempts to introduce Kangaroo Island animals as a food supply for shipwrecked mariners.

One such introduction did succeed: in about 1905, an unknown number of Tammar Wallabies was introduced to Greenly Island from Kangaroo Island (Mitchell and Behrndt, 1949). These wallabies thrived—about 50 were counted in 1976 (Robinson, 1980)—and can now be found all over the main central and small south-western section of the island, giving us an opportunity to see the impact of 80 years of wallaby grazing on an island that had not been grazed by anything other than Bush Rats and Cape Barren Geese for more than 10000 years. The northern portion of Greenly Island is detached from the main, central portion

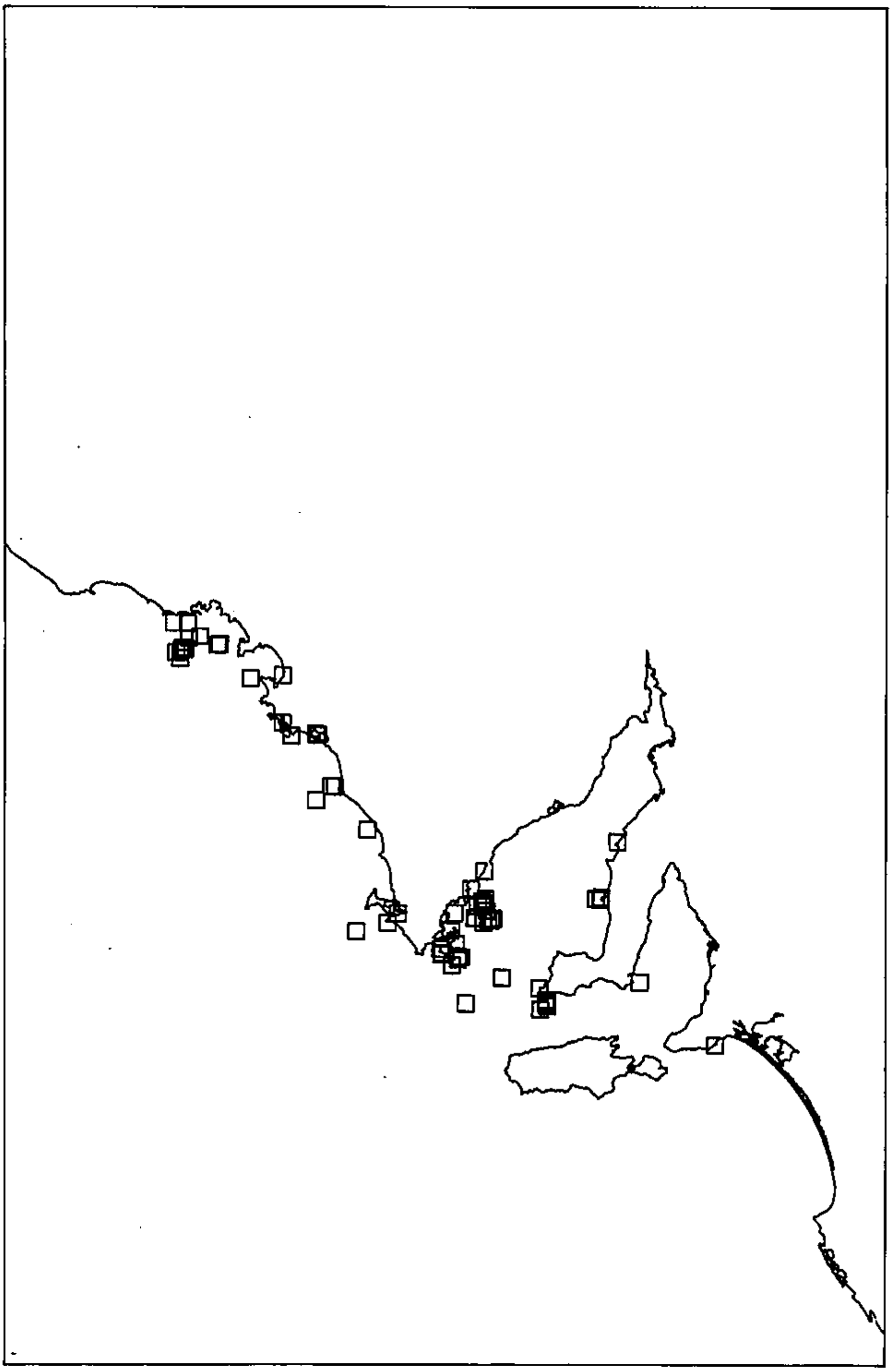


**Figure 13.** Maps of offshore islands where Iceplant (*Mesembryanthemum crystallinum*) has been recorded.

by a narrow sea way that the wallabies have apparently been unable to cross. Some plant species absent from the main island can be found on North Greenly, and there is significantly less *Poa* grassland on the ungrazed northern island (Fatchen, 1982), indicating that the introduced wallaby population has totally changed the plant ecology of the central and south-western portions of Greenly Island.

Tammar Wallabies have been introduced to Granite and Boston Islands in recent years and though there is very little natural vegetation remaining on these islands, large wallaby populations could still cause problems. The four largest South Australian islands, Kangaroo, St Peter, Flinders and Thistle, are known to have supported natural populations of these wallabies and were probably the only islands large enough to do so without significant environmental deterioration.

## Plant and Animal Biogeography

In 1834, a young English student of natural history sailed aboard HMS *Beagle* on a voyage of discovery that was ultimately to take him around the world. His name was Charles Darwin, and his observations on this voyage and later researches were to form the basis for the publication in 1859 of his famous book, *On the Origin of Species by means of Natural Selection: or the Preservation of Favoured Races in the Struggle for Life.*

This controversial work was to lay the foundations for all of today's evolutionary theory. Though many observations contributed to the arguments outlined in his book, Darwin was obviously deeply influenced by his visit to a group of islands in the South Pacific, the Galapagos Islands. Here, on small islands formed from submarine volcanoes and never connected with the South American mainland 1200 km to the east, he found a variety of plants and animals, many of them significantly different from related forms in South America. Though he did not pay great attention to the fact at the time, his most exciting later observation was that there were also consistent differences between islands in the Galapagos Archipelago. Finches, for example, had slightly different beak shapes depending on which island they occurred, while the shell shapes of the giant tortoises also varied consistently. Darwin reasoned that the original stock that reached these remote islands from South America had, over many thousands of years, been exposed to a process he called 'natural selection', and that this led to changes—evolution—until, through slightly different selective forces on each island population, the different species of finches and tortoises we see today were produced.

At the same time as Darwin was sailing around the world on the *Beagle*, another young Englishman, Alfred Russel Wallace, was making observations of the natural history of the East Indies. He also observed differences and similarities between the fauna, particularly the butterflies, of the many islands in the region, and corresponded with Darwin. Many of Darwin's and Wallace's views on evolution have since been modified, but they were both superb naturalists and for anyone interested in island natural history, their books still make fascinating reading. The importance of the study of island flora and fauna in the development of evolutionary biology has continued, and on South Australia's offshore islands the work of Schmitt (1977) on the Bush Rat and Schwaner (1985) on the Black Tiger Snake are important contributions.

The Bush Rat (*Rattus fuscipes*) (Plate 34) is mainly a ground-dwelling omnivorous native rodent inhabiting forest, heath and scrub. Its diet consists largely of leaf-litter invertebrates, seeds, berries, stem and leaf material, roots and fungi.

**Plate 34.** Bush Rat (*Rattus fuscipes*). Photo S.J. Doyle

There are four recognised subspecies, each inhabiting a separate coastal region of Australia; the South Australian subspecies is *Rattus fuscipes greyi*. Within this subspecies' distribution there are three isolated mainland populations; on southern Eyre Peninsula, the southern Mount Lofty Ranges and the south-east, together with populations on Kangaroo Island and 13 other offshore islands (Figure 14).

Unlike the volcanic islands of the Galapagos and Indonesian archipelagos, South Australia's are continental islands that were all connected with the mainland during the periods of lowered sea level of the Pleistocene Ice Ages (see Chapter 1). During the most recent Ice Age there is evidence to suggest that the climate along the expanded continental edge of southern Australia was wetter and more temperate than it is today, and that its coastal heath probably supported a continuous population of Bush Rats from the south-west of Western Australia, across the broad continental shelf below the present Nullarbor cliffs and right across South Australia and Victoria (this idea is supported by the presence of Bush Rats isolated on islands such as Dog, Goat and Eyre, where are no adjacent mainland populations survive).

The subsequent rise in sea levels and drying of the climate isolated populations of Bush Rats on offshore islands, and also fragmented the species' mainland range. Though rats are traditionally thought of as good colonisers across water, these are Black or Ship Rats (*Rattus rattus*), which traversed the world in association with European and Asian navigators, or Polynesian Rats (*Rattus exulans*), which spread to many islands in the Pacific with Polynesian voyagers. Bush Rats, on the other hand, live in the bush and avoid associating with humans, so the Bush Rats found on South Australia's offshore islands today must be remnants of widespread Pleistocene Ice Age coastal populations.

In his studies of Bush Rats, Schmitt (1975, 1977a, 1977b and 1978) assumed that before the isolation of the offshore islands, all the South Australian populations shared a common gene pool. By examining variations in protein structure he determined the variations within three mainland populations, Kangaroo Island, and nine offshore islands (Dog, Goat, Eyre, Pearson, Greenly, Waldegrave, Williams, Hopkins and North) and measured a range of skull characteristics in each of these populations to see if they showed a similar variation. He concluded that Bush Rat populations on the small South Australian islands are individually *less* variable than most populations of other mammal species that have been studied, indicating that on these small islands strong forces reduce and eliminate variability within these confined populations.

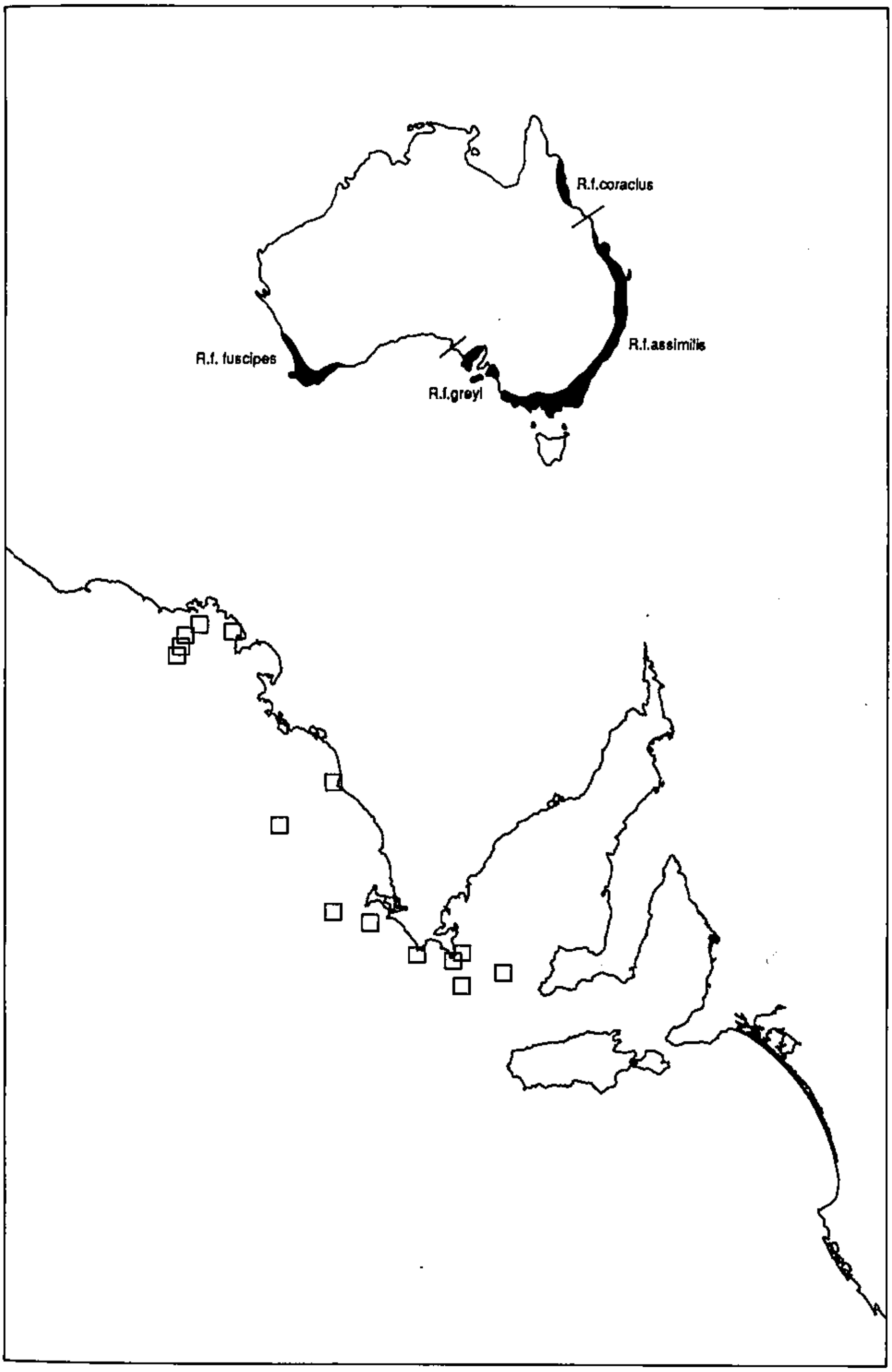



**Figure 14.** The Australian and South Australian offshore island distribution of the Bush Rat (*Rattus fuscipes*).

Comparisons between islands, however, using a measure called 'genetic distance' (which provides a quantitative estimate of two populations' degree of difference or similarity) reveals that in comparison with other mammal species studied, the island populations of the subspecies *R. fuscipes greyi* are much *more* variable. Given their relatively recent isolation from the mainland, these island rat populations have therefore evolved extremely rapidly. This species gives scientists an opportunity to study the very early stages of the processes of evolution and speciation.

The study of Black Tiger Snakes (Plate 35) is still in its relatively early stages, but preliminary results from Schwaner (1985), Barnett and Schwaner (1985) indicate that there may be an even more interesting evolutionary story to tell. Like Bush Rats, Tiger Snakes occur across coastal southern and south-eastern Australia. Within South Australia, black-coloured populations occur on southern Yorke and Eyre Peninsulas and in the southern Flinders Ranges (Figure 15), while there are island populations on Kangaroo Island, the small islets in Pelican Lagoon and 11 other offshore islands (Figure 16).

Bush Rats and Tiger Snakes provide evidence of evolution in the very recent past, and examples that can be dated in this way are very rare indeed. Darwin and Wallace would surely be gratified that island populations of animals are continuing to provide significant insights into the mechanisms of evolution.

The flora and fauna of continental islands, such as those around the South Australian coast, are commonly believed to be parts of the original mainland populations cut off by the rises in sea levels that created the islands. Once the landbridges linking islands to the mainland disappeared, colonisation (the introduction of new species from outside) was thought to have ceased and in general, though some species might become extinct, islands were generally regarded as a 'museum' that preserved archaic forms: the survival of giant tortoises on the Galapagos and on some Indian Ocean islands, and the Tuatara of New Zealand, tended to support this idea of islands being very stable places.

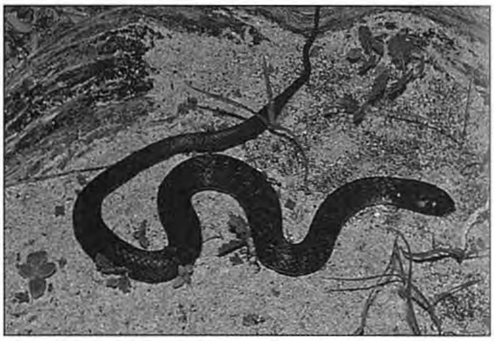


**Plate 35.** Black Tiger Snake (*Notechis scutatus*). Photo P.D. Canty

There is also a well-known relationship between the number of species and island area; as island area increases, so the number of species it can support increases. Should the number of species decline on an island through local extinctions, the parallel process of island speciation should result in the evolution of new species to fill any vacant niche and return the total species number supported by that island to the 'species/area curve'.

MacArthur and Wilson's theory of island biogeography, published in 1967, was revolutionary because they regarded the flora and fauna of islands not simply as relics of past history but as dynamic and changing entities. Their equilibrium theory states that the species number is maintained by a balance of immigrations and extinctions, with an island's species composition changing constantly. There are many complex ways in which

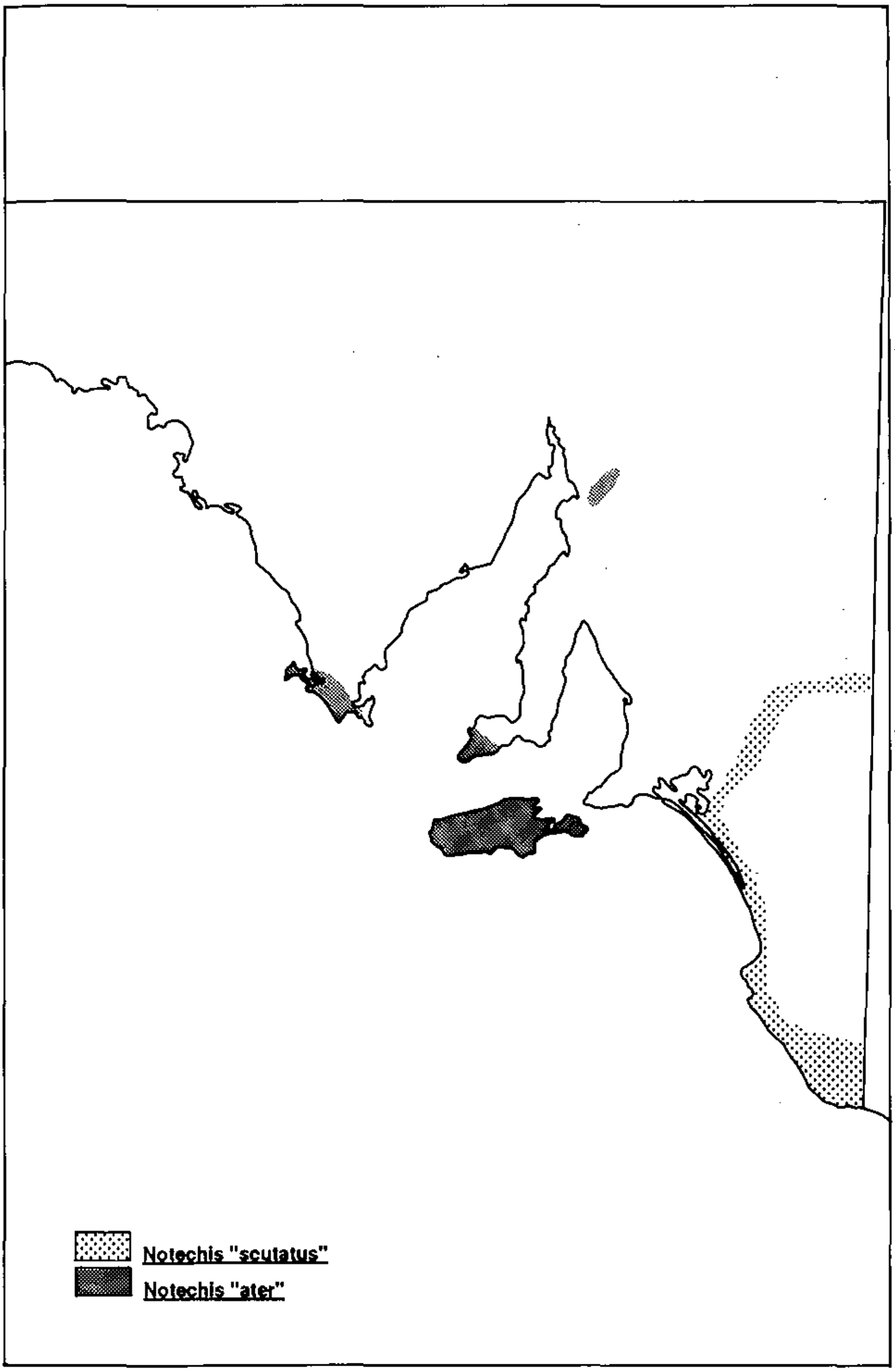



**Figure 15.** The distribution of Tiger Snakes—*Notechis scutatus* and *N.'ater'* on the South Australian mainland and Kangaroo Island.

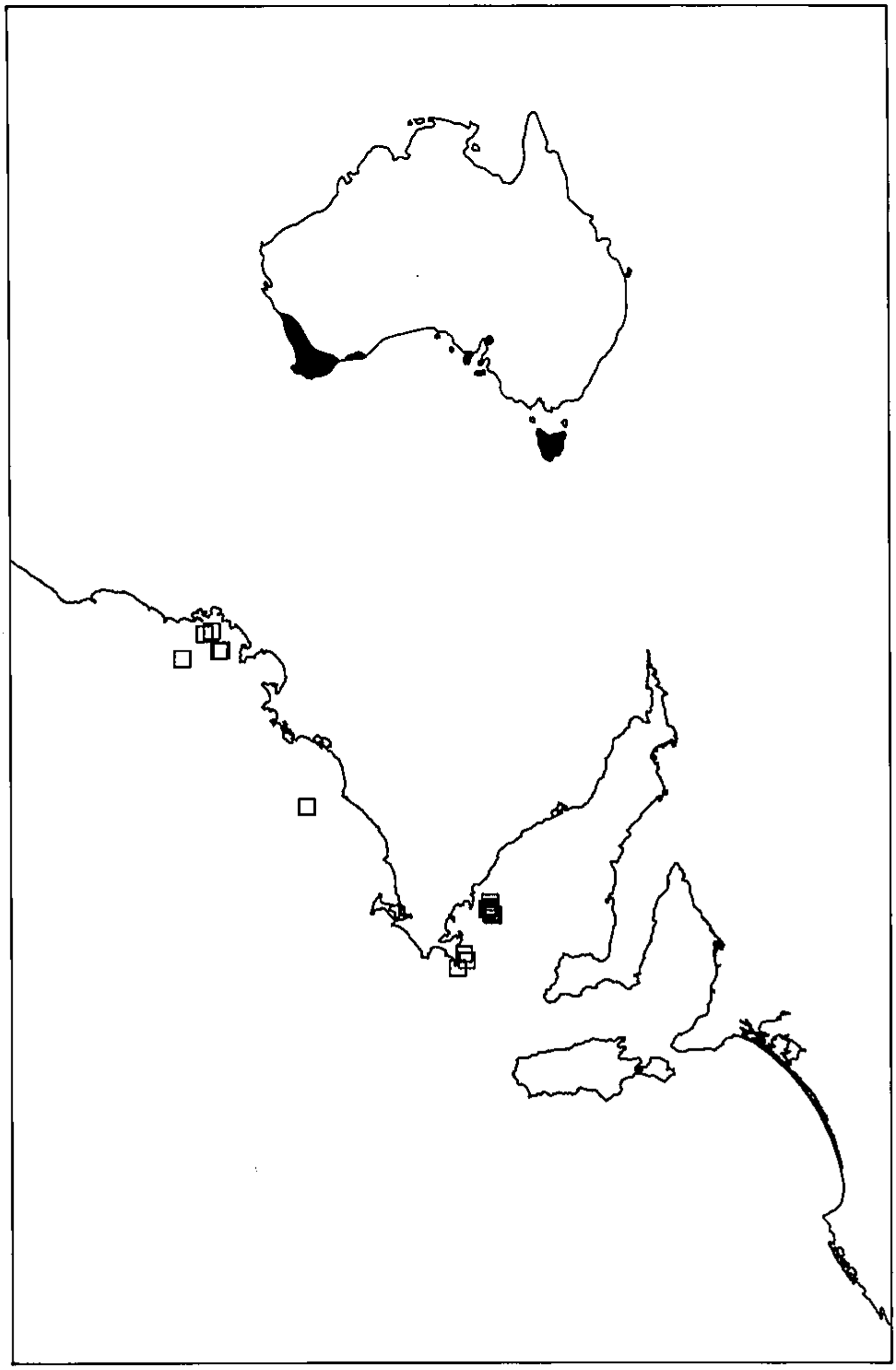


**Figure 16.** The Australian and South Australian offshore island distribution of Black Tiger Snakes (*Notechis scutatus*).

immigration, extinction and speciation can interact on islands, but ecologists are interested in whether colonisation and extinction rates are constant enough over time to leave this equilibrium at a measurable level for a given island.

It is also of interest to determine whether evolution into distinct species (the speciation process) on islands happens more quickly or more slowly than the turnover of species through immigration and extinction. Studies such as those on Bush Rat and Tiger Snake populations on South Australian islands are beginning to provide some information on the timing of this process.

These processes obviously take place over very long periods, and monitoring changes on a particular island is extremely difficult. Fortunately, with a number of islands of differing size and distance from the adjacent mainland some of the predictions of the theory can be tested. For example, all else being equal, extinction rates will decrease with increasing island area, so that by assuming the same original composition of 'founding' species for adjacent large and small islands, we can predict that any difference in species number between them could have been due to differing extinction rates since isolation. Likewise, we could predict that immigration rate would decrease with distance from the mainland. This book provides information from a range of islands of different areas and distances from the mainland for the statistical tests required by the equilibrium theory of island biogeography.

Though these questions are theoretical and not easily explained, the answers can only be found on offshore islands. An understanding of these processes is of fundamental importance in managing the conservation of entire continents. As the world's human population expands, plants and animals are increasingly becoming confined to 'islands' or fragments of their original habitats, surrounded by crops or grazing land in which they cannot survive and reproduce. Natural area managers all over the world are beginning to consider factors such as reserve size and isolation and whether many of the species currently conserved will survive there when the systems come to 'equilibrium' at some time in the future.

A study of the processes at work over the past 15000 years on South Australia's offshore islands may ultimately provide some practical answers about the future direction of nature conservation on the South Australian mainland.

## Some Island Life Histories

There are many species of plants and vertebrates on South Australia's offshore islands; these are listed in the Appendices, with more information on the flora and fauna of each island in Chapters 4 to 11. This section discusses the fascinating natural histories of characteristic island animals and plants.

### Penguins

**Little Penguin**
***Eudyptula minor* (Plate 36)**
The Little Penguin is the smallest of the 16 species of penguins in the world, all of which are confined to the Southern Hemisphere. It is the only penguin to breed in Australia and, unlike some other species, does not migrate from its breeding areas on islands along the southern Australian and New Zealand coast and the Chatham Islands. A fairly long movement for a Little Penguin was recorded when a dead banded bird was recovered from Carpenters Rocks in South Australia: it had been banded five

years beforehand in Port Campbell National Park, 240 km to the south-east. The Australian record, however, is of a young bird banded at Five Islands off the New South Wales coast, that spent a week ashore 1000 km from its banding site (Stabel and Gales, 1987).

There are a few breeding sites on the Australian mainland, and two of these (at Carpenters Rocks and Cape Northumberland) are in the south-east of South Australia. Both these populations, however, appear to be at serious risk from dogs and foxes (May, 1978). Offshore islands (including Kangaroo Island) however, are doubtless the stronghold of this species of penguin, and Figure 17 shows the islands where the species has been recorded. Breeding records are summarised in Parker et al. (1979), but some additional breeding records were noted during the survey.

A good account of the biology of the Little Penguin can be found in Stabel and Gales (1987). Little Penguins nest beneath rocks in limestone caves, cliffs and crevices, or simply dig a scrape beneath a bush. In sandy areas they construct a burrow about a metre long and almost as deep. The nest chamber is lined with grass or pieces of seaweed, and in South Australia the breeding season is normally from late July to early January, though in some years breeding has been recorded in April and May.

Two plain white eggs are laid in the nest chamber and when the chicks first hatch they are covered with fine grey down. The Little Penguin's egg is compared in Figure 18 with that of other burrowing seabirds found on South Australian islands.

At about 10 days this is replaced with longer down that is brown above and cream below. The moult to the adult birds' blue and white plumage begins in the fifth week and is completed by eight weeks. Incubation of the eggs or chicks is shared by both parents in turn, and shifts can last up to 10 days. The return to the nesting burrow in the evening from one of these extended fishing expeditions is greeted by a chorus of extremely loud braying, rising to a crescendo — which can make attempting to sleep on penguin breeding islands a particularly trying experience.

In common with many other species of penguins, Little Penguins enter and leave the water in groups at well-defined places. This habit has been turned into a major tourist attraction on Phillip Island, Victoria where large numbers of birds land just after dusk on sandy Summerland Beach and then conduct a 'Penguin Parade' across the beach to their breeding burrows in the dunes. This spectacle is sometimes watched by thousands of spectators.

When the chicks are about two weeks old, both parents have to spend the day at sea to catch enough food for them. It is quite common for one chick to grow faster than the other, but once they are fully fledged they leave the burrow and go to sea, dispersing widely during their first year. By the time the chicks leave their parents have lost a significant amount of weight; they then go to sea for about six weeks before returning to the colony for their annual moult.

**Plate 36.** Little Penguin (*Eudyptula minor*). Photo P. D. Canty

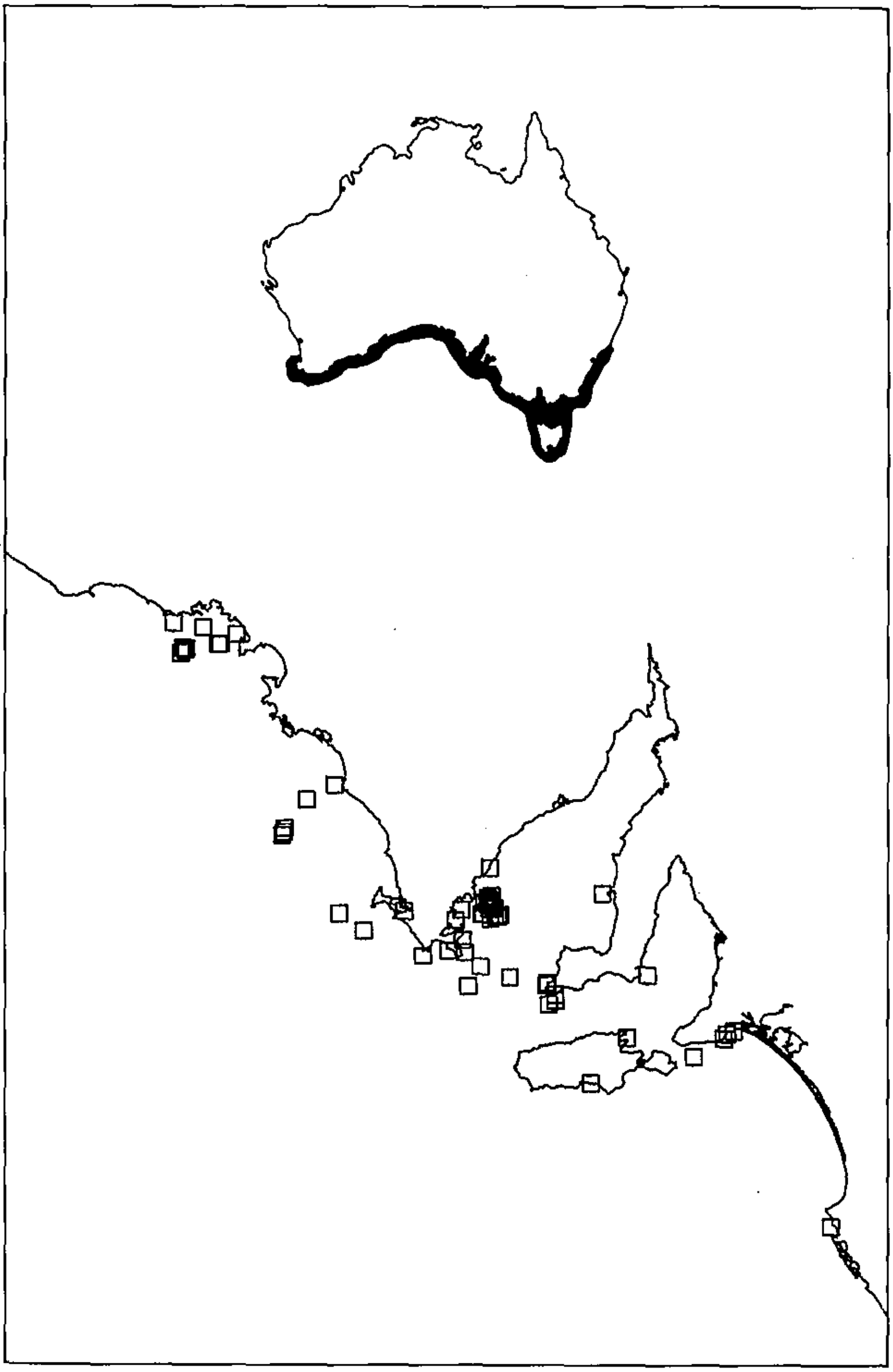


**Figure 17.** The Australian and South Australian offshore distribution of the Little Penguin (*Eudyptula minor*).

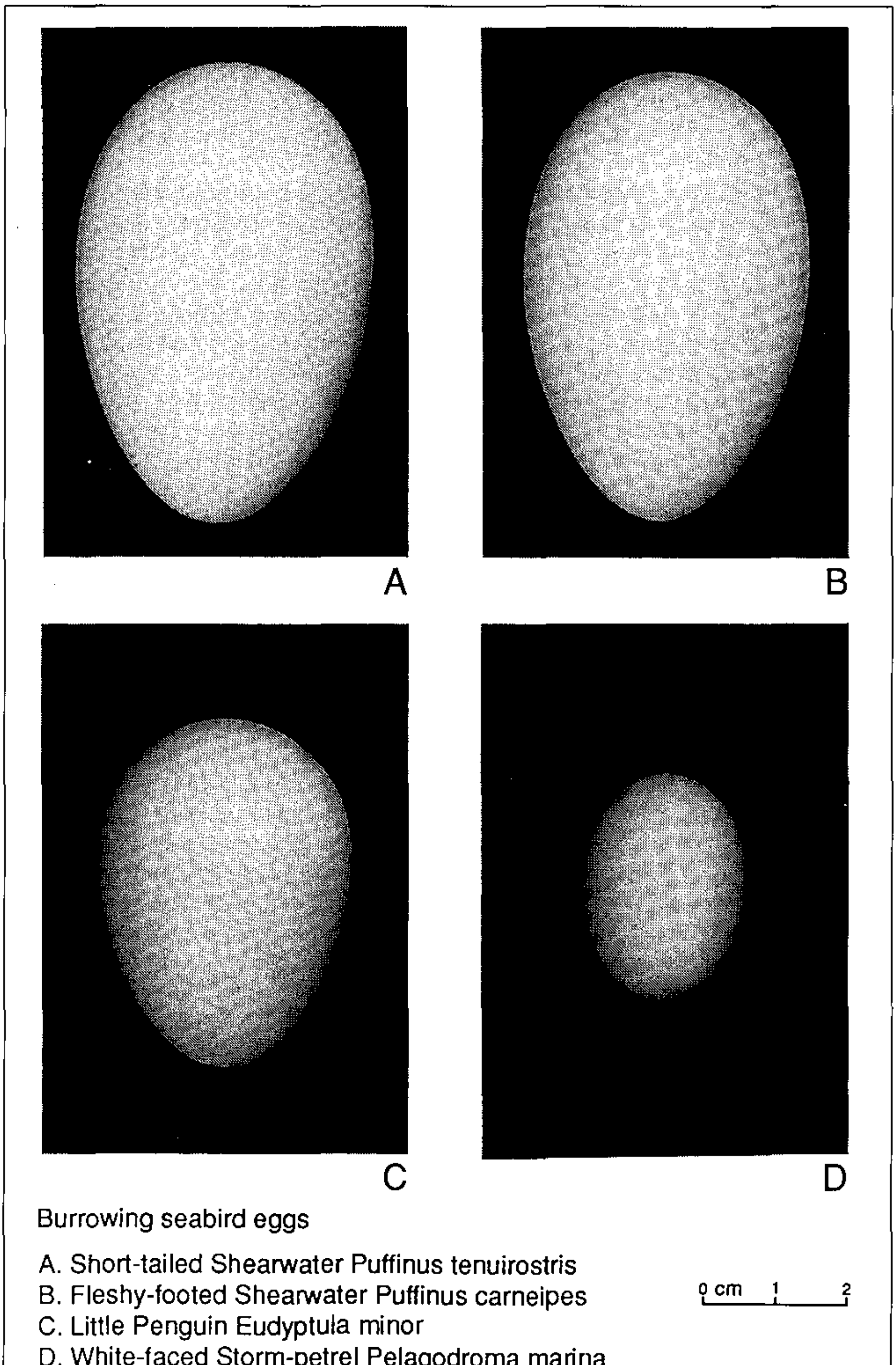



**Figure 18.** The eggs of the four species of burrowing seabirds recorded from South Australian offshore islands.

Though Little Penguins are still abundant and secure in South Australian waters, there is some suggestion of significant declines on Flinders, Wardang and perhaps Granite Islands since the earlier part of this century (Parker et al. 1979).

## Shearwaters and Storm-petrels

**Short-tailed Shearwater**
***Puffinus tenuirostris* (Plate 37)**
The Short-tailed Shearwater or Mutton Bird is only known to breed around the southern coast of Australia, from the Nuyts Archipelago to Broughton Island in New South Wales. The populations on the islands of Bass Strait are well known because of the longstanding mutton birding industry involving the commercial harvesting of chicks during an open season between 27 March and 3 April each year (Callister, 1991).

**Plate 37.** Short-tailed Shearwater (*Puffinus tenuirostris*).
Photo S.J. Doyle

There has never been any organised mutton bird industry in South Australia, despite the fact that a significant proportion of the species' population breeds on South Australian islands. CSIRO held the lease on St Francis Island between 1956 and 1967 during the period when it was carrying out a major research project on mutton bird biology in relation to the Bass Strait industry (Serventy, 1967, 1974; Serventy and Curry, 1984). However, there appears to have been little work done in South Australia and no suggestions of any expansion of the industry. The island distribution of the Short-tailed Shearwater is shown in Figures 19 and 20.

As part of the present study the numbers of active shearwater burrows per unit area were counted on many of the islands visited, and on all islands the area covered by burrows was mapped. By calculating the average active burrow density per island and using the overall average density for islands when actual burrows were not counted, it is possible to calculate an estimated Short-tailed Shearwater population for South Australia. These calculations are shown in Table 2.

Even allowing for the problems of indirect population estimates, something in the order of one and a half million shearwaters returning to South Australia's islands to breed each year has a significant impact on their ecology. With an average density of 237 burrows per ha on South Australian islands, simply walking can be strenuous and destructive—it is difficult not to break through the burrows in the sandy island soil.

To experience the return of this enormous number of shearwaters to their nesting burrows in the evening is one of the great natural history experiences of the world. These oceanic birds, such masters of the air, are not really designed for life on land ... and especially for landing. Most seem to engineer some sort of crash-landing into a bush or grass tussock, and birds often make several passes over a burrow site before landing.

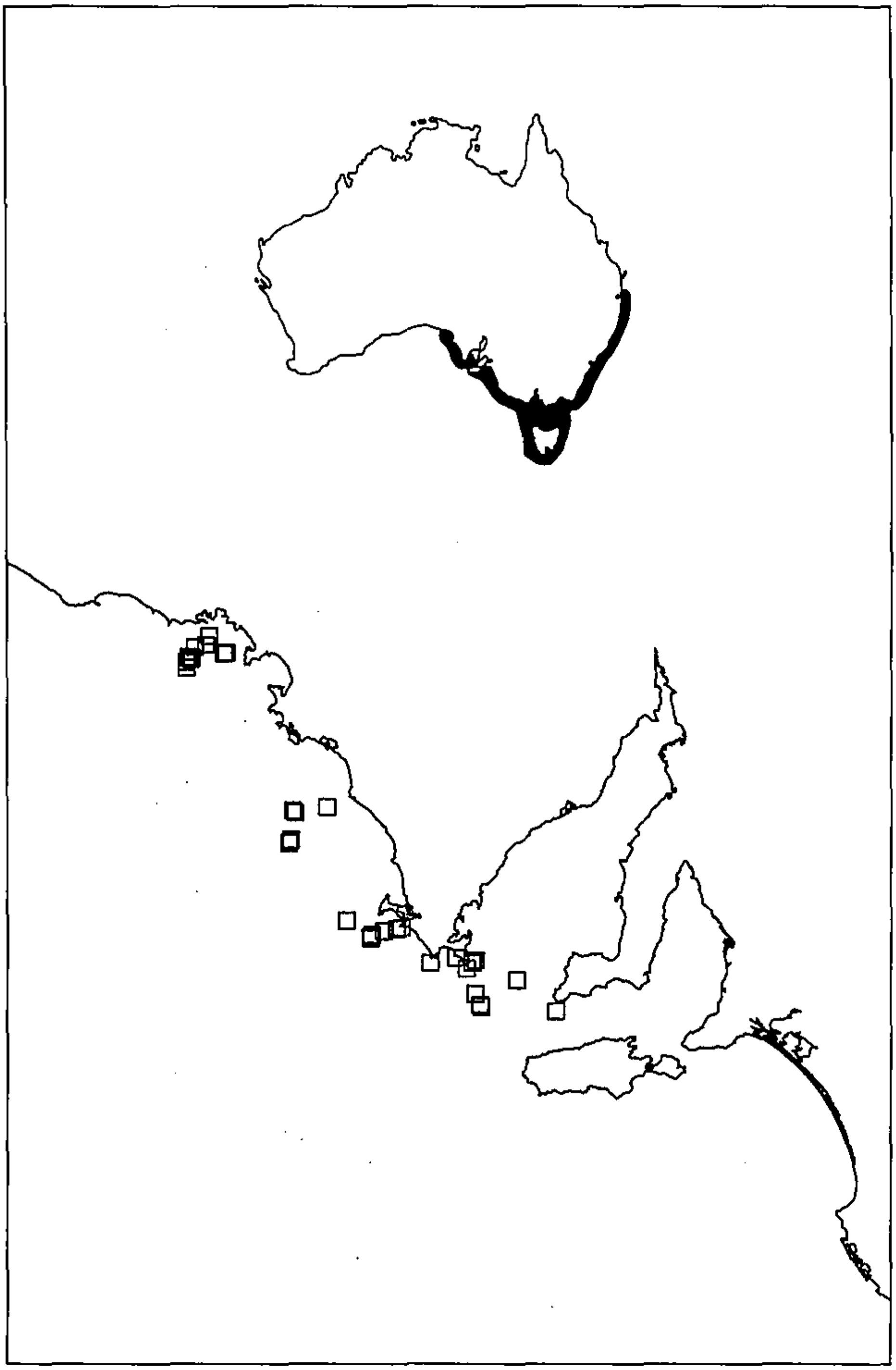


**Figure 19.** The Australian and South Australian offshore island distribution of the Short-tailed Shearwater (*Puffinus tenuirostris*).

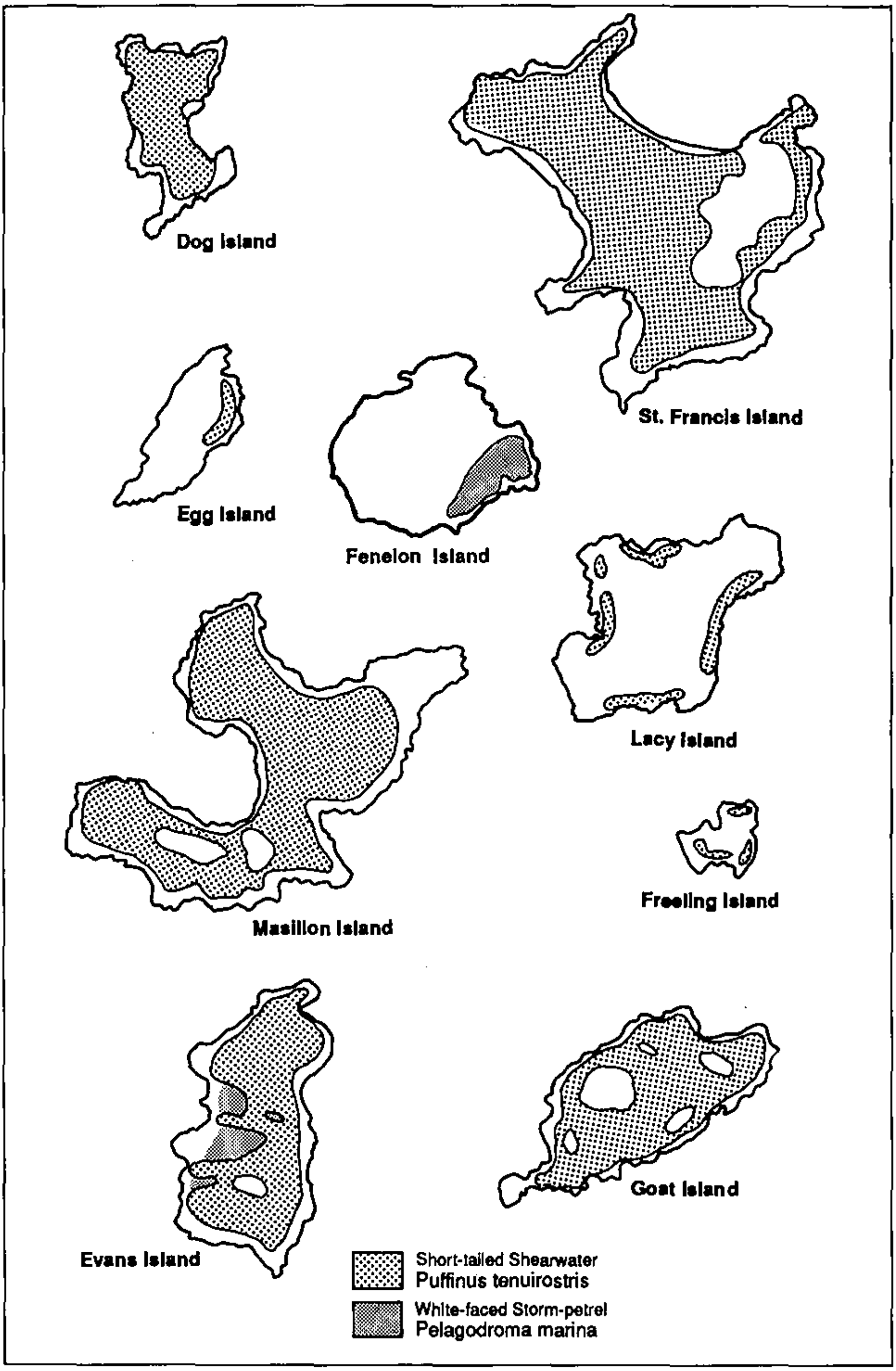



**Figure 20.** The distribution of breeding colonies of the Short-tailed Shearwater (*Puffinus tenuirostris*) and the White-faced Storm-petrel (*Pelagodroma marina*) on South Australian offshore islands.

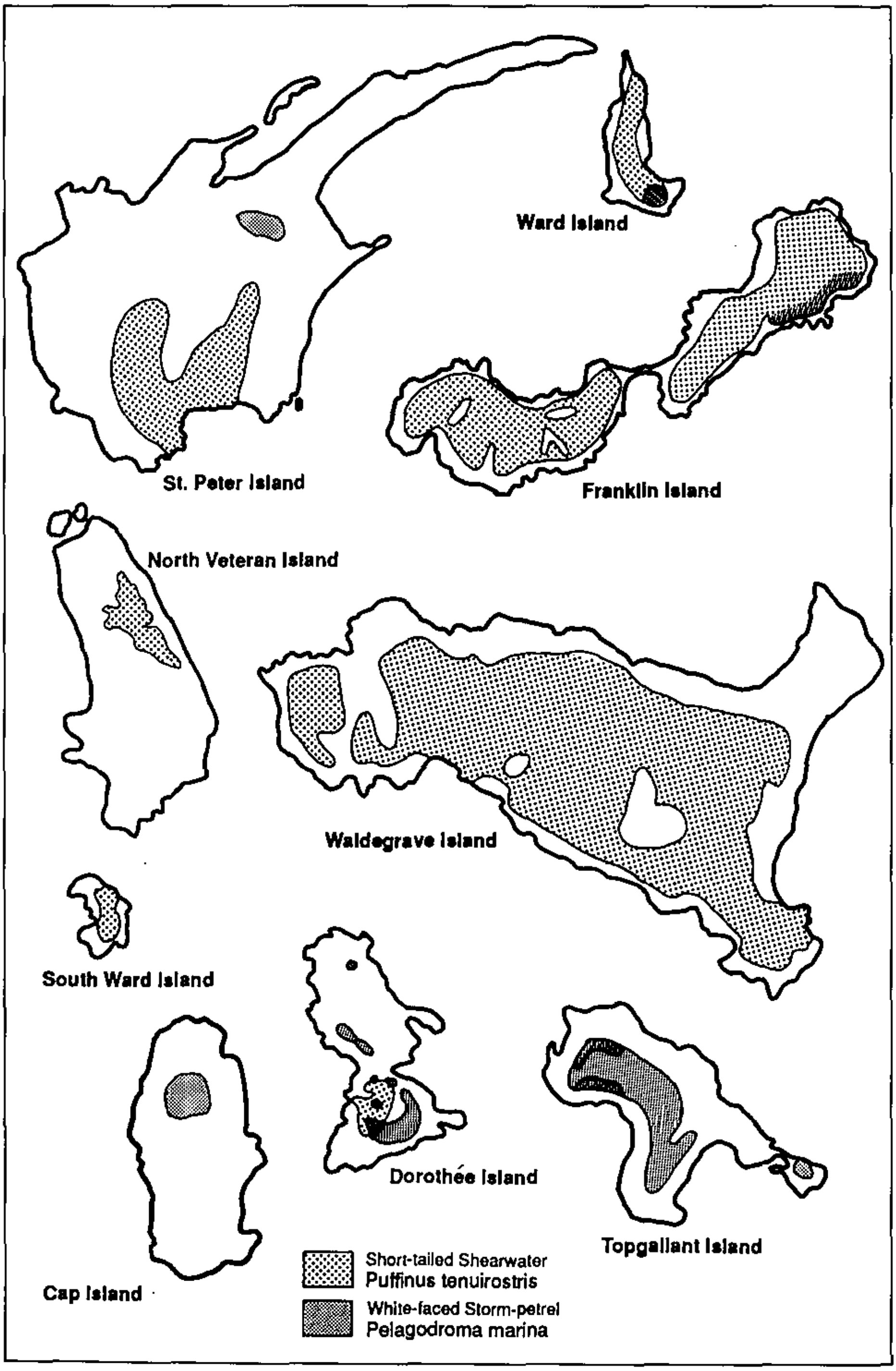



**Figure 20.** (cont'd) The distribution of breeding colonies of the Short-tailed Shearwater (*Puffinus tenuirostris*) and the White-faced Storm-petrel (*Pelagodroma marina*) on South Australian offshore islands.

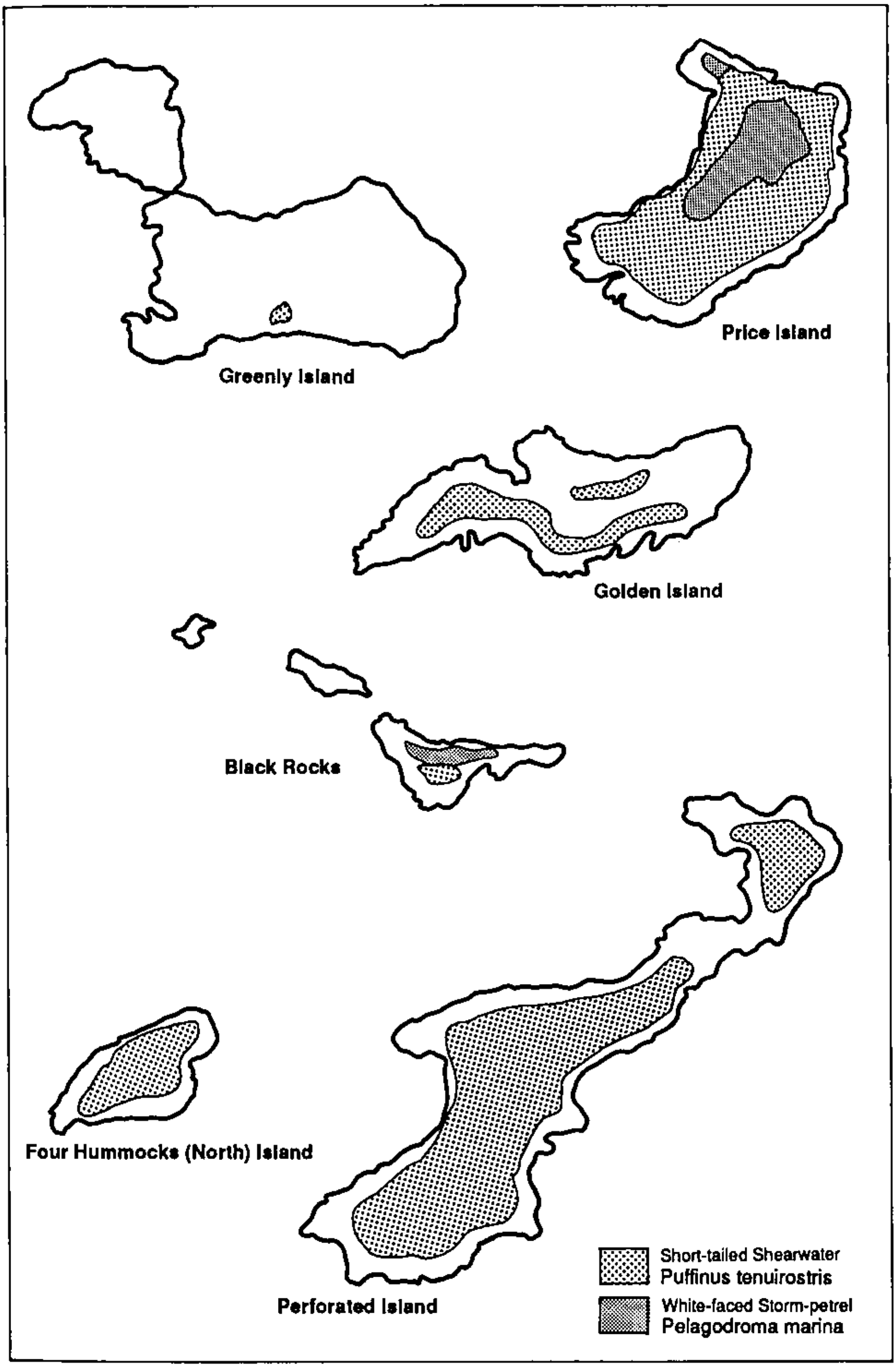



**Figure 20.** (cont'd) The distribution of breeding colonies of the Short-tailed Shearwater (*Puffinus tenuirostris*) and the White-faced Storm-petrel (*Pelagodroma marina*) on South Australian offshore islands.

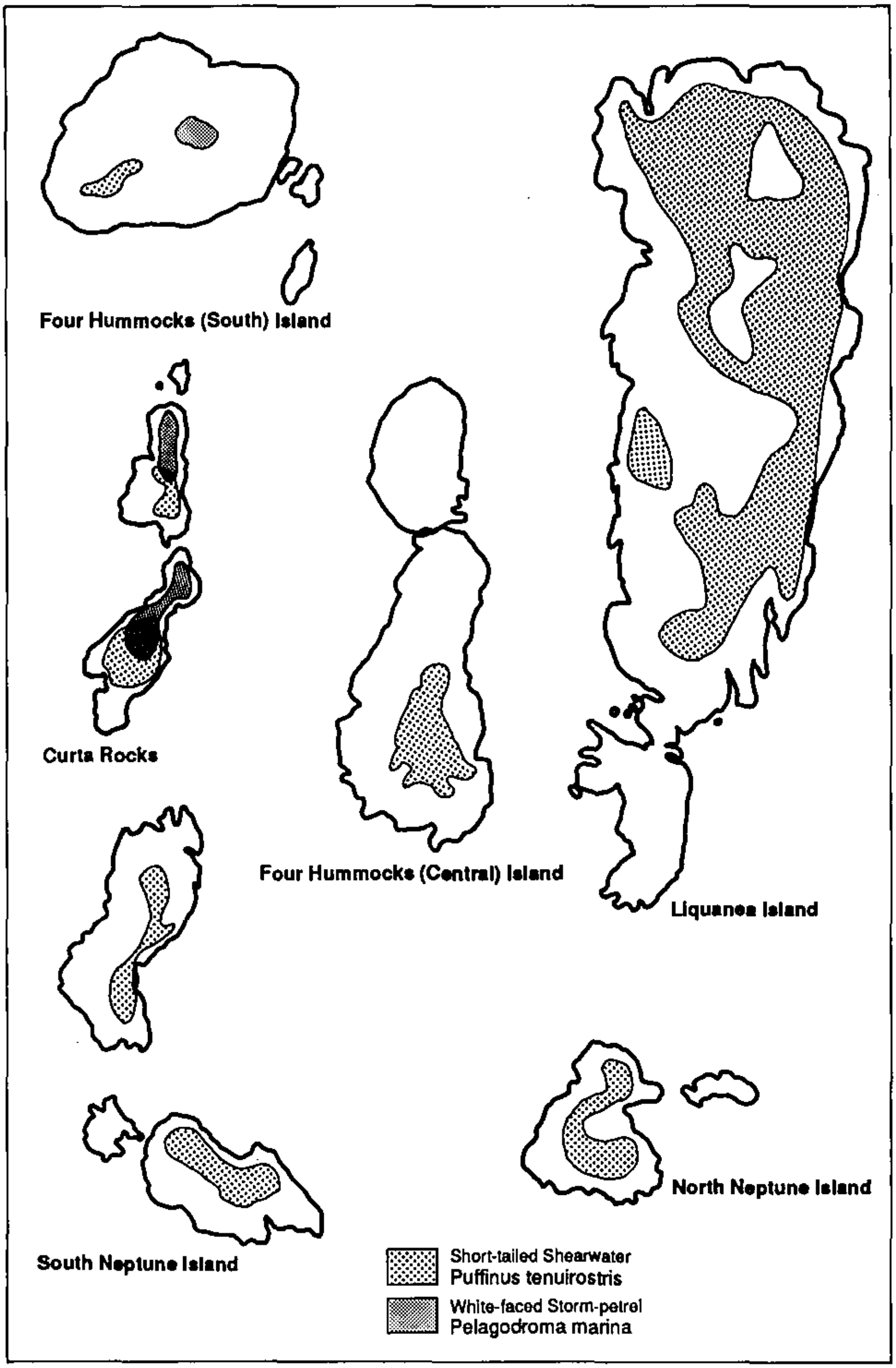



**Figure 20.** (cont'd) The distribution of breeding colonies of the Short-tailed Shearwater (*Puffinus tenuirostris*) and the White-faced Storm-petrel (*Pelagodroma marina*) on South Australian offshore islands.

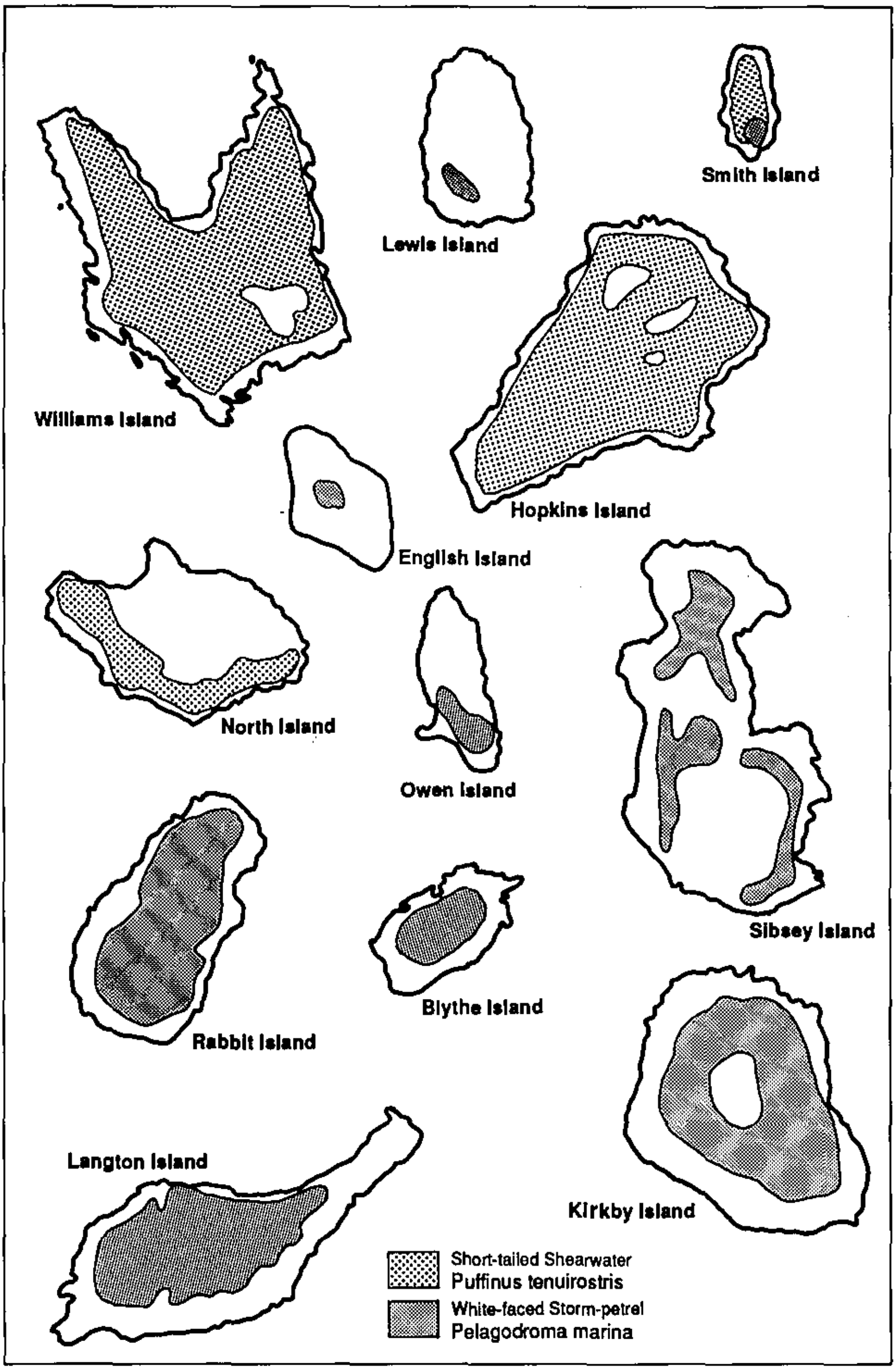



**Figure 20.** (cont'd) The distribution of breeding colonies of the Short-tailed Shearwater (*Puffinus tenuirostris*) and the White-faced Storm-petrel (*Pelagodroma marina*) on South Australian offshore islands.

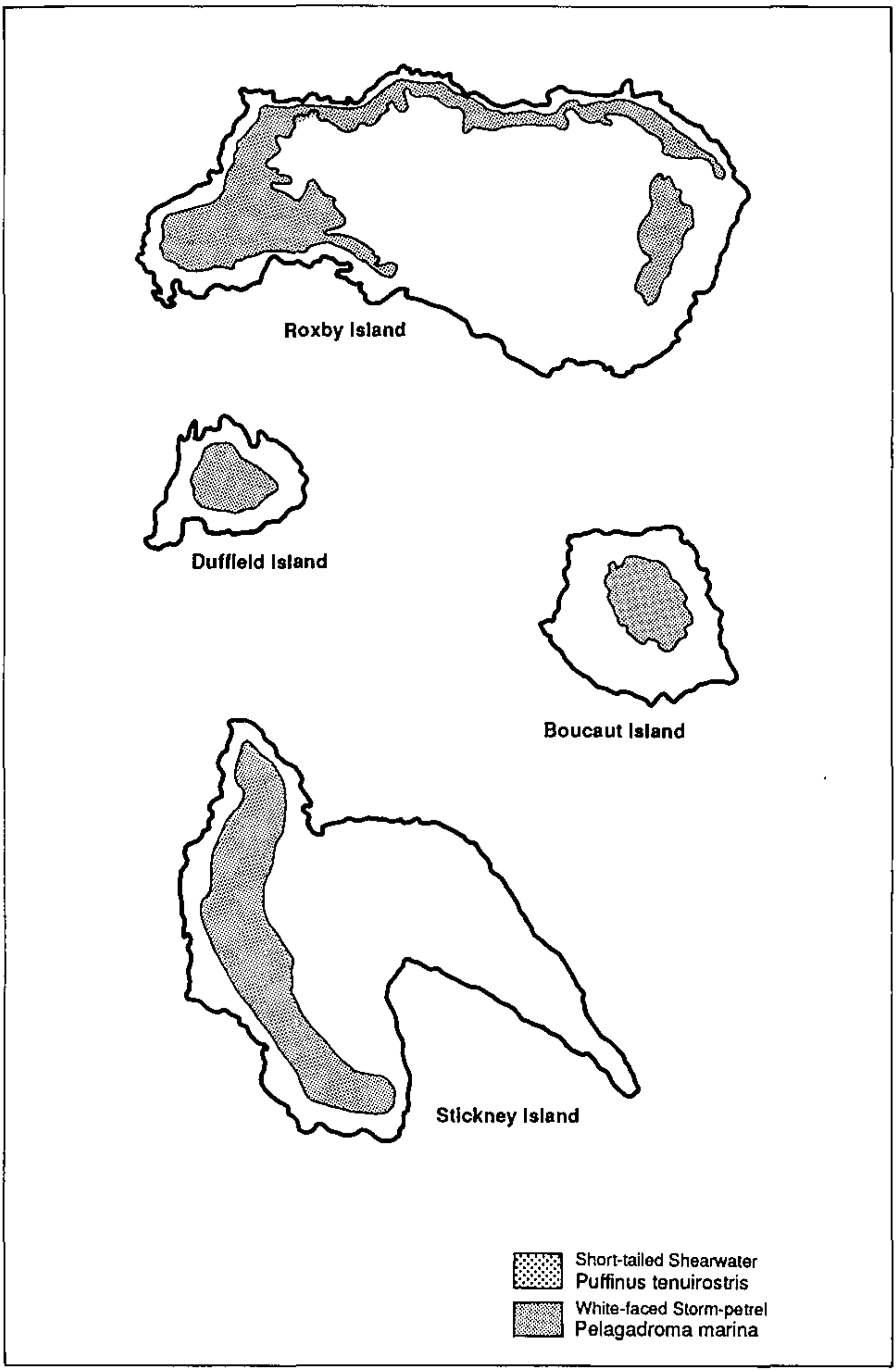



**Figure 20.** (cont'd) The distribution of breeding colonies of the Short-tailed Shearwater (*Puffinus tenuirostris*) and the White-faced Storm-petrel (*Pelagodroma marina*) on South Australian offshore islands.

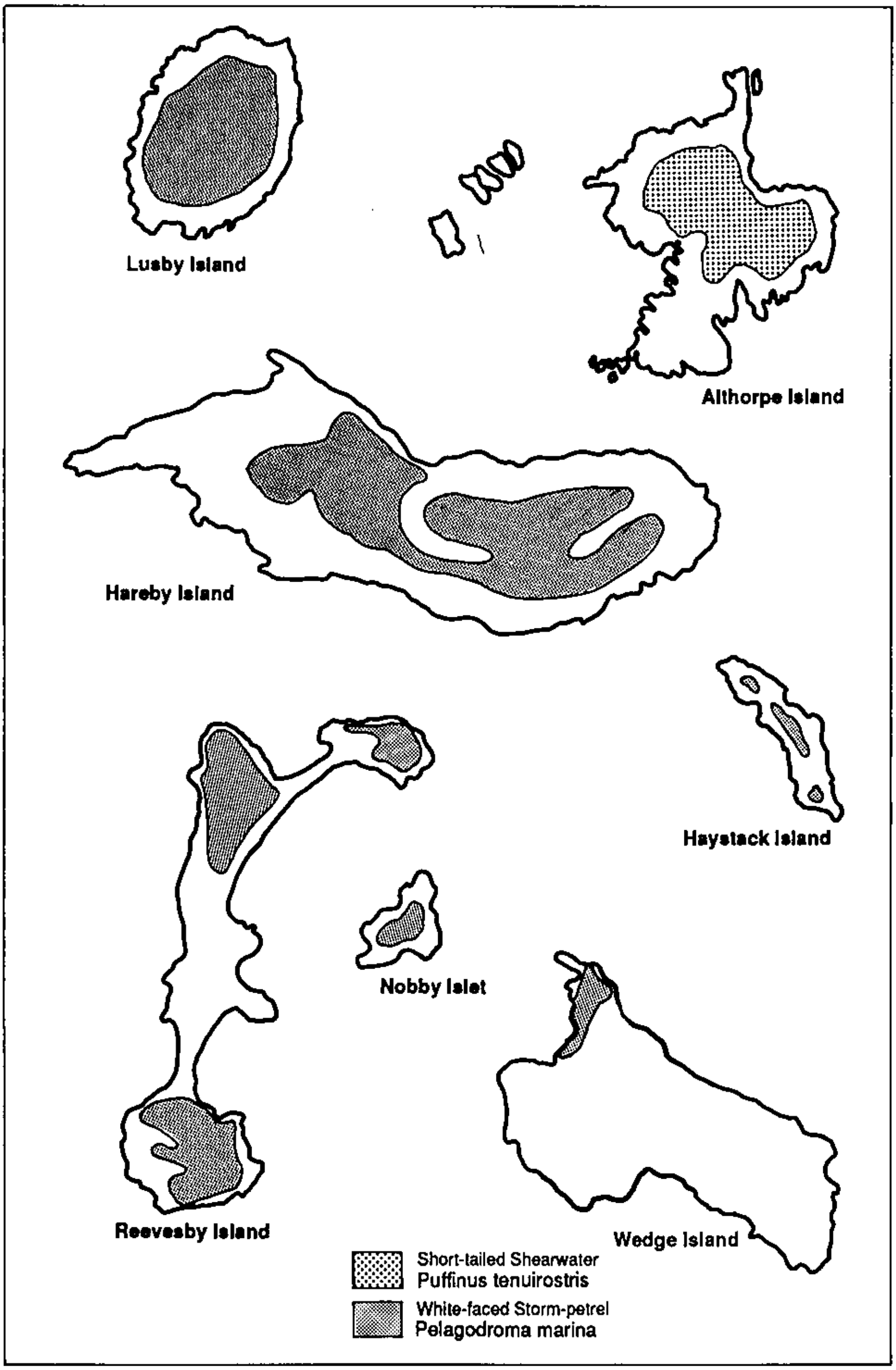



**Figure 20.** (cont'd) The distribution of breeding colonies of the Short-tailed Shearwater (*Puffinus tenuirostris*) and the White-faced Storm-petrel (*Pelagodroma marina*) on South Australian offshore islands.

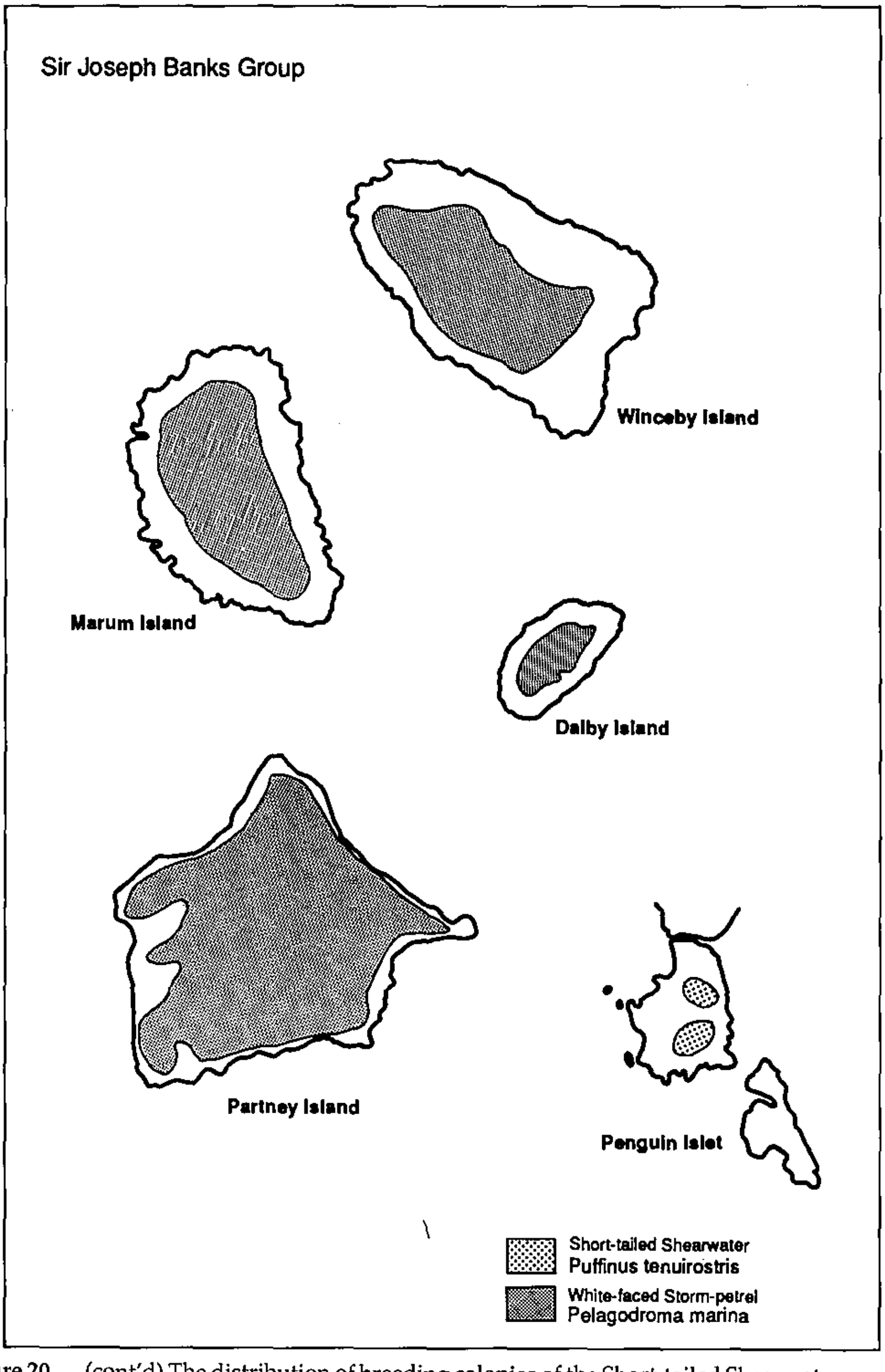



**Figure 20.** (cont'd) The distribution of breeding colonies of the Short-tailed Shearwater (*Puffinus tenuirostris*) and the White-faced Storm-petrel (*Pelagodroma marina*) on South Australian offshore islands.

Once on the ground the bird stumbles toward its burrow, where its mate begins a raucous chorus of throaty calls surpassed only in volume by the Little Penguins with which they share many of these island rookeries.

Most of our knowledge of the life history of the Short-tailed Shearwater is derived from detailed studies on the Bass Strait islands, but these can be equally applied to South Australian populations. The adult birds return to the breeding colonies in late September, with immature and non-breeding birds following some time later. Adults generally reunite with their partner of the previous season, and the pair occupies its previous burrow or one close by. The burrow is cleaned out and prepared for egg-laying during nightly visits, while during the day great 'rafts' of many thousands of birds can be seen feeding on the sea.

After mating at the burrow, the adults leave the colony for about three weeks before egg-laying, which is highly synchronised throughout the range of the species, occurring for 12 days from about 20 November: peak laying always occurs between 24 and 26 November. The male incubates the eggs for 12–14 days, then the female takes over for another long spell. The chicks hatch in mid-January, after an incubation period of 53 days. They are deserted by day when they are about three days old, but the adults return with food each night for the first week. After this, feeding visits are less regular.

The chicks grow at an astonishing rate and reach double the adult weight just before fledging. The fledglings leave the colony in late April or early May, and it is estimated that there is at least a 50 per cent mortality rate in their first year, a major factor in the biological justification for permitting an annual harvest of chicks from the Bass Strait populations.

Banding recoveries from birds marked in Bass Strait have revealed that not only do Short-tailed Shearwaters return each year to the island of their birth (though they may not actually breed until they are two years old), but also that they undergo an enormous annual migration, spending the northern summer in the waters of the North Pacific before returning to their southern summer breeding grounds in southern Australia. Though the adult birds moult their head and body feathers in their Australian breeding colonies, they congregate in Arctic seas above the north-western Pacific to moult their flight feathers before the long flight south again. The annual flight of the Short-tailed Shearwater is one of the most spectacular examples of migration of birds in dense flocks that has yet been documented.

**Table 2.** Population estimates for Short-tailed Shearwaters on South Australia's offshore islands.

| Island | Area of colony (ha) | Burrows (ha) | No of quadrats | Estimated total burrows | Population | Maximum density recorded |
|---|---|---|---|---|---|---|
| St Francis | 525 | 260 | 63 | 136500 | 273000 | 800 |
| Egg | 2.5 | 80 | 1 | 200 | 400 | 80 |
| Dog | 28 | 211 | 24 | 5908 | 11816 | 400 |
| Freeling | 1 | 56 | 5 | 56 | 112 | 80 |
| Masillon | 95 | 208 | 20 | 19760 | 39520 | 400 |
| Lacy | 10 | 237 | - | 2370 | 4740 | - |
| Evans | 48 | 307 | 22 | 14736 | 29472 | 600 |
| Franklin | 290 | 176 | 97 | 51040 | 102080 | 600 |
| St Peter | 558 | 300 | 8 | 167400 | 334800 | 480 |
| Goat | 200 | 237 | - | 47400 | 94800 | - |
| Waldegrave | 187 | 237 | - | 44319 | 88638 | - |
| Dorothée | 4 | 237 | - | 948 | 1896 | - |
| Topgallant | 1 | 237 | - | 237 | 474 | - |
| Ward | 3 | 237 | - | 711 | 1422 | - |
| Ward (S) | 1 | 237 | - | 237 | 474 | - |
| Greenly | 1 | 237 | - | 237 | 474 | - |
| Golden | 7 | 237 | - | 1659 | 3318 | - |
| Price | 18 | 237 | - | 4226 | 8532 | - |
| Perforated | 30 | 237 | - | 7110 | 14220 | - |
| N. Four Hummocks | 5 | 237 | - | 1185 | 2370 | - |
| C. Four Hummocks | 4 | 237 | - | 948 | 1896 | - |
| S. Four Hummocks | 1 | 237 | - | 237 | 474 | - |
| Liguanea | 45 | 237 | - | 10665 | 21330 | - |
| Curta Rocks | 11 | 211 | 7 | 2321 | 4642 | 240 |
| Williams | 110 | 268 | 7 | 28930 | 57860 | 240 |
| N. Neptune | 50 | 189 | 7 | 9450 | 18900 | 280 |
| S. Neptune | 8 | 230 | 4 | 1840 | 3680 | 440 |
| S. Neptune (Lighthouse) | 12 | 552 | 5 | 6624 | 13248 | 1000 |
| North Islet | 22 | 153 | 6 | 3366 | 6732 | 200 |
| Hopkins | 109 | 320 | 9 | 34880 | 69760 | 400 |
| Smith | 2 | 252 | 3 | 504 | 1008 | 400 |
| Althorpe | 42 | 267 | 9 | 11214 | 22428 | 720 |
| Penguin | - | 237 | 15 | 356 | 712 | - |

Mean density = 237/ha.
Total number of birds = 1505228

**Fleshy-footed Shearwater**
***Puffinus carneipes* (Plate 38)**

The Fleshy-footed Shearwater is commonly seen at sea off the South Australian coast in summer months, but it is nowhere near as abundant as the Short-tailed Shearwater. It can be distinguished by its larger size, darker plumage and flesh-pink legs and feet. Before the present study, it was recorded as breeding on St Paul and Amsterdam Islands in the Indian Ocean, on a number of islands off the coast of Western Australia from Cape Hamelin to the Recherche Archipelago, on Lord Howe Island and on some islands off the North Island of New Zealand.

Because of the birds' presence in South Australian waters during the breeding season between September and May, it has been suspected that there is a breeding colony somewhere in this State. On an expedition in May 1980 a landing was made on Perforated Island, where the dense tussock grass cover and extremely deep shearwater burrows suggested that this might support a Fleshy-footed Shearwater colony mixed with the Short-tailed Shearwaters. There were no shearwaters nesting at the time and, though a number of bodies from the previous breeding season were collected, they all proved to be Short-tailed Shearwaters.

**Plate 38.** Fleshy-footed Shearwater (*Puffinus carneipes*). Photo A. C. Robinson

The Curator of Birds at the South Australian Museum and the Coffin Bay NPWS Ranger revisited Perforated Island in January 1982 in the hope of solving the mystery and, though they excavated three extremely large and deep burrows, one was found to contain a Short-tailed Shearwater and the others were not in use. Whether Fleshy-footed Shearwaters bred in the large, deep burrows on Perforated Island or possibly on other islands in the Whidbey Group was still an open question.

In November 1982 Smith Island, south of Pt Lincoln (Figure 21), was visited and again very deep shearwater burrows were noted: in fact, one of the group stepped out of the helicopter and disappeared into a hole to above his waist! Again, these deep burrows were scattered among the shallower Short-tailed Shearwater burrows. This time, however, a burrow was found occupied by a Fleshy-footed Shearwater sitting on a single egg. Figure 18 showed a comparison of the size and shapes of the eggs of the four burrowing seabirds now recorded from South Australia. More work will be needed on Smith Island to determine the size of the Fleshy-footed Shearwater colony, though our impression was that it numbered several hundred pairs. The tantalising question of other colonies in the Whidbey Group has still not been satisfactorily answered.

Fleshy-footed Shearwaters, like Short-tailed Shearwaters, are known to undergo a northerly migration once they leave their nesting colonies in May, but much less is known of the details. Birds banded on Lord Howe Island have been recovered from the seas around Korea and Japan, while birds assumed to be from West Australian and Indian Ocean island populations move into the north-western Indian Ocean. It must be assumed at this stage that the Smith

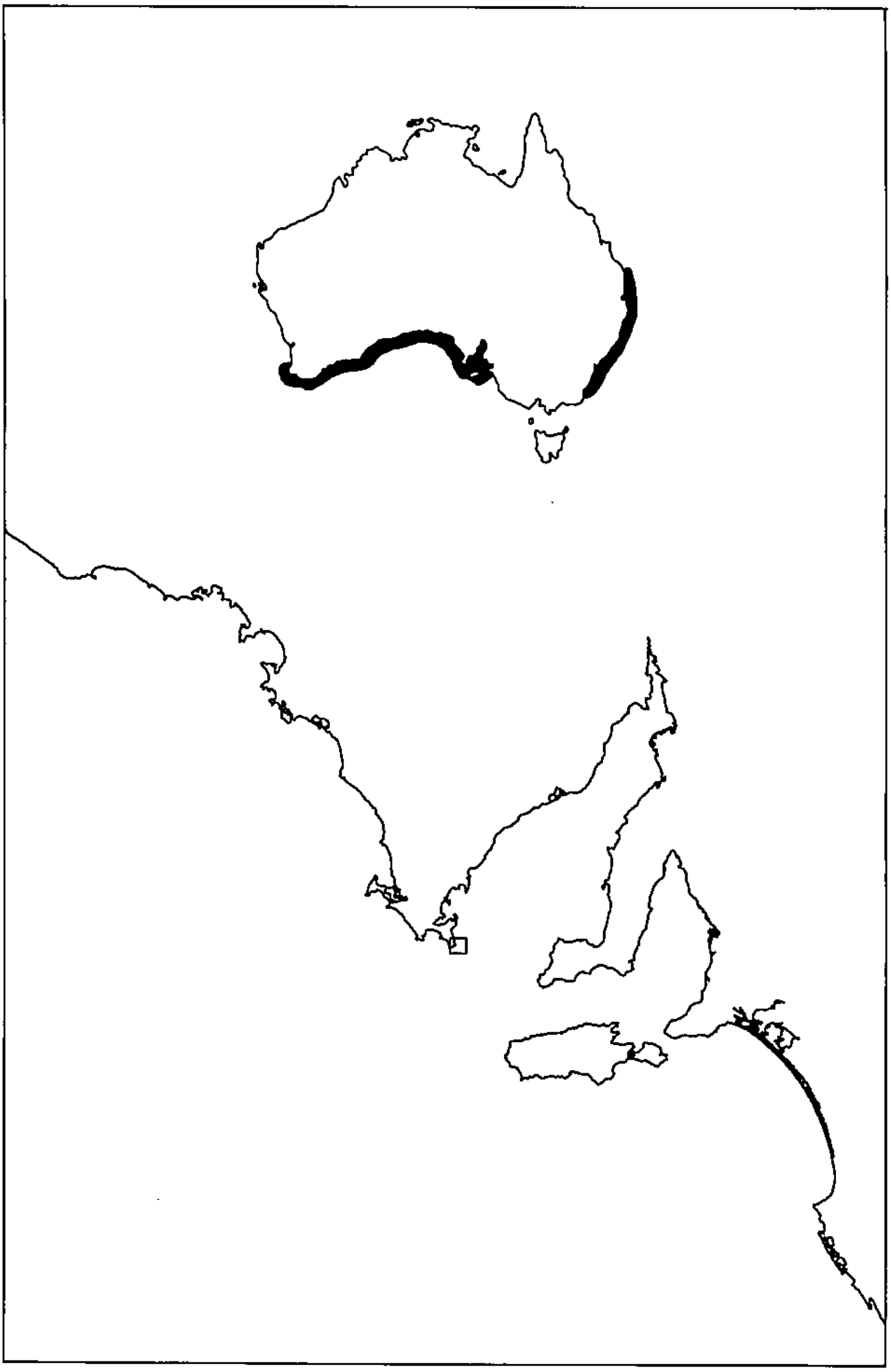


Figure 21. The Australian and South Australian offshore island distribution of the Fleshy-footed Shearwater (*Puffinus carneipes*).

Island birds are part of this Indian Ocean population, and represent its eastern breeding limit.

**White-faced Storm-petrel**
***Pelagodroma marina* (Plate 39)**
These delicate little grey and white birds, with their distinctive white eyebrows and long black legs, are one of the delights of night-time walks on the islands of the Sir Joseph Banks Group, where they flutter about in the torchlight like large moths. This species is found throughout the Pacific, Indian and Atlantic Oceans; in Australia it breeds on many islands off the southern coast, from Houtman Abrolhos in Western Australia to Broughton Island near Newcastle in New South Wales.

In South Australia it nests from October to February (on the islands shown in Table 3 and Figures 20 and 22) in a shallow burrow that normally has a number of bends in it and may have more than one entrance. Because their nesting burrows are so much smaller and shallower than those of the shearwaters, the Storm-petrel's breeding colonies tend to be found in open, exposed situations near the top of islands as long as there is some minimal vegetation cover and soil into which to burrow. At a number of colonies, notably on Reevesby and Dorothée Island, the wings of birds that had succumbed to some predator were quite commonly found; Parker and Cox (1978) suggest Barn Owls or Pacific Gulls in the case of the Dorothée Island birds, while on Reevesby Island the population of feral cats is likely to be the major predator (though Barn Owls also occur on this island).

Storm-petrels are strictly nocturnal on their breeding islands, flying in to their burrows well after sunset and leaving before dawn. It seems unlikely that Pacific Gulls would be a predator unless they are able to extract incubating birds from their burrows during the day, so it seems it is Barn Owl predation that leaves these wings lying around the breeding colonies, as there are no feral cats on Dorothée. Cats certainly prey on Storm-petrels on Reevesby Island, but they probably eat the whole bird rather than leaving its wings.

The estimated populations of Storm-petrels on their breeding islands is given in Table 3, using the same method as described for Short-tailed Shearwaters. These estimates may be somewhat inflated, however, as Storm-petrel colonies tend to be rather patchy. Nonetheless, there are some significant breeding populations on the islands of the Sir Joseph Banks Group and about 300000 birds breed each year in South Australia.

**Plate 39.** White-faced Storm-petrel (*Pelagodroma marina*). Photo P. D. Canty

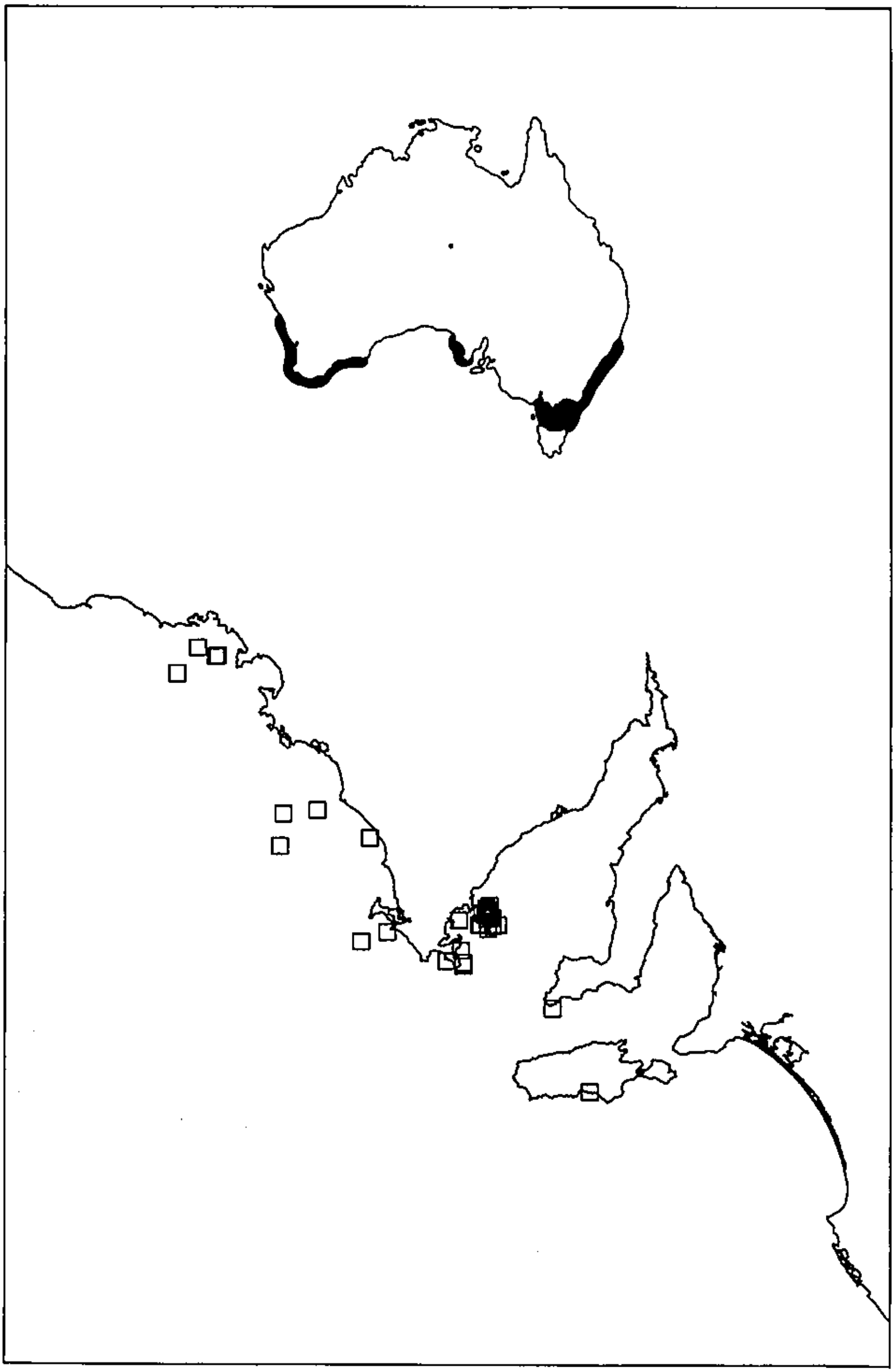


**Figure 22.** The Australian and South Australian offshore island distribution of the White-faced Storm-petrel (*Pelagodroma marina*).

**Table 3.** Population estimates for White-faced Storm-petrels on South Australia's offshore islands.

| Island | Area of colony (ha) | Burrows (ha) | No of quadrats | Estimated total burrows | Population | Maximum density recorded |
|---|---|---|---|---|---|---|
| Topgallant | 6 | 325 | - | 1950. | 3900 | - |
| Dorothée | 8 | 325 | - | 2600 | 5200 | - |
| Cap | 0.5 | 325 | - | 167 | 325 | - |
| Black Rocks | 1 | 325 | - | 325 | 650 | - |
| Price | 6 | 325 | - | 1950 | 3900 | - |
| Curta Rocks | 10 | 335 | 8 | 3350 | 6700 | 600 |
| Lewis | 1 | 325 | - | 325 | 650 | - |
| Smith | 0.5 | 325 | - | 167 | 325 | - |
| Owen | 1.5 | 300 | 2 | 450 | 900 | 320 |
| Rabbit | 2 | 325 | - | 3900 | 7800 | - |
| Kirkby | 15 | 160 | 9 | 2100 | 4800 | 320 |
| Hareby | 22 | 325 | - | 4550 | 9100 | - |
| Blythe | 3 | 325 | - | 975 | 1950 | - |
| Reevesby | 174 | 325 | - | 56500 | 113100 | - |
| Dalby | 2 | 325 | - | 650 | 1300 | - |
| Partney | 37 | 325 | - | 12025 | 24050 | - |
| Winceby | 15 | 325 | - | 4875 | 9750 | - |
| Haystack | 1 | 325 | - | 325 | 650 | - |
| Nobby | 1 | 504 | 5 | 504 | 1008 | 800 |

Mean density = 325/ha
Total number of birds = 210358

## Cormorants

There are five species of cormorants and shags in South Australia; three of these, the Black-faced Shag (Figure 23) and the Pied (Figure 24) and Little Pied Cormorants (Figure 25), are commonly encountered on offshore islands and fishing in the surrounding waters. These species commonly breed in mangroves, so are represented as breeding species on the few islands that support extensive mangrove areas. When there are no trees, however, all species will also nest on the ground.

Pied Cormorants have been recorded breeding on Troubridge and Busby Islands, while Little Pied Cormorants breed on Baudin Rocks, Busby, Bird and Roxby Islands. It is the Black-faced Shag, however, that is the most marine species and therefore most dependent on islands for breeding.

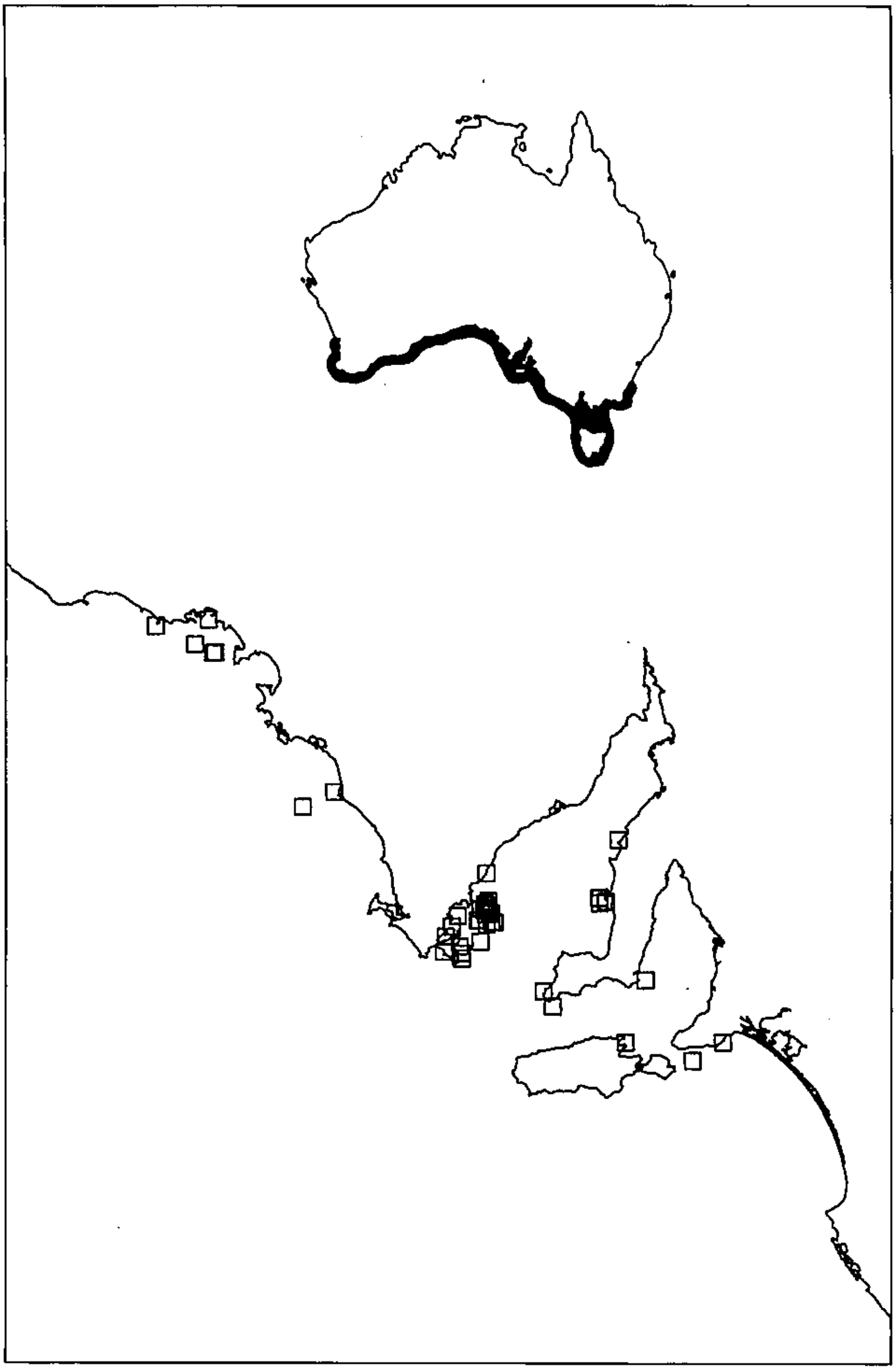


**Figure 23.** The Australian and South Australian offshore island distribution of the Black-faced Shag (*Leucocarbo fuscescens*).

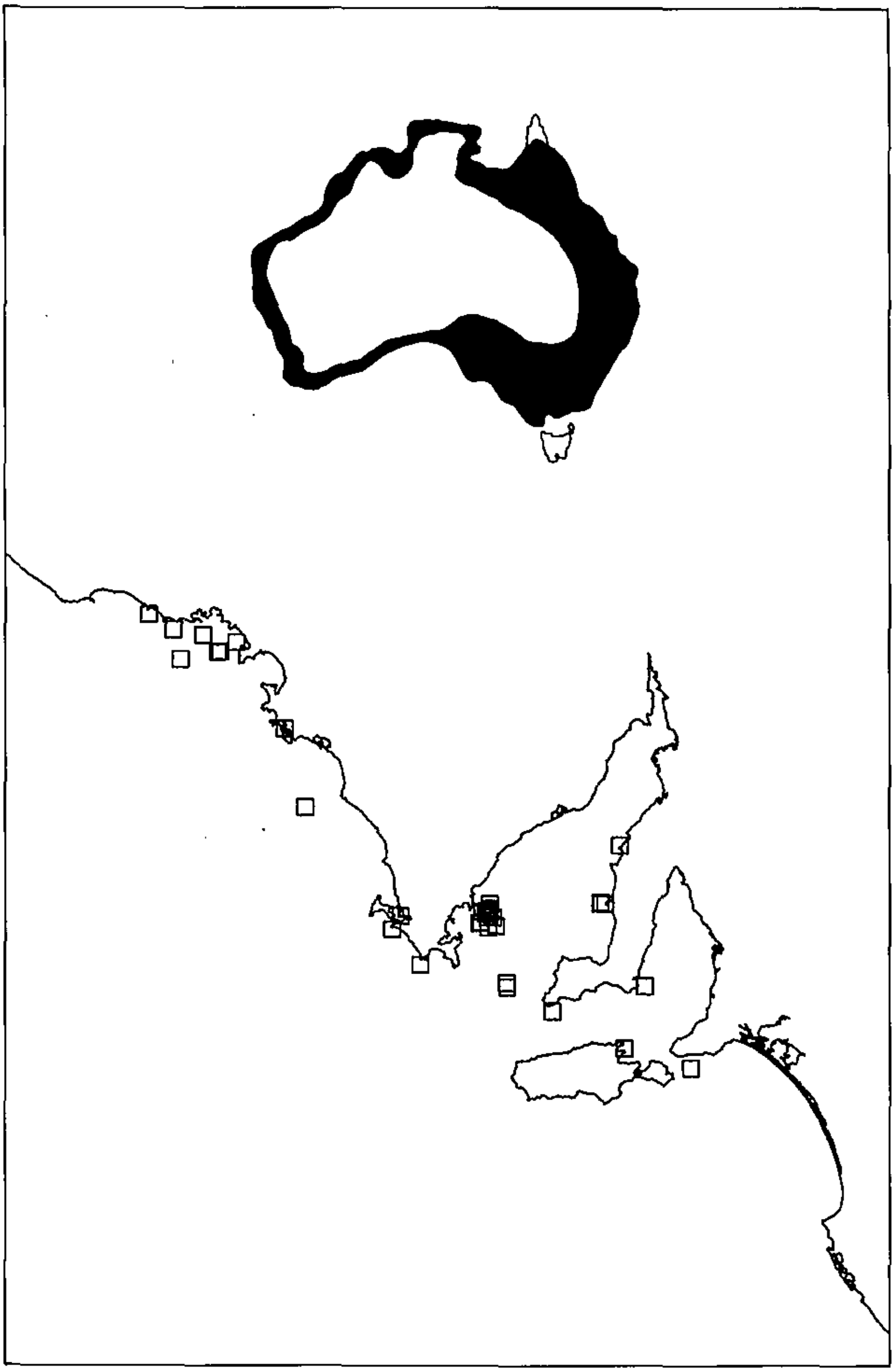


**Figure 24.** The Australian and South Australian offshore island distribution of the Pied Cormorant (*Phalacrocorax varius*).

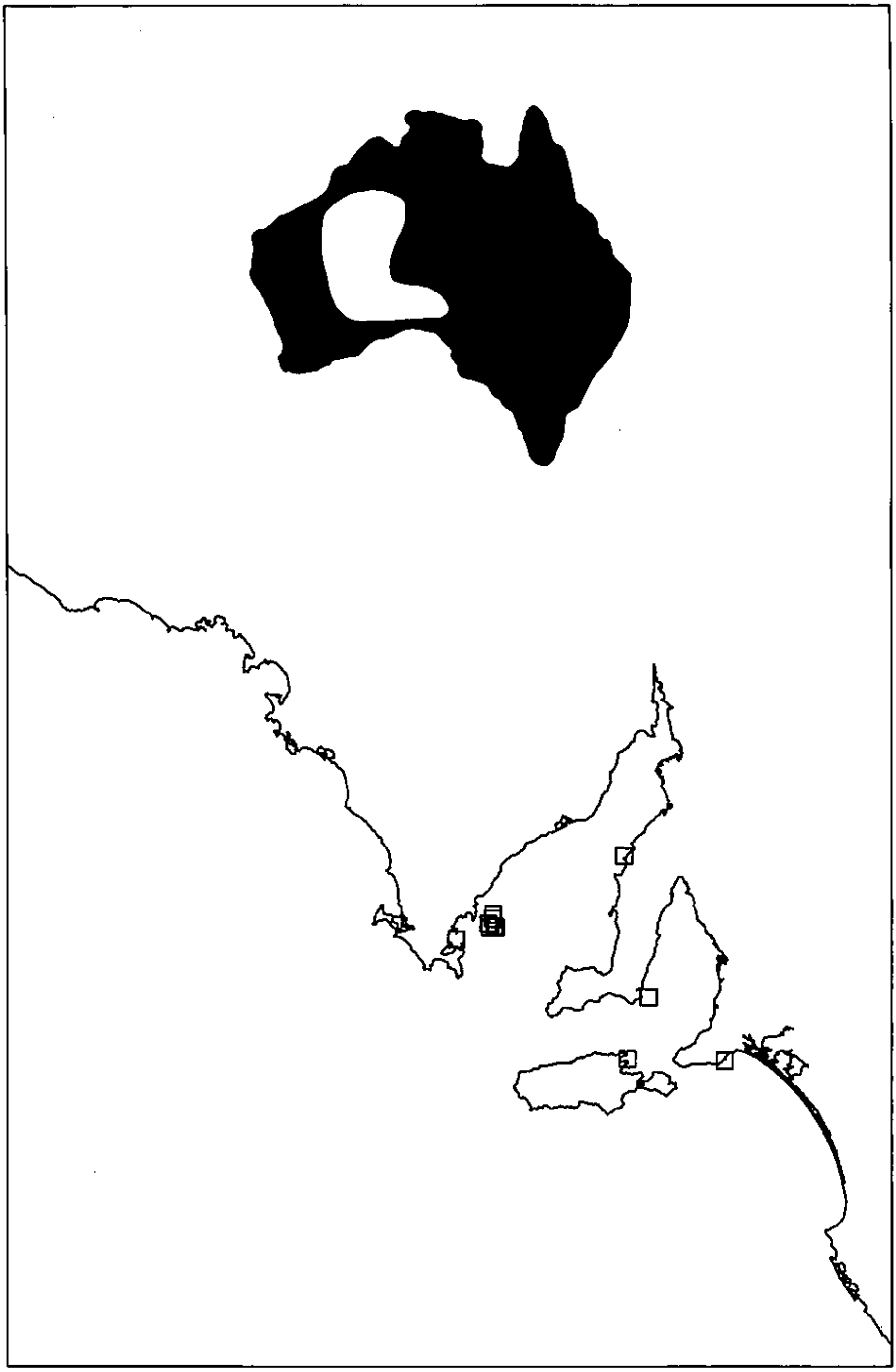


**Figure 25.** The Australian and South Australian offshore island distribution of the Little Pied Cormorant (*Phalacrocorax melanoleucos*).

**Black-faced Shag**
***Leucocarbo fuscescens* (Plate 40)**

A walk in a large shag breeding colony is a memorable experience; untidy nests made of seaweed, grass or other convenient plants are packed close together, the ground is coated with a whitewash of guano and the smell is overpowering.

The breeding season is from mid-January to May, at a time when the bare rocky sites they choose for their rookeries are exposed to the hottest summer sun. The incubating birds spend most of their time on the nests with their throats vibrating rapidly; this gular fluttering, as it is called, is a method of regulating temperature by increasing evaporation from the skin of the throat, which is richly supplied with surface blood vessels. The chicks also indulge in gular fluttering from the time they hatch.

Black-faced Shags generally only go fishing once a day, catching about a fifth of their body weight in fish before returning to the rookery to feed the chicks and take over the task of incubation. Because they feed on fish, shags and other cormorant species are unpopular with fishermen who feel they are in direct competition. Studies of the diet of the Black-faced Shag in particular have shown that though they feed on a variety of fish, very few are the species caught by commercial fishermen. Shags convert these fish into a phosphate-rich guano, and the guano mining industry on the South Australian offshore islands discussed in Chapter 3 was based on deposits largely derived from shags, cormorants and, to a much lesser extent, Little Penguins.

**Plate 40.** Black-faced Shag (*Leucocarbo fuscescens*). Photo P. D. Canty

## Cape Barren Goose

**Cape Barren Goose**
***Cereopsis novaehollandiae* (Plate 41)**

The Cape Barren Goose is found only around the southern coast of Australia, from the Recherche Archipelago in Western Australia to the Furneaux Group at the eastern end of Bass Strait. Detailed studies of its natural history have been carried out in South Australia (Robinson et al. 1982, 1986, 1995; Delroy et al. 1986) and in Tasmania (Pearse, 1975).

In South Australia geese breed on the islands shown in Figure 26 and fly to the breeding islands following the opening rains of April or May each year. Four to six eggs are laid in a nest built in a shallow depression on the ground and lined with down from the female's breast. Incubation takes four and a half weeks, with only the female involved. When she leaves the nest for very short periods she covers the eggs with down and can lose up to 20 per cent of her body weight by the time the chicks hatch. The attractive black and white chicks eat grass from the day of hatching and follow their parents around within a breeding territory that is defended against neighbouring birds by the male.

The chicks grow quickly and by six weeks have lost their stripes, these being replaced by down of a overall grey. They are fully fledged in another six to eight weeks; this is a critical period for a bird that feeds on green grass, as by August

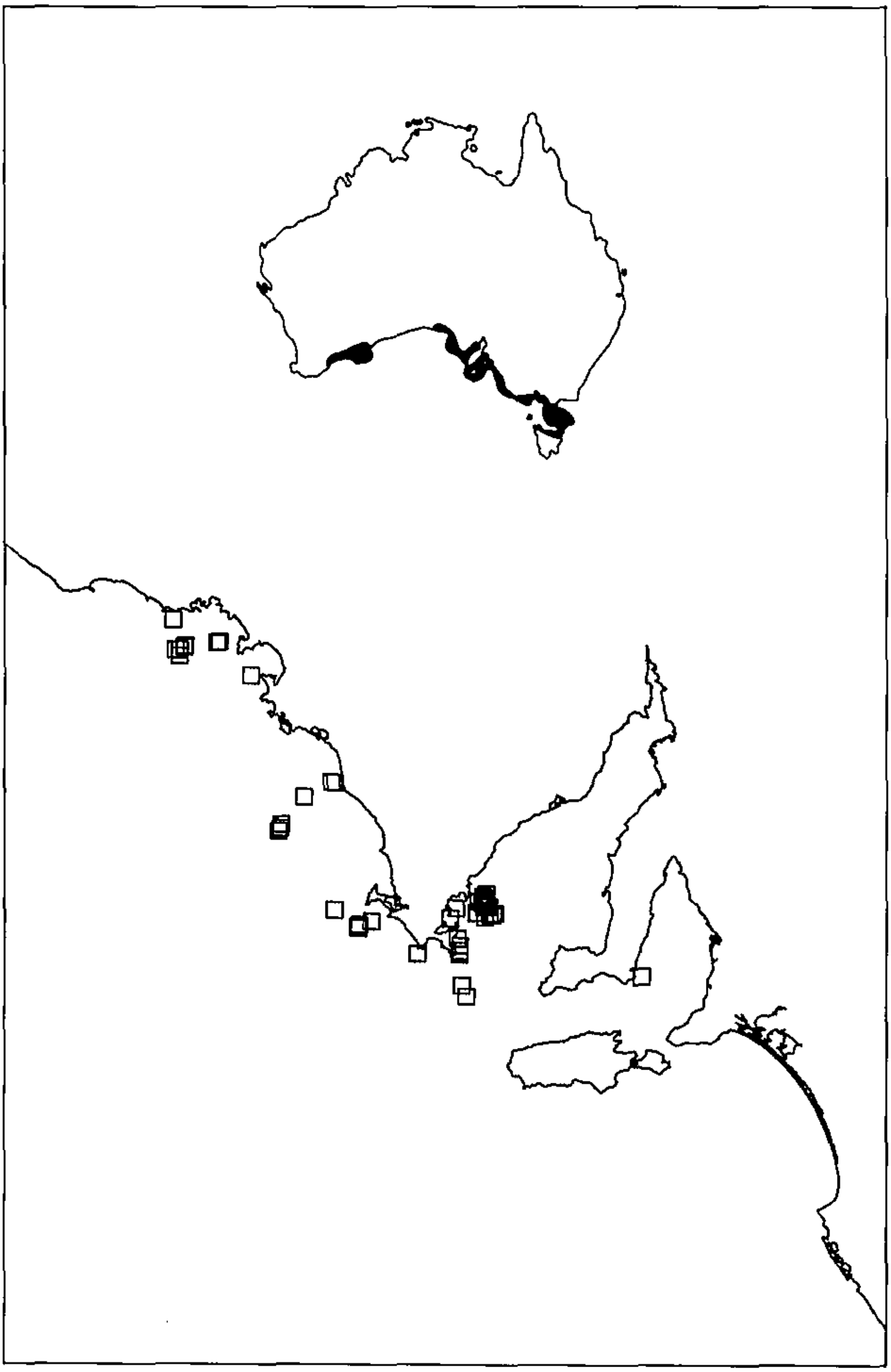


**Figure 26.** The Australian and South Australian offshore island distribution of the Cape Barren Goose (*Cereopsis novaehollandiae*).

and September the vegetation is beginning to dry. Both adults and young birds must leave the breeding island at this time and fly to swampy areas on the mainland for the summer. Just as there are traditional breeding islands, so there are traditional summering areas on the South Australian mainland, at swamps near Elliston, on the southern tip of Eyre Peninsula and around the lakes at the mouth of the Murray River.

The South Australian Cape Barren Goose population now numbers at least 3000 birds, and has recovered from a much lower level in the 1950s, when the species suffered extensive hunting, particularly on its breeding islands. Conservation of this species was one of the main justifications for acquisition by the Government of the islands of the Sir Joseph Banks Group as Fauna Reserves (now Conservation Parks) in the late 1960s, and the species now seems to be well on the way to recovery.

**Plate 41.** Cape Barren Goose (*Cereopsis novaehollandiae*). Photo DENR

## Birds of Prey

Several species of raptors or birds of prey have been recorded from South Australia's offshore islands, ranging from Wedge-tailed Eagles to Marsh Harriers, Peregrine and Little Falcons and Australian Kestrels. All these species tend to be found either on the large islands or on islands close to the mainland, and all obtain their food from the land. Two other species, however, the Osprey and the White-bellied Sea-eagle, can be regarded as true birds of the coast and islands and both obtain a significant proportion of their food from the sea.

### Osprey
***Pandion haliaetus* (Plate 42)**

Throughout the world there are sedentary populations of Ospreys on coastlines fringing areas of warmer water. In the northern parts of America, Europe and Asia, Ospreys migrate south in September to spend the southern summer in South America, Africa and South Asia respectively. In South-east Asia, Indonesia, New Guinea and Australia there is a distinctive subspecies *Pandion haliaetus cristatus* that is thought to be sedentary throughout its range (Figure 27). Ospreys can be distinguished from sea-eagles by their smaller size and their dark-brown upper parts, which contrast with the white underparts and head. In flight their wings are bowed rather than upswept.

Records of Ospreys from throughout Australia collected by the *Atlas of Australian Birds* (Blakers et al. 1984) suggest that the South Australian Osprey population is significantly isolated from the west and east coast populations, and there is no doubt South Australia supports the major population across the southern Australian coast. Ospreys in South Australia almost invariably breed

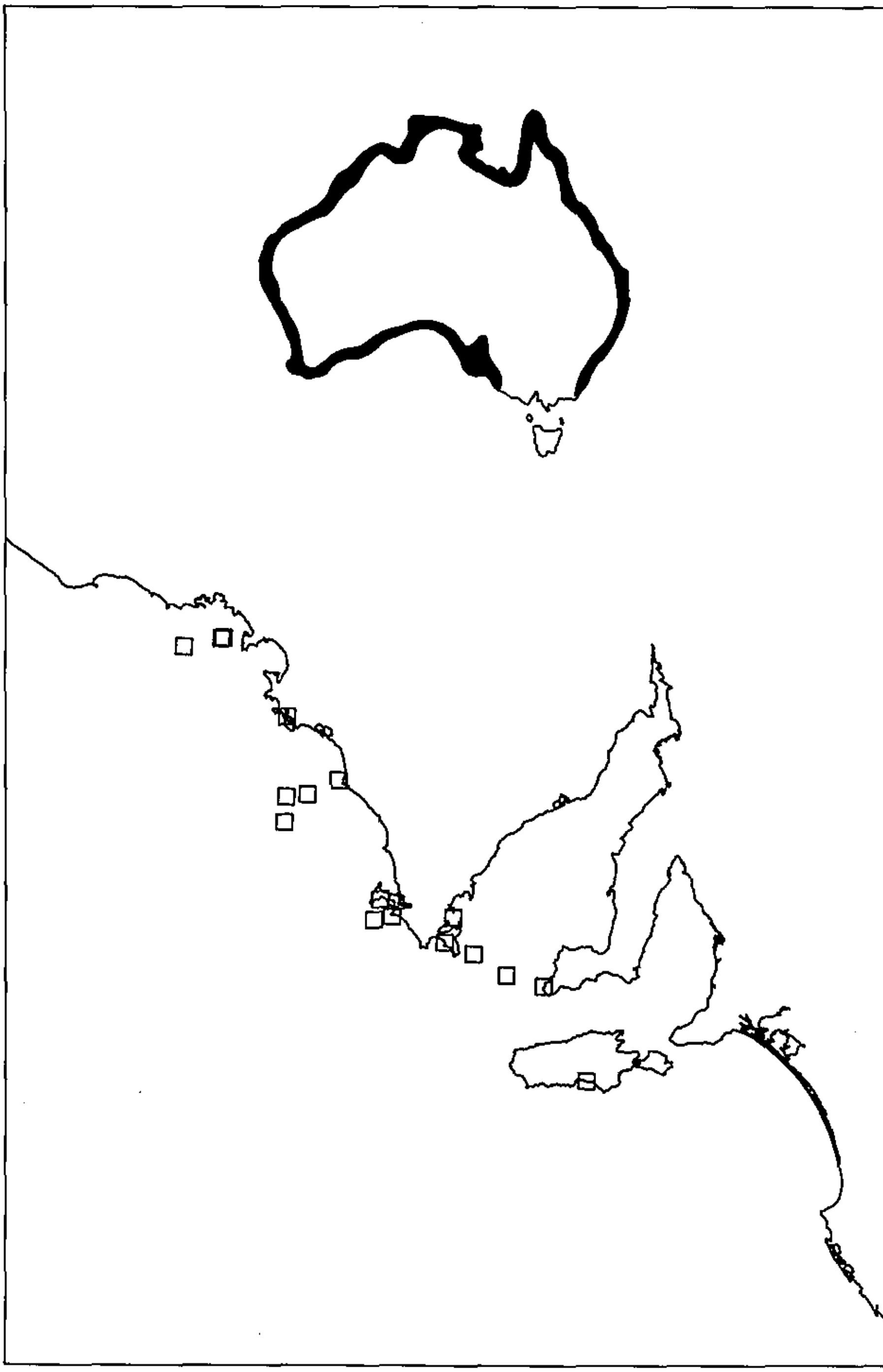


**Figure 27.** The Australian and South Australian offshore island distribution of the Osprey (*Pandion haliaetus*).

on rock stacks or cliffs overlooking the sea, often in positions that are inaccessible from the ground.

Studies on Kangaroo Island show breeding occurs from September to January, and can vary within this period from year to year. Both the male and female take part in the building or rebuilding of the nest, and some pairs use the same nest site year after year, adding more sticks each year until the nests become very large structures indeed. The nests are often lined with seaweed. The female usually incubates the eggs and is fed by the male, who may also take a minimal share of incubation (which takes 34–36 days). At first the young are protected by the female and the male continues to bring food, but as the chicks' demands for food increase both parents have to hunt.

Ospreys feed exclusively on fish, caught in spectacular dives into the water, and often plunge at least a metre underwater to grasp a fish in their talons. They also catch fish that swim on the surface by skimming low and plucking the fish from the water with their feet.

In Europe and North America, Osprey numbers have declined seriously since the 1950s. Much of this decline can be attributed to the effects of pesticides such as DDT, which accumulates in the birds' bodies and causes the production of eggs with too-thin shells. Since DDT has been banned in much of the Northern Hemisphere, Osprey populations seem to be making a spectacular recovery. In much of Australia the problem does not appear to have been as great, but this is no cause for complacency as the relatively small numbers of breeding Ospreys in South Australia are still extremely vulnerable to this type of disturbance.

**White-bellied Sea-eagle**
***Haliaeetus leucogaster* (Plate 43)**

The White-bellied Sea-eagle belongs to a group of closely related birds including the American Bald Eagle and the African Fish Eagle. The White-bellied Sea-eagle is found in India, South-east Asia, Indonesia, New Guinea and Australia, and in this country occurs all around the coast, also penetrating considerable distances inland along river systems (Figure 28). Adult Sea-eagles can be readily distinguished from Wedge-tailed Eagles by their grey and white colouring but the subadults, which retain their brown juvenile plumage for several years, are much more difficult to distinguish. Sea-eagles have shorter wings tipped with white, and soar with their wings held at a much steeper angle than do Wedge-tailed Eagles.

**Plate 42.** Osprey (*Pandion haliaetus*). Photo A. C. Robinson

**Plate 43.** White-bellied Sea-eagle (*Haliaeetus leucogaster*). Photo DENR

**Figure 28.** The Australian and South Australian offshore island distribution of the White-bellied Sea-eagle (*Haliaeetus leucogaster*).

Although Sea-eagles eat a considerable amount of fish, which they pluck skilfully from the water with a trailing foot, they also hunt extensively on land, taking a wide variety of birds, mammals and reptiles. A Sea-eagle's nest examined on Franklin Island contained remains of fish and Little Penguins, but also held traces of the Greater Stick-nest Rat and bandicoot fur and bones. A nest on Greenly Island contained wallaby remains (Finlayson, 1948a). They will also feed readily on carrion.

Sea-eagles build huge stick nests in trees if they are available, generally near the highest point of land or nest on the ground, particularly on cliff ledges and stacks overlooking the sea on islands with no trees. They spread their breeding cycle from April to December, with some variation between years. Sea-eagles appear to form stable pairs and a mated pair will defend its territory and return to the same nest year after year. Most of the South Australian offshore islands only support a single pair of Sea-eagles, though their young of previous years may share the island territory for a short time. The White-bellied Sea-eagle is a more widely distributed bird than the more specialised Osprey, and it is to be hoped that the sight of a pair of these magnificent birds soaring against the sky over many of our offshore islands will be a permanent part of the South Australian landscape.

## Gulls and Terns

The Silver Gull and the Pacific Gull are common and breed on South Australia's offshore islands. A third species, the Kelp or Dominican Gull, very similar in general appearance to the Pacific Gull, appears to be colonising Australia: it was first recorded at Botany Bay in 1943, and the first sighting in South Australia was in 1967. It began nesting on Moon Island near Lake Macquarie in New South Wales in 1958, but has not so far been recorded as a breeding species in South Australia.

Caspian, Crested, Fairy and Bridled Terns breed on South Australia's offshore islands. Three other species of interest were encountered during the present survey: a single Sooty Tern, which breeds on some Barrier Reef islands and islands off the West Australian coast from Houtmans Abrolhos northward, was regularly seen in a Crested Tern rookery on The Brothers Island through the 1970s and was recorded by us on our visit in December 1976; the body of a dead White-fronted Tern, collected on Cap Island in May 1980, was the first record from South Australia from west of Kangaroo Island; and a tern body found on South Casuarina Island in November 1982 proved to be the first Australian record of the Antarctic Tern.

### Silver Gull
***Larus novaehollandiae* (Plate 44)**

The Silver Gull or Seagull is a common sight even in city parks. It is an extremely adaptable bird that can feed along the coast or inland with equal facility: flocks of gulls are a common sight following a plough to feed on the soil invertebrates that are exposed, as are the screaming flocks that congregate around fishermen and picnickers on Australia's beaches.

**Plate 44.** Silver Gull (*Larus novaehollandiae*). Photo P. D. Canty

Any group of Silver Gulls establishes a dominance hierarchy, and a series of obvious and stereotyped behaviour patterns is adopted by dominant and subordinate birds. A complete range of these behaviours can be observed by feeding scraps to a flock of gulls in a city park, and the same patterns can be seen where gulls breed. They are colonial nesters and generally breed on islands with low vegetation and good all-round visibility.

Islands suitable for gull breeding can range from a heap of rubbish in a flooded rubbish dump to more conventional offshore islands (Figure 29). In the breeding colonies the male establishes or reclaims a previously used territory that he defends against neighbouring birds. There he is joined by a female, usually the mate of previous years. Silver Gulls can breed at two years of age but usually breed at three, and around the southern coast of Australia the main breeding season begins in July and August.

Clutches of two to three eggs are laid in a rudimentary nest which, at its most elaborate, is simply a pad of vegetation scraped into a shallow hollow on the ground. Nesting duties are shared by the parents and once the chicks have begun to develop primary wing feathers they leave the nest and wander within their parents' territories. When disturbed, nestlings crouch beneath a small bush or a crack in a rock. They reach independence in six weeks.

There have been a number of studies of Silver Gulls around Australia. Dr Robert Carrick initiated a long-term study in the Beachport area of South Australia in 1968, and up to 1971 banded about 3 600 adult and juvenile Silver Gulls, many of them from the large breeding colony on Penguin Island. Dr John Ottaway has continued this project, and the results of this study now represent the most valuable data ever collected on Silver Gull movement and longevity (Ottaway et al. 1984). He has found that Silver Gull movement patterns range from extremely localised to highly mobile and flexible. A significant percentage of birds live as long as 15 years, and there is no doubt some birds banded in the Beachport area will be shown to have lived to 16 years or more.

**Pacific Gull**
***Larus pacificus* (Plate 45)**
In comparison with the screaming flocks of Silver Gulls, the Pacific Gull is a solitary bird seen singly or in pairs on oceanic beaches, sometimes with a number of the brown-plumaged subadult birds. It is the commonest gull on all South Australian offshore islands (Figure 30) and, whereas the Silver Gull is often absent from the smaller, more remote islands, the rocks at the water's edge invariably support at least one pair of Pacific Gulls.

**Plate 45**. Pacific Gull (*Larus pacificus*)
Photo P. D. Canty

Though like all gulls Pacific Gulls will feed on anything they can find, on offshore islands they seem to specialise in feeding on molluscs. At low tide they stalk the rock platforms and exposed reefs, wrenching molluscs such as limpets and turban shells from the rocks with their powerful beaks. They then fly to a favoured expanse of flat rock and drop

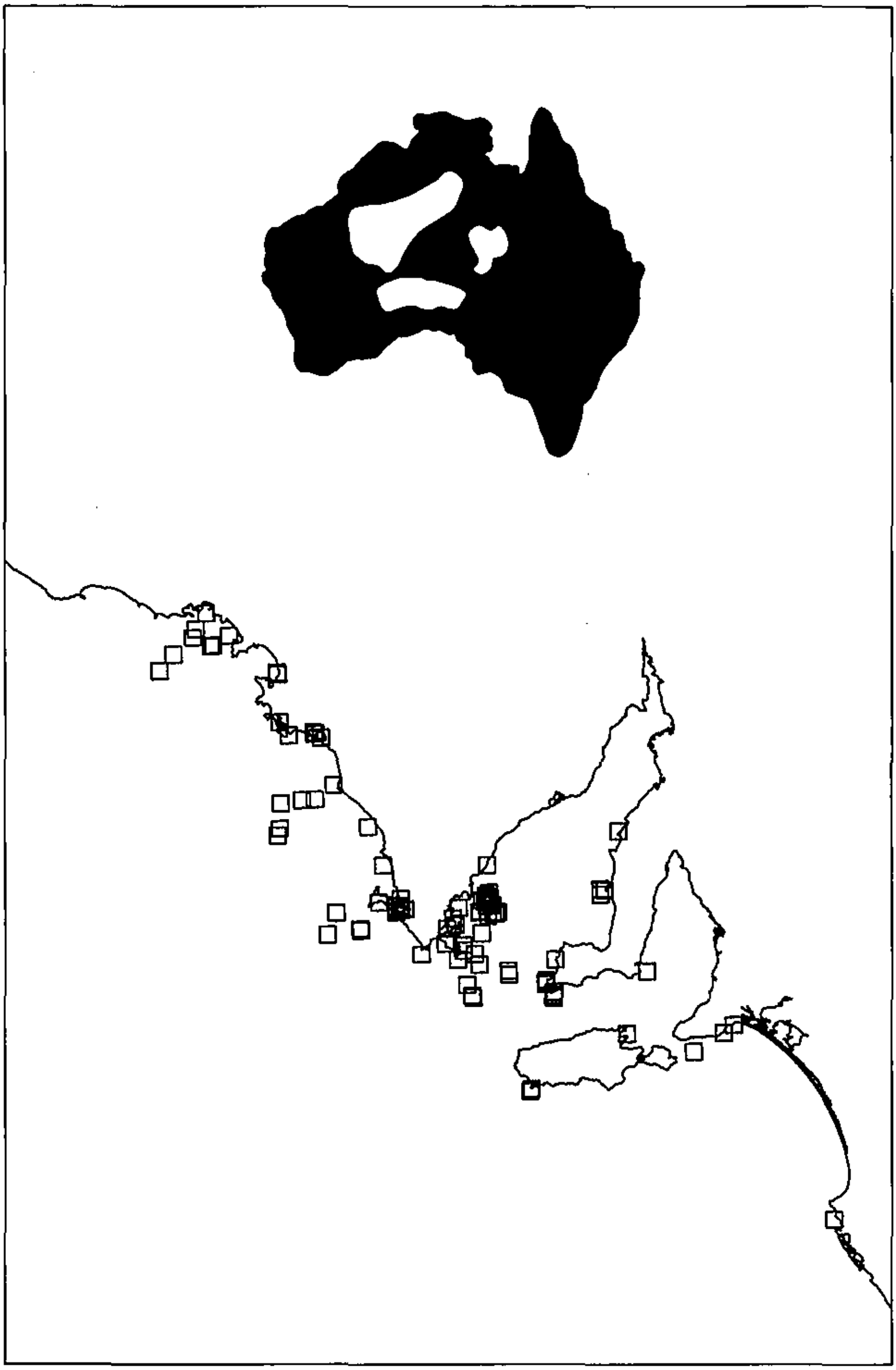


**Figure 29.** The Australian and South Australian offshore island distribution of the Silver Gull (*Larus novaehollandiae*).

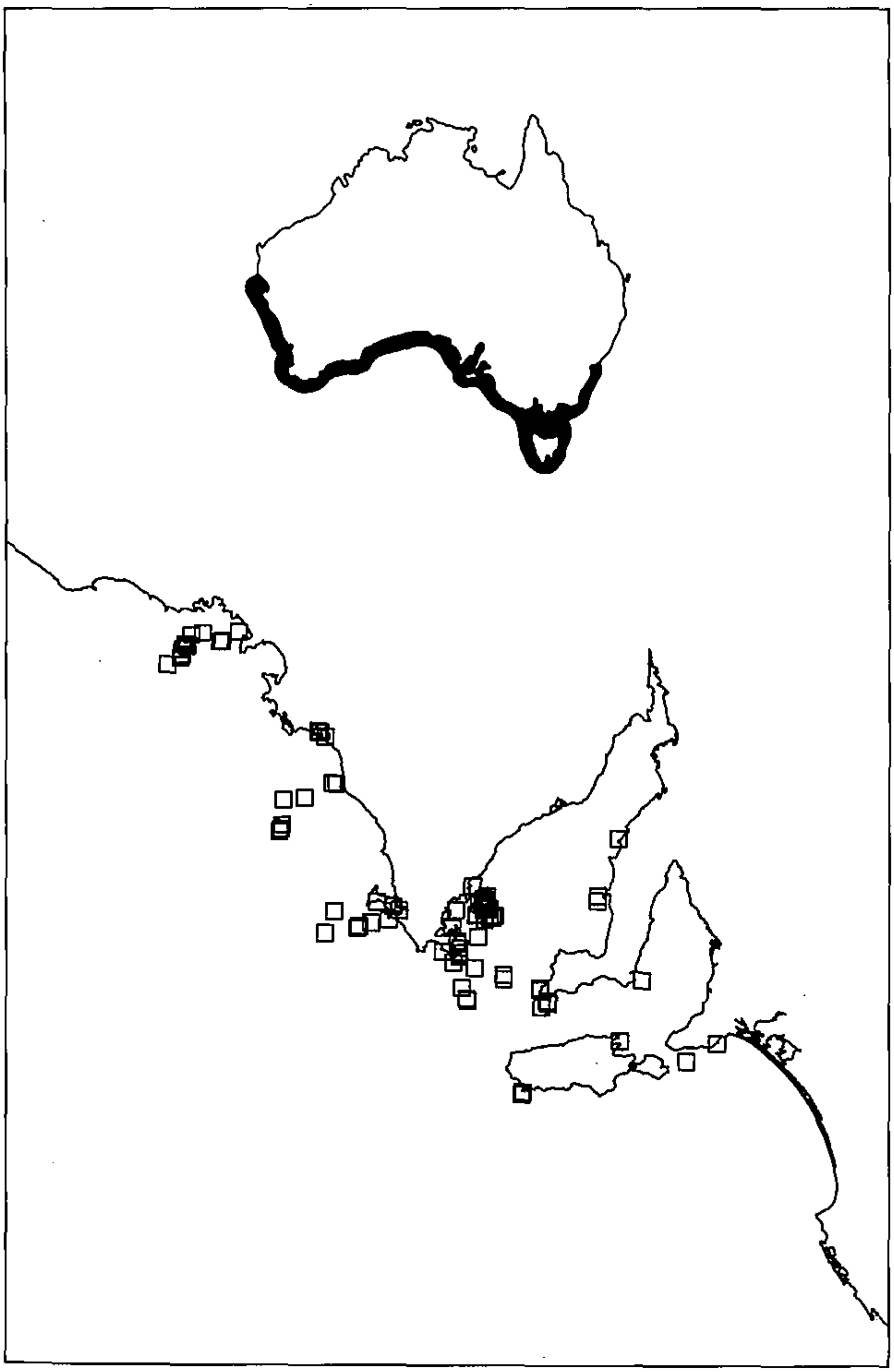


Figure 30. The Australian and South Australian offshore island distribution of the Pacific Gull (*Larus pacificus*).

their catch from some distance up in the air to smash the shell and get at the flesh of the animal inside. Favoured rocks for smashing shells are obviously used by many generations of gulls, and are littered with the whitened fragments of past meals.

Pacific Gulls are usually solitary nesters, with a pair selecting a site on a rocky area above the sea, though the survey found a small colony of six pairs nesting together on Marum Island. Their nests are constructed from woven grass and seaweed, and are generally more elaborate structures than those of the Silver Gull. Two mottled and well-camouflaged eggs are laid in September: juvenile and immature birds are a mottled brown and are quite unlike the black-winged, snowy white adults.

Pacific Gulls probably take four years to achieve their adult plumage, and over that period their beak colour will also change from the immature pale yellow with a dark tip to the bright yellow and orange tip of the adult. Two subspecies of the Pacific Gull are recognised; the western subspecies *Larus pacificus georgii* breeds eastward to Kangaroo Island, and is replaced by *L. p. pacificus* in Victorian and Tasmanian waters (Parker and Cox, 1978).

**Caspian Tern**
***Hydroprogne caspia* (Plate 46)**
The Caspian is the largest of the terns, its bright red bill making it unlikely to be confused with any other species. It is found around the Australian coast (occasionally on inland lakes) and also in Eurasia, Africa, North America and New Zealand. Caspian Terns are generally seen singly or in pairs on many of South Australia's islands (Figure 31), and an island may only have a single breeding pair. In other cases they nest in small colonies.

**Plate 46.** Caspian Tern (*Hydroprogne caspia*). Photo A. C. Robinson

They nest in a scoop in the ground, adding little or no vegetation, and lay one or two eggs between September and December. Breeding Caspian Terns are very aggressive and will swoop intruders, making a continuous loud croaking call rather like the calls made by some crows. They feed on fish, which they catch by spectacular vertical dives into the sea, often from heights of 20 or 30 m.

**Bridled Tern**
***Sterna anaethetus***
The first and only breeding records to date of this species in South Australia were obtained in January 1968, when a pair of Bridled Terns, with a recently hatched nestling, were found on Baudin Rocks (Bonnin, 1969) (Figure 32) near large breeding colonies of both Silver Gulls and Crested Terns. In December 1968 a pair of birds was again found in the same area, and a fresh egg was found in the shade of a bush. This egg had hatched when the island was revisited in January 1969, and the chick was banded. In addition to the two adults there was a third adult bird present on the island, assumed to be the nestling of the previous year grown to maturity.

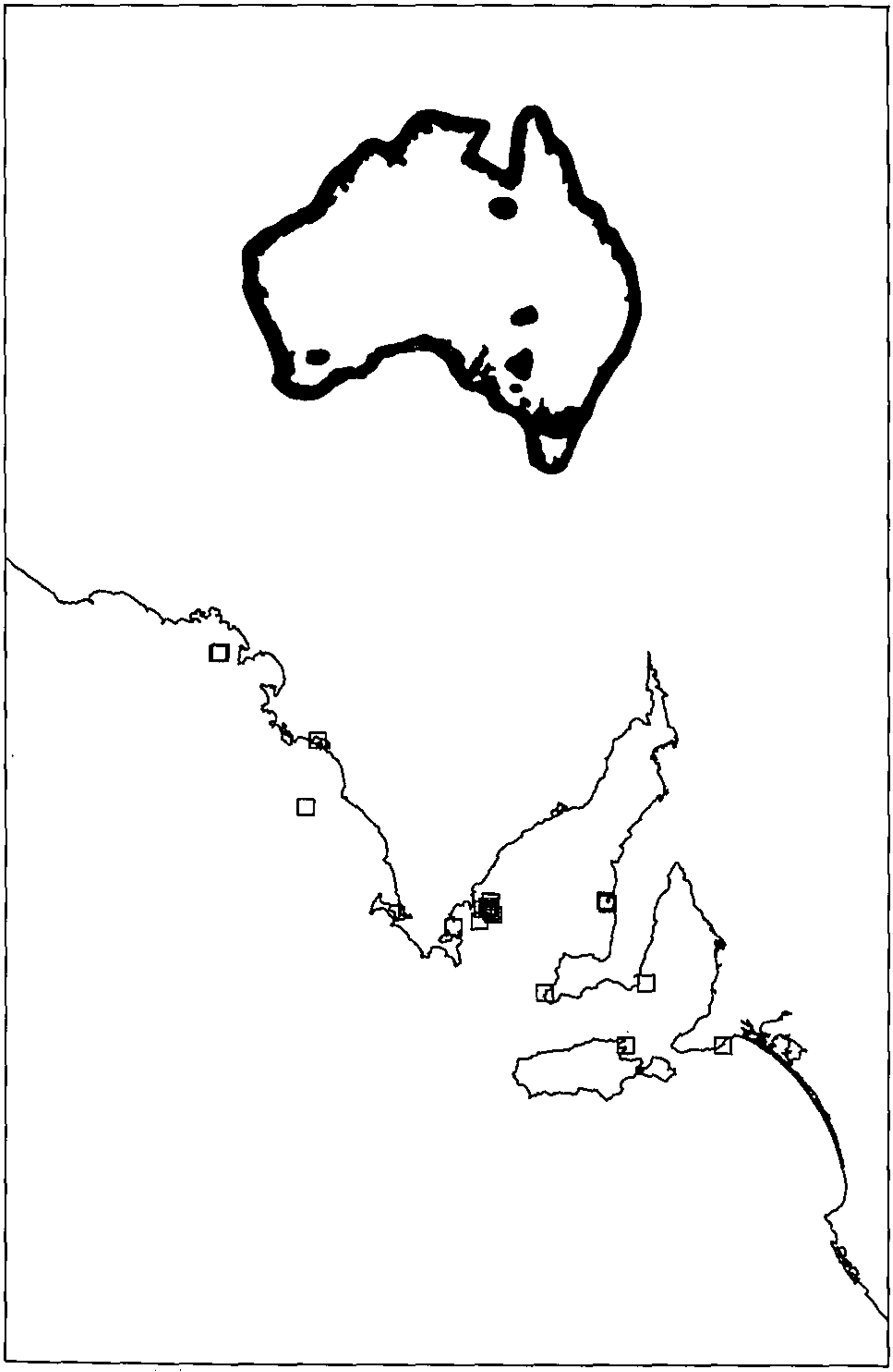


**Figure 31.** The Australian and South Australian offshore island distribution of the Caspian Tern (*Hydroprogne caspia*).

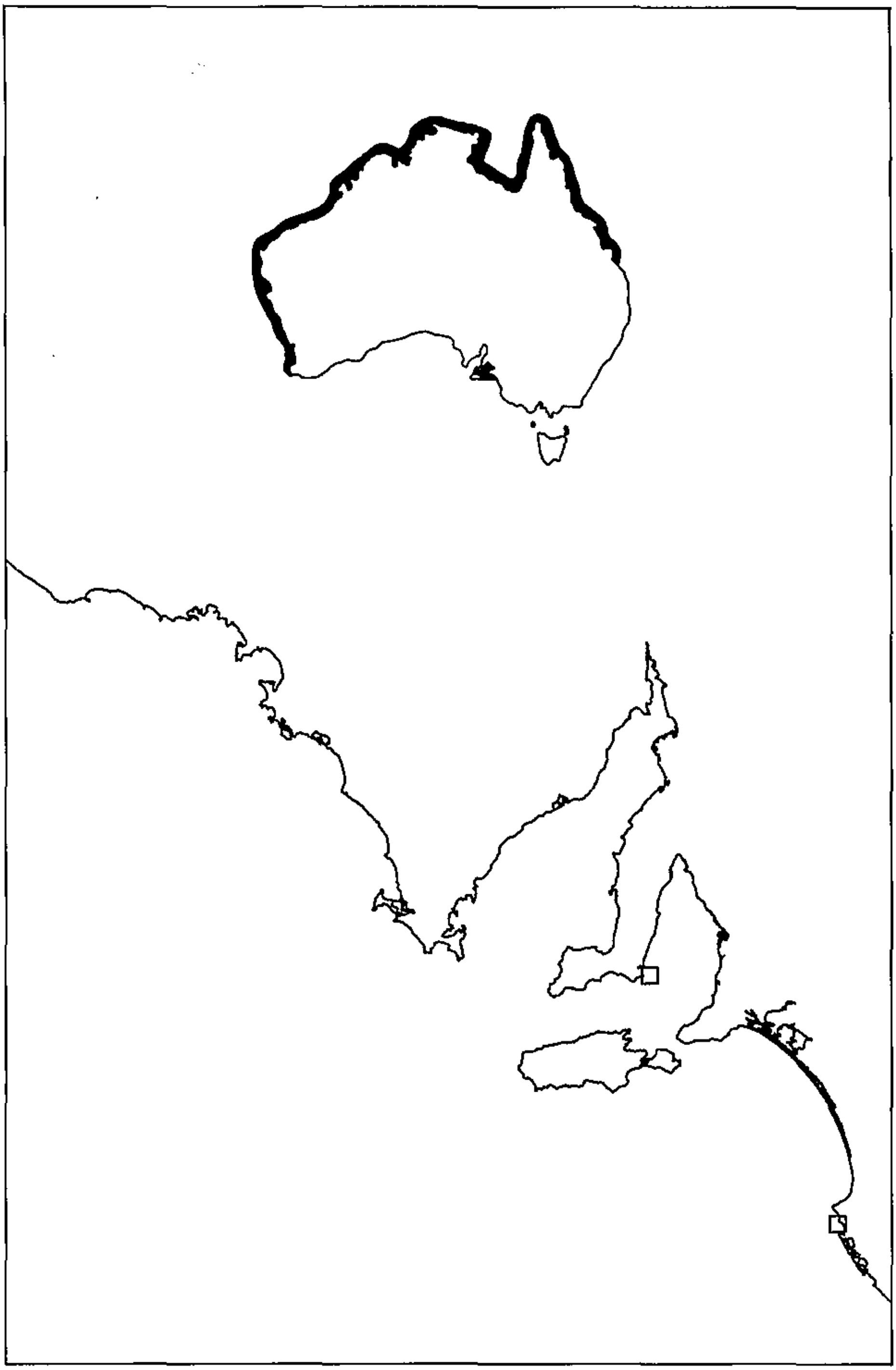


**Figure 32.** The Australian and South Australian offshore island distribution of the Bridled Tern (*Sterna anaethetus*).

**Fairy Tern**
***Sterna nereis* (Plate 47)**
These delicate little birds are the smallest of the terns that breed in South Australia. Their breeding colonies are scattered along the Australian coast from the Dampier Archipelago in Western Australia to Wilson's Promontory and the coast of Tasmania. In South Australia (Figure 33) the species has been banded on its breeding islets in the Coorong and on Wright and West Islands.

They generally breed in small, loose groups with the nests widely spaced on bare rocky or sandy areas. At a nesting colony on Seal Island inspected during the survey, the two eggs were laid directly into any hollow in the limestone surface with little or no attempt to line it with vegetation. Small parties of Fairy Terns are often seen feeding off the coasts of South Australia's offshore islands, but in this State they never appear to congregate in the flocks of several hundred birds typical of Crested Terns.

**Plate 47.** Fairy Tern (*Sterna nereis*).
Photo J. Bransbury

**Crested Tern**
***Thalasseus bergii* (Plate 48)**
This is by far the most common tern in South Australian waters, and roosting flocks numbering several hundred are found on the coasts of most offshore islands (Figure 34). It breeds in closely packed noisy colonies with the nests just far enough apart to be out of beak range of the next-door neighbours. The nest is a simple scrape in the ground, and generally only a single speckled egg is laid, though two are found occasionally.

As with Silver Gulls, there have been a lot of banding studies of Crested Terns coordinated by the Australian Bird Banding Scheme. In South Australia the first banding of Crested Terns was on Penguin Island in 1953; this program has continued to the present, making it one of the longest-running seabird studies in Australia. On West Island both Crested, Caspian and Fairy Terns have been banded since 1966, and a detailed summary of the results of this study has been published (SANPWS, 1983).

These and interstate studies have shown that Crested Terns usually breed when they are two years old, and that they return to the same breeding colonies for many years, living up to 17 years. Despite the fidelity of some terns to their breeding islands they also disperse extremely widely, the current record being held by an individual, banded as a chick on Lipson Island in South Australia, being recovered at Noosa Heads, Queensland, 1800 km to the north-east.

**Plate 48.** Crested Tern (*Thalasseus bergii*).
Photo P. D. Canty

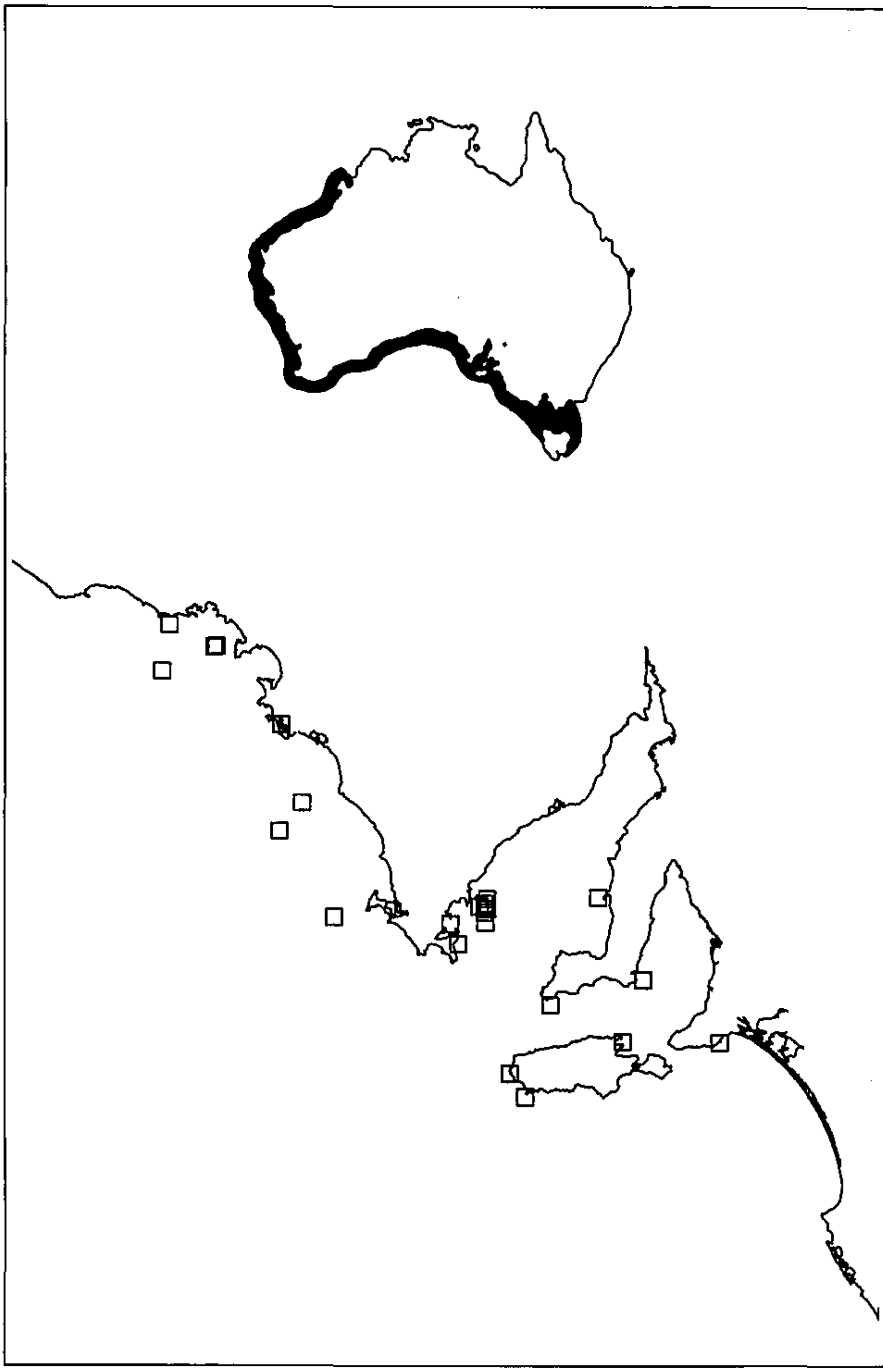


Figure 33. The Australian and South Australian offshore island distribution of the Fairy Tern (*Sterna nereis*).

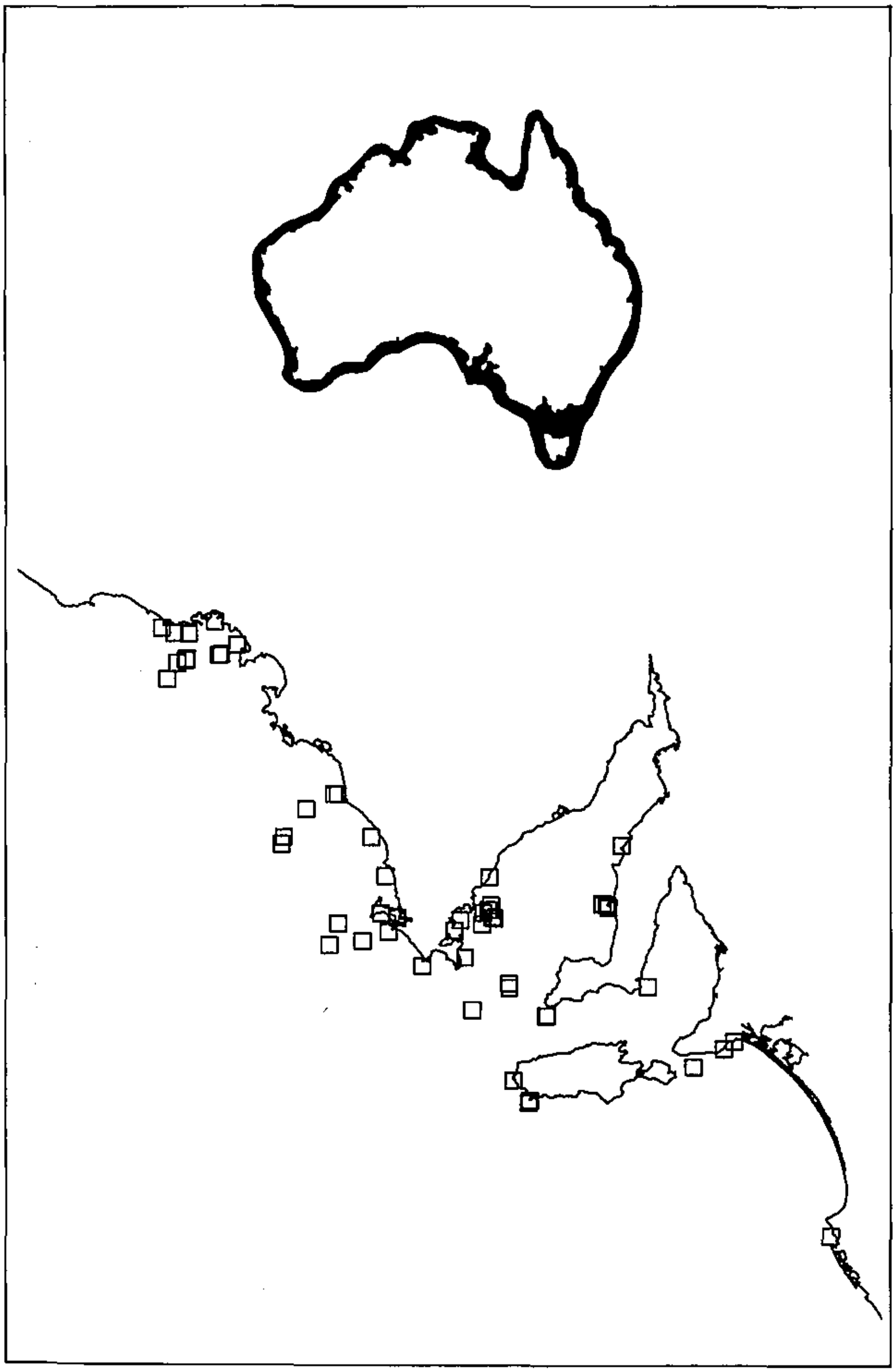


**Figure 34.** The Australian and South Australian offshore island distribution of the Crested Tern (*Thalasseus bergii*).

## Seals

Two species of seals breed around the coast of South Australia; the Australian Sea-lion and the New Zealand Fur-seal. Other seals that breed in Antarctic waters such as the Leopard, Crabeater, Weddell's and Ross Seals, occasionally visit the coast but do not breed here. The Southern Elephant Seal had a breeding colony on King Island in Bass Strait, but these were wiped out by sealers in the early 1800s. The nearest breeding population of this species is now on Macquarie Island and, once again, individual elephant seals occasionally visit the South Australian coast. In October 1986 a female Southern Elephant Seal gave birth at Wright Bay just north of Cape Thomas in the south-east of the State; the first recorded birth of this species in South Australia in historical times.

Both species of seals that breed regularly in South Australia have been the subject of field studies. The Australian Sea-lion has been studied on Dangerous Reef (Marlow 1968, 1972, 1975), on Kangaroo Island and on other South Australian island breeding colonies (Ling and Walker 1976, 1977, 1978, 1979; Stirling, 1972 a, b), while the New Zealand Fur-seal has been studied on the Neptune Islands (Stirling 1970, 1971 a, b; Stirling and Warneke, 1971). Summaries of the status and management of seal populations in South Australia can be found in Best (1986) and Robinson and Dennis (1988).

### Australian Sea-lion

***Neophoca cinerea* (Plate 49)**

The Australian Sea-lion is, in terms of total numbers, one of the 'rarer' seals in the world. It is restricted to the southern coasts of Australia, and though Flinders (1814) found the species on islands in eastern Bass Strait, its range has contracted westward since then, doubtless due to the effects of the sealing industry. Sea-lions, unlike fur-seals, were hunted only for their oil and hides, their coarse hair was of no value to the fur trade—and sea-lion hunting tended to be associated to some extent with shore whaling rather than the earlier period of fur-seal hunting.

The description of the sealers' camp on Troubridge Island in 1838, detailed in Chapter 3, is probably typical of the period and is most interesting biologically, since sea-lions have not been recorded breeding on Troubridge Island this century (though individual animals have been seen there in recent years). The total distribution of the Australian Sea-lion today is from Houtman Abrolhos in Western Australia to The Pages in South Australia (Figure 35).

Sea-lions haul out on sandy beaches or smooth, shelving granite platforms, and on many islands will climb quite steep slopes to reach favourite basking and wallowing spots on top of the island, some distance from the sea. Where dunes back sandy beaches, as at the well-known Seal Bay colony on Kangaroo Island, they penetrate several hundred metres inland to sheltered spots among the dunes.

**Plate 49.** Australian Sea-lion (*Neophoca cinerea*). Photo A. C. Robinson

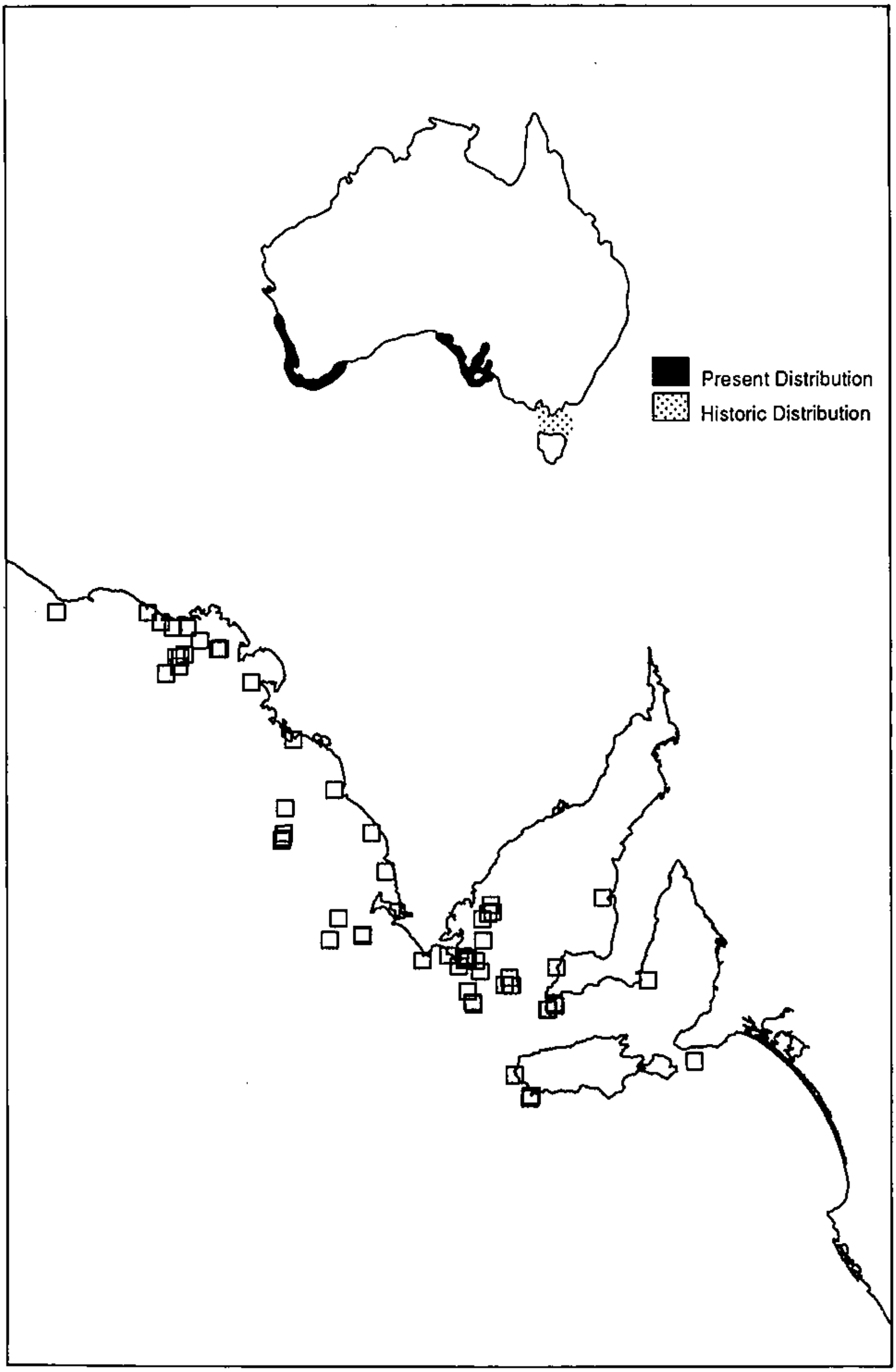



**Figure 35.** The Australian and South Australian offshore island distribution of the Australian Sea-lion (*Neophoca cinerea*).

Sea-lions remain at favoured hauling-out places throughout the year and feed on fish, squid and crustaceans nearby. They are fairly approachable at all the South Australian colonies, but at the colony on the beach at Seal Bay on Kangaroo Island, the animals have become particularly accustomed to people and provide 70000 visitors a year with a wildlife experience unique outside the Arctic and Antarctic regions (SANPWS, 1977; Robinson and Dennis, 1988; Gales et al. 1994).

Until recently, the total number of Australian Sea-lions in South Australia is still not known with any accuracy because they are so widely distributed on remote islands, and no complete count of all the colonies in a short period of time has been made. Counts of Australian Sea-lion colonies between 1974 and 1987, including all the data from the SANPWS island surveys, are given in Robinson and Dennis (1988). Between December 1987 and February 1992 Nick Gales, Peter Shaughnessy, John Libke and Terry Dennis organised a concentrated count of all known sea-lion and fur-seal populations around the coasts of southern Western Australia and South Australia (Gales et al. 1994).

Table 4 is an attempt to produce two total counts for South Australia in years before 1990, when the best figures are available. For the estimates in 1976–77 and 1982, approximations used include:

- amalgamation of the counts for years 1976–77 and comparison of these with 1982 to derive as wide a coverage of all the islands as possible; and
- where there are duplicated counts in each period, calculation of separate totals from maximum and minimum counts.

These counts are compared with the systematic count conducted between 1987 and 1992, which gives the most complete and accurate estimate of Australian Sea-lion populations to date. Since there will be an unknown number of adult Sea-lions away at sea whenever a count is made at a colony, Gales et al. (1994) used the production of pups at each colony to estimate the total population of the species. They estimate there are now 6600 to 8300 Australian Sea-lions in South Australia, and a further 2700 to 3400 in Western Australia.

Little is known about movement between the various colonies, but the considerable variation in counts over time shown indicates that major changes in the numbers present at particular colonies do occur. It therefore appears that the South Australian population of Australian Sea-lions may be in the order of 7500 animals.

Some indication of the longer-term stability of two populations can be obtained from counts conducted by SANPWS/DENR at Seal Bay since 1962 and at Point Labatt since 1966, detailed in Robinson and Dennis (1988). It appears

**Table 4.** Estimates of the total population of Australian Sea-lions in South Australia.

| | 1976–77 | | 1982 | 1987–1992 | |
|---|---|---|---|---|---|
| | Maximum | Minimum | | Maximum | Minimum |
| Islands | 2576 | 1076 | 1879 | 6459 | 1845 |
| Kangaroo Island | 487 | 132 | 390 | 391 | 120 |
| Pt Labatt | 68 | 15 | 46 | 42 | 17 |
| **Totals** | **3131** | **1223** | **2315** | **6892** | **1982** |

there was an increase in the total Seal Bay population between 1972 and 1974; since then, though there are considerable fluctuations within years, the maximum population appears to have stabilised at around 400 animals. At Point Labatt, a colony on the South Australian mainland, counts are more difficult to interpret; they appear to have reached a maximum of 80 in 1966, declined to 45 through the early 1970s, then recovered to 75 by 1978. Since then they declined by about a third by 1982 and fluctuated around 50 individuals in the 1980s. Against this apparent decline is the fact that Point Labatt may be establishing itself as a small breeding colony rather than simply a hauling-out area, with single young pups being recorded for the first time in February 1978 and again in January 1979.

Australian Sea-lions breed on a number of islands in South Australia (Table 5) but the three main breeding colonies are The Pages, which account for about 25 per cent of the annual pup production for this species, Seal Bay on Kangaroo Island and Dangerous Reef.

Though there have been a number of studies of breeding in the Australian Sea-lion, some aspects of its reproductive cycle are still very unclear. Most species of seals have a fixed reproductive cycle with a gestation period of 10–11 months. There is commonly a period of delayed implantation of about four months of the blastocyst (fertilised egg) following mating.

The breeding season of the Australian Sea-lion has generally been stated to be between October and December (Harrison, 1969; King, 1964; Nishiwaki, 1972). In two studies (Marlow, 1968; Stirling, 1972a) the first pups were born in October, but on Dangerous Reef, Marlow (1975) recorded that the breeding season was highly variable and may begin before the beginning of October, extending into early January. We visited Dangerous Reef on 26 November 1982 and the 41 pups seen on Main Reef appeared to range from newborns to animals one to two months old.

More detailed studies by Ling and Walker (1976, 1977, 1979) at Dangerous Reef and at Seal Bay on Kangaroo Island have shown that breeding can occur in any season and that there is probably no well-defined breeding season, though there are peaks. From 1975 to 78 these peaks of births occurred 16 and 17 months apart for the three generations of pups. Observations on three individually marked female sea-lions at Seal Bay have shown periods of 17 and 18 months between the birth of successive pups (Ling and Walker 1978), much longer than the general 10–11 month period for other seal species.

There are two possible explanations. If, as Marlow (1968, 1975) notes, mating takes place about seven days following birth, then there would be a gestation period of up to 18 months. This would require a delay of nine or 10 months in the implantation of the blastocyst, assuming six or seven months of subsequent development in the uterus following implantation before birth. Delayed implantation has now been demonstrated in the Australian Sea-lion through the discovery of a free blastocyst in the uterus of one female Australian Sea-lion (Tedman, 1991). An alternative explanation, now thought less likely, is that mating does not invariably occur immediately after birth and that there is a more normal gestation period of 10–11 months.

Table 5. Locations of colonies of Australian Sea-lions where pupping has been recorded, with numbers of adults and pups at each site.

| Breeding colony | Number of adults | Number of pups | Year |
|---|---|---|---|
| The Pages | 1012 | 522 | 1990 |
| Seal Bay | 331 | 156 | 1977 |
| Dangerous Reef | 243 | 236 | 1977 |
| Purdie | 159 | 49 | 1982 |
| Olive | 130 | 25 | 1982 |
| Franklin | 110 | 43 | 1982 |
| Liguanea | 96 | 16 | 1990 |
| Peaked Rocks | 77 | 12 | 1990 |
| English | 75 | 40 | 1975 |
| North Islet | 64 | 8 | 1975 |
| Lewis | 58 | 7 | 1975 |
| Albatross | 55 | 12 | 1982 |
| Fenelon | 43 | 8 | 1973 |
| Freeling | 19 | 1 | 1975 |
| Jones | 27 | 6 | 1990 |
| Lounds | 23 | 26 | 1982 |
| Ward | 60–70 | 12–14 | 1979 |
| St Francis | 3 | 1 | 1975 |

**New Zealand Fur-seal**
***Arctocephalus forsteri* (Plate 50)**

The New Zealand Fur-seal has a discontinuous distribution around the Southern Ocean. It occurs in New Zealand, on Macquarie Island and on the southern coastline of Australia from Eclipse Island in the Recherche Archipelago in the west to Casuarina Islands in the east (Figure 36). From Lady Julia Percy Island in Victoria, east through the Bass Strait islands and Tasmania and north to Port Stephens in New South Wales, it is replaced by a very similar species, the Australian Fur-seal *Arctocephalus pusillus doriferus*, while another subspecies *A. p. pusillus* occurs in South Africa.

Occasional juvenile Australian Fur-seals have been recorded on beaches in the south-east of South Australia, presumably from the colony on Lady Julia Percy Island in Victoria.

Since 1988 male Australian Fur-seals have been recorded in the large New Zealand Fur-seal breeding colonies at Cape Du Couedic and Cape Gantheaume on Kangaroo Island. Both species favour broken rocky outcrops close to very rough, breaking waves for both hauling-out and breeding sites. In South Australia the New Zealand Fur-seal is never seen far from the water's edge, unlike sea-lions, which are often found on top of islands or in sand dunes well away from the sea.

Both species of fur-seals were extensively hunted by sealers, and many colonies were severely reduced. The population on Macquarie Island, for example, was completely exterminated; fur-seals only recolonised the island in the 1900s, or perhaps even later (Csordas, 1963).

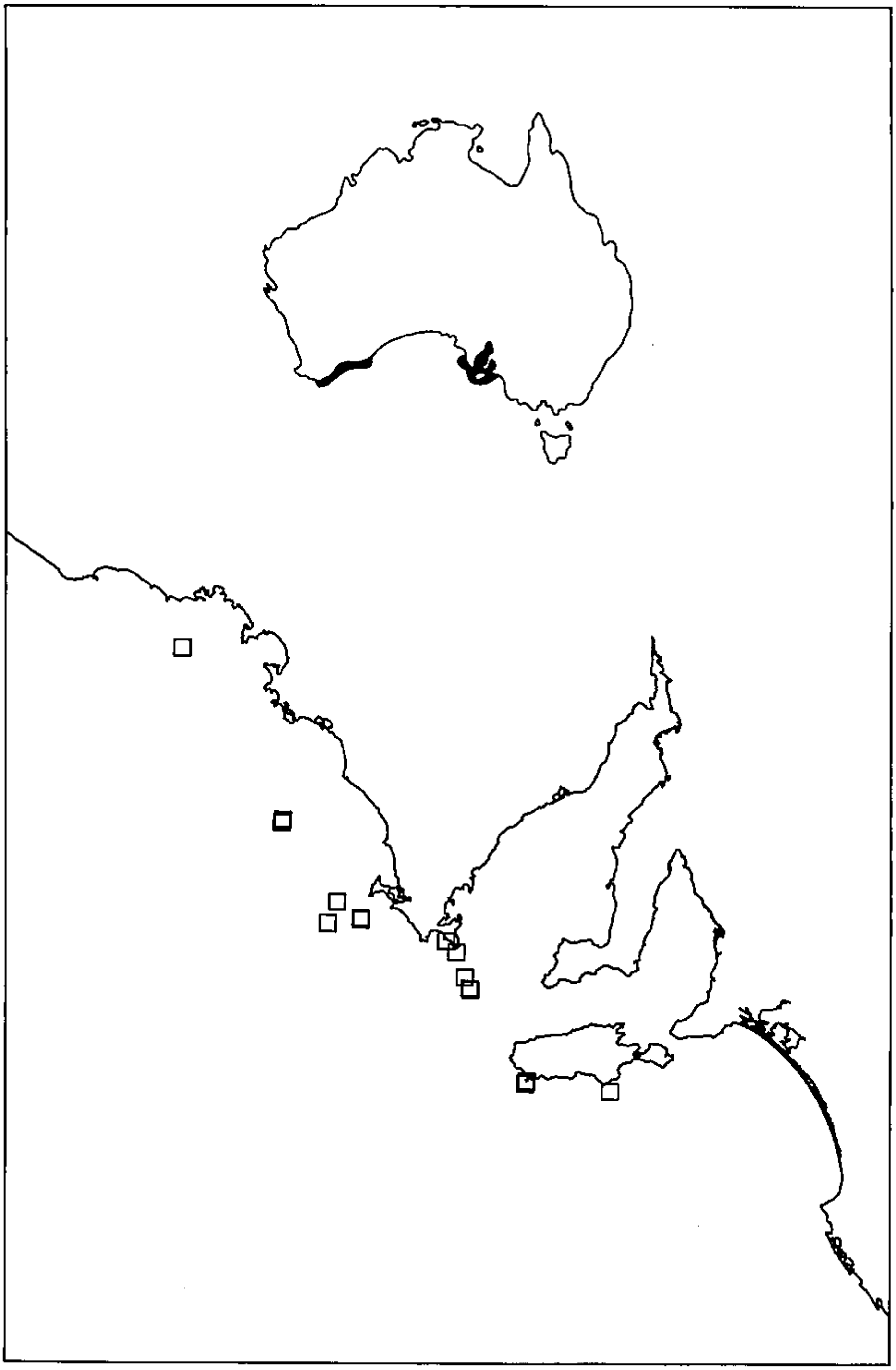


**Figure 36.** The Australian and South Australian offshore island distribution of the New Zealand Fur-seal (*Arctocephalus forsteri*).

The distribution of New Zealand Fur-seals in South Australia is shown in Figure 36 but because of their preference for rough, rocky sites with caves and ledges, they are very difficult to count with any degree of accuracy. Counts of fur-seal colonies between 1971 and 1987, including all the data from SANPWS surveys, are given in Robinson and Dennis (1988).

Fur-seals are present in both breeding and non-breeding colonies at all times of the year, but total numbers and the proportions of the different sex and age classes vary with the season. Robinson and Dennis (1988) estimated that there were at least 2000 New Zealand Fur-seals in South Australia, but more detailed work in 1987–91 (Shaughnessy et al. 1994) significantly increased this figure. More accurate counts were obtained during the breeding season by a series of mark-release-recapture studies of pups. Once the number of pups is known, the total population can be estimated by multiplying pup numbers by between 3.4 and 4.5, depending on whether the population is stable or increasing. This work suggests the total South Australian population is more than 13 500.

**Plate 50.** New Zealand Fur-seal (*Arctocephalus forsteri*). Photo P. D. Canty

More detailed studies by Dr Peter Shaughnessy of fur-seal populations on Kangaroo Island from 1988 to 1995 indicate the rate of expansion of these populations. Over this period numbers rose exponentially, at 15–20 per cent per year. This recovery rate has also been observed in studies of fur-seal populations elsewhere in the Southern Hemisphere.

Observations on the South Neptunes in 1969–70 by Stirling (1971a, b) show that the New Zealand Fur-seal has a well-defined summer breeding season, though some adult males remain on the South Neptunes throughout the year defending large, loosely defined territories from mid-October. With the influx of adult males, more permanent territories are well established by the latter half of November.

Fighting between adult males is highly ritualised, and serious injuries are rare. The males defend territories, but individual females have no bonds to specific males and pass relatively freely between territories. The average ratio of males to females in a particular territory is 1:4.5, though up to 14 females have been recorded associated with one particular male: the fact that this same male only had a single female associated with him the next day shows how mobile the females are.

The first pups are born in late November, and births continue until mid-January in areas that seem to have two main characteristics; easily accessible water for cooling off in sea pools kept full by rainwater or spray, and easy access to high rocks behind the colony so females and pups can escape wave action during heavy seas. Within two weeks of birth the females mate and the males lose interest in them. There is some evidence to suggest females return to the same areas in subsequent years to give birth.

Pups can swim at birth, one even having been observed being born under water when its mother was chased into the sea by a male. Females stay with their pups for a few days after birth, but a week later will leave them for up to two hours while they go to sea to cool off and feed. By their second week the pups begin to associate with each other in small groups and by three to four weeks swim regularly in rock pools, playing with others in their age group. Pups are suckled for almost a year, but just before the next breeding season the mothers wean them forcibly; both adult males and females are intolerant of yearling animals in breeding colonies, and these are forced to congregate in other areas.

## Bettongs and Wallabies

**Brush-tailed Bettong**
***Bettongia penicillata*** **(Plate 51)**
The Brush-tailed Bettong was so common around Adelaide at the turn of the century that dealers sold them by the dozen at about ninepence a head for coursing on Sunday afternoons (Wood Jones, 1924). They are now considered extinct over the whole of their former range in south-eastern Australia, and now only occur in a few small populations in the south-west of Western Australia (Figure 37). Details of the biology of the species in Western Australia can be found in Christensen (1980).

Bettongs also occurred on St Francis and St Peter Island at the time of European settlement, but the early farmers managed to eradicate these 'pests' in a short time. In 1971, Tony Robinson collected some skull fragments of bettongs from a blowout in sand dunes on St Francis Island, and it was confirmed that the animal that had occurred on the island was indeed the Brush-tailed Bettong (Robinson and Smyth, 1976).

**Plate 51.** Brush-tailed Bettong (*Bettongia penicillata*). Photo P. D. Canty

There was no sign of any living bettongs or the cats that were supposed to have brought about their demise, so SANPWS decided to undertake a program aimed at re-establishing a population of Brush-tailed Bettongs on St Francis Island.

A small number of animals was obtained from Western Australia and a captive breeding program was begun, with a series of releases into the wild once a captive population was established. The first of these was on a small, artificial island at the head of Spencer Gulf. These animals survived in the wild for 12 months, confirming that captive-bred animals could be successfully introduced to the wild. Slightly larger islands in Venus and Baird Bays were the next stage, and again populations were successfully established. Unfortunately, as mentioned in Chapter 5, a fox exterminated the Baird Bay island population in 1994, but the population on Island A in Venus Bay is still thriving.

In 1980 a group of 40 bettongs, again from the captive population, were released on St Francis Island and, though there was some mortality, at least one of these animals was still surviving in April 1982 when the island was re-trapped. In April 1982 only a single female was caught, but she had a pouch young that had been conceived on the island. In May

1983, 11 animals were introduced to Wedge Island and the island's owner had begun to see the animals. The Bettong program to this stage is covered in Delroy et al. (1986).

Because of the apparently limited success in establishing bettongs following the first release on St Francis Island, SANPWS arranged two more releases with 42 and 48 animals released in April 1984 and September 1987 respectively.

In October 1988 a major effort involving 355 trap nights (a 'trap night' is one trap set open for one night) over a large proportion of St Francis Island resulted in the capture of only a single bettong from the 1987 release. By 1989 it appeared efforts to reintroduce the Brush-tailed Bettong to St Francis Island had failed for unknown reasons, given the fact that bettongs have been successfully established on the small and apparently much less suitable habitat of the islands in Venus and Baird Bays.

In February 1989 the first monitoring of the 1983 introduction of 11 bettongs to Wedge Island was carried out. There were abundant signs of bettong diggings over the whole island, and 38 animals were captured in 78 trap nights, suggesting a population had successfully established itself there. Subsequent monitoring has shown that this population is increasing, and bettongs appear to be occupying virtually all suitable habitat on the island.

In September 1989 a major release of bettongs was carried out on St Peter Island, and annual monitoring from 1990 onward has shown the population has also become established and is still expanding.

The bettong management program has now entered an exciting new phase, with an attempt to substantially reduce rabbit, fox and cat numbers over the whole of the Venus Bay peninsula before the release of Brush-tailed Bettongs on to the South Australian mainland. The first release was in April 1994, and subsequent monitoring has shown that these (and other animals released at later dates in the same year) appeared to be well established.

South Australia's offshore islands have provided much information on re-establishment of the Brush-tailed Bettong in this State, and populations on Wedge and St Peter Islands will be maintained along with what is hoped to be a successful return of the species to selected and carefully managed areas of the mainland.

**Black-footed Rock-wallaby**
***Petrogale lateralis* (Plate 52)**

There has been considerable confusion over the exact relationships of the rock-wallabies. The population on Pearson Island was described in 1922 as a separate species, *Petrogale pearsoni*, by Oldfield Thomas of the British Museum from specimens collected by F. Wood Jones in 1920, but recent work using blood protein and chromosomal comparisons have shown that it falls within a large group of rock-wallabies now collectively named *Petrogale lateralis* (Briscoe et al. 1982). This species occurs in the western Kimberleys, around Mount Isa, in the Central Australian ranges and the south-west of Western Australia, and there are five offshore island populations on Salisbury, Coombe, Wilson and Mondrain Islands in the Recherche Archipelago and on Pearson Island (Figure 38).

Scenically spectacular Pearson Island is greatly enhanced by the presence of these brightly coloured rock-wallabies. In common with many animal populations that have been isolated for thousands of years on islands unexposed to humans, these wallabies are very 'tame' and will approach people closely in daylight,

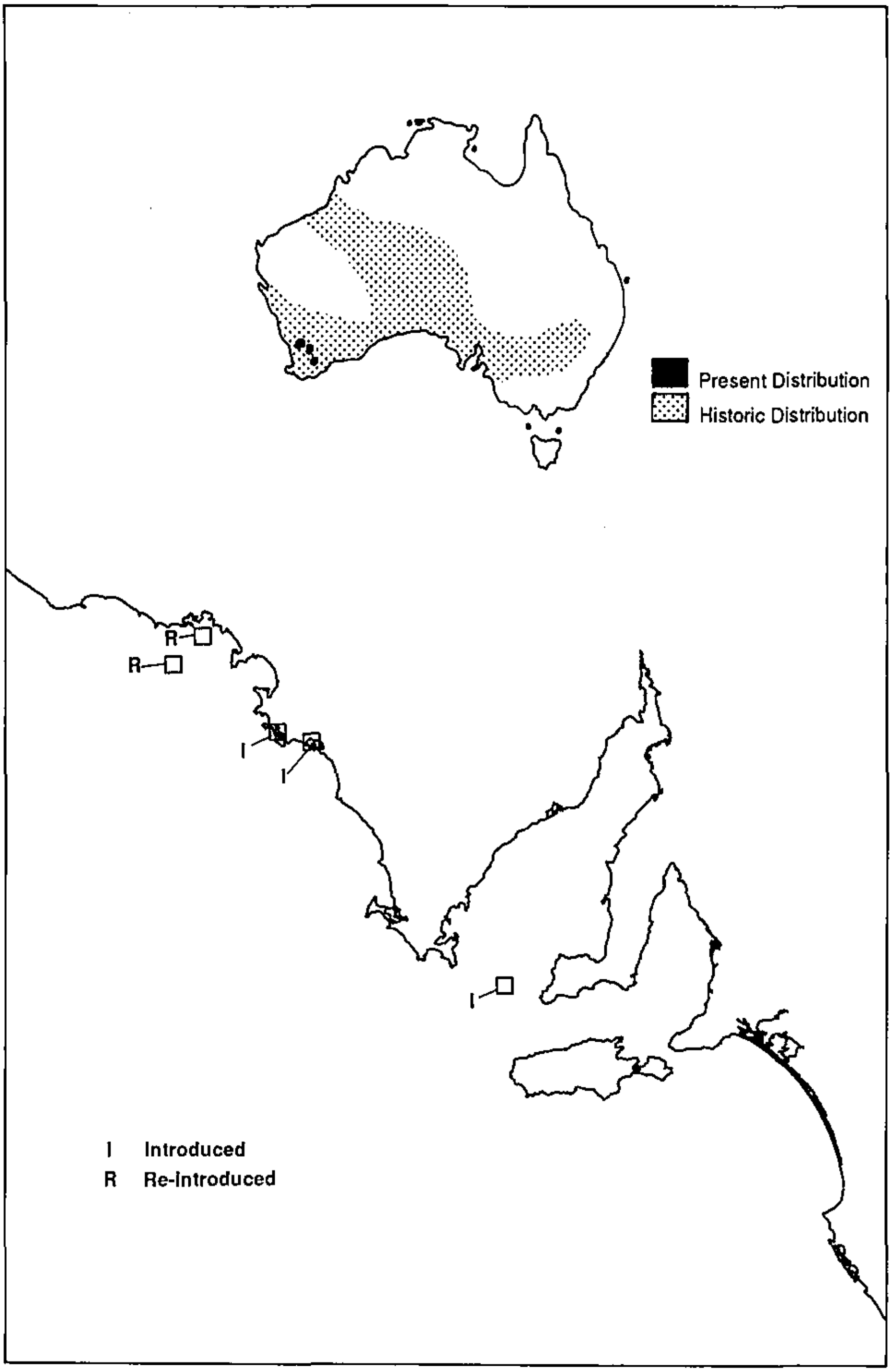



**Figure 37.** The past and present Australian distribution and the islands in South Australia where introduced populations of the Brush-tailed Bettong (*Bettongia penicillata*) occur.

though they are most active—particularly in the hotter times of the year—at night.

Pearson Island, like Greenly Island, is divided into two islands; the main northern portion is separated from the smaller central and southern sections by a sand spit that dries out at low tide. This appears to have acted as an effective barrier to rock-wallabies, and early visitors to the island mentioned that they only saw wallabies on the northern section (Wood Jones, 1923). The Royal Society of South Australia mounted a major expedition to Pearson Island in 1960 (Shepherd and Thomas, 1971), and members also noted the absence of wallabies or any skeletal remains in caves on the central and southern sections.

**Plate 52.** Black-footed Rock-wallaby (*Petrogale lateralis*). Photo A.C. Robinson

Several wallabies were caught by this expedition and transferred to a camp on the middle section, where four females, one male and one animal of unknown sex escaped. From this inadvertent introduction a population of rock-wallabies has become established on the central and southern parts of Pearson Island; Thomas and Delroy (1971), who visited the island in 1969, estimated there were between 50 and 150 animals on these parts of the island, and demonstrated that this rate of increase was quite possible from the original six escapees. Robinson (1980) showed that the introduced wallabies were still well established on Central and South Pearson, and Fatchen (1982) using data collected during the same 1976 expedition, suggested that they were having a detrimental effect on the vegetation there. In November 1975 a group of animals was captured on the northern section of Pearson Island and transferred to Wedge and Thistle Islands, where both populations now appear to be well established.

**Tammar Wallaby**
***Macropus eugenii* (Plate 53)**

This small wallaby is well known to residents and visitors to Kangaroo Island, where it is still abundant enough to be considered an agricultural pest in some areas. Throughout the rest of its range in Australia (Figure 39), however, it is quite a different story. At the time of European settlement it occurred widely in the south-west of Western Australia and in a rather indeterminate area of southern South Australia, which certainly included much of Eyre and Yorke Peninsulas and the southern Flinders and Mount Lofty Ranges. It still occurs in Western Australia, but on the South Australian mainland it may only still survive as a tiny remnant population near Cleve.

**Plate 53.** Tammar Wallaby (*Macropus eugenii*). Photo A. C. Robinson

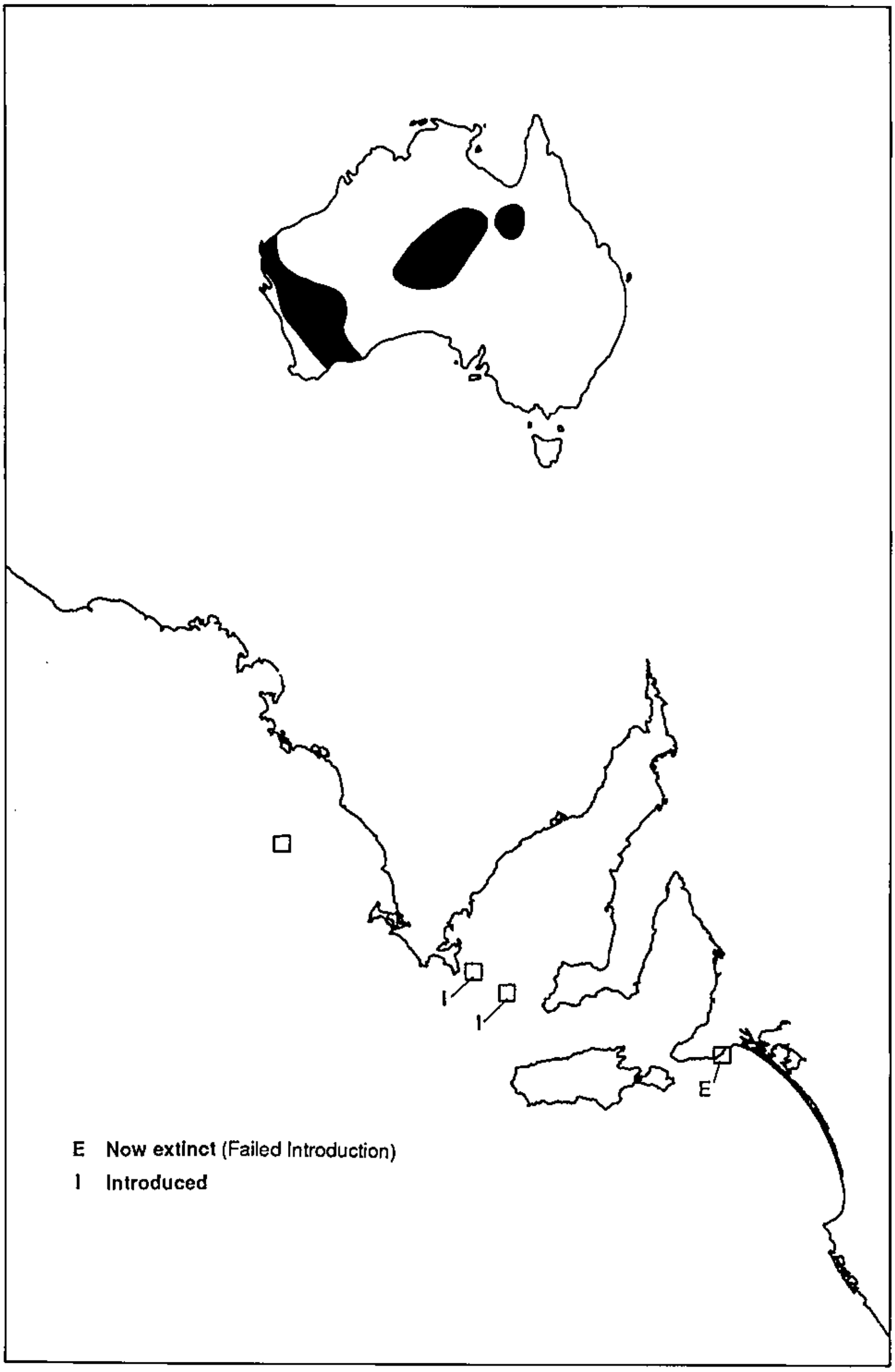



**Figure 38.** The Australian distribution and the islands in South Australia supporting natural or introduced populations of the Black-footed Rock-wallaby (*Petrogale lateralis*).

Early navigators around the South Australian coast recorded Tammar Wallabies on St Peter, St Francis, Flinders and Thistle Islands; these populations all now seem to be extinct, and the story of the Flinders Island populations is probably typical of what occurred on the other islands.

Flinders Island animals differed considerably from the Kangaroo Island population in having a finer, more graceful build and a short, sleek coat. Flinders described his impressions of these animals:

> A small species of kangaroo not much bigger than a cat was rather numerous. I shot five of them and some others were killed by the botanists and their attendants, and found to be in tolerably good condition (Flinders, 1814).

In 1920 Professor Frederick Wood Jones visited the island but could find no trace of the wallabies. The tenant at that time, Mr May, informed him that he believed the animals were extinct but had been common before 1920. He recalled that as many as 30000 had been slaughtered at one time, but in 1920 a bushfire had swept through their remaining habitat and not one had been seen since. Wood Jones visited the island again in 1922 and 1924, finding signs of the wallaby's survival in fresh tracks and faeces, and finally three animals, two of which he collected for specimens.

In 1964 D. Seton, a fauna officer with the then South Australian Department of Fisheries and Fauna Conservation, visited Flinders Island for a day. Though he saw no wallabies in an area of *Melaleuca* scrub he searched north of Groper Bay and found evidence of tracks and droppings, and believed the wallabies were still reasonably common in this area.

In 1968 the Commissioners of the National Park and Wildlife Reserves sought the cooperation of the Field Naturalists' Society of South Australia Mammal Club to provide information on the status of the Flinders Island Wallaby. A group of biologists visited Flinders Island in June 1968 and attempted to search the remaining areas of natural vegetation thoroughly for any trace of the wallabies.

At this time Mr W.R. Baldock, who lived on the island, had not seen any live wallabies for 12 months and before this they had been rare for at least two years. The detailed results of this expedition are described by Aitken (1968). They saw no wallabies, but in a remnant area of 20 ha of well-vegetated sand dunes found recent resting areas and some fresh tracks and droppings. They concluded that only two to five wallabies remained on the island. Sheep were immediately fenced out of this remnant vegetation patch, but a five-day search in June 1974 (Delroy 1974) failed to find any trace of the wallabies.

Tony Robinson visited Flinders Island for two days in 1983. The family now living on the island has never seen any wallabies and again no signs were found, so it now seems certain this population finally became extinct some time between 1968 and 1974, a tragic example of just how vulnerable the sometimes extremely large animal populations on islands are to disturbance.

## Stick-nest Rats and Tiger Snakes

**Greater Stick-nest Rat**
***Leporillus conditor* (Plate 54)**

The Greater Stick-nest Rat was widespread across southern Australia at the time of European settlement, but had become rare by the middle of the 19th century, being found only in areas where sheep and cattle had not penetrated. It seems to have survived on the Nullarbor Plain into the 1930s, but is now considered extinct on the Australian

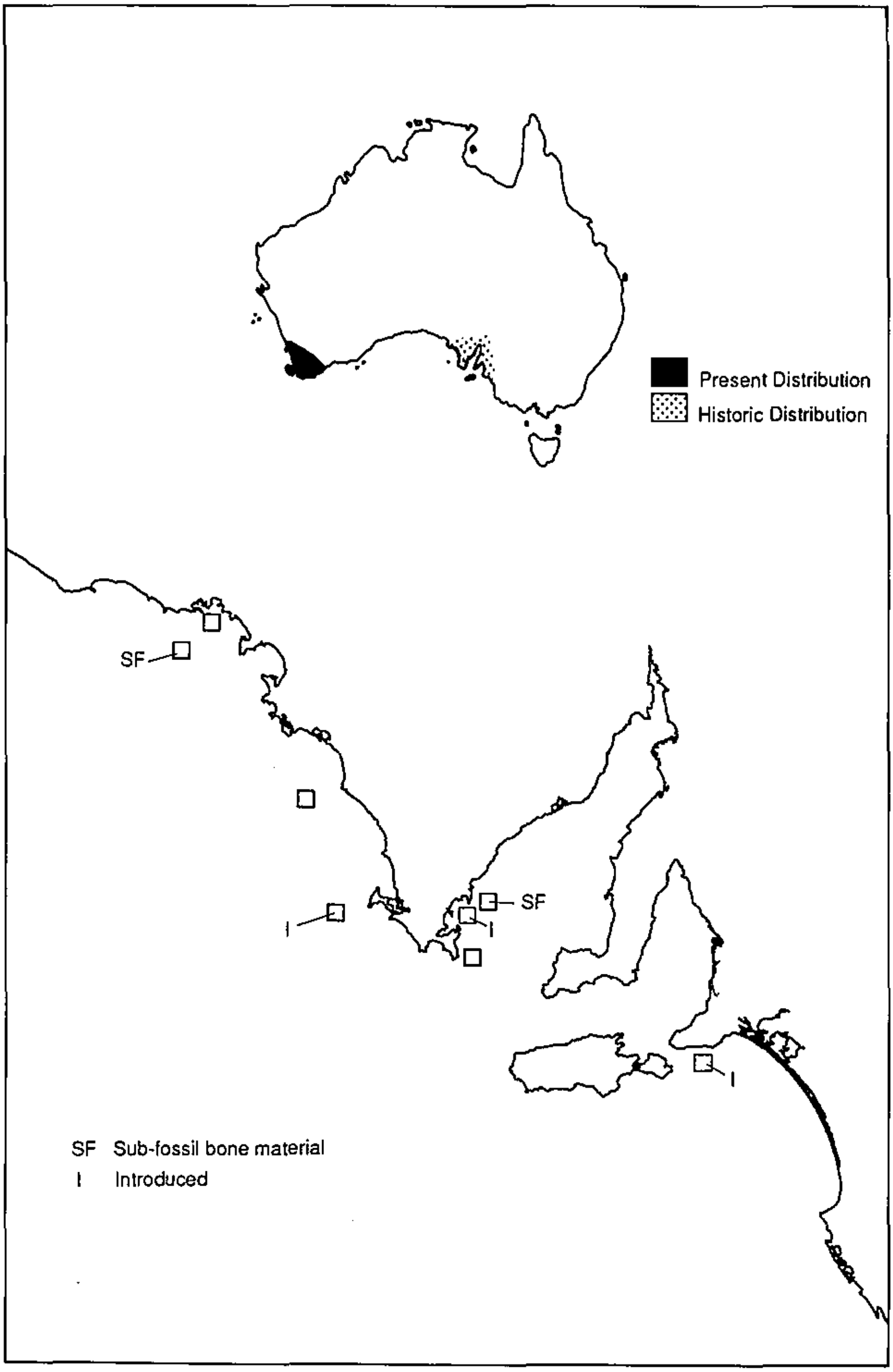



**Figure 39.** The past and present distribution and the islands in South Australia where introduced populations of the Tammar Wallaby (*Macropus eugenii*) occur.

mainland (Figure 40). F. Wood Jones, Professor of Anatomy at the University of Adelaide, visited the Franklin Islands in 1920 where he discovered a large and thriving population. Specimens he collected were described as a separate species and were named in his honour *Leporillus jonesi*, though they are now considered the same as the extinct mainland species.

The Franklin Islands now support the only known population of these interesting native animals, and have consequently been proclaimed a Prohibited Area under the National Parks and Wildlife Act.

**Plate 54**. Greater Stick-nest Rat (*Leporillus conditor*). Photo S. J. Doyle

A detailed study of the rats on the Franklin Islands has been carried out by SANPWS (Copley, 1988), and has resulted in the development of a scientifically based management program for the species. Bones of stick-nest rats have also been found in sandhills on Reevesby Island, but there is no way of knowing how old these are. There is no record of stick-nest rats living there during the time the island was farmed.

Greater Stick-nest Rats on Franklin Island are attractive animals, rather like small rabbits in appearance. They live among rocks or under bushes and cut sticks to add to these refuges, making nests of varying complexity. The largest nests built around bushes in relatively open areas can be 1.5 m in diameter and up to 1 m high, the products of many generations of rats.

They seem to be exclusively vegetarian, eating the leaves and fruits of many succulent and semisucculent plant species (Robinson, 1975; Copley, 1988). On the Franklin Islands the rats prefer sheltered sites, among coastal boulders, beneath limestone capping or among relatively dense shrub cover on the islands' platforms. In fact such sites, along with the protection afforded by muttonbird burrows, provide enough shelter for the rats not to need to build above-ground stick-nests in most situations, and most shelter beneath rocks or shrubs.

Trapping, hand-netting and radio-tracking suggest Greater Stick-nest Rats have relatively fixed home ranges and that they may be territorial. They are apparently monogamous, and females can produce several litters of one or two young per year. The population of rats on both islands is estimated to be about 1000 individuals, though the low recapture frequencies indicate this is probably an under-estimate. Barn owls and tiger snakes prey on the rats and may account for between about 500 to 800 individuals a year, a predation level balanced by the rat's reproductive rate. The survival of this last population of one of our fascinating native mammals depends on Franklin Island remaining as natural and undisturbed as possible.

The management program developed by DENR for the Greater Stick-nest Rat involved the establishment of a captive breeding program based on animals from the Franklin Islands. By 1990 the small population of feral cats was successfully eradicated from Reevesby Island in

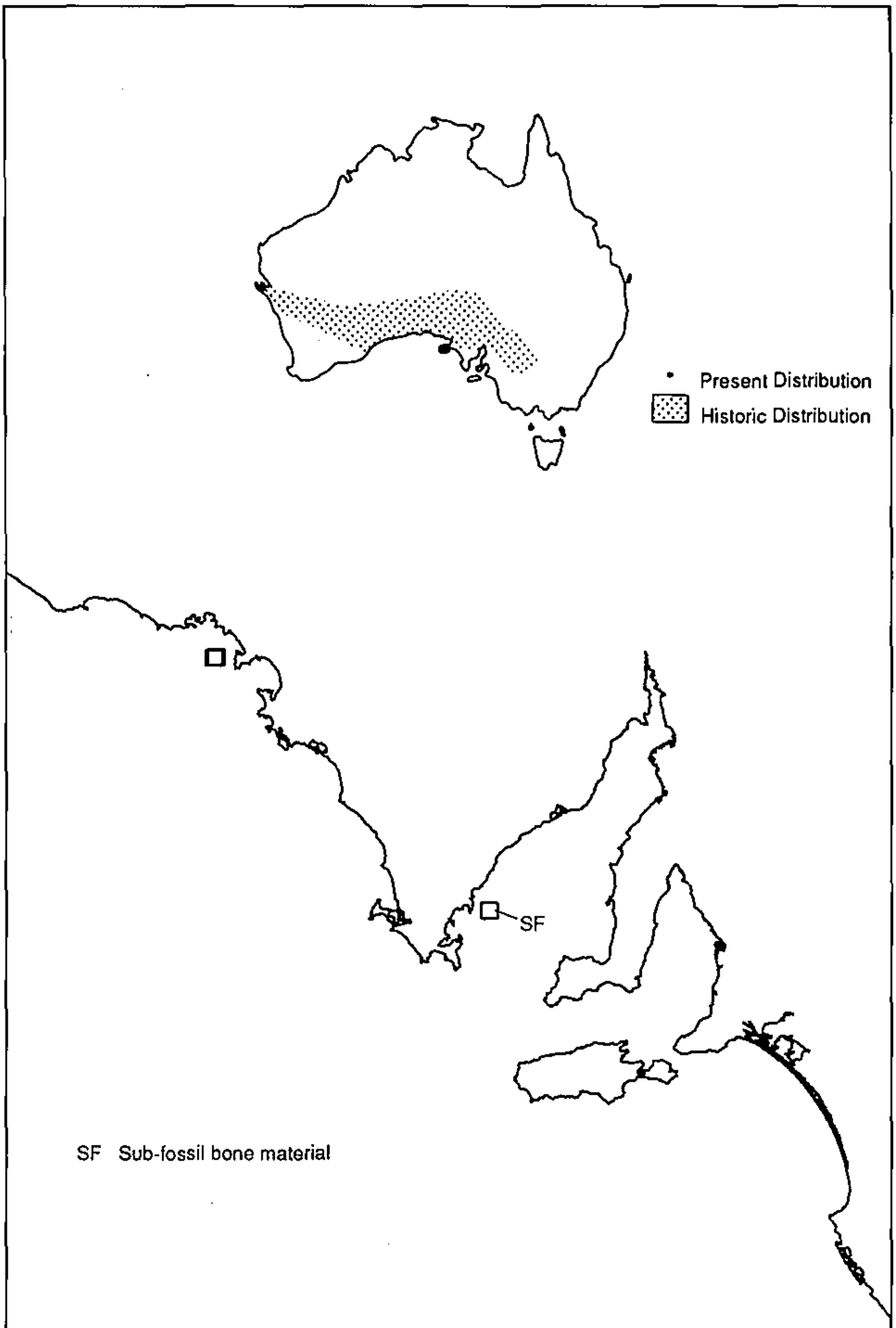



**Figure 40.** The past and present Australian distribution and the islands in South Australia which support populations of the Greater Stick-nest Rat (*Leporillus conditor*).

preparation for a reintroduction of stick-nest rats. In September 1990, 16 animals were released, followed by more animals in 1991. Monitoring since then has shown that the rats have successfully established a large population and, as with the Franklin Islands, it is now possible to flush stick-nest rats from beneath bushes while walking around on Reevesby Island.

The success of the Reevesby Island program inspired SANPWS to release Greater Stick-nest Rats on to the large cat-, fox- and rabbit-free St Peter Island in the Nuyts Archipelago Conservation Park: a series of releases began in June 1993, and monitoring since then shows that this population is also becoming established.

**Black Tiger Snake**
*Notechis scutatus*

*Notechis ater niger* was formerly the accepted scientific name for all the Black Tiger Snakes found on South Australia's offshore islands and adjacent areas of southern Eyre and Yorke Peninsulas. An extensive study of the species to reassess the taxonomic relationships of the island snakes in relation to all the other named forms of Australian tiger snakes began in 1981, and initial results reported by Schwaner (1985) suggest that both mainland and island forms are most appropriately called *Notechis scutatus* regardless of their body colour.

Tiger snake ecology is also being studied on a number of South Australian islands. It is already clear that there are consistent differences in size, scale counts and a number of biochemical markers between snake populations on different islands, and the relationship of these black snakes to the striped Common Tiger Snakes of south-eastern Australia is quite complex. As a study in evolutionary biology these island tiger snake populations are at least as complex as the Bush Rats studied by Schmitt (1978), details of which are described earlier in this chapter under the heading, Plant and Animal Biogeography.

Black Tiger Snakes are the major terrestrial predator on South Australia's islands, feeding on lizards when small and on seabirds such as Short-tailed Shearwaters and White-faced Storm-petrels when they grow larger. On islands such as Franklin Island, with enormous numbers of nesting Short-tailed Shearwaters, there is an equivalently large number of very large snakes. Preliminary estimates based on marking and subsequent recapture of marked snakes on Franklin Island reveal that there are about 1100 snakes on West and 450 snakes on East Franklin Islands.

The evolution of the marked differences in body size between Black Tiger Snake populations on different islands, together with differences in sexual dimorphism and sex ratio, have been attributed by Schwaner (1985) to differences in the prey available on the different islands. In the Sir Joseph Banks Group, Hareby and Roxby Islands are about the same area and only three km apart, yet the average snout-to-vent length of the largest Hareby island snakes of both sexes is greater than 1 m, whereas snakes on Roxby Island have average lengths of less than 80 cm. The only prey available to the small Roxby Island snakes consists of small lizards, while on nearby Hareby Island large numbers of White-faced Storm-petrels breed there between September and March.

Schwaner suggests that following their isolation on these islands 6000 to 10000 years ago, the founding populations of tiger snakes would have been exposed to strong selective forces to utilise the prey items isolated with them in the most energy-efficient manner possible. Small Roxby Island snakes do not seem to grow into large Hareby Island-sized animals even if given abundant food in the early stages of their lives, suggesting that differences in maximum body size among islands are due to regulatory genes controlling maturation at different sizes.

Apart from the fact that the differences between Roxby Island snakes and the much larger individuals on Hareby and some other islands appear to be genetic, and that they could be considered different species, we have in these snake populations a very unusual example of quite a fast rate of evolutionary change in natural populations. These tiger snake islands around the southern Australian coast are 'living laboratories' where the complex processes of evolution can be studied in relatively simple ecosystems.

The other important aspect of these island Black Tiger Snakes are the consequences if they manage to bite a human. Fortunately they are not particularly aggressive toward people, and a bite is most likely to result from handling the snakes or an accident, such as brushing a snake that was resting in a bush (a common habit, particularly on islands such as Roxby where the adult snakes are relatively small). Mirtschin and Davis (1982) discuss the difficulty of estimating the danger to people of bites from Australia's venomous snakes, and present a rating score incorporating venom toxicity, venom yield, fang length, temperament and frequency of bite. On this scale the Black Tiger Snakes, with their relatively placid temperaments and habit of biting only once, score 9 compared with the aggressive, multiple-striking Taipan, which scores 21; nevertheless, if you are unfortunate enough to be bitten by a Black Tiger Snake it is only the venom toxicity and the amount injected into your system that count.

Standardised tests have been conducted on all of Australia's venomous snakes on the basis of venom toxicity in mice, and venom yield is expressed as the total number of doses from a bite that would kill 50 per cent of the test mice. This test is called the $LD_{50}$, and on this rating the Inland Taipan has 218000 $LD_{50}$ doses while the Common Taipan has 95000 and the Black Tiger Snakes from Reevesby Island are third on the list, with 18000 $LD_{50}$ doses. In short, a bite from any of South Australia's island Black Tiger Snakes would be extremely dangerous, and anyone contemplating visiting the islands where they occur should take great care, wear sensible clothing and be familiar with accepted first aid procedures for the treatment of snakebite.

These beautiful snakes are an integral part of these small island ecosystems and, where the islands have not been too disturbed by human settlement, perform an important function in regulating the populations of their prey species, whether lizards, seabirds or small mammals. Likewise, the numbers of snakes an island can support is intimately tied to the population sizes of their prey. On islands with a long history of human settlement and the consequent alteration of the habitat, both for the snakes and their prey, there have certainly been significant shifts in these complex ecological relationships and it is only by understanding how the snakes operate on relatively undisturbed islands that we can begin to plan management for islands such as Reevesby, which are no longer as they were before European settlement.

## Plants

### Cape Leeuwin Wattle

***Albizia lophantha* (Plate 55)**

Plants of the genus *Albizia* have a worldwide distribution, mainly in the tropics, and in Australia most species occur in Queensland and northern New South Wales. One species, however, the Cape Leeuwin Wattle, occurs in southern Australia. This spectacular plant has its main centre of natural distribution in the Karri forests of south-west Western Australia, but has been widely grown in home gardens and is becoming naturalised in areas such as the Dandenong Ranges in Victoria.

The South Australian Herbarium has 18 records of this species from the South Australian mainland, ranging from the south-east, the southern Fleurieu Peninsula and the Mount Lofty Ranges. It is difficult to tell if any of these represent natural occurrences or are the result of garden escapes. The offshore island distribution of this plant (Figure 41) is of great interest, and has been considered by Kirkpatrick et al. (1974) and Robinson et al. (1981).

Cape Leeuwin Wattle has been recorded from four widely separated island groups across the southern Australian coast, the Recherche Archipelago (Willis, 1953), the Investigator Group (Symon, 1971) and a number of islands in Bass Strait (Willis, 1947; Kirkpatrick et al. 1974). It occurs on 15 islands in the Recherche Archipelago and on nine islands in Bass Strait.

**Plate 55.** Cape Leeuwin Wattle (*Albizia lophantha*). Photo A. C. Robinson

In 1969 Cape Leeuwin Wattle was discovered in a small ravine on the north-east part of Dorothée Island (Symon, 1971), growing as a small thicket only 10 to 20 m from the sea and comprising 10–20 plants, wind-pruned to 1–2 m high. The Investigator Group was again visited in 1976 and the occurrence of Cape Leeuwin Wattle was described by Fatchen (1982).

Pearson Island has been extensively examined by botanists, including Osborn (1923), Specht (1969), Symon (1971) and Fatchen (1982). None of these authors recorded Cape Leeuwin Wattle, but in May 1980, SANPWS staff landed by helicopter on Pearson Island for three hours and discovered two plants in a gully on the southern side of the peak of the main northern part of the island (Robinson et al. 1981). The main plants were 4 m high with a trunk 15 cm in diameter, and were flowering and seeding profusely. Seedlings were germinating around the base of these plants, in an area burnt by an intense wildfire believed to have started from a lightning strike in April 1975.

The presence of populations of Cape Leeuwin Wattle on remote and relatively inaccessible islands across southern Australia is intriguing. Kirkpatrick et al. (1974) say of the species on Rodondo Island that, 'the possibility of sea dispersal to Rodondo must be virtually prohibited by the steep sea cliffs there, a minimum of 70 m high'. Likewise, Robinson et al. (1981) state that, 'as a member of the Leguminosae the hard seeds of Cape Leeuwin Wattle would probably survive in a viable form floating in the sea, but the occurrence on Pearson Island 130 m above sea level makes it extremely unlikely that these plants arrived by sea. The seeds are clearly too heavy to have been dispersed by wind, so they must have been brought by some animal agency'.

Though there is a faint possibility that the first seed may have travelled from Dorothée to Pearson Island on a biologist's boot, this is extremely unlikely, and impossible in the case of the Rodondo occurrence. It must therefore be assumed that birds are the most likely means of dispersal of these seeds. Of the birds present on Pearson and Dorothée Islands (Parker and Cox, 1978), only four species could possibly have eaten and transported the seeds of Cape Leeuwin Wattle: Rock Parrots, Galahs and two species that are themselves recent introductions to these islands, starlings and sparrows. Of these the Rock Parrot is considered the most likely agent; it is common on all offshore islands from Shark Bay in Western Australia to Baudin Rocks in the south-east of South Australia, and is known to feed on seeds on these islands and in the non-breeding season is thought to disperse to the mainland and other islands (Parker and Cox, 1978).

A relatively short transfer of 6 km, such as from Dorothée to Pearson Island, is quite possible and the seeds were stimulated to germinate by the 1975 fire. A similar germination response of Cape Leeuwin Wattle to fire on Woody Island in the Recherche Archipelago was noted by Willis (1953).

The long distance dispersal of Cape Leeuwin Wattle of 900 km between the Recherche Archipelago and the Investigator Group by Rock Parrots is more difficult to explain. It has not been recorded from the mainland or the islands between these two groups. The transfer to Rodondo and the other Bass Strait islands poses a different problem if Rock Parrots are considered the agent of seed dispersal, as the known range of this species does not extend into Bass Strait. Again in this case, a direct island-to-island transfer involves a distance of 1000 km, but here there are known mainland occurrences of Cape Leeuwin Wattle in both South Australia and Victoria, and at least some of these occurrences may pre-date European settlement.

The unanswered questions about the distribution of Cape Leeuwin Wattle will, we hope, stimulate some interest in recording more detail of its changing distribution in southern Australia.

These few examples of the fascinating natural history of some vertebrates and plants on South Australia's offshore island give some indication of the wealth of biological knowledge to be found. The invertebrate faunas of most of the islands are virtually unknown, but we can expect them to provide even more interesting stories than the vertebrates and plants.

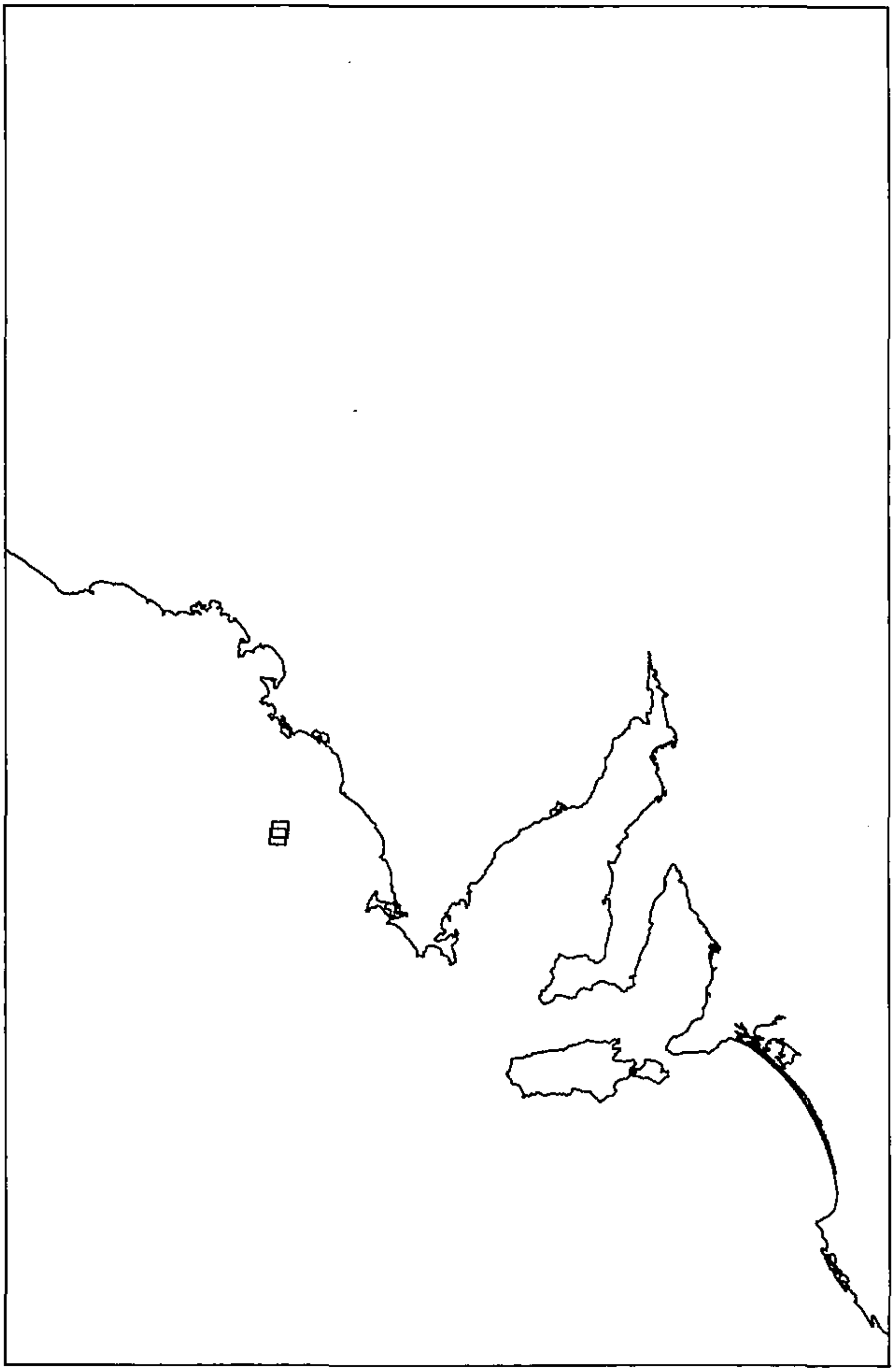


**Figure 41.** The South Australian offshore island distribution of the Cape Leeuwin Wattle (*Albizia lophantha*).

# Chapter 3

# CULTURAL HISTORY

South Australia's offshore islands are a mirror of the history of South Australia and its Aboriginal population, with the islands playing a particularly important role in the early sea-borne exploration of the State's coastline. In the new colony, settlers quickly occupied the islands with their natural 'fences' at the water's edge, as they saw the mainland as a vast, trackless wilderness inhabited by wild dingoes and 'dangerous' Aboriginal people, where sheep could only be kept if they were shepherded into pens at night. As ships were then the only means of contact between the far-flung settlements around the coast of the colony, there were no real disadvantages in living on an island; indeed, an island offered the bonus of fish to eat and access to the valuable whale and sealing industries.

Islands were also important landmarks for ships navigating the State's coastal waters, though they and their surrounding rocks and reefs were equally dangerous to shipping. Many shipwrecks occurred, and a series of lighthouses was built on selected islands in an effort to reduce these risks.

As roads and railways spread through South Australia, the coastal shipping trade began to decline in importance. With it there was an equivalent increase in the difficulty of farming offshore islands, and many families were forced to abandon their homes and move to the mainland. Finally, in relatively recent times, there has been an increasing interest in the islands for conservation and tourism.

## Exploration

### Pieter Nuyts

The first voyage of exploration into South Australian waters was that of Pieter Nuyts, an official of the Dutch United East India Company, in 1627. His vessel was the 400 tonne *Gulden Zeepaard,* commanded by Francis Thijssen. As no ship's records have survived, other than an early chart of 1644 based on the voyage (Figure 42), it may never be established whether Nuyts's expedition along the south coast of Australia was one of planned 'discovery' or an accidental landfall (Halls, 1971).

The *Gulden Zeepaard* sailed eastward across the southern Indian Ocean with the benefit of westerly winds and continued along the southern coast of Australia for about 2000 km. The expedition ventured as far as a group of islands in the Great Australian Bight, later named Nuyts Archipelago by Matthew Flinders in 1802. Nuyts circumnavigated the group of islands in January 1627, naming the two largest St Pieter and St Francis, the former commemorating his own patron saint and the latter that of Francis Thijssen—the earliest European placenames in South Australia.

The islands must have looked inhospitable to these early mariners, with barren shores, harsh summer conditions and probably a scarcity of water, so Nuyts's voyage ended at the archipelago that bears his name and the *Gulden Zeepaard* headed back for Batavia. It is not

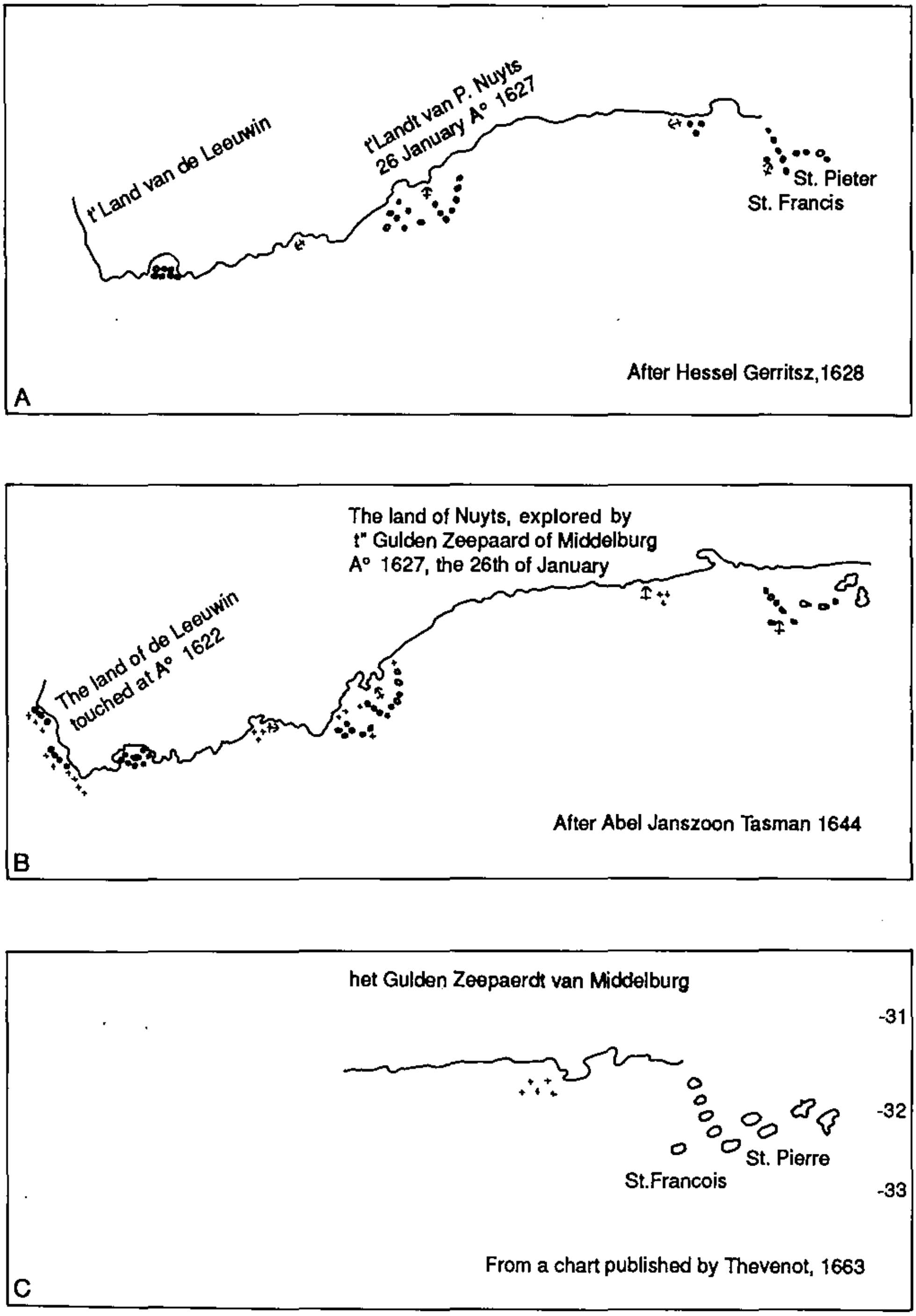



**Figure 42.** The three surviving charts of the voyage of Pieter Nuyts in 1627 (after Hails 1971).

surprising, given the remoteness and obscurity long associated with 'Nuyts Land', that in 1726 Jonathon Swift chose the Isles of St Pieter and St Francis as the setting of Lilliput, the mythical land of tiny people, in his epic story *Gulliver's Travels*.

## Matthew Flinders

The southern coast of Australia was not visited by European explorers from 1627 to the late 18th century. In the 1790s there were several French expeditions, one by Rear Admiral Bruny D'Entrecasteaux in the frigate *Recherche*, who was searching for the ill-fated French navigator La Perouse. As did Flinders a decade or so later, D'Entrecasteaux praised the accuracy of the earlier Dutch charts for the coast of 'Nuyts Land'; however, being short of fresh water and unable to locate a supply on the mainland, D'Entrecasteaux abandoned his examination of the coast at Cape Adieu, west of Fowler Bay. The next voyage of exploration was in December 1800, when Lieutenant James Grant in His Majesty's ship the *Lady Nelson*, headed for New South Wales, described the south-eastern coast of South Australia as far west as Cape Northumberland.

It was not until 1802, with the voyage of 28-year-old Matthew Flinders in the sloop *Investigator*, that the unknown coast between Fowler Bay and Cape Northumberland was accurately examined and documented.

There was great interest in organising an expedition of exploration of the 'Great South Land'; a leading protagonist in the enterprise was Sir Joseph Banks, the botanist who accompanied Captain James Cook on his voyage along the east coast of the continent. Flinders later named the islands he discovered in Spencer Gulf the Sir Joseph Banks Group:

> ... in compliment to the Right Honourable President of the Royal Society, to whose exertion and favour the voyage was so much indebted (Flinders, in Lewis, 1918).

In January 1801, Captain Matthew Flinders took command of the refitted *Investigator* and was given instructions to examine the coast from Bass Strait to King George the Third's Harbour (King George Sound, Western Australia). On 18 July the same year, the vessel set sail for 'Terra Australis' from Spithead with 88 crew aboard. Fowler Bay, the extremity of the previously known coast of southern Australia, was reached on 28 January 1802. During his voyage along the coast of South Australia (Figure 43), Flinders visited many offshore islands and assigned their names. As the islands were visible landmarks they were often used to take bearings:

> The naturalists landed upon the island [Waldegrave] where I also went to take bearings with a theodolite and observations for the latitude and longitude (Flinders, in Lewis, 1918).

Further, as the islands often represented obstacles to navigation, Flinders also charted a safe passage in relation to their shores, and mentions where the islands afforded good shelter for sailing vessels; for example, Petrel Bay on St Francis Island could shelter 'several ships'.

Of particular interest to Flinders was the group of islands he named Nuyts Archipelago in honour of the Dutch navigator who first charted their shores in 1627. Flinders's party recorded detailed navigation information in relation to the islands, naming several of them after the young officers of the *Investigator*. The ship's botanist, Mr Brown, also examined the natural history of the islands:

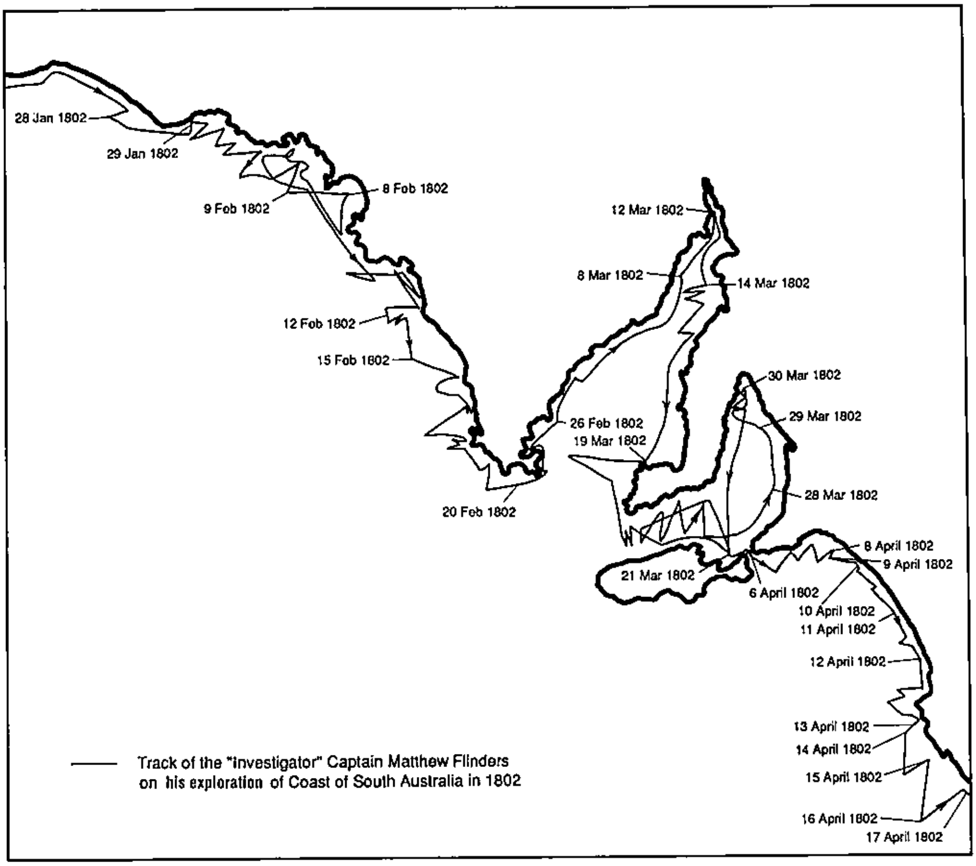



**Figure 43.** The course of Matthew Flinders along the South Australian coast in 1802.

> For several days before anchoring here [St Francis Island] we had observed large flocks of sooty petrels [Short-tailed Shearwaters]; and I found the surface of the island, where it was sandy and produced small shrubs, to be full of their burrows. Penguins had their burrows nearer to the water side. A small species of kangaroo [probably the Brush-tailed Bettong] was also found ... Mr Brown and his party returned from the eastern island, bringing four kangaroos of a different species to any seen before. Their size was not superior to that of a hare and they were miserably thin, and infected with insects. At some preceding season the island had been frequented by [Cape Barren] Geese; but at this time, the vegetation being almost burnt up, they seemed to have quitted it from want of food. The heat was, indeed, such as to make walking a great fatigue; and this was augmented by frequently sinking into the bird-holes and falling upon the sand. The thermometer stood at 98 deg. in the shade (Flinders, in Lewis, 1919).

Conditions on the island, where Flinders reported 'no fresh water, not even to rinse our mouths, could be found', must have been similar to those encountered by Nuyts more than 150 years earlier. However, of consolation to the party was the plentiful availability of Sooty Petrels as a source of food. Despite their fishy taste, Flinders records that the good supply of 1200 birds, easily obtained from the islands, represented a welcome change to the men whose diet consisted largely of salted meat. A prized delicacy were the teal shot on the western side of St Peter Island.

Other fauna noted in the Nuyts Archipelago was a yellow snake [a carpet python]:

> In our way up the hills to take a commanding station for the survey, a speckled, yellow snake lay asleep before us. By pressing down the butt end of a musket upon his neck I kept him down whilst Mr. Thistle, with a sail needle and twine sewed up his mouth and he was taken on board alive for the naturalist to examine; but two others of the same species had already been killed and one of them was seven feet nine inches in length (Flinders, in Gill, 1908).

In the Investigator Group of Islands, south of Anxious Bay, Flinders named Waldegrave Island after Admiral William Waldegrave, third in command at the Battle of St Vincent. Flinders describes the geology of this island:

> I found the island to bear a great resemblance to the Western Isle of St. Peter, in its cliffy shores, granitic basis and its super-stratum of calcareous stone; in its vegetable productions, and in the surface being much excavated by the burrows of the sooty petrel (Flinders, in Lewis, 1919).

As for many of the other islands, he reported that there was no indication of Waldegrave having been visited before by Europeans or 'Indians' (Aboriginal people). In naming Pearson Island in this group, Flinders assigned the maiden name of the mother of his good friend and first lieutenant, Robert Fowler. On nearby Flinders Island, named after his second lieutenant, he records the sighting and shooting of several specimens of a small species of kangaroo [Tammar Wallaby]. After charting and naming several islands, including the Whidbey Islands near Coffin Bay, Flinders headed south-east for the coast near Port Lincoln. He sighted and named Wedge Island in the Gambier Group on account of its shape, a small cluster of low, inaccessible islands, and the Neptunes. Flinders named Thistle Island, the large island off Cape Catastrophe, in honour of his ship's Master and friend, Mr John Thistle, who on 20 February was to drown with seven crewmen (who Flinders describes as active and useful young men and a loss to the company)—after whom Williams, Lewis, Hopkins, Smith, Grindal and Little Islands were named—and Midshipman William Taylor. Taylor Island honours his name.

Flinders spoke favourably of Thistle Island and, though no fresh water was to be found:

> the island was pretty well covered with wood, principally eucalyptus and casuarina (Flinders, in Lewis, 1919).

He describes how he was swooped by a white eagle [sea-eagle], which he thought had mistaken him for one of the kangaroos on the island. There are no kangaroos on Thistle Island today; those sighted by Flinders were probably Tammar Wallabies or perhaps even Western Grey Kangaroos:

> Their size was superior to any of those found upon the more western islands, but much inferior to the forest kanguroo of the continent (Flinders, in Lewis, 1918).

In Boston Bay, Flinders described Boston Island as being woody and of some elevation. Kirkby Island and most others in the Sir Joseph Banks Group, however, were 'destitute of wood and almost of shrubs' and with little fauna other than a few Australian Sea-lions. Reevesby and Spilsby, however, were 'higher and of greater extent and probably somewhat more productive' (Flinders, in Lewis, 1919).

Though at the time he did not ascertain if it was in fact an island, Flinders describes sighting fires of Aboriginal people on the mainland near

Wardang Island. At the southern base of Yorke Peninsula he named the Althorpe Islands and to the east, where he encountered a fierce gale and an extensive sandbank, Troubridge Shoal. To the south of these, one of his major discoveries was that of the large island he named 'Kanguroo Island'.

In Backstairs Passage, referring to them as the only danger in the strait, he named the three small rocky islets The Pages (Flinders, in Lewis, 1919).

An often-recounted incident of Flinders's voyage is his meeting on 8 April 1802 with French navigator Nicolas Baudin in what became known as Encounter Bay. Though France and England were at war at the time, the explorers' meeting was amicable and Flinders provided Baudin with several maps published by Arrowsmith. The two navigators also exchanged information on the respective coastline they had explored, Baudin of the coast to the east and Flinders of that to the west. Flinders later named the group of rocks near Guichen Bay, Baudin Rocks.

Flinders died in 1814, having spent six years on the island of Mauritius where he was imprisoned by the French. Tragically, on the day he died, the account of his explorations, *A Voyage to Terra Australis*, was published in London.

## Nicolas Baudin

The instructions issued to Baudin by the French Government were similar to those issued by the English to Flinders. A point of departure for the voyage of exploration was to be the Isles of St Peter and St Francis, and it was speculated that Baudin would investigate the possibility of an inlet in the coast stretching as far north as the Gulf of Carpentaria.

Baudin set off with two vessels, *Le Géographe* and the *Le Naturaliste*. However, it was mainly *Le Géographe* which, heading westward, studied the South Australian coastline in the early months of 1802 (Figure 44).

Baudin's journals have been translated into English, and provide a fascinating account of his voyages. Many of Baudin's descriptions relate purely to navigation and the danger of the coastal features:

> It ends in a fitting cape [Cape Martin], at the tip of which there lies a small island [Penguin Island], reaching about half a league out to sea. Its southern section is low and narrow, but the northern part is [higher] and can be seen from a fair way off. The island is completely surrounded by rocks and so is hardly approachable. The same applies to the whole coast, which is shielded by a reef and a line of more or less large rocks that prevent any landing there (Baudin, in Cornell, 1974).

Baudin sighted and described other islands off the coast of his 'Terre Napoleon', including The Pages and Althorpes. The Casuarina Islands, to the south-west of Kangaroo Island, he named on his second voyage to the south coast in 1803 after the vessel that accompanied him. The captain of the *Casuarina* was M.L. Freycinet. Other French names bestowed by Baudin on South Australian islands and retained on official maps are Masillon and Fenelon Islands in the Nuyts Archipelago, and Carpenter Rocks in the south-east. Baudin thought little of the Isles of St Peter and St Francis. He describes the difficulty experienced in exploring the islands due to squally weather:

> ... which to judge from what we have seen of them, are scarcely worth the trouble we took over them (Baudin, in Cornell, 1974).

The naturalists Freycinet and Peron were delighted with their stay here and from Ile Eugene (St Peter Island) obtained a new species of kangaroo [a Brush-tailed Bettong] weighing only eight to ten pounds and a new kind of phalanger [a Brush-tailed Possum] (Horner, 1987).

Nicolas Baudin died at Mauritius on 16 September 1803, on the return voyage to France, of a fever that had troubled him since he visited Timor in 1801.

Another account of Baudin's voyage is to be found in the *Voyage de Découvertes aux Terra Australes*, written by Louis Freycinet and Francis Peron, the natur-alists who accompanied Baudin on his southern voyage. Peron described many of the natural features of the islands, such as the petrified roots of trees on Thistle Island, possibly at a locality now known as Fossil Point.

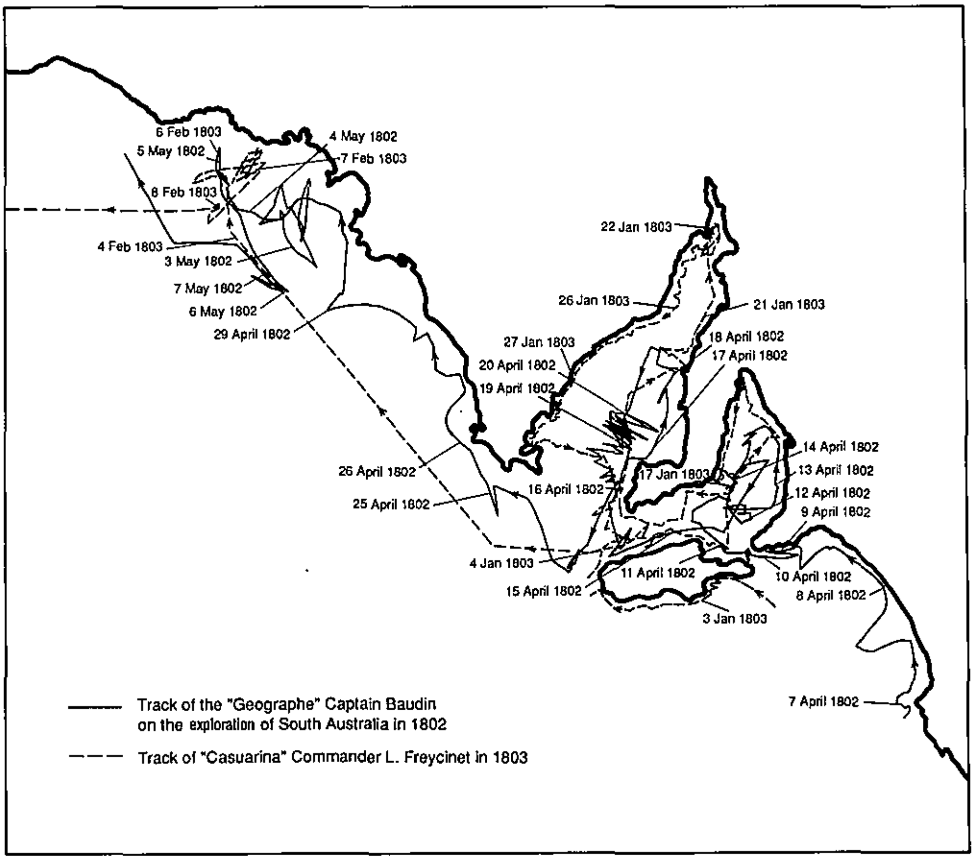



**Figure 44.** The course of Nicholas Baudin in 'Le Géographe' in 1802 and Louis Freycinet in the 'Casuarina' in 1803.

## Australian Aboriginal Association

When early explorers such as Baudin and Flinders visited Kangaroo Island, they noted the lack of human habitation. Flinders found it curious that there were no Aboriginal fires as on the mainland coast and that the kangaroos were extremely tame. Even the evidence of recent fires on Kangaroo and Thistle Island he attributed to natural causes.

Yet despite the absence of recent historical Australian Aboriginal occupation on Kangaroo Island, archaeological evidence indicates that an ancient culture, possibly dating as early as 30000 years BP, existed on the island and the mainland when sea levels were lower and the land masses were joined. Tindale named this the 'Kartan Culture' from the Ramindjeri or Encounter Bay tribe's name of *Karta* for Kangaroo Island. The traditional Aboriginal legend of the creation of Kangaroo Island (described opposite) perhaps originated from a time when the island was accessible.

Though Kangaroo Island was separated from the mainland when sea levels rose about 9500 years ago, occupation was recorded for a period afterward and, since it is unlikely that water craft were available for mainland Aboriginal tribes to cross Investigator Strait to the island, this occupation was possibly by a relict population (Lampert, 1981).

Lampert found stone artefacts on Eyre Peninsula, Thistle and Boston Islands when he was studying mainland Kartan associations with Kangaroo Island and, since Boston Island showed Aboriginal occupation of the shoreline, concluded that Boston Island was visited after its isolation from the mainland shortly before 7500 years BP. Travel to the island seems possible, since it is only 2.5 km from the mainland, and the waters between are sheltered. Though there was scattered evidence of occupation on Thistle Island, Lampert concluded it had not been visited after the rise in sea levels.

There is also historical evidence of mainland Aboriginal tribes visiting the more accessible islands, especially at low tide. There are reports that members of the Ramindjeri of Encounter Bay would cross to Granite Island during low tide along a reef west of the present causeway. Pullen Island may also have been visited on occasion; seabirds such as Little Penguins and Silver Gulls could have been used as a food source. Other small islands accessible at low tide include Daly Head Islet, South Islet in Pondalowie Bay, several islands in Venus Bay, Baird Bay, Coffin Bay and Kellidie Bay on the west coast and Cowrie and Penguin Islands in the south-east.

Although Wardang Island is 11 km off Port Victoria, there are reports of Point Pearce people swimming and walking the channel to the island to fish (J. Branley, pers. comm.). It is believed that Wardang Island was sacred to the local Narangga tribe, since burials took place there, and it is possible to wade from Wardang to Goose Island to the north, and Island Point off Point Pearce is accessible at low tide.

It is not surprising that such distinct landforms as the offshore islands featured in the creation stories of the coastal mainland Aboriginal tribes. The following story, possibly from the Kaurna of the Adelaide Plains, gives an account of the formation of Kangaroo Island that they believed was the home of spirits of departed ancestors, by the spiritual being Ngurunderi who also created Granite Island and The Pages Islands in Backstairs Passage:

> Ngurunderi [pronounced *Ngoo-oond-air-ie*], a great totemic being ... during his Dreamtime journey down the Murray Valley in pursuit of his two unfaithful wives, ultimately arrived on the shores of Encounter Bay, where he caused Granite Island and the other islets to emerge from the sea. He then hastened westward in search of his fleeing wives, catching sight of them near Blowhole Creek [Tjirbuk, pronounced *Cheerbook*], from where Kangaroo Island [Ngurungaui, pronounced *Ngoor-oond-gowie*] is clearly visible. Ngurungaui was almost connected to the mainland at that time and it was possible to reach it by walking and wading across the shallows. The fugitives attempted to do this. Meantime, Ngurunderi, in a very bad humour, had arrived at Tjirbuk and seeing his wives in midchannel he called with a thunderous voice for the sea to rise and overwhelm them. Ngurunderi thereupon transformed them into two small rocky islands called Metalong, now the Pages. A reed basket carried by the younger of the women became a nearby reef (Edwards, 1972).

Another legend, of Pulyallana, passed down through members of the Nauo tribe of lower Eyre Peninsula, gives a similar explanation for the creation of the islands off the coast near Port Lincoln:

> The legend ... tells how Pulyallana had the misfortune to lose his two wives who fled from him. After much searching he overtook them near Cape Catastrophe and killed them both. They were converted into stone, together with their children, and can still be seen today in the shapes of rocks and islands off shore (Wanklyn, 1971).

Pulyallana was himself subsequently raised into the sky at or near *Pyyundu*, the Aboriginal name for what we know as Cape Sir Isaac.

The Narangga tribe of Yorke Peninsula had a different explanation for the creation of Wardang Island:

> Wardang Island was known to the Narangga as Wauraltee, because many bandicoots were there long ago. Once a great warrior, furious at his people's misdeeds, angrily hurled his club on to the ground near the coast, causing a large depression. The sea rushed in, forming Port Victoria Bay, while pieces of land flew westward forming a group of islands, the largest of which is Wardang (Heinrich, 1976).

In 1884 Wardang Island, which was sacred to the Narangga tribe, was leased to the Yorke Peninsula Aboriginal Mission, based at Point Pearce, 'for the use and benefits of the inhabitants of the province' (Heinrich, 1976). The island was generally used by the mission for sheep grazing and subleases for mining were issued. The Aboriginal reserve was cancelled from 1915 to 1924 and abolished in 1948. In 1973 the island was declared a Historic Reserve and ownership since vested with the Aboriginal Lands Trust.

Boston Island (Plate 56), the Aboriginal name for which is *Kerrillyilla* or *Kurilyelli*, was briefly an Aboriginal mission for the remnants of the Port Lincoln tribe. The mission was established by Archdeacon Hale:

**Plate 56.** An aerial view of *Kerrillyilla* — Boston Island— which briefly supported a mission for Port Lincoln Aborigines. Photo P. D. Canty

> Our object in choosing this locality was principally seclusion, that we might be cut off from the society of blacks living in the wild state, and protected from the unwelcome intrusion of evil minded persons among the whites. These advantages we set against the formidable disadvantage that no permanent fresh water as yet had been found on the island (Hale, in Hodder, 1893).

As with many other islands, occupation failed due to the lack of available water and a mission station, Poonindie, was established in 1850 on the mainland near Louth Bay.

## Sealing

European explorers at the beginning of the 19th century observed seals in great numbers on the island shores and in the nearby waters along the south coast of Australia. Though the islands were often barren and waterless, after about 1803 and before the permanent settlement at Adelaide in 1836, these remote rocky outcrops attracted sealers, a rough breed of men, seeking the abundant New Zealand Fur-seal:

> The islands in Bass Strait and those fronting on the south coast of Australia as far westward as the Gulfs of St. Vincent and Spencer were frequented by sealing vessels (J. Lort Stokes, in Hodge, 1931).

By the 1820s, it was common practice for vessels from the eastern colonies and from the United States to leave two or three men for several months in semi-isolation on the larger islands during the summer sealing season, returning to collect their haul at the end of the season. It was the task of these men to harvest, usually by clubbing and skinning, New Zealand Fur-seals that frequented the islands. The soft underbellies of the skins were valued for the European fur trade; seal oil, though less commercially attractive, was also collected from Australian Sea-lions for export (Robinson, Delroy and Jenkins 1982).

The island sealers were said to be of questionable character, with some believed to be escaped convicts or deserters. It may be difficult to distinguish fact from legend in relation to the sealers, whatever their origins and exploits, but conditions on the islands were certainly harsh and hazardous.

Captain John Hart, a South Australian Premier who was involved in the State's early whaling industry, mentions the sealers he saw in the 1830s on islands in Spencer Gulf, and one in particular on Thistle Island who lay under suspicion of having killed his original companions (Hart, in Gill, 1908). This man had with him two Aboriginal women, whose curly hair Hart felt clearly indicated their Van Diemen's Land origin. There are similar reports of captive Aboriginal women from the South Australian mainland being employed by sealers to help in their sealing operations on Kangaroo Island. In an article published in the *South Australian Register* of 6 June 1878, the correspondent mentions an Irish sealer named Bill Brien (sometimes spelt Bryan) who abducted an Aboriginal woman and took her to Flinders Island in about 1826. She later bore him a son, who helped in the seal harvest. The family grew melons on the island and used these to barter with passing ships. In 1845 a young, Aboriginal man with a broad Irish accent, Bill Brien Junior, left Flinders Island for Port Lincoln on the mainland. There are also reports of two Aboriginal women, named Charlotte and Sally, being left on St Peter Island by sealers (Cumpston, 1974):

> Many of the crews became so attached to the islands visited that when their vessels were about to leave the neighbourhood they preferred to remain taking with them a boat and stores as payment for their work (J. Lort Stokes, in Hodge, 1931).

On Thistle Island, Hart mentions the roguish inhabitant having a convenient stone hut with a good small vegetable garden, and paddocks growing wheat and barley; pigs, goats and poultry were also kept.

In 1831 Hart, then the 22-year-old Master of the schooner *Elizabeth*, left a man on Baudin Rocks in Guichen Bay in the south-east to carry out sealing, and also noted the great number of penguins on this rocky island (Bermingham, 1972).

Though there are only scant references to sealers and their activities off the coast of South Australia, they certainly altered the islands they occupied. The little available timber would have been cut and used for fuel, and the island animals killed for food. The most significant impact, however, was in the slaughtering of seals; numbers were in marked decline by 1830, and the industry wound down rapidly.

By the time of settlement in 1836 there was generally little sealing being carried out on the islands. H.J. Finnis claimed that the Government even made attempts to remove the troublesome sealers from the islands (Finnis, SAA, 1384/50). However, there is a report of a sealing camp in operation on Troubridge Shoal in 1838, given by Edmund Bowman when he wrote to his family about the wreck on Troubridge of the ship *Parsee*, on which he was a passenger:

> A sealing party with a small schooner and their huts on a small island ... The island where we landed is nothing but a barren bit of sand bank, and rendered still more disagreeable by the large quantity of seals killed there. They killed 33 the morning after our people went ashore (Bowman, in Sommerville, undated).

## Whaling

From the late 1820s the southern coastline was visited by whaling vessels, some of American and French origin and some from the eastern colonies. Also involved in whaling from 1837 were several local enterprises, including those operated by the South Australian Company with its Chairman, the enterprising George Fife Angas. Whaling carried out by this company has been described as South Australia's first industry.

While there are various references to the potential of some of South Australia's islands as sites for whaling fisheries, there is only documentation of whaling stations on Thistle, Granite and Flinders Islands. Edward John Eyre, who was keen to see Eyre Peninsula develop economically, describes the suitability of the coast in the vicinity of St Peter Island for whaling, saying that in the late 1830s the only stations were at Coffin and Fowler Bay (Eyre, in Sommerville, undated). Later, other mainland stations, including Streaky Bay and Sleaford Bays, operated briefly. Although the *South Australian Register* of 28 March 1840 reported that a whaling station was to be established at Boston Island, this also being a suitable signal post for whalers from Port Lincoln, and that the venture had already commenced, it is unlikely the report was anything more than a suggestion (Parsons, 1981).

The whalers were exploiting the plentiful supply of the docile Southern Right Whale—'right' because it was slow-moving, swam near the surface, did not dive when harpooned, floated when dead, and because of its abundant supply of oil-rich blubber—in the bays of the southern coast. The whales came to calve in these shallow, sheltered bays in the winter months, making them a comparatively easy catch for whaling vessels that had previously concentrated largely on deep sea, ship-based whaling for Sperm Whales. Whale oil, obtained from boiling down blubber, had many uses including soap making and oil for lamps; the 'whalebone' obtained from baleen plates was used in making umbrella spokes and for stiffening ladies' corsets.

In shore-based whaling of the Southern Right Whale, the catch was sighted from mainland or island lookouts. Once the alarm was sounded, manoeuvrable whale boats sped to harpoon calves and mature whales. The carcases were then towed to shore, where the cleaning and boiling down operation took place. The whale blubber was 'tryed down' in large iron cauldrons called try-pots.

Thistle Island was occupied in 1838 by agents of the South Australian Company as a bay whaling station, and great hopes were held for its success. Its story is probably typical of all the South Australian whaling stations. James Horton, in *Six Months in South Australia*, wrote:

> The South Australian Company... placed a Mr. MacFarlane in charge. He then went to Hobart Town and engaged 35 bay whalers to work the station. Then in March, 1838 the company sent a carpenter to prepare accommodation for the men on the island. He was taken to a sandy bay with safe anchorage now called Whaler's Bay and erected a few buildings from which operations were commenced in April. The company's schooner *Victoria* was used to supply the station and to cut in the whales but it was a poor season and only about 60 tons of oil was gathered. All the time the men complained about the scarcity and quality of the provisions and most had left by September claiming that the whales had deserted the area (Parsons, 1981).

The small quantity of whale oil was later collected from the island by the *Lord Hobart* for eventual shipment to England. As a result of the low catch, the Thistle Island station was abandoned and in the following year the South Australian Company started a new fishery at Sleaford Bay on the mainland. The new operation was carried out in conjunction with the Hack Brothers and Captain John Hart, and was known as the United Fishing Company. In the 1839 season a boat party was again installed on Thistle Island but, after only a short stay with no successful catches, was sent to Encounter Bay. Even the Sleaford Bay operation met with little success and was abandoned in 1841. According to Parsons, the poor catches were due to whales being frightened from the area (Parsons, 1981).

In 1907, when the *Governor Musgrave* visited the island, the footings of the whaling hut on Thistle Island were still intact (Plate 57). There are still remains, which are possibly these whaling relics, on Thistle Island today (Theo Modra, pers. comm.).

An archaeological survey carried out on Thistle Island in 1993 investigated the ruins of the early sealing station at Poet Point, near the southern end of the island. The site, dating from before 1830, is a rare and important one, providing evidence of the earliest European settlers of South Australia. The site is fragile, and extreme care should be taken around the ruins of the five rubble masonry structures.

## A Food Supply for Mariners

Shipwrecked mariners, in desperation, would have captured and eaten any small island mammals and birds: a party from the *Vulcan*, a cutter wrecked on Neptune Island in 1840, subsisted on penguins for 50 days. Generally, however, the islands were so poorly endowed with such animals other precautionary measures were often taken.

There are occasional references in early sources to exotic animals being introduced to the islands; without predators they would rapidly build in numbers, and were generally released as food for whalers, sealers or shipwrecked

**Plate 57.** The whalers' hut ruins on Thistle Island from 'The cruise of the *Governor Musgrave*' in 1907. Photo former SA Archives.

mariners. In 1841 rabbits were released on West Island, Wright Island and Granite Island by Dr Penny, medical officer at Encounter Bay, to develop a food supply for whalers operating in the area. As late as the 1960s rabbits on West Island, possibly descended from the early introductions, were eradicated by the Department of Fisheries and Game. It is also believed that goats were at one time introduced to West Island.

Goats were released on the Althorpes in the latter half of the 19th century, possibly by a lighthouse keeper as a source of food, and a small group remained on the island until the late 1980s. Goats, turkeys and pigs may also have been released on Wedge Island for shipwrecked mariners, though none remain today. Kangaroo Island Tammar Wallabies were also released on Greenly Island in 1907 and still occur there. A curious report comes from Captain Lee's voyage in the *Nereus* in 1839. He mentions the sighting of more than eight fox hounds or Newfoundland dogs, possibly left by a sealer or whaler, on Waldegrave Island.

The names of Rabbit Island in the Port Lincoln group of islands, and Goat Island in the Nuyts Archipelago, may also pertain to the practice of releasing these animals on islands to supply fresh meat to boat crews. Rabbit Island in Coffin Bay is said to take its name from the introduction of hares to the island by W.T. Mortlock, for sport shooting. There is also a Goat Island in nearby Kellidie Bay.

## National Security

Especially in the 19th century, when sea power was the major threat to the security of South Australia, the islands were considered strategic locations. Several islands actually had particular functions during the wars. About the time of World War I, Torrens Island near Port Adelaide was a torpedo station, and Wedge Island served as a radar base for the RAAF in World War II. A bunker was built near the lighthouse, and the island was occupied by about 40 RAAF personnel for several of the war years.

Until 1964 the Adelaide University Regiment, during field exercises on Newland Head, used West Island as a target for gunnery practice; a sign was erected on the island to warn of the presence of unexploded shells. These shells have now been removed and the fallen sign provides a nest site for a Little Penguin (SANPWS, 1983).

Neptune Island, a strategically located lighthouse, housed a gun that was fired periodically during World War II and the cliffs of Thistle Island were used by the Royal Australian Navy for target practice during the war (Ion Ullet, pers. comm.).

## Post-Settlement Government Surveys

Even in the first few years of settlement after 1836, ships were lost along the coast, including several owned by the South Australian Company. Government surveys soon followed as a result of the need to document South Australian waters and, in particular, their hazards, and to ascertain the nature of the coast for settlement. These surveys (too numerous to list) include those of Captain Crozier, T. Lipson, J. Lort Stokes and W.J.S. Pullen. Later surveys carried out by Royal Navy officers, including Commander Hutchinson and Staff Commander F. Howard, continued to add information to the valuable coast charting first carried out by Flinders in 1802. In fact, so detailed and thorough were the bearings and soundings of Flinders's charts that much of his coastal survey information survived well into this century, and is only now being superseded by the most recent RAN hydrographic surveys.

In April 1837 Captain Crozier in command of HM Brig *Victor* anchored near Granite Island and surveyed the area, giving the name of his ship to the harbour. Encounter Bay was surveyed in 1839 by Colonial Marine Surveyor W.J.S. Pullen, possibly in the *Waterwitch*.

Captain Thomas Lipson, Adelaide's first Harbour Master (after whom Lipson Island is named) examined Franklin Harbour in 1839. The harbour — and Franklin Harbour Islands, near Tumby Bay — were named in 1839 by Governor Gawler in honour of Sir John Franklin, who served with Matthew Flinders and was later Governor of Tasmania and an Arctic explorer. In 1840 Lipson also charted Williams Island, which was not visited by Flinders in 1802. Yatala Shoal was examined and named after the government survey vessel the *Yatala* by Lipson in 1850.

Baudin described but did not name, Pelorus Island, near Cape Gantheaume off the southern coast of Kangaroo Island (Plate 58). This island is surrounded by reefs and a deep canyon, and was surveyed by Captain Harding of HMS *Pelorus* in 1838. The colony's Governor, Captain Hindmarsh, was on board during this survey.

Not visited by Flinders but named by him were the Neptune Islands, which were examined by Stokes in 1840 and later in 1873–74 by Captain Howard in an Admiralty survey. Wedge Island was charted by Hutchinson in 1867.

**Plate 58.** The remote Pelorus Island first surveyed by Captain Harding in 1838. Photo P. D. Canty

An important survey of the West Coast took place in 1858 as a prerequisite to settlement of the area, and included the study of suitable harbours and sites for jetties. Traffic had previously comprised mainly small trading vessels, and the proposed improvements would facilitate better communication with the West Coast. Instructions for the survey were issued to Captain B. Douglas by the Minister controlling harbours, the Hon. John Hart. While carrying out the survey, Douglas named Hart Island in the Nuyts Archipelago after his commander, who had discovered the island in 1832.

Other islands named after prominent South Australian citizens include Price Island (after Thomas Price, a State Premier), and Freeling Island (which commemorates Henry Freeling, Surveyor General and Colonial Engineer). Eyre Island was named in honour of the explorer Edward John Eyre, and Duffield Island takes its name from Walter Duffield MP 1857–71, MLC 1873–1880.

Some islands were named as a result of local events and incidents. Venus Bay Islands are named after the schooner *Venus*, which was the first to enter the bay in 1849, later returning to Adelaide with a cargo of wool. Baird Island is believed to derive its name from a man named Baird, said to have been killed by Aboriginal people near Calca when overlanding stock to Port Lincoln.

Smooth, Egg, Dog and The Wedge Islands were named by Flinders because of their shapes; and North Island in the Gambier Group, the two West Islands (in the Nuyts Archipelago and near The Bluff at Encounter Bay) were so named because of their geographical location. Bird, Goose, Albatross and Penguin Islands take their names from their bird life.

## Island Shipwrecks and Lighthouses

As overland routes were poorly developed in the early years of the colony, coastal shipping was an essential and economical form of communication and transport of both cargo and passengers. Not only did small sailing vessels such as schooners, cutters and later ketches service the local coastal towns and properties, but substantial ocean-going vessels also plied South Australian waters, sustaining vital trade and communication links with the eastern colonies and with Britain.

Not surprisingly, there were many shipwrecks on South Australia's islands and reefs, among the most dangerous of which were Troubridge Shoal, Carpenter Reef, Margaret Brock Reef and Wardang Island. Between 1847 and 1950 about a dozen shipwrecks took place on the Sir Joseph Banks Group. Ships were also wrecked in the vicinity of Tipara Reef when approaching the northern Spencer Gulf towns of Moonta and Wallaroo (Plate 59).

One of the most common and accurate methods for a ship to define its position when sailing relatively close to shore is by taking angles between well-defined objects on land: in the early years of the

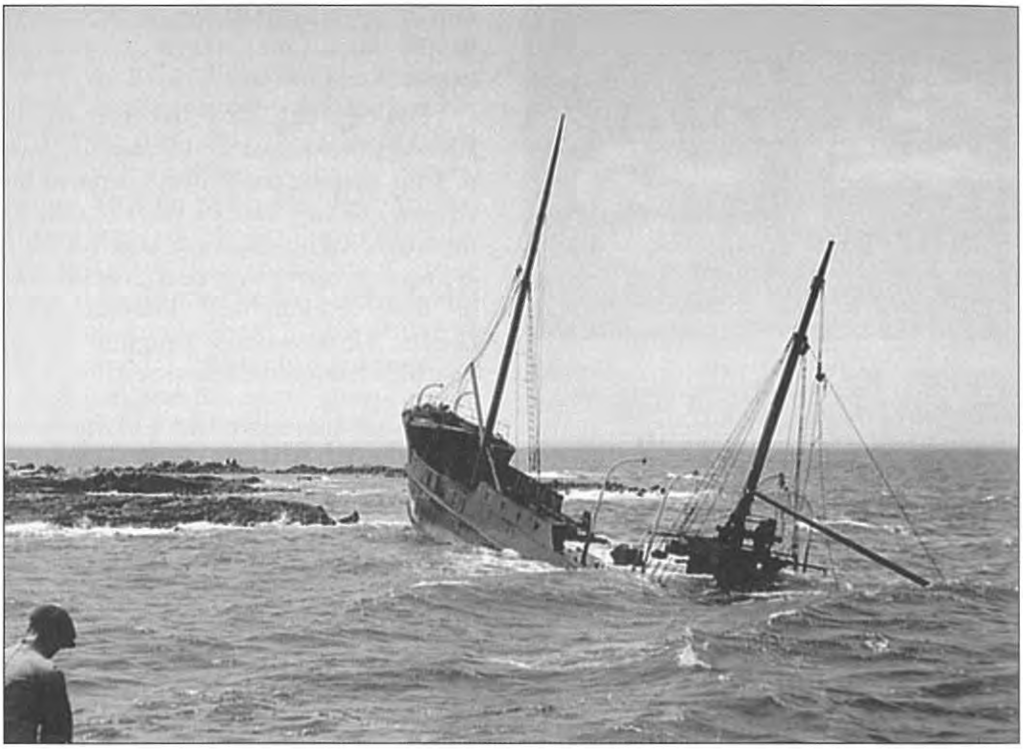


**Plate 59.** The *Minnipa* aground on Boston Island. Photo former SA Archives

colony, before the development of navigational aids, this method of navigating could be extremely dangerous, especially at night and during times of poor visibility and when hazards such as islands, submerged reefs or shoals and narrow channels lay in the ship's path.

Troubridge Shoal — three sandbanks and nearby Marion Reef, off the south-eastern tip of Yorke Peninsula — lay in the path of vessels entering the main shipping lanes into Port Adelaide. In the 1840s and the 1850s many sailing ships came to grief in this area, so a lighthouse was installed there in the mid-1850s to warn navigators (Plate 60).

In subsequent years a network of lighthouses was developed at dangerous spots on the mainland, and on islands and reefs. Functioning in conjunction with beacons and buoys on reef rock hazards, these installations were at first administered by the Trinity Board then, from about 1860, by the Marine Board and after 1916 by the Commonwealth Government (today, the Commonwealth Department of Transport and Communications).

Almost 20 island lighthouses were built in South Australia over about 130 years (Table 6) and vary considerably in construction, staffing, operation and servicing (Parsons, 1995). Several early towers were of prefabricated cast-iron; others were circular masonry columns and in recent years, some island lighthouse towers have been made of weather-resistant stainless steel or fibreglass (Plate 61).

Some of the early lighthouses comprised an elaborate complex of buildings including residences to house up to three keepers and their families, a store for kerosene for fuel and equipment, jetties for landing personnel and stores and, in several locations, a flying fox for hauling provisions up steep cliffs to the lighthouse. These stand in contrast to the small, simple, unmanned fibreglass lights, powered by solar panels or by gas, that are today serviced by helicopter.

Automatic lighthouses have been proposed for and erected on Taylor, Thistle, South Page, Sibsey and North Neptune Islands, while proposals for Franklin, Liguanea, Hart and Greenly Islands have either been rejected or postponed. The siting of these new facilities has been the subject of close cooperation between DENR, which now manages these islands as Conservation Parks, and the Commonwealth Department of Transport and Communications.

The fascinating history of the Althorpe Islands light (Plate 62) is typical of a number of the manned island lighthouses. Rocky, desolate Althorpe Island lies off the southern end of Yorke Peninsula. A lighthouse (Plate 63) was built on the island in 1879 following the wreck of the barge *Fairfield*, en route from Adelaide to Wallaroo in 1874.

Construction work was dogged by ill fortune; the cutter *Young St George*, involved in bringing supplies to the site, was wrecked on the reef nearby.

**Table 6.** South Australian island lighthouses.

| Island | Year that the light first operated |
|---|---|
| Troubridge Shoal | 1856 |
| Tipara Reef Structure | 1877 |
| Cape Jaffa (Margaret Brock Reef) | 1872 |
| Penguin | 1878 |
| Althorpe | 1879 |
| Neptune | 1901 |
| Wardang | 1909 |
| Winceby | 1911 |
| Dangerous Reef | 1911 |
| Wedge | 1911 |
| Four Hummocks | 1914 |
| Flinders | 1914 |
| St Francis | 1924 |
| Williams | 1963 |
| Pearson | 1968 |
| Evans | 1964 |
| South Page | 1980 |
| Taylor | 1982 |
| Sibsey | 1983 |
| Thistle (Waterhouse Point) | 1983 |
| North Neptune | 1983 |

Note: Several lighthouses have since been replaced by lights on the mainland, so the date of dedication of the Lighthouse Reserve may not be concurrent with date of first operation.

**Plate 60.** The Troubridge Island lighthouse. Photo A. C. Robinson

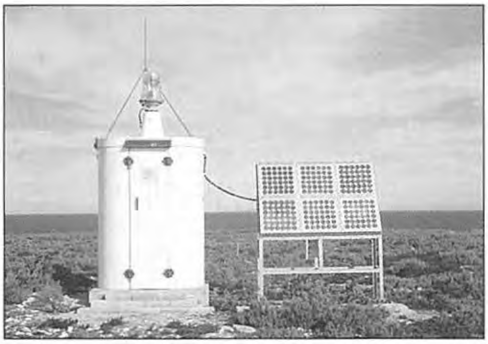


**Plate 61.** Solar powered lighthouse on Sibsey Island. Photo A. C. Robinson

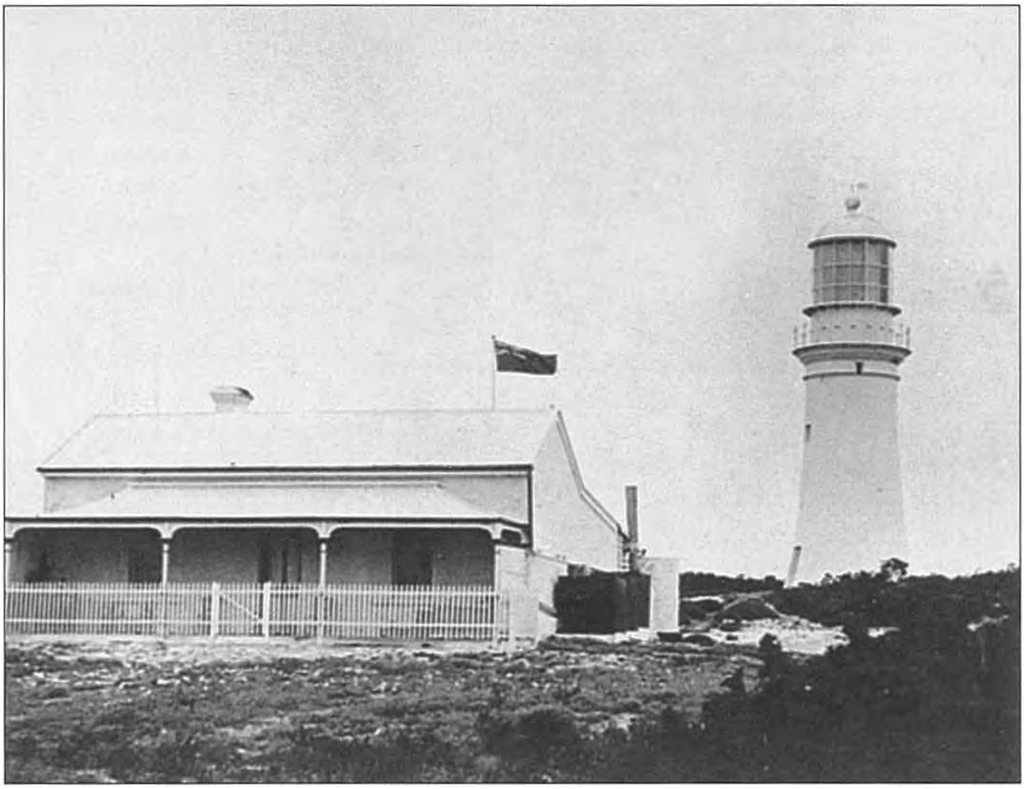


**Plate 62.** The Althorpe Island Lighthouse photographed between 1907–12. Photo former SA Archives

The foreman, Mr Anley, was killed by a rock falling from the cliff while he was asleep on the beach, and because no water was available on the island, all the water needed for building the lighthouse was brought from Adelaide at the great cost of £1500.

The terrain of the island also posed particular access problems. The flat plateau of the island is surrounded by cliffs 100 m above sea level. A tiny beach on the eastern side provides the only practicable means of access in fine weather, and a tortuous and dangerous pathway had to be carved up a sheer cliff face by men suspended in slings from the flying fox system used to transport materials from the beachhead to the summit. The path is substantially the same today.

**Plate 63.** Lighthouse and associated buildings on Althorpe Island. Photo A. C. Robinson

Communication with the mainland was also difficult in the early days; on one occasion a keeper was ill on the island for eight months before the government steamer provided help. Matters improved in 1886, when a telephone cable was laid to Cape Spencer.

The lighthouse complex included a 61 m long jetty, a flying fox and a steam engine that drew a rail car up and down the precipitous cliff face. The tower, and three keepers' cottages built from limestone and sandstone quarried on the island, are fine examples of early government architecture and are listed on the State Heritage Register.

When the light was converted to electric operation in 1963, the kerosene operated light was replaced with a quartz halogen lamp producing an intensity of a million candlepower, making Althorpe (with a visibility of 45 km) one of the strongest staffed lights in South Australia. An additional light of 20000 candlepower near the Althorpe Light was established in 1967.

With the installation of automatic lighthouses on the mainland of southern Yorke Peninsula at Cape Spencer and West Cape, the importance of the powerful Althorpe Island light has declined and the light has been converted to automatic operation.

Neptune Island's lighthouse complex was constructed in 1901, after serving at Port Adelaide from 1866. With the recent erection of a new brick tower light on the island, the old tower and its original light (which had a range of 26 nautical miles) were dismantled and shipped back to Port Adelaide, where it has been re-erected as part of the Maritime Museum. The light and cottages (of local granite, and originally roofed with French Marseilles tiles) are listed on the State Heritage Register.

Neptune Island, one of the most isolated of the offshore islands, was nicknamed 'Alcatraz' by lighthouse keepers. The light was kerosene-powered before 1976, and three families lived on the island to maintain watches on the manually operated two-hour system and to provide three-hourly weather reports. In 1976 the light was converted to electric operation, which only required two lighthouse keepers. The keepers usually spent up to a year on the island before returning to the mainland on annual leave. Water shortages presented a major difficulty, and on one occasion so little water was available for domestic use that it was necessary for a keeper's wife to wash her baby's nappies in the sea. This situation has been largely rectified by the provision of a larger tank storage system. In the 1980s the island airstrip was abandoned, and supplies and staff were transported by helicopter.

In 1990, following conversion of the lighthouse to automatic solar-powered operations, most of the island was added to Neptune Islands Conservation Park with the exception of a Lighthouse Reserve around the lighthouse and associated helicopter landing site.

DENR has licensed a private operator to run a specialised tourist enterprise making use of the former lighthouse keepers' houses. The licensee will also continue to operate South Neptune Island as an important part of the Bureau of Meteorology's network of weather observation stations.

As in the case of the other island lighthouses, windswept Neptune Island has not been without tragedy. In late August 1840 five men set off from Memory Cove in the single-masted cutter the *Frances* for the Neptune Islands in search of geese, eggs and seals. While their vessel was at anchor a sudden wind sprang up, smashing the *Frances* on to rocks and leaving the men with only a damaged dinghy. After almost a month and a half on the island, subsisting on only penguins and with no signs of rescue, two of the party made for Port Lincoln in a makeshift craft. The remainder of those marooned on the island were later rescued by a whaleboat sent out from Port Lincoln.

A black-bordered entry in the station log book, dated 28 July 1910, records how a keeper was swept off the rocks while fishing. His remains were later found and buried on the island.

In 1969 a two-and-half-year-old child drowned after falling off the jetty, and in the following year a keeper disappeared while inspecting outbuildings for damage during a violent storm. His body was found several years later, having been washed up on Wedge Island, 35 km to the north-east.

On 18 June 1970 a lighthouse keeper and his dog went missing, believed swept off the rocks by a wave. The most recent deaths occurred in 1989, when 23-year-old twin sisters disappeared while walking on the island.

## Pastoral Land Use

Many of South Australia's offshore islands are small, rocky and exposed, home only to seabird populations. However, there are some more sizeable islands—mainly in Spencer Gulf and off the West Coast—that have supported pastoral operations from the mid-19th century, some even earlier. This early occupation may seem surprising given the problems of moving stock and the tenuous economic viability of many of the islands today, but in the 1840s and 1850s, sea transport was the major method of moving livestock, goods and people. Many of the early island pastoralists often conveniently combined interests in sea trade and pastoralism.

Perhaps, also because of an English tradition of island pastoralism, settlers in South Australia saw the benefits of using an island's natural boundaries to confine stock, since mainland pastoral run boundaries remained mere lines on a map for many years and fencing was out of the question. On the mainland West Coast, where early altercations with the Aboriginal population almost saw the abandonment of settlement, islands must also have appeared safe—which is not to say that life on the islands for pastoralists was easy.

Large islands such as Wedge (Plate 64) were mainly taken up as one run, whereas in the Sir Joseph Banks Group and the Nuyts Archipelago leases included a large island and several smaller islands in the vicinity, the latter used mainly in spring to take advantage of the flush of new pasture. Some island leases were also run in conjunction with mainland properties. This was especially valuable on islands where stock suffered the debilitating effects of coast disease; mainland properties further inland did not exhibit the mineral deficiencies causing this disease and stock grazed in these areas could, after several months, recover from the ill effects of grazing on the islands.

A major problem for islanders was transport to and from the mainland. At least once a year it was necessary to ship out the year's wool clip, livestock or grain harvest. Similarly, everything needed for island life had to be shipped in. Dwellings were often small and simple, with large families often cramped in two-roomed houses, and exposed island conditions often meant improvements deteriorated quickly (Plates 65 and 66). Hazardous travel often meant islanders tended to stay put for long periods without venturing to the mainland—and many island ketches, the only link with the mainland for many lessees, were shipwrecked. It is not surprising that pastoralists frequently found it difficult to find shearers and managers, or that there was a great turnover of some island leases.

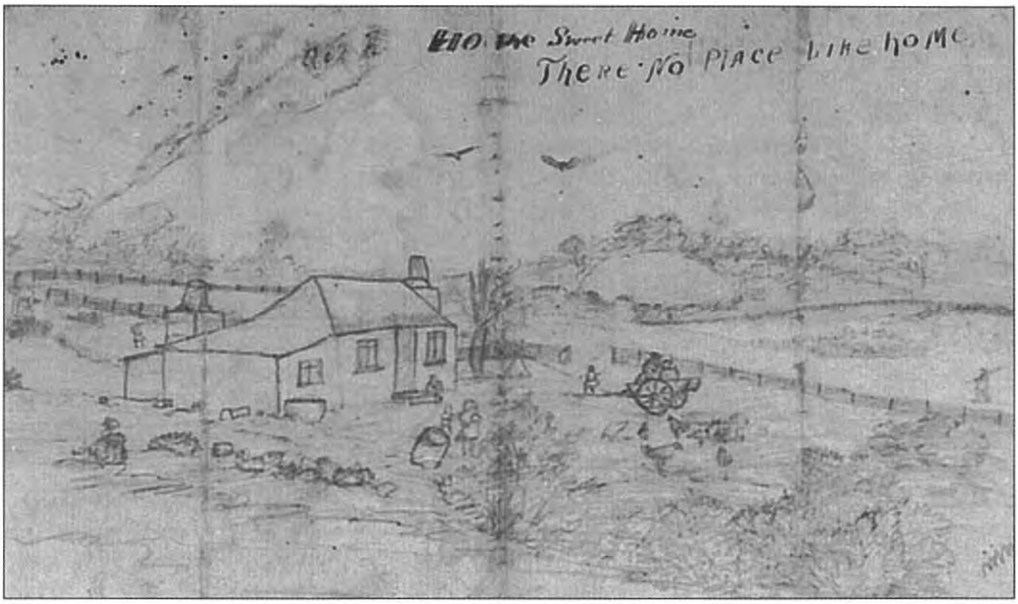



**Plate 64.** A sketch of the original homestead built by John Joseph Daw on Wedge Island in 1859. Photo former SA Archives

**Plate 65.** A rusting iron, relic of a former resident on Green Island.
Photo A. C. Robinson

**Plate 66.** A Sunshine Stripper from the farming period on Reevesby Island.
Photo R. B. Jenkins

Many of the settlers who took up pastoral properties had young families. For their children this often meant a wonderful experience in what many must have thought was an island paradise, but their parents had to organise correspondence lessons or send their children to the mainland for schooling. Some, not wanting to separate the family (especially when their children became teenagers) would often return to the mainland.

For women in particular, who rarely had business as a reason to leave the island, isolation from family and friends often meant terrible loneliness. The absence of any social life was another factor that contributed to families leaving the islands, though some people relished the isolation and the challenge of living in often difficult conditions. Invariably, settling on an island represented a step back in time in terms of facilities and accommodation; long after mechanised transport and farm implements had been accepted on the mainland, horses were still used on many islands.

Especially during the harsh economic times of the Great Depression of the 1930s and the drought years of the 1960s, there was a growing awareness that pastoralism, with its associated effects such as the spread of weeds, harsh fire regimes and removal of natural vegetation and indigenous wildlife habitats, was an undesirable way of using the land. Many islands were dedicated as reserves for fauna and flora conservation, and today the only islands still used for grazing (albeit in some cases to only a minor extent) are Flinders, Wedge, Thistle, Spilsby, Taylor, Boston and Louth.

## Mineral Exploration

Detailed geological exploration of many of South Australia's islands, especially those remote from the mainland, is still in its early stages. However, islands off southern Eyre Peninsula were exploited in the late 19th century for bird guano, applied directly to the soil as phosphate fertiliser.

Guano—almost entirely restricted to islands—is basically an accumulation of seabird excreta, rich in ammonium phosphate. If the guano rests on limestone rocks, the ammonium phosphate may react with calcium carbonate in the limestone to form a lime phosphate rich in phosphate (the lime phosphate imported into Australia from Christmas Island and Nauru for conversion into superphosphate is derived from guano in this way). However, South Australia's deposits were only small and were apparently worked out by the 1930s, after being exploited during the Depression, when the cost of superphosphate rose to prohibitive levels.

In South Australia guano is defined not as a mineral, but is under the control of the Department of Lands that leases Crown Lands and issues licences for 'obtaining and removing therefrom guano and other manure'. The list of localities that have produced guano and their relative importance is incomplete, but licences have at some time been issued over the following islands (Jack, 1919):

**Off the West Coast:** Goat, Evans, Thomson, Eyre, St Francis Group, Franklin, Olive, Flinders, Waldegrave, Venus Bay.

**Off Southern Eyre Peninsula:** The Brothers (Coffin Bay), Rocky, Greenly, The Hummocks (Whidbey Group), Curta Rocks, Liguanea, Williams, Smith, Hopkins, Lewis, Grindal, Taylor, Bickers, Kangaroo Reef, Donnington Reef, Dangerous Reef, Louth, Rabbit.

**Sir Joseph Banks Group:** Reevesby, Winceby, Marum, Partney, Lusby, Kirkby, Dalby, Blyth, Hareby, Boucaut, Langton, Duffield, English, Sibsey and Roxby.

**Spencer Gulf/Investigator Strait:** Wardang, Neptune, Gambier, Wedge, Ward Rock, Althorpes.

**Off Kangaroo Island:** Busby, Beatrice, Casuarina, islands in American River and Pelican Lagoon.

**Off the South East coast:** Baudin Rocks.

Guano from the small islands of Coffin Bay and Mount Dutton Bay was mainly collected from deposits (first recognised by Police Inspector Tolmer in 1849) by local farmers for their own use. As these deposits were exhausted, attention was given to the islands of Venus Bay, then to the Waldegrave Islands near Elliston and later to the Sir Joseph Banks Group. Working ceased before World War I. Over a period of about 20 years, 15200–20300 tonnes of guano were sold. Guano leases for the Sir Joseph Banks Group of islands were also held by Bill Haigh, who formed the Penguin Island Guano Company in 1898. Baillie (1974), who worked for Haigh, described his employer and the guano mining operation:

> Getting guano from the island was a hard gruelling job. It had to be shovelled into bags from most inaccessible places and eventually carried on one's back down to the sea coast, at times [400 m] away. But this was not the worst. The cutter was pulled in as near as possible to the rocks and a plank was then thrown across the sea on to the deck of the ship. My task was to watch the boiling sea and run this swaying plank with a bag of guano on my back. It was no easy task, and was dangerous as well. During the five years with Haigh I never lost a bag of guano, and Haigh spoke about it quite often in later years.
>
> He was a first class man with a boat, and he could take the *Albatross* where few dared to follow. He knew his boat intimately, and the sea, even on the darkest night, was an open book to him. Sometimes at anchor, the wind would shift, and we would have to clear out in the middle of dark night. Often I marvelled at Haigh's navigation. He would always find another haven sheltered from the storm …

In March 1966, a group of Mines Department geologists inspected several of the old guano deposits on Sibsey, Langton, Marum and Winceby Islands in the Sir Joseph Banks Group, Bickers Islets near Port Lincoln and The Brothers in Coffin Bay (Johns, 1968). Old workings were examined and small accumulations of guano found, usually washed along with sand, shells and other debris into sinkholes and cavities in the limestone, where they were preserved from further erosion. The survey concluded that no useful phosphate reserves remain on these islands (Johns, 1968). Because South Australian island deposits in general produced only small tonnages of low-grade phosphate rock and since most of these deposits were worked out early this century, no workable deposits are thought to remain on the islands.

## Island Recreation

Since early European settlement the islands have attracted people seeking solitude, closeness to nature and the splendour of island scenery. Memorable experiences for any visitor to an island off the South Australian coast are enhanced by stories of early occupants, shipwrecks and lighthouses. Almost every early description of the islands makes reference to the seabird colonies of the islands, and artist and chronicler George French Angas, after visiting many of the islands on board the Government cutter commanded by Captain Lipson in 1845, said of the Althorpes:

> We anchored close to the Althorpe Island during the night, where the confused tumult arising from the screams of the innumerable sea fowl uttering their wild harpy like shrieks was deafening to us and is distinctly heard for miles. These strange discordant sounds contribute not a little to the dreary aspect of the sea girt rock, that rose darkly with its saddleback summit, against the light of the ascending moon (Angas, 1847).

He paints a more harmonious picture of Thistle Island:

> Two brothers who were shipmates of mine have settled here with their flocks and are the sole occupants of this picturesque island. On its northern shores immense numbers of nautilus are thrown up; it being the barrier to Spencer's Gulf, the placid waters of that afford shelter to the delicate creatures, which are driven by the northerly winds on to the shores of Thistle Island (Angas, 1847).

Other descriptions come from island adventurers in the late 19th century. Sir Joseph Verco, a keen conchologist, combed southern seas from 1895 to 1918 and his appropriately titled 1935 book, *Combing The South Seas,* describes Christmas on Troubridge Island and the pleasure of eating Tommy Ruffs and Christmas cake. On Althorpe Island another culinary delight was the Short-tailed Shearwater eggs that could be gathered easily and that were good to cook. Even the breast of a tough old mutton bird was fit for cooking after being soaked overnight in salt water. Verco also mentions the possibility of harvesting mutton bird chicks on St Francis Island to produce machine oil, and that this revenue-producing venture could help reduce ploughing problems caused by mutton bird burrows. A. Maguire says of a sojourn on St Francis Island in 1909:

> After a most enjoyable trip, due to the extreme kindness shown by the owners of that "pearl of the sea" St. Francis Island, I returned to the mainland from a most delightful holiday, spent on the ozone bearing slopes of that sanitorium (Maguire, 1921).

Yachts have long had a tradition of visiting the islands, especially in the summer holiday period. The Royal South Australian Yacht Squadron (based at Port Adelaide since 1869) and the Cruising Yacht Club of South Australia (whose headquarters are at North Haven) conduct cruises that include several mainland and island ports-of-call in the two gulfs, though on occasions yachts venture as far afield as the islands of the Far West Coast. Islanders have traditionally welcomed such visits; in the Sir Joseph Banks Group up to seven or eight yachts can anchor overnight off each island in the Christmas–New Year period, and there are especially popular anchorages off Reevesby, Wedge and Thistle Islands in Spencer Gulf. There are several publications available that provide pilot details and information of interest to yachting enthusiasts for South Australian waters. In *Cruising Gulfs Log;* Neil Thompson wrote of the islands:

> But for the last hour before sunset it is just relax, listen to the wind high overhead and know that special feeling of being in a secure haven completely self-sufficient, just off the coast of a friendly island (Thompson, 1983).

Many shipwrecks lie in the waters around South Australia's offshore islands, and visitors need to be aware of some simple rules to protect these sites.

*Please dive, photograph and explore shipwrecks if you wish, but do not interfere with them by disturbing or removing anything or by anchoring on top of the remains: an anchor can seriously damage a wreck.*

All shipwreck remains are declared Historic Shipwrecks under Commonwealth (*Historic Shipwrecks Act 1976*) or State legislation (*Historic Shipwrecks Act 1981*), and it is illegal to interfere with them in any way. A booklet, *Wardang Island Maritime Heritage Trail,* prepared by State Heritage, has information on eight shipwrecks around this island and information is available from State Heritage on wrecks near other islands.

Several tours operate to the islands for those who do not have their own boats, and some islands have developed as tourist destinations in their own right. The best known and longest-standing tourist island is Granite Island, connected by a causeway to the mainland at Victor Harbor.

After a somewhat chequered history of early whaling, disputed ownership and a role in the Port of Victor Harbor, Granite Island became an important tourist attraction and recreation area in the late 1800s. As early as 1888 the District Council of Encounter Bay was given permission to carry out tree planting, and ever since there have been intermittent periods of visitor development on the island. A chairlift was installed in 1964, and walking trails, seats, shelters and public conveniences are administered by the District Council of Victor Harbor. Not only do these facilities cater for tourists, but the island also offers fishing and views of dramatic coastal scenery and native fauna, including the Little Penguin and, for a time, introduced Tammar Wallabies. With its closeness to Victor Harbor, itself relatively close to Adelaide, Granite Island is an important feature of local seaside recreation.

Several islands in Spencer Gulf have recently been partly converted to tourism from pastoral land use. Spilsby and Wedge Islands are owned freehold and were managed by a company called Exclusive Islands, which flew tourists to the islands, providing everything for a wonderful 'get away from it all' holiday. The historic farm buildings have been upgraded for accommodation, and the owners of Thistle and Flinders Islands also provide tourist rental accommodation on a much more restricted basis.

In the late 1980s, however, the visitor management of Wedge Island, Thistle and Spilsby Islands changed when the State Government negotiated management agreements that allow the subdivision and sale of exclusive holiday home allotments. In the case of Wedge Island, for example, 114 allotments are provided, on which holiday homes chosen from several standard designs must be built. No fences are to be built around the allotments, and there are special regulations relating to the introduction of animals, firearms and large motor vehicles. Revegetation of formerly grazed areas and around the allotments is to be carried out, using plant species native to Wedge.

## Island Conservation

From the time of first European contact with the South Australian coast, the overriding attitude was that of resource exploitation. Though members of Flinders's and Baudin's parties described the curious flora and wildlife of the area, their main purpose was to assess the country for permanent settlement and agriculture. Later, sealers and whalers almost brought about the extinction of the New Zealand Fur-seals. Some island animal species disappeared during this early period of occupation, and native vegetation was used for firewood.

The first pastoralists missed no opportunity to tap the islands' resources, often stressing limited supplies of feed and water by grossly over-stocking; indeed, stocking rates recommended for the larger islands in the 1850s were considerably higher than would be permitted on pastoral leases today.

Even in the early years there was some interest in the natural history of the islands, and this increased soon after the turn of the century. This early interest, however, was often shown by individuals primarily interested in adding to their private collections of shells and birds' eggs. The situation changed somewhat with a growing awareness that individual species were under threat of extinction and at the turn of the century, organisations such as the Field Naturalists' Section of the Royal Society of South Australia and the South Australian Ornithological Association began to campaign to protect individual species.

These bodies also carried out scientific field excursions to the islands. One such important trip to the islands was the voyage of the Government steamer SS

*Governor Musgrave* in 1907, with many scientists on board. One purpose of the trip was to retrace the steps of Matthew Flinders's voyage more than a century earlier. When planning the expedition, organisers stated that:

> Excepting the description given by Flinders of many of the islands on Spencer's Gulf very little more is known, and as the meeting of the Australasian Association for Advancement of Science in January 1907, would bring together in Adelaide a number of scientists from all parts of Australia, it was considered that an interesting and instructive outing would result from a visit to those islands (Gill, 1908).

In the late 1880s, the Field Naturalists' Section of the Royal Society put pressure on the Government to introduce the *Kangaroo Protection Act* of 1891. The fur trade had placed the Western Grey Kangaroo in serious decline on Kangaroo Island as early as the 1870s. Though there had been earlier campaigns, such as moves to protect the Cape Barren Goose in 1864, the Act of 1891 heralded a more active campaign to persuade the Government to protect endangered species, largely by declaring closed seasons and to a lesser extent by setting aside areas for wildlife habitat.

At about the turn of the century the South Australian Ornithological Association expressed concern for the safety of one of the few surviving colonies of fur-seals, on the Casuarina Islets off the south-western coast of Kangaroo Island. As a result, on 6 May 1900 the outermost Casuarina Island was declared a Closed Area in respect to birds and animals under the *Birds Protection Act* of 1900. Dangerous Reef and The Pages Islands were declared sanctuaries on the same date. The public was forbidden to visit the islands, but in 1912 the Cape du Couedic head lighthouse keeper reported that a party on the Casuarinas intended sealing; the men were subsequently informed that the seals were protected and were instructed to leave the island. In September 1955 North Casuarina Island was declared a sanctuary to protect the seal population from shooting parties from the mainland.

The conservation value of the islands in Coffin Bay, Kellidie Bay, Mount Dutton Bay and Port Douglas was also recognised in 1909 when, on the basis of a request to the Government by a prominent local citizen through the South Australian Ornithological Association, the islands were proclaimed a Bird Protection Area under the Act of 1900. The reason given for their protection was that these 'shore' islands comprised breeding grounds for Cape Barren Geese, Rock Parrakeets and other birds (Lands Office, 1749/1909). Busby and Beatrice Islands near Kingscote were dedicated sanctuaries in the same year, due to the destruction of seabirds by fishermen (Lands Office, 471/1909).

On 27 July 1916, Pearson's Isles were declared part of a Bird Protection District under the *Birds Protection Act* of 1900 and the *Animals Protection Act* of 1912, to protect the Black-footed Rock-wallaby.

Scientific interest was later shown for the St Francis Island Rat Kangaroo, a species of bettong, by eminent zoologist Professor Frederick Wood Jones, who in the mid-1920s documented the decline of this small mammal. As were populations of many island mammals the rat kangaroo or *tungoo* was generally fearless of humans and on St Francis Island sometimes:

> ... tried frequently to hop into the homestead to take bread or other eatables known to them from the table ... their only offence seems to have been that they had a liking for the garden produce of the family who settled on the island. Cats were introduced in order to exterminate the Tungoos, and their work has

> been done completely. To what species the animal belonged can never be known and the fact of its extermination in this manner is much to be regretted. There are many islands in the vicinity of St. Francis to which some members of the original colony could have been transported and so given a chance to survive. The story is one of importance from the point of view of legislation for the protection of insular faunas, since it demonstrates clearly how rapidly and how completely an interesting fauna may be destroyed and lost to science forever (Wood Jones, 1923–25).

Another example of public concern for island conservation occurred in 1965, when the Department of Lands received a request from the Kingston Branch of the National Trust that Baudin Rocks in the South East, sometimes known as the Godfrey Islands, be declared a reserve to afford protection to the wildlife population:

> An inspection of the islands by members of the Kingston Branch of the National Trust recently disclosed that wildlife is being destroyed wantonly. Bodies of seals that had been shot were on the beach ... others had been mutilated, presumably to obtain bait for crayfish pots.

Baudin Rocks were proclaimed as Fauna Reserves as a result of this approach.

The dedication of farming islands in the Sir Joseph Banks Group as sanctuaries in the mid-1960s was almost directly related to the need to protect the islands as breeding grounds for the Cape Barren Goose, a species that was then considered under serious threat of extinction, and one that, even in 1864, had been provided with some sort of protection:

> Farming ... had a two-fold effect on the Cape Barren Goose populations, it brought about a significant increase in the amount of grassland on many islands thus increasing the available breeding habitat for geese, but at the same time the settlers exploited the geese as a convenient seasonal food resource. Cape Barren Geese were generally regarded as fair game for anyone who could obtain them. A.J. Campbell in his classic work on Australian birds and their nests, first published at the turn of the century mentions that "Some years ago fishermen in Spencer Gulf did a thriving trade in the spring catching young birds and fattening them for Christmas" (Robinson, Delroy and Jenkins 1982).

An island sanctuary not related directly to individual species protection was that of Greenly Island, which was perceived as offering a remarkable natural wildlife refuge. In 1948 members of the Adelaide Bushwalkers assisted South Australian Museum staff in a field trip to Greenly Island to make a collection of the island's flora and fauna, and to investigate its possibilities as a sanctuary:

> ... the island is a wonderful little piece of original Australia, with no introduced birds, plants or animals. Its ecology is entirely self supporting. There are no deposits of guano to exploit, it offers no anchorage for fishing craft, and it has no use for pastoral or farming purposes. But it does offer a home for numerous wallabies, seals, Cape Barren Geese, penguins and numerous birds as well as a unique species of native rat (H.A. Lindsay, President, Adelaide Bushwalkers DL 472/1948).

Mr Lindsay's letter to his local Member of Parliament went on to urge the Government to set aside the area as a sanctuary for all time. Greenly Island was subsequently declared a closed area for animals and birds under the *Animals and Birds Protection Act* 1919–1946 on 28 October 1948.

Despite this long history of interest in island conservation in South Australia, the major contribution was made in the 1960s when staff of the Department of Fisheries and Fauna Conservation made a systematic effort to secure as many islands as possible for conservation purposes. These were acquired and declared Fauna Reserves or, where islands were in non-South Australian Government ownership, as Fauna Sanctuaries.

In 1972, a number of government conservation authorities were unified under one department, at which time island Fauna Reserves became Conservation Parks under the control of the South Australian National Parks and Wildlife Service. The progress of the dedication of South Australia's offshore islands for conservation is shown in Table 7.

**Table 7.** Island Fauna Sanctuaries and other conservation areas.

| |
|---|
| **Bird Protection District–*Birds Protection Act 1900*** |
| Dangerous Reef Islands, Pages and Casuarina (proclaimed 6 May 1900) |
| Islands near Kingscote, Busby and Beatrice (proclaimed 13 May 1909) |
| |
| ***Animals Protection Act 1912*** |
| Pearson's Isles (proclaimed 3 August 1916) |
| |
| **Closed Area with Respect to Animals and Birds, *Animals and Birds Protection Act 1919–1946*** |
| Greenly (proclaimed 28 October 1948) |
| Pullen near Port Elliot (proclaimed 28 October 1948) |
| Thistle (proclaimed 4 October 1951) |
| Rabbit, County of Flinders (proclaimed 18 August 1960) |
| |
| **Fauna Reserves–*Fauna Conservation Act 1964*** |
| Godfrey Islands [Baudin Rocks] (proclaimed 19 August 1965) |
| Greenly, Nuyts Reefs |
| Mount Dutton Bay Area: Section 181, Hundred Wrenfordsley County Robinson in Baird Bay |
| Isles of St Francis: St Francis, Dog, Egg, Fenelon, Masillon, West Islands, Hart, Freeling, Smooth |
| Nuyts Archipelago: Franklin Islands, Goat, Lacy, Lounds |
| Investigator Group: Topgallant, Pearson Isles exclusive of islands Section 12–13, Ward, Purdie, Waldegrave and a small island to the west (proclaimed 1 September 1966), Eyre |
| Gambier Islands: Three islets south and west from Wedge |
| Sir Joseph Banks Group: Blyth, Boucaut, Duffield, English, Sibsey |
| Whidbey Islands: Four Hummocks exclusive of the southernmost, Perforated, Price |
| Coffin Bay, Port Douglas, Kellidie Bay Area: The Brothers, Goat, Rabbit |
| Islands near Port Lincoln: Smith, Hopkins, Lewis, Owen, Albatross, Rabbit, Liguanea |
| Islands near Kangaroo Island: Beatrice Islet, Busby Islet, Casuarina Islets (The Brothers), Nobby, Pelorus Islet, Island near Sleaford Bay |
| Curta Rocks (proclaimed 23 May 1968) |
| Tumby Islands (proclaimed 9 January 1969) |

# Part Two

# A Guide To The Islands

The information in the following chapters is designed to provide a convenient summary of the natural history of all South Australia's offshore islands. All islands—even those not visited as part of the South Australian Department of Environment and Natural Resources (DENR) biological surveys—are included (the South Australian National Parks and Wildlife Service—SANPWS—became DENR in 1994, and references in the text reflect this change). Included are points of interest relating to each island, and annotated lists of the plants, mammals, birds and reptiles (in alphabetical order, by family then species), for each of the islands for which such information is available: unless necessary, scientific names are listed in the appendices, not in the text. Since these records were collected during our visits to the islands or other short visits recorded in the literature, they are representative of the animals the average island visitor can expect to encounter.

The listing runs from west to east around the coastline; where islands occur in recognisable groups, a brief general introduction to the group is provided. Table 8 lists the South Australian offshore islands covered in this book and the form of land management, and Figure 45 shows the location of the islands. Information on reefs is also included where known and, wherever possible, suggested boat landing sites are provided.

Chapter

# 4 ISLANDS OF THE FAR WEST COAST

For the purposes of this guide, the Far West coastline stretches from the border of Western Australia to just west of Streaky Bay. This section of coast is peppered with islands, including not only the Nuyts Archipelago but also many smaller groups, isolated islands and reefs. All are of great variety and interest, despite their general similarity in appearance.

A characteristic shared by many South Australian islands, including those of the Far West, is a common geological history linked to the bedrock of the continental shelf. Variations occur where the older bedrock is capped with a younger, more localised formation, or where the island is the visible remains of some relatively confined ancient volcanic activity, such as an extruded inselberg that differs from the surrounding rock types.

The islands of the Far West are generally based on ancient granitic rocks of a similar type and age, though there are interesting variations. Many are partially or wholly capped with much younger rock, formed during the series of events that resulted in the islands' formation.

The continental shelf, exposed by the retreating sea during the most recent Ice Age, was subjected to scouring by wind and rain. Large beds of limey sand were lifted by wind and piled into extensive dunes that, over time, consolidated into a form of sandy limestone called calcarenite. These systems of solidified dunes, known as the Bridgewater Formation, capped the older bedrock of the shelf in thick layers, with major deposits along the South East, Eyre Peninsula and Far West coastlines. When the Southern Ocean eventually reclaimed the continental shelf, most of the old dunes were submerged, only those layers capping higher hills and ground above the new coastline remaining visible. The calcarenite, with its ochreous colours of cream, yellow and orange, is often the most prominent feature of the islands many of these hills have become.

Calcarenite is a relatively soft rock and offers little resistance to physical and chemical weathering. The swells of the Southern Ocean have reclaimed much of it, and have transformed the gentle contours of the old dunes into formations ranging from low reefs to towering cliffs, stacks and sea caves.

The varied nature of the Far West coastline, ranging from exposed deep water to sheltered shallow bays, has also created a broad spectrum of island forms.

The biological components of the Far Western islands are also outwardly similar; the basic types and compositions of species are repeated where comparable conditions exist, and ancient ties with the mainland are visible to varying degrees. The larger islands appear as miniature replicas of the mainland, often with dense stands of trees and tall shrubs harbouring their associated animals; decreasing size and exposure to the sea, however, favour increasing dominance of purely coast-adapted species.

**Table 8.** South Australian offshore islands covered in this book and showing the form of land management.

| Group/Main Islands | Management |
|---|---|
| **Islands of the Far West Coast** | |
| Nuyts Reef | Nuyts Reef Conservation Park |
| Reef off Point Bell | Vacant Crown Land |
| Sinclair Island | Sinclair Island Conservation Park |
| Purdie Islands | Nuyts Archipelago Conservation Park |
| Lounds Island | Nuyts Archipelago Conservation Park |
| St Francis Island | Isles of St Francis Conservation Park |
| Smooth Island | Isles of St Francis Conservation Park |
| Egg Island | Isles of St Francis Conservation Park |
| Dog Island | Isles of St Francis Conservation Park |
| Freeling Island | Isles of St Francis Conservation Park |
| West Island | Isles of St Francis Conservation Park |
| Masillon Island | Isles of St Francis Conservation Park |
| Fenelon Island | Isles of St Francis Conservation Park |
| Hart Island | Isles of St Francis Conservation Park |
| Cannan Reefs | Vacant Crown Land |
| Lacy Island | Isles of St Francis Conservation Park |
| Evans Island | Lighthouse Reserve |
| Franklin Islands | Nuyts Archipelago Conservation Park |
| St Peter Island | Nuyts Archipelago Conservation Park |
| Goat Island | Nuyts Archipelago Conservation Park |
| Bird Rock | Vacant Crown Land |
| Eyre Island | Nuyts Archipelago Conservation Park |
| Olive Island | Olive Island Conservation Park |
| **Far West Coast Bay Islands** | |
| Eba Island | Eba Island Conservation Park |
| Pigface Island | Pigface Island Conservation Park |
| Unnamed Island (Baird Bay) | Baird Bay Islands Conservation Park |
| Jones Island | Baird Bay Islands Conservation Park |
| Island A | Venus Bay Conservation Park |
| Island B | Venus Bay Conservation Park |
| Island C | Venus Bay Conservation Park |
| Garden Island | Venus Bay Conservation Park |
| Germein Island | Venus Bay Conservation Park |
| Tank Island | Venus Bay Conservation Park |
| Unnamed Island (Venus Bay) | Venus Bay Conservation Park |
| **Islands of Western Eyre Peninsula** | |
| Waldegrave Island | Waldegrave Island Conservation Park |
| Little Waldegrave Island | Waldegrave Island Conservation Park |
| Flinders Island | Perpetual Lease |
| Topgallant Island | Investigator Group Conservation Park |
| Ward Island | Investigator Group Conservation Park |
| Pearson Island | Lighthouse Reserve |

**Table 8.** (cont'd) South Australian offshore islands covered in this book and showing the form of land management.

| Group/Main Islands | Management |
|---|---|
| The Veteran Isles | Investigator Group Conservation Park |
| Dorothée Island | Investigator Group Conservation Park |
| Cap Island | Cap Island Conservation Park |
| North Rocky Island | Rock Island (north) Conservation Park |
| Greenly Island | Greenly Island Conservation Park |
| Mount Dutton North Island | Mt Dutton Bay Conservation Park |
| South Mount Dutton Bay Islands | Mt Dutton Bay Conservation Park |
| The Brothers | Coffin Bay National Park |
| Rabbit Island (Coffin Bay) | Coffin Bay National Park |
| Goat Island (Coffin Bay) | Coffin Bay National Park |
| Yangie Bay Island | Coffin Bay National Park |
| Avoid Island | Avoid Bay Islands Conservation Park |
| Black Rocks | Avoid Bay Islands Conservation Park |
| Golden Island | Whidbey Isles Conservation Park |
| Price Island | Whidbey Isles Conservation Park |
| Perforated Island | Whidbey Isles Conservation Park |
| Unnamed Rock | Whidbey Isles Conservation Park |
| Four Hummocks Islands | Whidbey Isles Conservation Park |
| South Rocky Island | Rocky Island Conservation Park |
| **Islands of Southern Eyre Peninsula** | |
| Cape Rock | Vacant Crown Land |
| Liguanea Island | Lincoln National Park |
| Curta Rocks | Lincoln National Park |
| Wanna Stacks | Lincoln National Park |
| Williams Island | Lighthouse Reserve |
| North Neptune Island | Neptune Islands |
| South Neptune Island | Neptune Islands |
| South Neptune (Lighthouse) Island | Neptune Islands |
| Wedge Island | Freehold |
| South-west Rock | Gambier Islands Conservation Park |
| Peaked Rocks | Gambier Islands Conservation Park |
| North Islet | Gambier Islands Conservation Park |
| Thistle Island | Freehold |
| Albatross Island | Lincoln National Park |
| Hopkins Island | Lincoln National Park |
| Smith Island | Lincoln National Park |
| Grindal Island | Lincoln National Park |
| Lewis Island | Lincoln National Park |
| Little Island | Lincoln National Park |
| Taylor Island | Perpetual lease |
| Owen Island | Lincoln National Park |
| Carcasse Rock | Vacant Crown Land |
| Donnington Reef | Lincoln National Park |

**Table 8.** (cont'd) South Australian offshore islands covered in this book and showing the form of land management.

| Group/Main Islands | Management |
|---|---|
| Bickers Islands | Lincoln National Park |
| Grantham Island | Recreation Park, D.C. of Port Lincoln |
| Boston Island | Freehold |
| Rabbit Island | Lincoln National Park |
| Louth Island | Freehold |
| Tumby Island | Tumby Island Conservation Park |
| Lipson Island | Lipson Island Conservation Park |
| **Islands of the Sir Joseph Banks Group** | |
| Kirkby Island | Sir Joseph Banks Group Conservation Park |
| Sibsey Island | Sir Joseph Banks Group Conservation Park |
| English Island | Sir Joseph Banks Group Conservation Park |
| Stickney Island | Sir Joseph Banks Group Conservation Park |
| Spilsby Island | Perpetual lease |
| Boucaut Island | Sir Joseph Banks Group Conservation Park |
| Duffield Islet | Sir Joseph Banks Group Conservation Park |
| Hareby Island | Sir Joseph Banks Group Conservation Park |
| Roxby Island | Sir Joseph Banks Group Conservation Park |
| Langton Island | Sir Joseph Banks Group Conservation Park |
| Blyth Island | Sir Joseph Banks Group Conservation Park |
| Dalby Island | Sir Joseph Banks Group Conservation Park |
| Reevesby Island | Sir Joseph Banks Group Conservation Park |
| Lusby Island | Sir Joseph Banks Group Conservation Park |
| Marum Island | Sir Joseph Banks Group Conservation Park |
| Partney Island | Sir Joseph Banks Group Conservation Park |
| Winceby Island | Sir Joseph Banks Group Conservation Park |
| Buffalo Reef | Vacant Crown Land |
| Dangerous Reef | Sir Joseph Banks Group Conservation Park |
| **Islands of Yorke Peninsula** | |
| Bird Island | Bird Islands Conservation Park |
| Goose Island | Goose Island Conservation Park |
| Little Goose Island | Goose Island Conservation Park |
| White Rocks | Goose Island Conservation Park |
| Seal Rocks | Goose Island Conservation Park |
| Green Island | Aboriginal Land |
| Island Point | Aboriginal Land |
| Rocky Island | Goose Island Conservation Park |
| Wardang Island | Aboriginal Land |
| Daly Head Islet | Vacant Crown Land |
| Royston Island | Innes National Park |
| Middle Islet | Innes National Park |
| South Islet | Innes National Park |
| Chinaman's Hat Island | Innes National Park |
| Seal Island | Althorpe Islands Conservation Park |

**Table 8.** (cont'd) South Australian offshore islands covered in this book and showing the form of land management.

| Group/Main Islands | Management |
|---|---|
| Haystack Island | Althorpe Islands Conservation Park |
| Althorpe Islands | Althorpe Islands Conservation Park |
| Troubridge Island | Troubridge Island Conservation Park |
| **Islands off the coast of Kangaroo Island** | |
| West Bay Islet | Flinders Chase National Park |
| North Casuarina Islet | Flinders Chase |
| South Casuarina Islet | Flinders Chase |
| Nobby Islet | Seal Bay Conservation Park |
| Pelorus Islet | Vacant Crown Land |
| Busby Islet | Busby Islet Conservation Park |
| Beatrice Islet | Beatrice Islet Conservation Park |
| **Backstairs Passage and Encounter Bay Islands** | |
| North Page Island | The Pages Conservation Park |
| South Page Island | The Pages Conservation Park |
| West Island | West Island Conservation Park |
| Wright Island | Recreation Reserve, D.C. of Victor Harbor |
| Granite Island | Recreation Reserve, D.C. of Victor Harbor |
| Seal Island | West Island Conservation Park |
| Pullen Island | Pullen Island Conservation Park |
| **Islands of the South-East Coast** | |
| Margaret Brock Reef | Lighthouse Reserve |
| Baudin Rocks | Baudin Rocks Conservation Park |
| Penguin Island | Penguin Island Conservation Park |

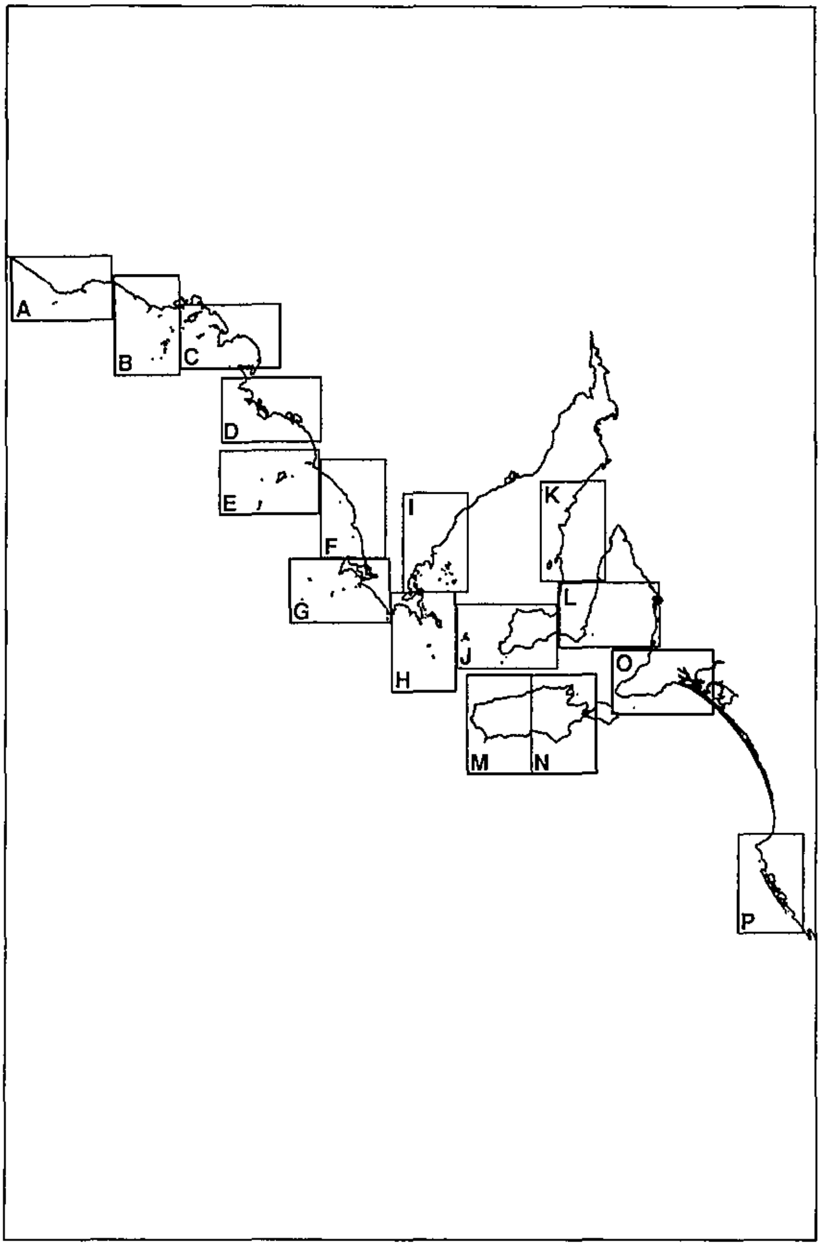



**Figure 45.** Location of South Australian offshore islands. (a) Nuyts Reef; (b) Nuyts Archipelago and Isles of St Francis; (c) Nuyts Archipelago; (d) Baird Bay and Venus Bay Islands; (e) Investigator Group; (f) Cap and North Rocky Islands; (g) Mt Dutton, Coffin Bay Islands and the Whidbey Group; (h) Port Lincoln Islands and the Neptune Islands; (i) Port Lincoln Islands and the Sir Joseph Banks Group; (j) Gambier Group and Yorke Peninsula Islands; (k) Yorke Peninsula Islands; (l) Troubridge Island; (m) West Kangaroo Island coast; (n) East Kangaroo Island coast; (o) Fleurieu Peninsula Islands; and (p) South-East coast Islands.

Human influence on this group of islands has been limited. Isolation, difficult access and lack of fresh water frequently deterred both Aboriginal and European use, and attempts to exploit and 'domesticate' several of the larger islands have met with varying degrees of success.

## Nuyts Reef (Figure 46)

From the west, this reef cluster is the first significant island group encountered on the South Australian coast. Named after Pieter Nuyts, the reef is an isolated group of exposed and submerged rocks lying about 12 km south of Cape Adieu on the mainland. Three main clusters of rocks form a roughly triangular pattern and are separated by deep water. The western-most group is dominated by a 13 m high islet; the northern by a 6 m high rock, while the southern point of the triangle is often only marked by breakers and boiling surf.

The power of the huge ocean swells has significantly reduced what were probably once more extensive islands. The supporting bulge of granite has been stripped of its calcarenite capping on all but the largest rocks, where a thin layer of calcareous sandstone still clings.

We are not aware of any landings on Nuyts Reef, so biological information has been gleaned from a variety of aerial surveys. The presence of any form of non-marine vegetation has not been confirmed. If plants do exist, they would require a secure foothold and high salt tolerance to withstand virtual submergence by pounding winter seas; the only likely growth would occur in skeletal soil pockets on the calcarenite layers that cap the tallest islets.

An aerial survey in 1977 counted 120 Australian Sea-lions inhabiting the group, and 1990 survey work has confirmed that this is a breeding colony (Gales, Shaughnessy and Dennis, 1994).

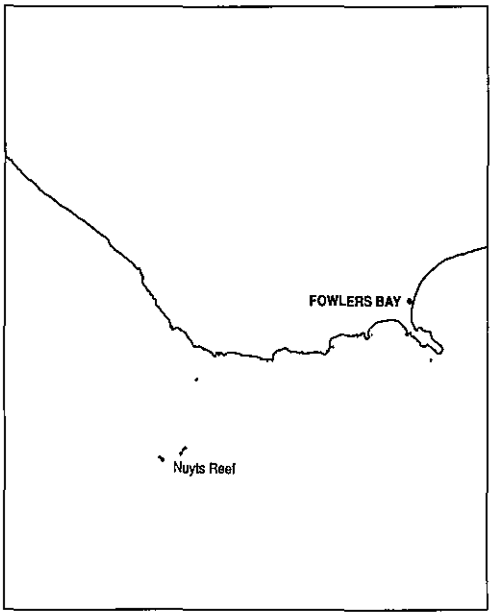



**Figure 46.** Map of Nuyts Reef

## Reef off Point Bell (Figure 47)

This small reef is completely submerged in stormy weather. In April 1982, however, the sea was relatively calm and a helicopter flyover revealed that it provides a resting place for flocks of the Crested Tern; a single Australian Sea-lion was also seen.

## Sinclair Island (Figure 47)

In stormy weather, Sinclair Island (Plate 67) appears as little more than a tumultuous swell of erupting white water. In calmer seas the single granite dome arches through the surge like a humpbacked whale, the surface worn into grooves and troughs resembling wrinkled skin. Depending on the sea, Sinclair Island, lying about 3 km south of Sinclair Point, is roughly 15 m high. The island was named by Matthew Flinders after Kennet Sinclair, one of his midshipmen, on 31 January 1802.

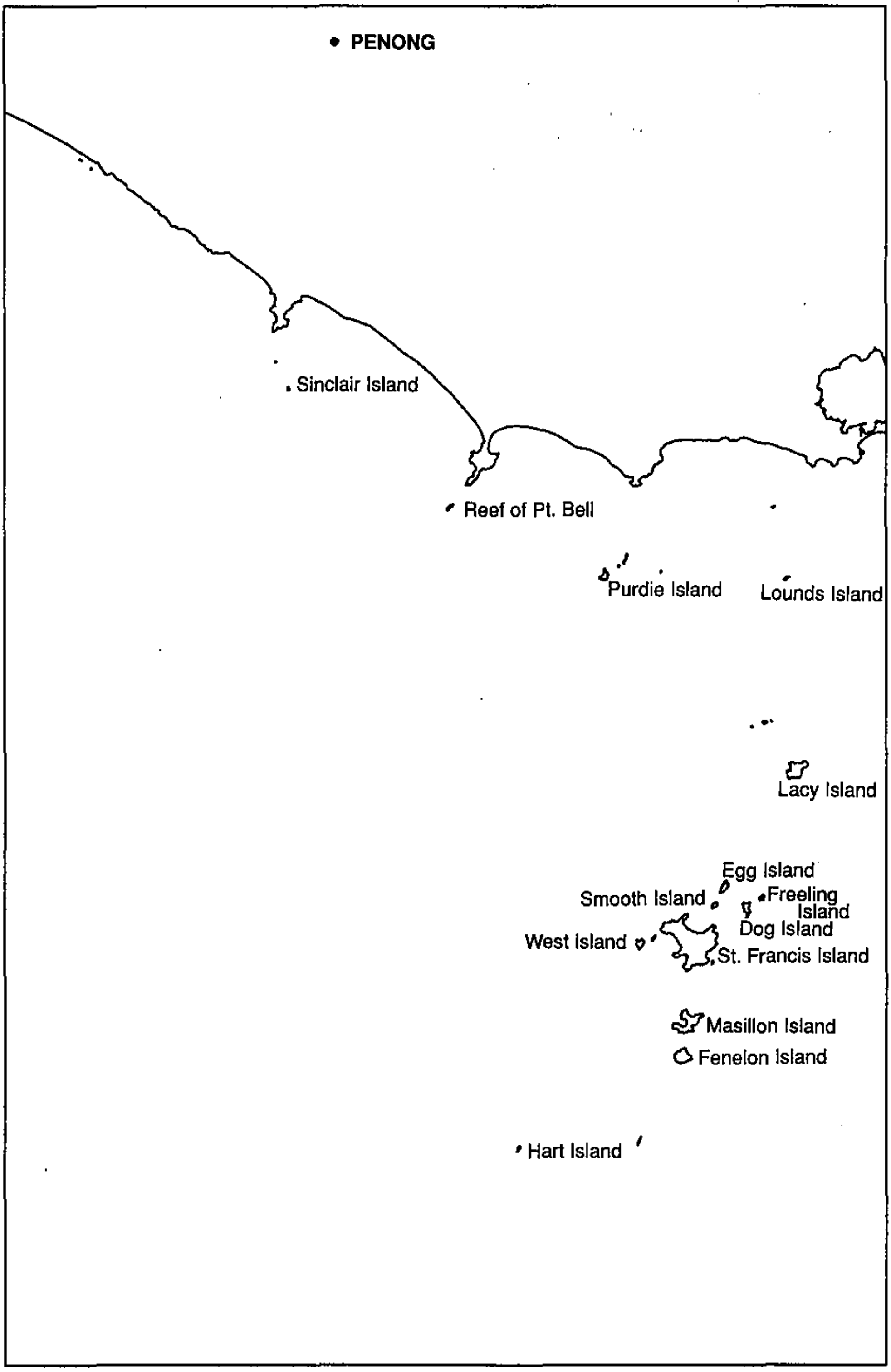



**Figure 47.** Map of Nuyts Archipelago and Isles of St. Francis

**Plate 67.** The surface of Sinclair Island from the air. Photo A. C. Robinson

Landing is not advised. An aerial survey revealed a small group of Australian Sea-lions, and flocks of Crested Terns and Black-faced Cormorants taking advantage of a low swell and dry summit.

## Nuyts Archipelago (Figures 47 and 48)

Stretching from the Purdie Islands in the west to Olive Island just off Cape Bauer in the east are the 19 main islands, and their associated rocks and reefs, of Nuyts Archipelago, named by Flinders in February 1802 to commemorate the amazing voyage of Dutch navigator Peter Nuyts, who reached this area in January 1627 (further details of both voyages can be found in Chapter 3). The eight outermost islands along this part of the coast are generally grouped together as the Isles of St Francis. The first edition of the *Australia Pilot* noted that there were only two anchorages among the islands; in Petrel Bay on the northern coast of St Francis Island, and off the Franklin Islands. At the time of that survey (1878) there were no inhabitants on any of the islands, though 'sheep are sometimes taken across to St Peter Island from the mainland'.

Since that time both St Peter and St Francis Islands have been held under pastoral leases, often involving some grazing of the surrounding islands as well, and this has substantially changed their biology (particularly that of the larger islands). All the islands are now part of either the Nuyts Archipelago or Isles of St Francis Conservation Parks, and are managed by DENR.

### Purdie Islands (Figure 47)

The Purdie Island group lies in deep water, 10 km south-south-west of Rocky Point. The islets form a chain, barely dry, with one large, 25 m high island on the western extremity. Flinders named the group on 1 February 1802 after Robert Purdie, surgeon's assistant on the *Investigator*.

The group is composed mainly of scattered granite rocks, the highest about 5 m above sea level. Too severely exposed to support permanently resident plants or animals, they are little more than roosting places for seabirds. The largest islet, however, retains a thick sheet of calcarenite and enough soil to support a wider range of low shrubs and salt-tolerant, low-growing plants.

An added burden to many plants' survival is the presence of a large breeding colony of Australian Sea-lions. In the colony's densest basking areas, only Marsh Saltbush seems capable of surviving the disturbance. The colony is especially concentrated at the northern end of the island, but is generally distributed both on granite and limestone over the whole island; in April 1982 it consisted of approximately 200 animals, including at least 50 pups, and a survey in 1990 found 112 pups (Gales, Shaughnessy and Dennis, 1994). Sharing this relatively small island with the sea-lions were 10 species of birds, the Marbled Gecko and two species of skink; the larger of which, the Bull Skink, is found only on islands with soil deep enough to support its conspicuous burrows.

## Lounds Island (Figure 47)

Lounds Island lies in deep water 16 km south-east of Rocky Point. Named by Flinders after midshipman Sherrard Lound on 7 February 1802, it is larger than most of its western neighbours and has a more diverse flora and fauna.

Lounds Island has a typical calcarenite on granite structure. A massive granite base protects the calcarenite cap from direct contact with the sea in all but the worst weather and, though relatively thin, manages to retain patches of sand and soil that in turn support low, wind and salt-pruned vegetation. The island's size also provides more diverse habitats, and it consequently harbours a larger range of birds and animals. A breeding colony of 50 sea-lions, including 25 pups, was found here during the survey; another survey in 1990 found 26 pups (Gales, Shaughnessy and Dennis, 1994). Close examination of any loose rock uncovered Marbled Geckos and on one occasion the small burrowing Four-toed Earless Skink (Plate 68).

**Plate 68.** The Four-toed Earless Skink (*Hemiergis peronii*), one of the most common reptiles on South Australia's offshore islands. Photo S. J. Doyle

Reptiles were stranded during the island's initial formation and these two species represent the hardiest of their kind, last survivors on all but the most barren islets. Birds found here included the Sooty Oystercatcher and the Turnstone, which forage along the tide line, Masked Plovers, Rock Parrots and the Singing Honeyeater, which are dependent on the island vegetation and its associated insects for their survival.

## The Isles of St Francis (Figure 47)

One of South Australia's most distant offshore groups, this cluster of 11 islands forms the south-westerly extension of the Nuyts Archipelago. Many of the islands have spectacular cliffs and sheltered bays. The prodigious granite foundations of these islands are also of interest; those supporting West, St Francis, Masillon and Fenelon Islands are of compositions not found on the mainland.

The islands' size and form are also diverse: their loftier summits and plateaus reduce the effects of the sea, and have encouraged the continued survival of a variety of plants and animals.

To the immediate north-west of St Francis Island lies a cluster of four islands that share a similar geological structure and that are exposed to comparable environmental conditions. They range from 12 to 60 ha in size, and appear superficially similar. Subtle differences can, however, be found and there is a trend of decreasing species diversity with decreasing land area. The islands are generally comparable enough to be seen as representing different stages in the decay of a single hypothetical island; it is possible to imagine that after thousands of years of erosion (if present conditions continue), the species found on the largest, Dog

Island, will be more similar to those now inhabiting its smaller, nearest neighbour, Freeling Island.

## St Francis Island

St Francis (Figures 47 and 48), at about 809 ha the largest island in the group, shows the greatest complexity. Its supporting granite base is usually concealed beneath a thick bed of calcarenite, exposed only as wave-slicked boulders and shelves fringing calcarenite cliffs along the western, southern and eastern coastlines.

The island reaches its highest elevation along the south-eastern coast, its rounded 81 m summit topped by an automatic lighthouse and radio beacon. On the leeward sides the contours are lower and less abrupt, and are softened by sandy beaches and gently curving bays and coves. The graceful arc of Petrel Bay, with a broad crescent of golden sand, is perhaps the island's most attractive feature, its north-easterly aspect offering the only safe anchorage in the island group and an easy landing point.

Localised volcanic activity occurred in this region about 1500 million years ago (Ma). Today, the only evidence of this activity lies in the extruded rock outcropping along the north-western coast of St Francis and on Hart Island, 19 km south-west. Most of the island's rock types have a blanket of sandy soil, thinning over more elevated areas and lying at some depth over the lower central portion. Stable sand dunes fringe Petrel Bay and crown some of the cliffs ringing the sandy coves on the south-western side.

Not surprisingly, a relatively large island with such varied structure provides habitats for a broad range of plants and animals. The dominant vegetation type is saltbush shrubland underlying tall clumps of African Boxthorn. The saltbush once thrived in almost pure stands on this soil type, but the introduction of boxthorn by landholders for fencing hedges and windbreaks has seen widespread infestation. The shallow soil and limestone outcrops characteristic of the elevated southern end support a taller, more diverse shrubland. Shrubs such as Cockies Tongue, Common Correa, Umbrella Bush and Shore Westringia are common. Closer scrutiny reveals many other equally beautiful wildflowers, their abundance determined by rainfall.

Small stands of Dryland Tea-tree grow on the southern side of St Francis, and are the tallest shrubs found. Native and introduced grasses carpet the ground over most of the island. Porcupine Grass or Spinifex grows in the taller shrubland, and tussocks of Coast Tussock Grass shimmer in the wind along clifftops. The thin soil layer over the volcanic rocks of the north-western end supports a distinct vegetation characterised by scattered saltbush, boxthorn, grasses and extensive mats of Karkalla and Round-leaved Pigface, identifiable by their thick, fleshy leaves and 'hot' pink flowers. The coastline vegetation is distinguished by its typically hardy, wind-pruned appearance and is composed of species common to this habitat on all the Isles of St Francis. Species composition changes from cliff to dune, but plants such as Nitre-bush, Cushion-bush and the fleshy creeper Bower Spinach thrive in most coastal zones.

The extensive nature of these dominant habitats supports a larger, more diverse range of animals, including many restricted and more specialised species.

Typically, birds are the most abundant vertebrates. By weight of numbers the Short-tailed Shearwaters (Mutton-birds), whose burrows are concentrated in the deep soil of shrublands, are dominant. St Francis Island supports a population of

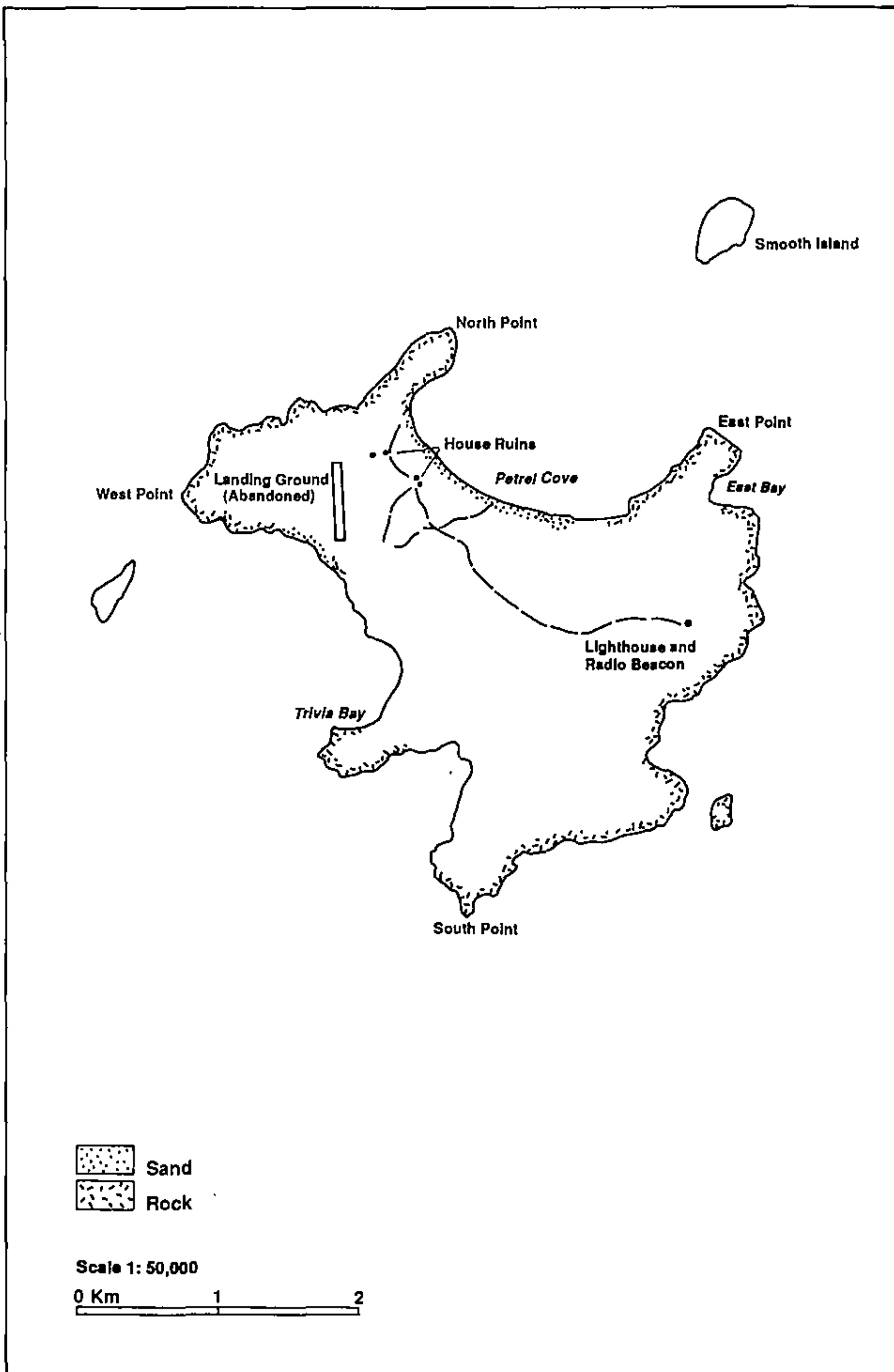



**Figure 48.** Map of St Francis Island.

about 270000 birds. When they return to the island, the shearwaters break the calm of the shrubland with a confusion of flying earth and stumbling bodies, and the nights are shattered by the sounds of feverish renovating and territorial squabbling. The shearwaters spend their days at sea, feeding, and with the arrival of evening, descend on the island in a dense cloud of wheeling and twisting forms, almost ghostlike in the ease and silence of their flight. The illusion is quickly shattered when their bodies, so well designed for air and water, crash clumsily into the ground.

Shearwater colonies are often literally stumbled on, and the annoyance and fatigue resulting from a 'walk' through such a colony usually discourages unnecessary forays. Indeed, after many uncontrolled falls, the visitor's admiration of this remarkable bird tends to dim momentarily.

The island hosts other birds of interest. The rare Osprey and the larger, more common White-bellied Sea-eagle seek the isolation and security of the cliffs, where they nest and from which they hunt. Cape Barren Geese graze on the spring grasses, while more cryptic Banded Rails are occasionally flushed from dense undergrowth where they forage for invertebrates. Sea and water birds are most common, taking advantage of the range of suitable habitats; Hooded Plovers, Red-capped Dotterels and Red-necked Stints scurry over sandy beaches, White-faced Herons stalk prey in rocky tidal pools, and Little Penguins and cormorants fish the surrounding waters, returning to roost at night.

The island supports one of only two populations of the Southern Brown Bandicoot *Isoodon obesulus nauticus*, an island-evolved variant of the mainland bandicoot that on the South Australian mainland is now confined to small pockets of wet forest, the closest hundreds of km away.

The Brush-tailed Bettong, mentioned in early accounts of St Francis Island such as those of Matthew Flinders, was exterminated, possibly through the introduction of cats (which have now also died out). An unsuccessful attempt to reintroduce bettongs was carried out by SANPWS in the 1980s (see Chapter 2).

Reptiles are more diverse on St Francis than on the surrounding smaller islands, with species utilising most habitats. Typical coast-tolerant species such as the Marbled Gecko can be found, though in smaller numbers than in similar habitat elsewhere — possibly because they must share their preferred refuges beneath rocks with the clawed Bynoe's Gecko and the spectacularly patterned Thick-tailed Gecko. Six species of skink were found and were common in their particular habitats. Shingles of volcanic rock on the north-western end of the island sheltered the only dragon species found, the Peninsula Dragon, while a single specimen of the Common Scaly-foot, a legless lizard, was found in saltbush shrubland.

The most memorable reptiles on St Francis Island are two species of snakes. The larger and more common is the intricately patterned Carpet Python (Plate 69). Often seen draped in bushes, this snake kills its prey, such as bandicoots and seabird chicks, by constriction. The Carpet Python is rare on the mainland of South Australia, and St Francis harbours the only island colony in this State. The Black Tiger Snake is uncommon, possibly due to years of persecution by island residents and visitors. Sightings are more frequent around shearwater burrows, in which these snakes often shelter — providing another reason to avoid walking through these areas. Though Black Tiger Snakes are generally not aggressive, they are extremely venomous and medical help is hours away.

Since Nuyts's first encounter in 1627, European impact on St Francis has become increasingly significant. Nuyts and his landing party may even have been the first humans to set foot here; there is no evidence of any Aboriginal occupation which, due to the island's present distance from the mainland, could only have occurred when the land bridge was intact. Distance from the more settled areas of South Australia was one of the many reasons that dampened entrepreneurial enthusiasm for the islands of the Far West until comparatively late in the State's history, and the first lessees of islands in this area were rich Adelaide pastoralists who had sufficient capital (and land elsewhere) to offset the difficulties of island agriculture.

The first lessee of St Francis was Robert Barr Smith; his application, made in 1859, also included several outlying islands in the group. He held the lease until 1870. The island had several freshwater springs which, when combined with the island's size and the convenience of a natural fence, provided good grazing for sheep. Sheep were not introduced until 1891, but by 1896 St Francis carried 1360.

**Plate 69.** A Carpet Python (*Morelia spilota*) from St Francis Island. Photo P. D. Canty

From 1870 to 1872 Henry Dale held the lease for St Francis, Franklin and Goat Islands; the lessee during the intervening years is unknown. With the issuing of the new pastoral leases in 1880 a newcomer to the district took up the lease. Thomas Lloyd, a stockholder of Kangarilla, leased the St Francis Group until 1887 when Alfred Burgess, overseer of St Peter Island, and then the Hosken family of St Peter Island took on the run. The lessees at that time were Thomas Lloyd and William Arnold; they were probably the first to reside permanently on the island, and the ruins of their limestone buildings still overlook Petrel Bay.

Lloyd and Arnold diversified into cultivation of cereals and vegetables and guano mining, bringing about some unfortunate conflicts with the natural inhabitants. Soil deep enough to grow crops was already well utilised by shearwaters and a long battle of clearing and hole-filling ensued. The shearwaters also provided a food source, as did Cape Barren Geese, and the oily flesh of shearwater chicks was even boiled down for machinery oil. Such self-sufficiency often made the difference between profit and loss, so any available resource was utilised fully. The deposits of penguin guano in caves around the island's eastern side provided rich fertiliser and a small export industry for several years. About 16 ha were planted for vegetables, favouring those requiring minimal maintenance; watermelons, sweet melons, pumpkins, onions and tomatoes were grown in sufficient quantities for sale on the mainland. Near the south-western point, 40 ha of lucerne was grown and to the west a further 4 to 8 ha of wheat and barley.

Cats were reputed to have been introduced to protect crops from bettongs and bandicoots. Chickens, ducks and turkeys were also raised and their eggs were appreciated by the local pythons, which were occasionally killed, along with any tiger snakes that ventured too close to the houses. Great care was taken to avoid the accidental introduction of rats and mice, which has helped preserve many native species. During the survey, the discovery of old rat bones in the dunes behind Petrel Bay indicated occasional though fortunately unsuccessful breaches of security.

In 1909 A. Maguire visited the island, travelling there from the mainland for a holiday on Lloyd's yacht the *Sunbeam* and noted that:

> Unlike St Peter Island, where much of the shore is low and sandy, St Francis Island has high rocky cliffs and is surrounded by deep water. This affords good anchorage, especially at the island's picturesque harbour, Petrel Cove: at length we made our way to the house, a comfortable building, situated about half a mile from the landing, and commanding a magnificent view of the ocean and surrounding islands and, above all, of Petrel Bay.
>
> We are met at the house by Mrs W. Arnold, who is the wife of Mr Lloyd's partner. Our hostess makes us welcome, setting to work with the true hospitality only found in remote parts where visitors are few and far between ... On the following morning I am invited to take a walk with Mr Lloyd over a portion of his island home in order to get in the ration sheep. For even amid the ease and luxury of this happy family the inner man must not be forgotten, and fresh meat, although scarce on the mainland, is abundant here. The sheep, a fine mob of Merinos, look like balls of wool, and are grazing peacefully on the slopes, which run to the water's edge. At the foot of these slopes are numerous permanent springs of fresh water running into the sea. The sheep may go to these and drink to their heart's content.
>
> We arrive home with the sheep, and as we are very warm we are treated to some watermelons. This luscious gourd grows abundantly on the parts of the island once known as "the mutton bird country". This was once the resting place of the old mutton birds and the temporary home of the young ones, and, in consequence, is rooted up and excavated to a depth of several feet, and is covered over by saltbush. This saltbush has to be removed by means of fire, and then begins the work of filling in the holes preparatory to ploughing it up; for unless the holes are broken down it would be impossible to get horses to work in it (Maguire, 1920).

Maguire continues to expound the benefits of the accumulated seabird excrement as a source of fertiliser:

> This is a valuable asset to the island, and I am firmly of [the] opinion that such soil as it would be equal to any fertiliser if used with judgement by the farmers on the mainland ... On inspection these [penguin] caves will be found to contain hundreds of tons of guano. Some of them run a good distance under the surface; in fact, one cave had quite a long tramline running into it at one time, with trucks to carry the guano to the shoot, in order to be shipped to some port ... There are a great many of the caves on the island, and one cannot help thinking that this ocean island is a veritable "treasure trove".

Guano leases were issued for the islands over several periods. Alfred and John Hones and Henry Burden held such a lease from 1883 to 1892, as did several pastoral lessees of the island in subsequent years.

Problems increased after 1914; a bad drought had affected the island for three years and during that year an earthquake turned the best springs bitter. Sheep numbers dropped to 150, and the lack of water reduced chances of a full recovery. In desperation, animals were spread over nearby islands.

Lloyd died in 1922 but Arnold continued until 1932, finally relinquishing the lease to Sander Hansen, who also held the St Peter Island lease. By 1939 the property was no longer viable; the bitter springs and overgrazing had taken their toll. The Land Board decided to spell the island for several years, hoping to rejuvenate the springs and vegetation, but agriculture was never again attempted. From 1957 to 1967, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) held the lease with the intention of establishing a mutton bird research station; however, this never eventuated. The Isles of St Francis were later dedicated as Fauna Conservation Reserves, then in 1972 as a Conservation Park.

The original lighthouse was built in 1924 to help guide local boats and freighters through Nuyts Archipelago. The light was serviced annually by ship and an amphibious landing craft, with emergency repairs carried out by light plane. Construction of a level airstrip was a challenge continually thwarted by the activities of shearwaters, and was finally abandoned when the light was replaced with a battery-operated unit serviced by helicopter. The strip is still visible along with other remains, such as an old vehicle shed, of the lighthouse servicing operation. In the 1980s a radio aerial was erected near the lighthouse as part of the South Australian Department of Fisheries radio network.

Two shipwrecks are known to have occurred on the island, though details are obscure. The Arnold family describes salvaging a 14 m boat from Petrel Bay and procuring the mast from another wreck in 'Mast Bay', a deep cove named by the Arnolds on the island's south-western coast.

## Smooth Island (Figure 47)

Smooth Island is a relatively small, tear-shaped islet lying about 200 m north of St Francis Island. As its name suggests, the granite base and thin calcarenite mantle have been smoothed by erosion. The island is 35 m high at its summit, and its steep granite flanks rise from deep water.

Smooth Island was not visited by the authors, but outward similarities to Egg Island can be extrapolated. Beyond the reach of storm waves, the calcarenite cap is likely to be fragmented into jagged rocks and shingles, with a sandy, skeletal soil filling depressions. Hardy saltbush should be found in deeper soil pockets with scattered thickets of Nitre-bush and, over the more sheltered central area, a gnarled heath of Twiggy Daisy-bush.

Seabirds would dominate the vertebrate inhabitants, probable species including Sooty Oystercatchers, Crested Terns and Pacific Gulls; and, though not resident, White-bellied Sea-eagles would include the island in their hunting territories. The island would probably be a favourable haunt for landbirds such as the Rock Parrot and Richard's Pipit.

Likely reptiles include the Marbled Gecko and Four-toed Earless Skink. The Bull Skink may also occur in small numbers. Impressions from a brief fly-over suggest the deep water surge would make any boat landing extremely difficult under normal conditions.

## Egg Island (Figure 47)

Egg Island is a close neighbour of Smooth Island and has similar outward characteristics; Egg, however, has an area of approximately 60 ha, roughly five times the size of Smooth. The elongated granite base supports a thicker bed of calcarenite that reaches a rounded summit 41 m high. The island's greater bulk is clothed in a relatively complex mosaic of coastal heath vegetation. The effects of the sea still modify the vegetation's appearance and composition, but reduced severity, greater area and more sheltered sites increase diversity, apparent in the 42 plant species identified during the survey.

The island is also more attractive to birds, harbouring 12 species at the time of the survey (probably a mixture of true resident species and a number of transient species resident on nearby St Francis Island). Landbirds include Singing Honeyeaters, Welcome Swallows and Australian Kestrels. Deeper patches of soil are well utilised by colonies of Little Penguins and Short-tailed Shearwaters.

The island is all but surrounded by deep water, apart from a breaking rock off the northern point. As is typical of this island type, steep granite shelves create a strong surge, making a boat landing very difficult.

## Dog Island (Figure 47)

Dog Island (the source of whose name is unknown) has a supporting base of light coloured granite into which a dolerite dyke up to 2 m wide has intruded. Beyond the reach of storm waves, the granite is blanketed by a thick bed of crumbly calcarenite. The coastline is carved into irregular coves and points where the waves are dulled by boulder beaches. The calcarenite capping is a bright yellow where it is exposed on cliffs and steep scree slopes, and the summit plateau rises gently from the south to 61 m, 20 m higher than the surrounding islands.

The soft calcarenite has yielded much sand. Lifted by the wind from the eroding cliffs, deep layers have blanketed the upper plateau, even forming a dune line along the eastern side. Unlike the veined limestone and skeletal soils on the smaller islands, the deep sand of Dog Island is dominated by a saltbush shrubland made up of Marsh Saltbush and Seaberry Saltbush, from 30 to 50 cm tall. Intermixed with this is a variety of heathland species, with some plants—such as the pale mauve Cushion Fanflower and the pale yellow Thyme Riceflower—that normally occur only on larger islands, hinting at a transition from a more diverse past.

The deep sand of this island has also favoured the Short-tailed Shearwater and the ground around and below each saltbush is perforated with burrows, supporting one of the densest island colonies of this species. An estimated population of around 33000 birds has been calculated—an astounding total compared to the next largest colony of 270 000 birds on St Francis, about 13 times larger.

In total, 14 species of birds were noted, including White-bellied Sea-eagles, Cape Barren Geese, Australian Ravens, Turnstones and a White-faced Heron.

The dense saltbush shrublands also support a population of the Bush Rat. On the mainland this rat is confined to wetter forests and heaths, and its presence here confirms the once wider range of this habitat during a period of low sea levels. The island rat appears to have adapted to a rather different habitat from its mainland counterparts, and it also survives on Masillon Islands in the Isles of St Francis group (its absence from St Francis Island may be due to competition from bandicoots, or predators such as the carpet python and tiger snake). The rat is nocturnal and no sightings were made during the brief daylight survey, though overnight trapping confirmed their presence.

The relative shelter of the island's coves has attracted small groups of Australian Sea-lions; which probably do not breed here, favouring the island more as a secluded resting and basking site. The only reptiles recorded were two species common where dense vegetation and deep sand occur. It is likely that different species would inhabit the rockier cliffs and scree slopes, but difficult access prevented a thorough search.

Landings by boat should be possible in any coves to leeward of the prevailing swell.

## Freeling Island (Figure 47)

Freeling is closely allied with Dog Island in its general characteristics. The granite base has been worn of most of its irregularities, though small bays are found on the south-western end. Calcarenite clings to the top, which rises to 35 m; it retains enough pockets of sandy soil to support a low saltbush shrubland. Escaping the unimaginative naming of its three neighbours, the island was named after Major-General Sir Arthur Henry Freeling, a Surveyor-General and Colonial Engineer.

A fairly typical bird fauna was recorded with small breeding populations of Short-tailed Shearwaters and Little Penguins. Marbled Geckos were common, with a single specimen of Four-toed Earless Skink also found.

Landings may be possible if any of the small coves are sufficiently sheltered.

## West Island (Figure 47)

West Island and its neighbouring reef are remnants of a promontory that once extended from St Francis Island. The main island lies in open ocean 1.5 km west of St Francis; the turbulent water in the intervening passages should be avoided. Boat landings may be possible in the prominent northern bay when in the lee of prevailing weather.

The well-exposed granite bases of both islands are of an unusual type and may have been formed by the volcanic activity that created the rocks underlying the north-western tip of St Francis. On the main island, a wedge-shaped cap of calcarenite tapers to the north-west from a height of 30 m, dropping in steep cliffs to boiling surf on the most exposed southerly sides. Only a thin sliver of calcarenite clings to the smaller island.

Heavy swells constantly pound the main island's western side and have swept away slabs of calcarenite, exposing large platforms of granite, both smoothing the platform and strewing it with tumbled heaps of granite boulders. The north-western point of the island supports a small colony of Australian Sea-lions, and during a 1982 visit a single pup estimated to be two to three weeks of age was found swimming in a sheltered rock pool. It is likely that a pup of this age could have swum with its mother from a large breeding population nearby. The animals do breed here however—a survey in 1990 found 14 pups (Gales, Shaughnessy and Dennis, 1994). The island cap has retained a shallow soil layer but the vegetation is severely modified by the sea, with highly salt-tolerant plants dominating. Eight species of birds were sighted, including a large flock of Cape Barren Geese. Edge feeders such as Sooty Oystercatchers and a White-faced Heron foraged in the many rock pools. Typical reptiles were abundant, with an unconfirmed sighting of the small and very swift Dwarf Skink.

The neighbouring reef, which was not visited, is used as a roosting site by birds such as Crested Terns in calmer weather. Any vegetation surviving here would probably consist of succulent, ground-hugging mat plants.

## Masillon Island (Figure 47)

Masillon and Fenelon Islands, like St Francis, have an extremely thick deposit of calcarenite. Its persistence is due to the underlying granite, which is high enough to protect the softer rock from direct contact with the sea. The islands are ringed by formidable cliffs and their lofty plateaus protect some interesting flora and fauna.

Masillon lies roughly 2.5 km south of St Francis Island. The sea has etched deep bays into the island's flanks, the most prominent on the western side almost severing the island in two. The island's unusual name is of French origin, named by the Baudin expedition after Jean Baptise Masillon, Bishop of Clermont.

From the sea, Masillon's profile is dominated by spectacular orange and yellow calcarenite cliffs. These drop to just above sea level, where the supporting granite base projects from a tumble of boulders and scree. Cross-bedding of calcarenite layers is often visible in these cliffs, a relic of the time when the sandstone was windblown dunes. The gentle upper plateau rises to three peaks of similar elevation, the highest (marked by a cairn) at 76 m.

Masillon supports three distinctive vegetation types. Fringing the clifftops of cracked limestone is a dense mat of wind and salt-tolerant vegetation. Originally dominated by Nitre-bush, this habitat is now increasingly invaded by introduced African Boxthorn. Interesting species found include the distinctive Cushion-bush and the attractive pink or white flowering, low Sea-heath.

Where the soil is shallow there is a diverse flora of small heathy shrubs. Several patches cover the lower areas on the upper platform and include such species as the Common Correa, Tar-Bush and Shore Westringia.

The remainder of the island has a deep coverage of loamy sand that is typically covered by Marsh Saltbush shrubland, a habitat that supports 40000 or so Short-tailed Shearwaters during their breeding season.

Masillon is large and diverse enough to support a population of the native Bush Rat. The rat is nocturnal and prefers the cover of dense shrubs, though animals are occasionally flushed during the day, appearing as little more than a brief brown blur.

Besides shearwaters, eight other bird species were recorded, all typical of an island this size. The variety of habitats yielded some interesting reptiles including a single Master's Snake (Plate 70); this small, mainly nocturnal species was found near the island's summit under limestone. It is venomous, though not dangerous to humans. The island provides enough resources to support two moderately large skinks. The Bull Skink was observed feeding on shearwater carcasses.

Access by boat would prove difficult; the deep western bay is walled in by sheer cliffs, and rough water breaks on most sides of the coast. Enough shelter may be found under suitable conditions in the wide northern bay. Any route to the summit plateau over the crumbly, unstable scree should be attempted with care.

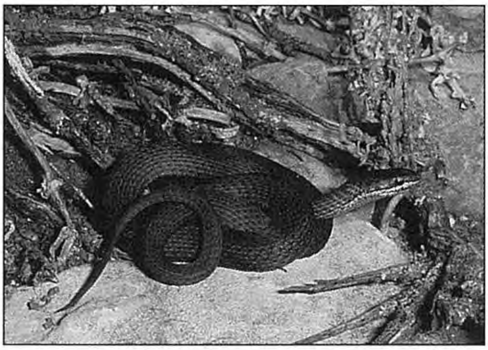


**Plate 70.** Master's Snake (*Drysdalia mastersii*) from Masillon Island. Photo S. J. Doyle

## Fenelon Island (Figure 47)

Fenelon lies 5.5 km south of St Francis Island and about 1.5 km south of its larger neighbour, Masillon. The island, named by Nicholas Baudin after Francois de Salignac de la Mothe-Fenelon, is dome-shaped, its calcarenite hummock sloping gently to a broad, protective rim of granite. The coastline is rounded, with the only cliffs by a small bay on the north-eastern side. Cradled in the otherwise jumbled boulders and scree of this bay is a small beach of golden yellow sand. With the exception of the aqua-coloured shallows washing the beach, the island drops into deep water. A few detached boulders are visible off the northern coast.

Fenelon's sloping cap rises to a height of 58 m and, perhaps because of its domed nature, has not retained the soil depths found on Masillon: instead, the surface is a patchwork of different vegetation types. Where deeper soil pockets exist, Marsh Saltbush shrubland grows; where limestone rises to the surface, the shallower soils favour shrubland dominated by Heath Bluebush, while the extensive outcroppings of shingled stone support a low, gnarled heath containing many attractive plants.

Depending on the rainfall, a variety of delicate heath flowers may be seen at most times of the year. The various species of daisy splash colour through the heath; purple, spidery *Brachycome* daisies, yellow Groundsel and Woolly Yellow-head or the dense white blooms of Shrubby Daisy-bush. Large, pendulous green and yellow bells contrast against the shiny dark green leaves of Common Correa bushes, ground-hugging Tar-Bush is flecked with scarlet from its long-throated blooms. Fenelon is one of the few islands where the unusual Leafless Cherry grows, a shrub characterised by clusters of long, spiky branches that are bright green, having taken over the role of photosynthesis from the minute, scaly leaves. However, the true botanical gem of Fenelon lies on the highest ground, near the rocky summit. Sheltering among the heath and little more than 50 cm high is a stand of wind-gnarled eucalypts (Plate 71). These 'trees' are the only eucalypts to be found in the St Francis Group and their persistence on this far outpost is a mystery. The stand is doubtless the last remains of a population stranded by the island's initial isolation more than 9000 years ago. As there was no evidence of these trees ever having flowered or fruited, their possible age is a humbling thought.

**Plate 71.** The stand of eucalypts on Fenelon Island.
Photo R. B. Jenkins

The attractive seclusion of the small beach is appreciated by a colony of Australian Sea-lions. A total of 69 animals was counted, including very young pups, confirming the locality as a breeding colony: a 1990 survey found 21 pups (Gales, Shaughnessy and Dennis, 1994). Favouring more rugged isolation, a small colony of New Zealand Fur-seals claim the granite headland on the southern side of the beach.

When compared with nearby Masillon, Fenelon's bird and reptile populations tend to reflect its shallower soils and more dominant heath. Not facing overwhelming competition from deep burrowing shearwaters, the dainty White-faced Storm-petrel is common, the thin soils more than sufficient for this species' many shallow burrows. An abundance of loose limestone shingles shelters a variety of skinks and geckos and the Master's Snake; the diversity of reptiles is further boosted by sand-adapted species, though these are limited in their distribution by the relative scarcity of deeper soil pockets.

Fenelon is one of the most attractive islands in the St Francis Group. Its splits and crevasses, fissuring the granite fringe, produce spectacular blowholes. The plateau not only supports a diverse and attractive heath, but also provides a pleasant respite from the stumbling falls, cuts and bruises that must be faced during a walk through the deep soil of a 'mutton bird island'. Access is possible in the more sheltered north-eastern bay, though care should be taken to avoid disturbing sea-lions during their breeding season.

## Hart Island (Figure 47)

Hart Island (named after Captain John Hart CMG, a former Chief Secretary and Treasurer) is a small, arrow-shaped islet about 43 km from the nearest point on the mainland. This lonely, outlying member of the St Francis group has the distinction of being one of the most distant islands from the mainland in South Australia, and was one of the first to be severed by the rising ocean 10800 years ago.

Hart was probably never a large island; small size, long isolation and ocean exposure have reduced it to a stump of worn rock. The island is composed of crystalline volcanic and granitic rocks of a similar type to those found on the north-western end of St Francis. The surface is patterned with intruded dykes of a younger, dark volcanic rock; the largest, up to 3 m wide, runs almost the entire length of the island. A large vagrant 'xenolith' of pink granite is embedded in volcanic rocks at the northern end. If Hart ever supported a calcarenite cap, the sea has left no evidence of it.

Hart is a permanent residence for few species; stagnant seawater pools near the 20 m high summit are testimony to the extreme conditions. The only vegetation present is some small patches of Round-leaved Pigface, a dwarf species, growing in cracks on the more sheltered eastern side of the summit.

The island is a well-used roosting site for birds, with a flock of about 600 Crested Terns dominating the species recorded. Most of the rocks are stained white with guano, indicating Hart's importance as a roosting area. Though a pair of Silver Gulls and three chicks were sighted, it is doubtful whether the island is sheltered enough to provide a major seabird breeding site. A few sea-lions were basking on rocks at the north-western tip.

The summit of Hart was examined as a possible site for an automatic NAVAID, but construction did not proceed.

A helicopter is the only feasible way of visiting this island.

## Cannan Reefs

This reef (named after Mr Cannan, Assistant Government Surveyor, who surveyed Streaky Bay Harbour) is almost as remote as Hart Island, lying 10 km east of that point. The only rock above water is about 8 m high and is washed bare.

A roosting place for birds and seals in calmer weather, Cannan Reefs may provide a glimpse of Hart Island thousands of years in the future.

## Lacy Island (Figure 47)

The Lacy group (named by Matthew Flinders on 3 February 1802 after Mr Lacy, one of the crew of the *Investigator*) lies 12 km north-west of St Francis Island and 19 km south-east from Rocky Point on the mainland. The group consists of one large island with a small islet and a cluster of submerged and drying rocks 3.5 km to the north.

The main island is, in many ways, similar to Fenelon. Unlike the flatter profile of nearby Evans Island, Lacy's underlying granite supports a domed bed of calcarenite. The granite fringe has been worn into small inlets and coves that give the island an irregular shape; some of the indentations are linked to gentle valleys, almost like drainage lines, that crease the rounded calcarenite cap.

The topographical variety is reflected in the complexity of the vegetation. Lacy's predominantly thin soil supports a low heath containing a relatively high diversity of species. Heath Bluebush shrubland occurs in areas with less outcropping limestone, while in deeper soil pockets of the valleys are dense shrublands of Marsh Saltbush and Nitre-bush. Most of the 48 plant species found on Lacy occur in the heath; the survey team had only previously found species such as Dryland Tea-tree, Black-anther Flax Lily, Sheep Bush, Climbing Lignum and Porcupine Grass on St Francis Island. The spiky Ridged Ground-berry and the wiry Slender Dodder-laurel were not found on any other islands in the St Francis group.

The thicker shrubs have also aided the survival (its presence confirmed by overnight trapping) of the Bush Rat. Birds are fairly typical of an island of this size: Short-tailed Shearwater burrows are concentrated in the valleys where the soil is deep enough; raptors (two species were sighted) hunt overhead and Rock Parrots and Singing Honeyeaters chatter in the heath. The variety of habitats, including a greater than usual area of shingly limestone, offers enough food and refuge for a surprisingly high number of reptile species; eight species were found, including three types of geckos and five skinks, providing prey for a pair of Australian Kestrels.

Landing on the main island by boat may be possible if the swell is low and a sheltered cove can be found. It would pay to keep in mind the Arnold family's misfortune when they attempted to graze sheep on Lacy: 100 sheep were landed there in the 1914 drought, but the swell was too high to get them off and all died over the hot summer months.

## Evans Island (Figure 49)

Evans Island (named by Flinders after Thomas Evans, a midshipman, on 8 February 1802), 17 km south of Point Peter on the mainland, and about 8.5 km east-north-east of Lacy, is as much a perfect example of a 'plateau' island form as Lacy is of the 'dome' form. Both are similar in their geological structure, with Evans (at 141 ha) slightly larger than Lacy (121 ha).

The calcarenite layer on Evans is much thicker. Away from the coast it is undulating beneath a deep blanket of soil, but small, rocky hills appear, the highest 37 m. At the coast the calcarenite drops steeply to a broad granite fringe; this transition is divided by jumbled boulders of both rock types, the harder granite weathering to more rounded forms in contrast to the jagged limestone and sandstone. Where the calcarenite is thicker the sea has carved out the underlying sandstone, leaving a limestone shell to form extensive overhangs and caves that are often quite deep.

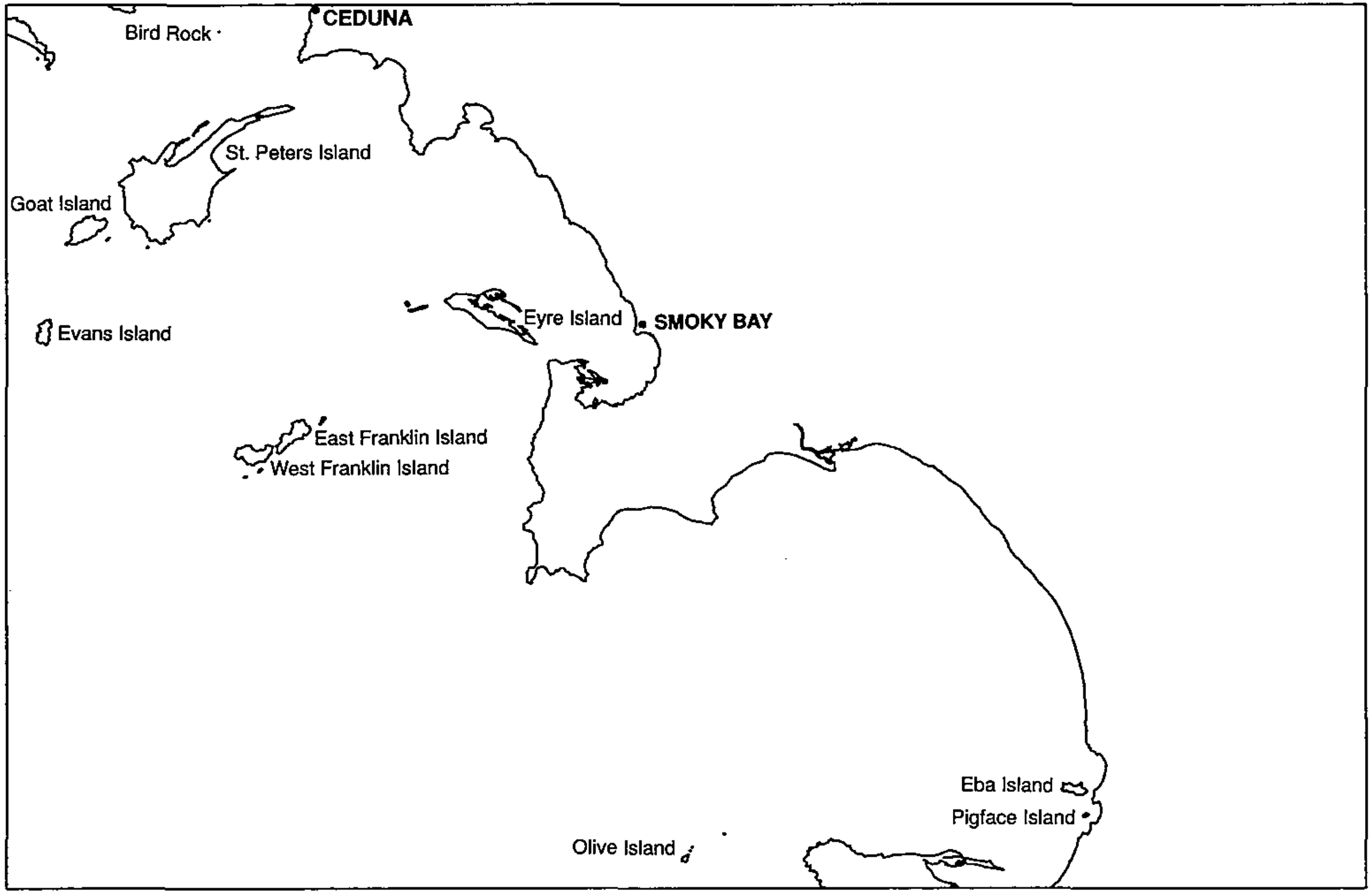



**Figure 49.** Map of Nuyts Archipelago.

The island is dominated by one vegetation type, though the rocky rises and the coastal strip provide a little variety. The upper plateau has deep soil that supports a dense, tall chenopod shrubland dominated by Marsh Saltbush. Add to this habitat 30000 or so Short-tailed Shearwaters digging a calculated 300 burrows per hectare and a hot April day, and the experience matches that described by Matthew Flinders when traversing similar habitat on St Francis Island:

> I found the surface of the island, where it was sandy and produced small shrubs, to be full of ... burrows ... The heat was, indeed, such as to make walking a great fatigue; and this was augmented by frequently sinking into the bird-holes and falling upon the sand (Flinders, 1814).

The island does contain a variety of other birds, perhaps aided by the proximity of St Peter Island, a stepping stone to the mainland. The survey's first sightings of Stubble Quail were recorded here, and the first sighting outside St Francis of Banded Landrails. A total of 16 bird species was noted.

Six species of reptiles were found, a balance of sand and rock-favouring types. Mammals were represented by two Australian Sea-lions basking on the granite platform.

Evans' highest point is crowned by a 3 m high lighthouse and a helipad. The light was once serviced by fixed-wing aircraft, and the remains of the landing strip (with an old harrow rusting nearby) run to the north of the light. The battle to maintain the strip against the onslaught of shearwaters was abandoned, and a helicopter is now used.

Sheltered access is usually possible in the small bay intruding into the eastern side of the northernmost tip.

## Franklin Islands (Figure 49)

These two islands, named by Flinders on 3 February 1802 after midshipman John Franklin, lie roughly 15 km from the mainland and 13 km east-south-east of Evans Island.

Both are of the plateau form, with a thick, gently undulating calcarenite mantle that drops steeply as scree slopes and cliffs to a massive granite platform along the coastal rim. Geologically and biologically the islands are virtually twins, joined by a ribbon of white sand that dries at low tide.

Superficially, both islands appear to differ little from others of similar form. Most of the western island is blanketed in a pale orange, loamy sand broken only by a few limestone ridges that cut across the upper platform at intervals. On most islands this soil configuration would carry Marsh Saltbush shrubland, but on both East and West Franklin Islands large, sprawling Nitre-bushes have assumed dominance. This change in dominance has not affected the presence of Short-tailed Shearwaters, which have honeycombed every available metre of deep soil with burrows. A small area of deep white sand dunes with characteristic vegetation cover lie on the north-eastern corner of West Franklin Island, near the sand spit.

East Franklin Island in general seems to retain a deeper, less loamy blanket of sand apparently more suited to Nitre-bush, which grows even more densely. On the sheltered northern side of each island the dissected granite fringe is buried beneath gently curving beaches of sand, surfacing only as rocky headlands. The long, sandy beach on the north-western side of East Island is backed by a strip of sand dunes with the same characteristic vegetation as on the western island dunes (Plate 72). In both cases

Coast Daisy-bush dominates, growing to 1.5 m. However, the East Island dunes include Cushion Fanflower, not found on West Island. Close scrutiny does reveal variation between the types and composition of vegetation between the two islands: to date, surveys have identified 42 species on East Island and 49 on West Island.

**Plate 72.** Spiny Rolling Grass (*Spinifex hirsutus*), West Franklin Island.
Photo P. D. Canty

It is only on examination of the lists of vertebrates—in particular the mammals—that the important assets of these islands become apparent. The islands harbour not only colonies of temperate relict species such as the Southern Brown Bandicoot and the Black Tiger Snake, but the world's last known natural population of the Greater Stick-nest Rat (see Chapter 2). This rabbit-sized, large-eyed rat, unlike some of its more aggressive relatives, is quite docile. The distinctive mounds of woven sticks in which the animal normally shelters are not as prominent on the Franklin Islands as they once were over its former range on the mainland: instead, the island populations seem more satisfied with the protection of overhanging rock ledges, only a few rudimentary stick-nests ever having been built. In the 1980s the islands were the scene of intensive scientific research when SANPWS conducted research into the biology of the Greater Stick-nest Rat, and the South Australian Museum investigated the evolution of island reptiles such as the Black Tiger Snake.

The unusual mammal fauna of these islands is complemented by a diverse bird population, the survey recording 28 species; notable sightings included an Osprey, either a Peregrine or a Little Falcon, and a variable population of Barn Owls. Both islands support an abundant population of Black Tiger Snakes, which grow to extremely large dimensions, reflecting the variety of prey present. Other reptiles include two species of gecko and four species of skink. There are two small islets off the south and north-east ends of the Franklin Islands and a survey in 1990 found breeding colonies of Australian Sea-lions on both, with 95 and 46 pups respectively (Gales, Shaughnessy and Dennis, 1994).

During the sealing era Franklin Island was the scene of a tragedy that left the graves of two men, one identified as an ex-convict who took refuge on Franklin Island. H.J. Finnis describes how a note in a bottle was found in 1848 near some human bones; still alive and sitting nearby was the man's faithful dog. The pathetic tale contained in the note described how several men, not including the note's author, went to abduct an Aboriginal woman from the mainland. However, during the excursion one man was possibly killed and the author's companion was speared in the hand. This man, 'Cape Jack', and the author of the note took to their boat, possibly to await being collected by a whaling vessel:

> We ... over to Franklin's Island, thinking we should see the vessel in sight when she came. Cape Jack's hand as been very bad since we cam. On Satterday morning about 4 o'clock hid ... being two nights I don't no wither the morti cramp inside. I buried him as

> well as i could and he is now in heaven, God Bless him. He has left me and the poor dog by our two selfs. I hop will send vessel or a boat to save us from diing here. Remember me to ...

The Franklin Islands were incorporated into the pastoral lease of St Francis, and were used as bonus grazing land for sheep during good seasons. The small, derelict timber-framed galvanised iron hut on the West Island (Plate 73) is possibly a relic of the island's agricultural past. A square cast-iron water tank lies rusting nearby, along with the remains of a post and wire fence. There is a broken stone and cement wall of a water catchment on the sloping granite fringe, and a stone cairn has been constructed on the cliff at the eastern end of the northern beach. There are no obvious relics of human activity on the East Island.

Why these two fairly typical islands retain such an important diversity of animal species is difficult to explain. Isolation, proximity to the mainland, variation in vegetation composition and sheer luck may all be contributing factors.

Both islands are part of the Nuyts Archipelago Conservation Park and have been declared Prohibited Areas to protect the Stick-nest Rat population. Permission to land can only be granted by the District Ranger, DENR.

**Plate 73.** The old hut and newer research shed on West Franklin Island.
Photo A. C. Robinson

## St Peter Island

St Peter (Figure 50) is the largest member of Nuyts Archipelago, and was named in 1627 by Pieter Nuyts after his patron saint. Separated from the mainland by five km of water at the closest point, St Peter lies in far more shallow depths than most islands in the group. Because of the island's 3439 ha size, its vegetation is less affected by the sea and is more closely aligned to that of the nearby mainland.

The supporting granite base is visible along the more exposed southern face, disappearing beneath a bed of calcarenite that forms cliffs along this coast and then covers most of the surface in gently undulating layers. The island's highest point, 44 m high Mount Younghusband, lies at the tip of the long eastern spit. The comet-like shape of the island is an artefact of local tide and wave flows, the currents trailing wave-worn sand in a long tail of sandbars that flow from the north-eastern side. Eroded deposits have also created two additional island habitats: where sandy beaches have formed on more sheltered sections of coast, the wind has overlaid the calcarenite with sand dunes; and in the most sheltered areas, fine silts have been deposited in sufficient quantities to support flourishing mangrove swamps.

The size, accessibility and vegetation of St Peter made the island suitable for agriculture and it was taken up under pastoral lease in 1859 by well-known Adelaide figure Robert Barr Smith. The island was leased by him until 1888, in partnership for some of this time with W.R. Swan. The syndicate also held land on the mainland and for some time on the St Francis Group.

In 1888 the island was allotted for sale and was taken up under lease by William Hosken, a stockholder originally of Cygnet River, Kangaroo Island. Hosken

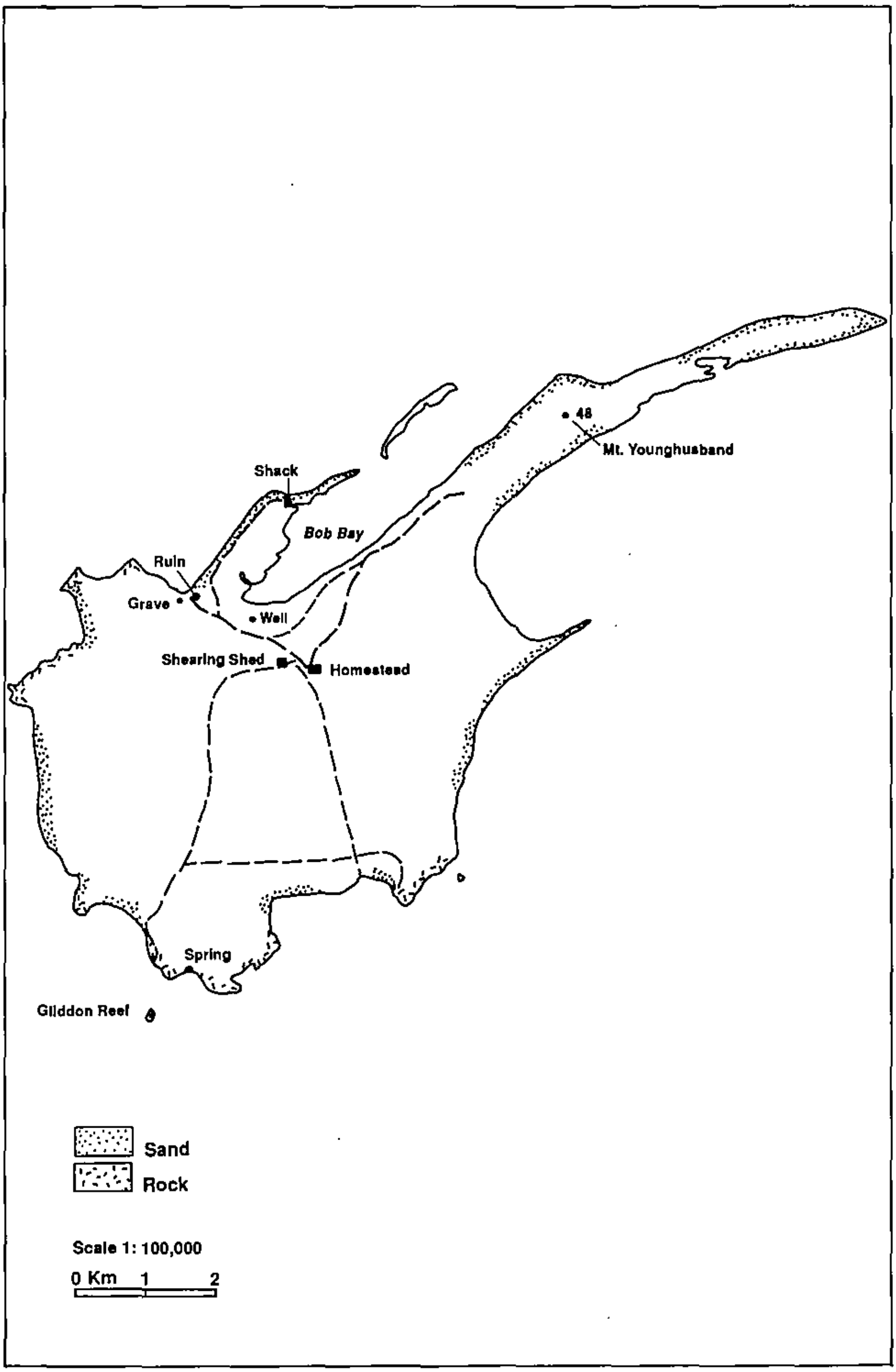



Figure 50. Map of St Peter Island.

also took up property at Warranda on Eyre Peninsula, but had problems there in finding water and had to reduce stock numbers:

> However, he extended his enterprise to St. Peter Island nearly opposite to Laura Bay. There is an abundance of water, good grain and bush on the island that Mr. Hosken stocked with up to 3000 sheep. He started with 500 head, which were taken over from the Peninsula in a big barge he built for the purpose (Cockburn, 1925–27).

Hosken may also have found the island desirable for a sheep station, as he experienced problems with Aboriginal people stealing stores from his shepherds at Warranda, and with wild dogs killing sheep. The island sheep station on St Peter was probably also run in association with nearby small islands grazed in spring.

Pastoral Lease No. 134 shows that in 1893 the occupiers of the island were Luke and John Henry Hosken, possibly sons of William. On the death of John Henry Hosken in 1895 the estate was transferred to Elizabeth Hosken, who was resident on the island. A stone cairn on St Peter is believed to mark a grave of a member of the Hosken family.

The next lessees of the island were James and Alfred Tainsh, listed as Master Mariners of Port Adelaide, and William Tainsh, a farmer of Denial Bay. The lease was taken up in 1902 and the Tainsh family, which combined pastoral and sea trading interests, was possibly associated with the island until 1916. Alfred Tainsh lived on the island until about 1909. The Tainsh family operated a wooden schooner, *John and May*, built in 1851, which may have traded between Port Adelaide and Thevenard. Though it is uncertain if she was wrecked on the island or just left when she fell into disrepair, the wreck of the *John and May* was visible for many years at the foot of Mount Younghusband on St Peter.

Subsequent lessees included William and Jean Clarke of Murat Bay (1929–35), Sander Hansen of Ceduna (1935–42), Hartley Thiselton of Denial Bay (1942–70) and Murray Collins and John Nicholls, both of Ceduna (1970).

In 1961 an inspection of the island by Department of Lands officers revealed that the pastoral operation was experiencing difficulties. Nine hundred sheep being run were in poor condition, possibly due to a poor season. About five years earlier there had been some attempts at cultivation, but these were unsuccessful. A major component of the pastoral practice was to burn off thicker vegetation every three to four years to create feed, and there was much evidence of this. There was also an extremely limited water supply, with one natural spring on the southern coast and a well. The water was of poor quality and limited quantity. However, the improvements—a shearing shed, a house of seven rooms and fencing—were generally in good order. Shipping of stock was carried out from the beach.

In 1977 the inspector's report revealed a different picture, perhaps relating to better seasons. The lessee at this time was J.E. Nicholls of Ceduna, and his stock was in strong store condition.

Until 1987 St Peter—the only island in the Nuyts Archipelago still used for sheep grazing — was leased by Mr and Mrs G.A. Williams of Lucindale. It was then purchased by SANPWS, and dedicated as an addition to Nuyts Archipelago Conservation Park on 14 January 1988.

Much of the vegetation of St Peter has been severely modified to favour the growth of open, introduced grassland. There are six major vegetation types, five dominated by native species and the sixth covering the cleared introduced grassland that forms the most extensive habitat. The remaining natural vegetation is dominated by a tall shrubland of Native Juniper, which favours areas of shallower soil. The shrubland has a high diversity of species, including several remnant Kangaroo Island White Mallee trees, indicating that much of the island may originally have supported mallee vegetation.

The effects of agriculture and the introduction of several alien animal species have doubtless caused some impact on resident animal populations. When Flinders visited the island in 1802 four bettongs were captured but, probably due to similar circumstances to those affecting the original St Francis population, the animals became extinct here. The Tammar Wallaby was reported here by early navigators; these have also suffered the bettongs' fate. Baudin's expedition mentioned that 'Short-tailed Opossums' occurred on St Peter Island, and the discovery of bones of Brush-tailed Possums in 1989 has confirmed this. Other, rather more surprising bone material discovered included a jaw fragment thought to be from a Black-footed Rock-wallaby.

Two of the snakes on St Peter, the Common Death Adder and the Black Tiger Snake, were seen as a threat by early pastoralists. One owner undertook biological control by paying Aboriginal people to capture Sand Goannas from the mainland; these were then released on the island and seem to have had a marked impact on the snakes. Only one Common Death Adder was seen during the survey and even in the Short-tailed Shearwater colony tiger snakes are rarely seen. The goannas, however, are now quite common. House mice were another successful introduction, becoming established during the early stages of settlement. An absence of mice was noted during the 1970s, but a recent plague on the mainland has re-invaded the island and it once again has a healthy population.

As part of the SANPWS program to establish additional populations of selected endangered species, St Peter Island was chosen for the reintroduction of Brush-tailed Bettongs. Late in 1989, 113 bettongs were released on the island and have been monitored regularly since. To date, the bettongs have successfully colonised the entire island, and tracks and signs of digging are readily seen. Following this success 101 Greater Stick-nest Rats were released on St Peter in mid-1993, and also appear to have established themselves successfully (see Chapter 2).

The island supports a profuse and varied bird population. The range of coastal habitats—in particular the mangrove and samphire swamps, and the extensive sand banks (Plate 74) — attracts many waders and other waterbirds.

**Plate 74.** Aerial view of the main mangrove area of St Peter Island.
Photo P. D. Canty

St Peter is an example of an island that, because of the calmer, shallow waters surrounding it, is not entirely subjected to the erosion suffered by ocean islands. Though the original calcarenite on granite is being steadily eaten away on the most exposed face, new habitats are being created on the sheltered side by re-deposition of eroded sand. The changes are frequently noticeable in human time scales: the island's old homestead once stood inland, photographs taken in 1914 showing no sign of the coast, but the house now lies in ruins on a beach that has carved out 1 km of land.

Access to the island can be best gained via the small beach fringing the large, north-western mangrove patch. From the beach a track runs inland to the present homestead.

## Goat Island (Figure 49)

Goat Island was once a bulbous headland extending from St Peter Island. The island, lying to the south-west of St Peter, is now separated by 2 km, with a barely submerged reef between the two the only evidence remaining of that link.

The geology is of the usual calcarenite on granite formation. The granite base, perhaps due to a calmer ocean, is broad and rounded. The calcarenite layer is thick and gently undulating to a maximum depth of 59 m, though steep cliffs mark the transition to granite on the more exposed south face. A sandy beach clings to the north-eastern tip, protected by the shallow reef water. A low, rocky reef to the south of the eastern tip dries at low water.

Geologically and biologically, Goat Island is very similar to Evans. The upper platform is almost entirely blanketed in deep soil, with only occasional hilly outcrops of limestone. A low Nitre-bush shrubland is confined to the rises, leaving the remainder of the island covered by Marsh Saltbush shrubland. The other species to exploit such a habitat successfully is, of course, the Short-tailed Shearwater. Though Goat Island (303 ha) is double the size of Evans, the available shearwater habitat is four times as large, supporting 94000 birds against 30000 on Evans. With such disturbance from burrowing, the total species list of only 11 plants is not surprising.

Fifteen other birds species were recorded here, including a single Brown Falcon; more mobile species would certainly move between Goat and St Peter. The dense chenopod shrubland shelters a population of the Bush Rat, though none were seen during the most recent survey. Only three species of skink were found.

The name of the island may have originated from the past presence of goats; perhaps, as was common practice, they were left to run wild as emergency food for stranded sailors, but no documented evidence of their presence can be found.

Interesting features include the occurrence of an unusual granitic rock containing pyrite (fool's gold) and red garnet, a gemstone; and small stands of the Weeping Pittosporum, with its attractive drooping foliage, cream flowers and small orange fruits. Between Goat and St Peter Island, the hull of the Greek grain ship *Eleni K* is visible. Wrecked in 1966 while on her way to Port Lincoln from Thevenard, the badly loaded boat was snapped in two by a large wave. All on board reached safety.

Access to the island can be gained on the sheltered northernmost side, though water depth over the reef section should be checked.

## Bird Rock (Figure 49)

Lying just north of the main Yatala Channel that guides ships into Thevenard harbour, Bird Rock is awash at high water. It consists of a ring of granite boulders with a small area of white sand on its leeward side. It formerly supported a lighthouse 7.5 m above the water, but the shipping channel is now well marked by a string of beacons. Large numbers of Cormorants, Silver Gulls and Crested Terns and a few Australian Pelicans regularly roost on the rocks and sand.

## Eyre Island (Figure 49)

Eyre Island lies about 2.5 km north-west of Cape Missiessy and 8 km west of Smoky Bay, and was named after explorer Edward John Eyre. Though large, the island shows little variation in its basic structure of sand with no visible rock outcropping of any type. Such a formation poses some interesting theories regarding the evolution of this island type. Eyre may have once had a rock-based structure that has since been completely eroded to form the present island, or it may have been formed from a permanent sandbank.

Despite its uniform appearance, Eyre supports three main habitat types. Extending from the western tip, two tongues of windblown sand form a V-shaped barrier of longitudinal dunes. The most extensive dune fields line the full length of the more exposed southern side. The greatest elevation on the island is the tall foredune, reaching 8 m, that runs parallel to the sandy beach on this side. The dunes are stabilised by a dense heath of predominantly tall shrubs such as Coast Daisy-bush. Species diversity is high; many species only previously found in shallow, rocky soils on other islands also occur here.

The remainder of the island lies very close to sea level and is inundated to varying degrees. The shelter provided by the dune barrier has allowed fine silt to build up in deep layers. Depending on the frequency of inundation, the silt supports two vegetation types; the drier inland area is clothed in samphire-dominated saltmarsh, while the outer fringe (and where the many snaking channels penetrate) is flooded twice daily by the incoming tide. These conditions are perfect for colonisation by the Grey Mangrove, which flourishes here in a dense woodland.

Mangrove swamps are among the most biologically productive ecosystems in the world, providing nourishment and shelter for bacteria, crustaceans, fish hatchlings, insects and birds in great numbers. The bird population (28 species were recorded) on Eyre is further boosted by the extensive sandbars that attract waders and shore feeders, and the coastal heath that caters for landbirds.

Mammals and reptiles are confined to the drier dune heathland. The Bush Rat has been observed at night foraging among stranded seaweed heaps on the western beaches, and may even dig burrow systems and live in the deeper piles. Two species of burrowing reptiles were found, and two species of skinks beneath driftwood. The Common Death Adder (Plate 75) is probably also common on the island, but its superb camouflage means it is rarely seen.

Depending on the tide, a visitor to Eyre Island could gain quite different impressions; patience and observation will be rewarded with an experience of island ecology perhaps more intimate than on the rocky islands further out to sea.

**Plate 75.** The Common Death Adder (*Acanthophis antarcticus*). Photo A. C. Robinson

## Olive Island (Figure 49)

Olive Island (named by Flinders after John Olive, a clerk on the *Investigator*, on 5 February 1802) is a cluster of the more resistant fragments of a rise once extending from the present Cape Bauer on the mainland. About 6000 years ago the higher outer tip of this point was isolated by rising sea levels; the small islet and a cluster of reefs are all that remain today, 6 km from the Cape.

The islet base and nearby reefs are composed of erosion-resistant, non-foliated granite, and the island retains a calcarenite cap worn to a mesa-like formation 10–17 m thick; the highest point on the island is 25 m. The north-eastern tip of the island has been pierced by a narrow inlet, and the sheltering granite point cradles a small sandy beach. With care, a dinghy could be landed here.

Olive's vegetation is simple, limited not only by salt and wind exposure, but also stressed by disturbance from a large sea-lion colony. The deeper patches of sand, mainly on the summit plateau, support a low shrubland of Marsh Saltbush with scattered clumps of Nitre-bush. Only 11 plant species were collected.

The island is a refuge and breeding colony for a large population of Australian Sea-lions: 155 animals were counted during the 1982 survey basking on the granite fringe or climbing with surprising agility to the heights of the calcarenite platform, and a survey in 1990 found 50 adults and 28 pups here (Gales, Shaughnessy and Dennis, 1994). From the air, well-worn paths can be seen winding to the summit or beneath the many sheltered limestone ledges.

Four bird species were sighted during the survey, though the only permanent residents are probably Rock Parrots, the other species being more wide-ranging in their movements. The loose limestone shingles provide suitable habitat for the Marbled Gecko and Four-toed Earless Skink, and sand and shrubland support a population of the small, swift Dwarf Skink.

Chapter

5

# FAR WEST COAST BAY ISLANDS

The remaining islands in the Far West section lie close to the mainland, and many were only isolated by the sea about 6000 years ago. Their youth, combined with the relative shelter of their localities, has protected their geology and biology from the more extreme environment of the outer islands. This can be seen in their less dramatic, gently worn coastlines and their close similarities to the nearby mainland in flora and fauna. Here, small islands are capable of supporting tall shrublands and mallee trees; a few km further out to sea, their vegetation is little more than a spray-blasted herbfield.

In the most protected coastal environments, such as the placid shallows encircled by Venus Bay, some islands are not severed pieces of mainland but formations that have been created where no dry land existed earlier. The conditions for the formation of such islands are rare in South Australia: the water must be shallow and protected enough to allow strong tidal flows, but lack powerful wave action. Such tidal flows carry large amounts of suspended sand particles that are lifted and deposited in vast sheets of undulating bars and channels. These features are rarely permanent, shifting and changing with each tide. Where a 'dead' spot exists in the flow—caused perhaps by the shape of the bay or a nearby headland—sand will often lie for such periods that a very large sandbar will grow, perhaps eventually becoming an island.

## Streaky Bay Islands

### Eba and Pigface Islands (Figure 49)

Within the sweeping arc of Streaky Bay are two rocky islets. Close to the shore towards the bay's southern curve, Eba (121 ha) is the larger, lying about 4 km south of Perlubie Hill. Pigface lies a further 1.5 km to the south and at 2 ha is little more than a large rock. Eba may have been named after a clerk in the South Australian Department of Lands, or after an acquaintance of Governor MacDonnell: Pigface was most likely named during the flowering season of the fleshy mat plants of the same name. Commonly found carpeting rocky coastal shores, the plant's dense blooms of almost iridescent pink are certainly eye-catching and, at times, perhaps the island's most distinctive feature.

Both islands are composed entirely of calcarenite, often overlaid with a more resistant limestone capping. Any underlying granite is deeply buried. Instead of a protective granite rim, the more exposed south-western sides meet the sea abruptly, dropping away in an almost unbroken wall. Where the waves slap, the wall is undercut and the limestone is carved into blowholes, scalloped ridges and blades of jagged rock.

The more protected northern coastlines, particularly on Eba, are less hostile. Here the calcarenite bed is softened by sand, exposed rock appearing only as headlands between small sandy coves. Wind has further piled the sand into low dunes that billow inland from the coast, on Eba adding some relief to the gently undulating platform that rises to a height of 26 m. In addition to the dunes, Eba has extensive patches of deep, loamy soil, interrupted only by occasional outcrops of sheet limestone where it thins to meet the rocky coastal fringe.

Eba's closeness to the mainland and its connecting sandbar attracted agriculture. The deep soil flats were cleared of vegetation and cultivated; a small homestead and yards were built from island limestone; and runoff from infrequent rains was collected in underground catchment tanks carved into the solid bedrock, fed by radiating grooves chipped along the sheets of outcropping limestone.

These efforts were not rewarded; the farm now lies in ruins, and old fence lines mark some of the paddocks that are now being reclaimed by native vegetation. Introduced pasture grasses, garden plants and planted eucalypts are the only living remains. Ploughs, harrows and other implements are scattered over the island, a rusting testament to over-optimistic endeavour.

The island's structure is reflected in the three main vegetation types. The most disturbed areas, where clearing and cultivation occurred, are now open grassland of predominantly introduced grasses and herbs. Stubble Quails favour such habitats and several were flushed during the survey. The deep, sandy soil combined with the added bonus of building rubble sheltered two Peninsula Brown Snakes beneath a sheet of corrugated iron and, though none were sighted, the possible presence of the introduced house mouse in the thick grasses would provide easy prey and a major food source for the snakes.

The grassland is being slowly reclaimed by a low shrubland dominated by Umbrella Bush. Where the dunes rise, the wattle gives way to Coast Daisy-bush and a dense cover of more familiar coastal species. The shrublands shelter several species of landbirds including Singing Honeyeaters, Grey Butcherbirds and Black-faced Cuckoo-shrikes.

Closeness to the mainland and the shelter afforded by Streaky Bay reduce the dominance of plants adapted to excesses of wind and salt spray. A narrow strip favouring species in this category fringes the top of the more exposed ledge formations. So sheltered are the ledges that the mazes of blowholes, cracks and overhangs harbour a large population of feral pigeons, which leave both islands at daybreak to feed on grain from crops on the mainland, returning at night to roost in safety. The birds are not only agricultural nuisances, but also displace native birds from potential roosts and nesting sites.

Another introduced competitor is the fox, using the connecting sandbar that dries at low tide to come and go at will. The presence of these efficient predators has certainly resulted in the absence of seabird breeding colonies, such as those on more isolated Pigface Island.

Pigface is more simple in structure and range of inhabitants. Similarly based on calcarenite, the island is comparable with Eba, though the gently undulating platform (which lacks the protection of inlets and headlands) drops in an abrupt rim formation along the entire circumference. The platform reaches 9 m and is characterised by a similarly varied surface of sandy soil and outcropping limestone. The wind has scoured a small sand blowout on the island's western tip.

Perhaps in an effort to extend the limited or failing resources of Eba Island, Pigface was cleared of vegetation and may have been grazed: it is dominated by an introduced grassland of similar composition to Eba, and the few surviving native plants face a long battle for reclamation.

A submerged reef hints at a previous connection to the mainland but it lies beyond the reach of the tide, unlike Eba's sandbar. The isolation and protection afforded by the deeper water are apparent in the willingness of several bird species to establish breeding colonies here, where none are found on Eba. Silver Gulls and Little Pied Cormorants roost in large numbers and, though no breeding activity was noted at the time of the survey there are many old nests, especially near the blowout area. Unfortunately, the only breeding resident—once again availing itself of the sheltered rocky rim—is the feral pigeon.

A further seven bird species were recorded, including a Banded Landrail (Plate 76), a Willy Wagtail and two other landbirds. The presence of a small flock of Little Black Cormorants, a species normally preferring inland waters, is of interest.

**Plate 76.** The Banded Landrail (*Gallirallus philippensis*). Photo A. C. Robinson

Access to these islands is rarely complicated by swells, though the smaller size of Pigface offers less protection from wind and waves. At low tide Eba can be reached on foot: if approaching the island at high tide, caution is needed to manoeuvre among the sharp fringing reefs.

## Baird Bay Islands

The elongated throat of Baird Bay includes two small islands. The larger, a 13 ha platform of sand and calcarenite, has no official name, being recorded simply as Section 181 on a cadastral map. It lies well within the shelter of land and rarely disturbed shallows. At the mouth of the bay, 8 ha Jones Island is a remnant of a calcarenite wall which, until it was breached, held the sea from a low inland valley. Absorbing the full force of ocean swells, its south-eastern face is marked by sharp cliffs and boiling foam. Reefs cause a broken arc of breakers to extend either side of the island to the towering cliffs of the mainland. The island was named after J.W. Jones, secretary to the Commissioner of Public Works.

### Unnamed Island (Figure 51)

The nature of the subdued waters fringing the unnamed island is reflected in its structure and inhabitants. Sandy shallows wash a ribbon of beach that all but encircles the island. The calcarenite platform rises from this narrow beach as a slope of compacted scree, dropping abruptly to the sea only as a ledge along a small section of the most exposed southerly coast. A tongue of sand reaches from a small point on the eastern side of the bay and dries to a connecting link at extreme low tide. A small stone hut has been built into a section of coastal cliff and was possibly built and used by fishermen, and a limestone chimney is all that remains of a small house that once stood on the island.

During 1979 the island was surveyed as part of a pilot study to determine the feasibility of introducing the Brush-tailed Bettong. Two main vegetation types were found, a low shrubland dominated by Umbrella Bush and a more open grassland covering the platform in roughly equal proportions. Thirty-nine plant species were identified; a rich diversity of shrubs including resinous Sticky Hop-bush, aromatic clumps of Shore Westringia and herbs such as the eye-catching, deep blue flowers of the Black-anther Flax Lily and Australian Hollyhock, conspicuous with its large lilac, pink or white blooms. After good rains the grasses grow tall and luxuriant; visually, the elegant, feathery Spear-grasses dominate, though introduced species such as Bearded Oat have gained a strong foothold.

Initial doubts were expressed as to the island's suitability for a bettong colony, mainly because predators such as foxes could cross the sandbar from the mainland. Ten bettongs were eventually released in 1982 after earlier trials on an island in nearby Venus Bay proved successful. The bettongs maintained a population of more than 20 animals until 1994, when a fox reached the island and killed them all.

Eight species of birds have been recorded from the island, including a single Osprey which, though hunting here, would probably seek a more inaccessible location to nest; and a Banded Landrail, a cryptic, ground-favouring bird usually seen scuttling through dense, shrubby undergrowth where it forages in leaf litter for insects. In 1989 a Banded Landrail with four chicks was caught in a bettong trap, proving that this species breeds on the island. Reptiles were not noted during the two surveys, though an island of this size and habitat diversity would certainly support a variety of species.

Access to this sheltered island is not difficult.

## Jones Island (Figure 51)

In contrast to the unnamed island, the nature of Jones Island is completely dictated by the sea and salt-laden winds, which exclude all but a narrow selection of species. Those that are here thrive, taking full advantage of the isolation this type of island affords.

Three types of low shrubland predominate, each characterised by its most numerous and/or conspicuous species. Coast Daisy-bush and Nitre-bush are two such species growing in separate, recognisable patches. The third, a less common formation, is distinguished by pink-flowering Austral Stork's Bill, a member of the geranium family. Perhaps due to the effects of a fire or past sheep grazing, areas of shrubland have been opened to invasion by grasses, mainly introduced species. Large patches occur on the more sheltered north-western face. A fifth vegetation type in the most exposed areas is characterised by dense mats of succulent Round-leaved Pigface. Common Iceplant is also well established in these exposed areas.

Distance from the mainland and turbulent waters offer security to a small population of Australian Sea-lions, and a 1990 survey counted five adults and five pups (Gales et al. 1994). The animals haul themselves out on the less elevated south-western tip of the island to bask among Nitre-bushes. Well-worn paths radiate from the easiest landing points to favoured sites, and are especially visible from the air. Eight species of birds were seen, the most important being a small pelican breeding colony. Pelicans are extremely sensitive to disturbance when

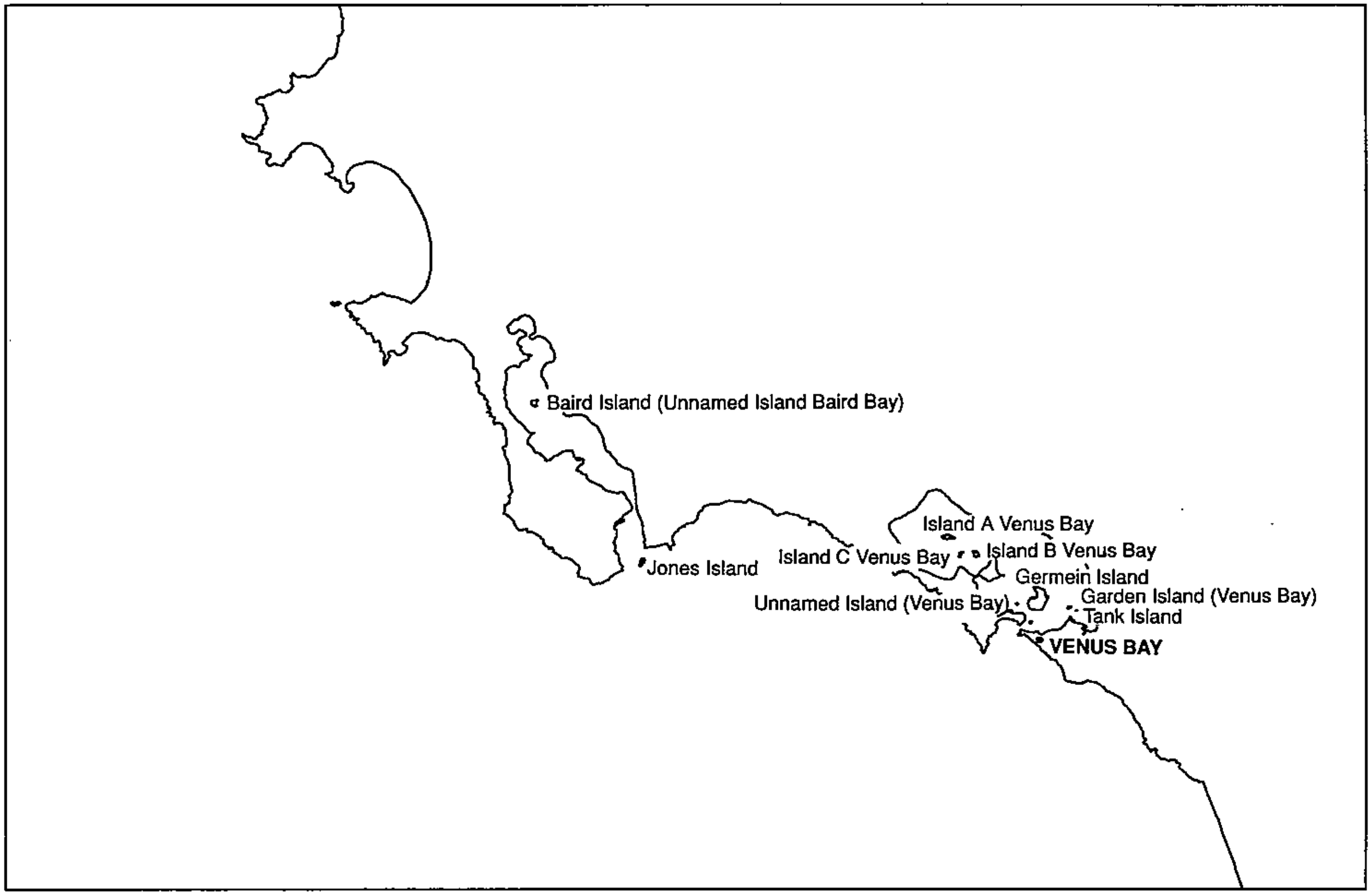



Figure 51. Map of Baird Bay and Venus Bay Islands

rearing chicks, so nesting sites are restricted to only a few locations, usually on isolated but relatively sheltered islands. Large flocks of local seabirds use the island as a roosting place and of the few landbirds encountered the Rock Parrot is most obvious, often seen flitting from shrub to shrub.

Only one species of reptile, the attractively patterned Bull Skink, was found in the time available for the survey. This swift, medium sized skink favours the denser shrublands where it shelters in conspicuous burrows. This species normally shares similar islands with species such as the Marbled Gecko and Four-toed Earless Skink, and it is likely a more thorough examination would also reveal these reptiles.

Access to Jones Island is determined by the weather. Some shelter is offered by a leeward approach, but the surge from diffracted breakers runs the entire length of this side. The lack of a beach or inlet in the calcarenite ledge calls for a relatively calm day, good timing and clever footwork to stay dry. Care should be taken to avoid disturbing the pelicans if they are nesting.

## Venus Bay Islands (Figure 51)

Spectacular cliffs tower over the narrow entrance to Venus Bay. The water is turbulent at the entrance, but inside the placid waters wash a shallow mosaic of seagrass meadows, limestone reefs, mudflats, sandbars and entwining channels. There are two groups of islands within the bay; Islands A, B and C (of the same geology as the surrounding land and created by rising water levels) and the 'sand islands', created by the action of the tides. For many life-forms, particularly marine species, the bay is a haven in which to reproduce, a nursery protecting vulnerable larvae and fry from the nearby ocean. The islands provide a breeding ground of similar importance to many species of birds, and support sensitive plants such as mangroves.

### Islands A, B and C (Figure 51)

A string of three small islands trails in the north-western bulge of Venus Bay. Their low and rounded profiles have attracted names no more imaginative than the first letters of the alphabet. Each is as old as the bay itself, being taller mounds of the underlying calcarenite bedrock characteristically blanketed in a crust of hard limestone and variable depths of sandy soil. Biologically, they all carry the scars of exploitation, the natural inhabitants severely restricted through the introduction of foreign species and agricultural pressures.

**Island A**

This 20 ha tear-shaped island is the largest in the cluster. Its shoreline has been worn to an undercut ledge that rises abruptly from the surrounding shallows. At the pointed tip, sand has mounded to form a dry beach that slopes gently to water level, then trails in a long, submerged bank. The island's upper surface retains relatively deep pockets of soil punctuated by sheets of outcropping limestone. The vulnerable limestone has been perforated by percolating rain water with solution tubes of varying diameters and depths. After rains, catchment in these hollows provides easy drinking water for wildlife and the runoff is also a bonus to plants fringing the outcrops, apparent in their more luxuriant growth and more prolonged, spectacular floral displays.

Dilapidated semicircular walls, rudely constructed from loose limestone, overlook the northern shore. These may have once been round-up yards or holding pens, presumably for sheep—though one unconfirmed story claims they were once used to round up rabbits. A few old sheep bones are the only remains to indicate either animal's presence on the island, but the reduced shrub cover and extensive patches of introduced grasses may be evidence of some form of grazing pressure.

The degraded, grassy nature of the island was one of the features that led to its choice for the first experimental introduction of Brush-tailed Bettongs (authorities did not want to interrupt a relatively undisturbed natural ecosystem) in an initial trial leading to the possible reintroduction of these rare rat kangaroos to some of their former island habitats. Contrary to the animals' apparent survival problems on the mainland, the original seven bettongs thrived, the population reaching 25 animals three years later. The most recent monitoring in 1994 revealed a population of 40 bettongs.

A major factor in the bettongs' success was doubtless the absence of direct competitors and introduced predators. The bettongs on Island A are difficult to see and to approach, often appearing as a dark blur dashing from a nearby bush. They build domed, grass-lined nests beneath shrubs, carrying nesting material with their tails, and an empty but still-warm nest is often the only confirmation of their presence.

Of the other species recorded during the preliminary survey, the White-bellied Sea-eagle and the Peninsula Brown Snake are possible predators and, while house mice had reached the island, no grazing competitor in the class of the rabbit existed. Despite the island's far from undisturbed condition, 12 species of birds have been recorded: Richard's Pipits scurry and flit nervously, maintaining a cautious distance and relying on their mottled brown camouflage to remain inconspicuous; and, taking advantage of fox-free grassland, plump Stubble Quail abound, frequently exploding into whirring flight almost beneath an unsuspecting footstep. When first visited in 1979, the sandy point hosted a small pelican breeding colony, but in subsequent years the site has been abandoned in favour of Island C. Other than the brown snakes four other reptiles have been recorded, the most interesting being the Lined Worm-lizard.

**Island B**

At 12 ha, Island B is the second largest in the group. Possibly due to some additional shelter afforded by a nearby headland, both Islands B and C have sandier coastlines, which generally soften the transition from the shore to low calcarenite platforms.

Though no living representatives were found, old rabbit bones confirm the previous presence of these animals, which must have been deliberately introduced; drought, disease or overpopulation may have caused their eventual demise. The island certainly appears to have suffered greatly under some form of adverse pressure: much of the natural vegetation has succumbed to a massive invasion of weeds, a tangle of boxthorns, burrs and grasses overwhelming the few remaining native species. Perhaps the island will gradually rejuvenate in the absence of rabbits.

A high number of bird species was seen, possibly because of the proximity of the mainland. A greater area for foraging and roosting, provided by both a sandy and rocky coastal fringe, seems to attract more coastal birds such as large flocks of roosting cormorants, gulls and both species of oystercatchers. Native landbirds such as the Singing Honeyeater and Rock Parrot compete for roosts and nesting sites with a large flock of starlings that return to the island at night, crowding in noisy groups among the protective spines of African Boxthorn bushes. The starlings also use the island's protective isolation to breed, venturing to the mainland only for raids on crops and insects.

A search for reptiles resulted in a single Marbled Gecko. Closer investigation may uncover more species, though this apparent scarcity may be a further indication of the island's condition.

**Island C**

Island C shares many features with B, though its degradation is less dramatic; possibly its smaller size—6 ha—made it less viable as a grazing resource.

The movement of wind and water in this region of the bay appears to be from west to east (apparent in the patterns of sand deposition), endowing each island in the group with a trailing sandbar on its easternmost point. This tip is possibly the most protected and offers easy access from the water to the island platform. A local population of pelicans (Plate 77) uses this island for nesting, with a deeper soil patch and a few shrubs harbouring a haphazard cluster of scratched-out hollows lined with sticks just above the sandbar. The survey found large white eggs and comically grotesque pink chicks.

**Plate 77.** Pelican (*Pelecanus conspicillatus*) chicks on Island C, Venus Bay.
Photo A. C. Robinson

Eight other bird species were recorded on the island, including another flock of starlings. An old complex of semicollapsed rabbit burrows was found in an area of deep soil and shellgrit and, though the survey made a special search for signs of rabbits, no fresh activity or animals were seen. Two specimens of Four-toed Earless Skink were collected: this species usually shares smaller islands with the Marbled Gecko, though none were discovered on this island.

Island C is easily accessible by boat, though the shallow inshore waters require a small, flat-bottomed punt for a dry landing. The pelicans should not be disturbed during the breeding season, not only for their apparent sensitivity to intrusion, but also because the fleeing adult birds leave the nests open to attack from the many gulls in the area.

## The Sand Islands (Figure 51)

### Garden Island, Germein Island, Tank Island and Unnamed Island

Behind the northern headland there is a particularly large 'shadow' of lazy water. In the bay's early history, sand-laden eddies swirled from the main current and deposited their burdens in this stagnant zone, eventually building a large island. Today, 202 ha Germein Island is by far the largest in the bay, supporting a dense cloak of vegetation and its associated animals. Reinforcing the island's importance over its diminutive companions, it escaped their undignified nomenclature, gaining a title in honour of John Germein, the Head Pilot, who landed in South Australia in 1837.

Garden Island (2 ha) and Tank and the Unnamed islands (1 ha each) have small plant assemblages. These islands were not visited during the survey, so vegetation descriptions have been derived from distant visual impressions and aerial photography. Unnamed Island is an area of fine silt and mud, barely dry, supporting a small clump of mangroves. Only a small patch of samphire marks the less inundated 'summit'. Garden and Tank Islands are a little more removed from tidal effects, providing a dryer (though still salt-dominated) platform. Hardy chenopod shrubs such as Marsh Saltbush and Nitre-bush compete for a foothold on coarser, more sandy soils compared with the fine muddy silts that dominate Unnamed Island.

The larger area of Germein provides conditions for extensive zones of different vegetation. The majority of the island is low and swampy, the lowest areas consisting of beds of glutinous mud flooded by a network of meandering channels at high tide. A mangrove woodland secures the mud beds with a network of spidery roots. On slightly higher ground lie stagnant areas of saltmarsh. The ground is wet from absorbed seawater and the sun bakes the surface mud to a crust, concentrating the seawater into glittering crystals. The slightly raised banks and flats support highly salt-tolerant Grey Samphire bushes and a few associated species such as Beaded Samphire, Austral Seablite and Round-leaved Pigface, all of which have succulent, fleshy leaves.

Germein has attained a further stage in its gradual evolution from the sea. At the southern tip and in several less extensive areas, the sand is coarser and dries more easily. Aided by the wind, a fringe of low dunes has risen slowly beyond the reach of the limiting tidal environment, providing a less demanding habitat for a far greater variety of coastal species. The main hindrances for potential colonists are secure passage across the open water and reaching the 'right' locality. At this stage in the island's development, species diversity is more restricted than for comparable areas on the mainland. The dune vegetation is dominated by Coast Daisy-bush.

Seabirds are the most obvious inhabitants of Germein Island—the only sand island surveyed—and eight species were recorded. Large numbers of oystercatchers and gulls foraged in the shallows or squabbled on the sand. A White-faced Heron waded along a mangrove channel, its stealth contrasting with the showy, pied plumage of Banded Stilts. Two species of landbirds were observed; Singing Honeyeaters restricted their territories to the dune vegetation, while insects in the swamps provided a more widespread food source for Welcome Swallows.

Though reptiles have yet to reach the island, two large mammals were surprising discoveries. The surrounding deep channels and extensive shallows have not deterred foxes or, surprisingly, Western Grey Kangaroos. A meal of seabird chicks could be sufficient motive to tempt a fox to swim from the mainland, but what might attract a kangaroo remains a mystery. Neither mammal was seen, but tracks were common; this could indicate that the island cannot support a permanent population of such large consumers, but even occasional visitors may contribute to Germein's diversity of plant species by depositing seeds in their faeces.

Access to the islands can be gained at any time, depending on tidal movements. The speed of water flow in the tidal channels and the extensive shallows should be taken into account as boating can be quite dangerous.

Chapter 6

# ISLANDS OF THE WESTERN EYRE PENINSULA

The most ancient rocks yet found in South Australia, venerable outcrops of granite and gneiss dated at 2300–2600 million years old, occur on Eyre Peninsula. They share this landscape with a wide variety of younger rock types such as granites, gneisses and metamorphosed sediments, the remains of silted seas, long vanished mountains and silenced volcanoes. Such formations, so permanent in human terms, were the temporary artefacts of a restless continent.

Only the more superficial features of the present coast were created by the current sea level; it was during this most recent geological phase that small groups of outlying coastal ranges became the formations we now see as islands. Their basic structures and component rocks are a product of the same long geological history as the mainland, from which they are separated only visually, and their recent contact with the sea has simply moulded them into sculptures that reflect their structural characteristics and ability to resist the action of waves.

The fringes of Eyre Peninsula, particularly the southern areas, also experienced widespread deposition of Bridgewater Formation calcarenite during the most recent low sea levels. Consequently, many of the older rocks were blanketed beneath deep layers, imposing coastal forms comparable with those of the far western shorelines and islands. More than other South Australian islands, the Eyre Peninsula groups contain the most visually spectacular examples of island geomorphology, due in part to their more varied geology and to the Southern Ocean, which reaches heights of fury and power rarely seen elsewhere along the coast.

The sea may not have been geologically significant, but to the many people who were seduced by the beauty and promises of wealth the islands seemed to offer, it was a formidable barrier. So difficult to reach are these islands that most experienced human contact only as lonesome platforms from which sealers and whalers hunted their fortunes, or as hosts to short-lived guano mining enterprises. Those that were opened to agriculture were generally the largest, more capable of supporting a viable farm with year-round feed, shelter and water. Some smaller islands in the calmer waters of Spencer Gulf were used for rotational grazing. Today most of the islands are preserved as National or Conservation Parks, the few still used as farms also catering for a growing tourist interest.

## The Investigator Group

After a long section of coast with only land-hugging islets, a group of true ocean islands extends almost 74 km south-west from Cape Finnis into the Great Australian Bight. Consisting of Flinders Island, Waldegrave, Topgallant, Ward and the Pearson Islands and a number of submerged rocks, this group displays features common to many Eyre Peninsula islands but combines them in awe-inspiring exhibitions of natural architecture.

## Waldegrave Islands

The Waldegrave Islands are remnants of a once more prominent Cape Finnis. The main island dominates the group, its 292 ha separated from the mainland by a 3 km passage. The remains of the bridging isthmus lie as a submerged reef connecting Cape Finnis to the island's north-eastern tip. Little Waldegrave is a 32 ha sliver of rock lying in deeper water off the main island's westernmost tip, with a submerged reef between the two islands. The most seaward remains of this formation are two detached rocks named, imaginatively, the Watchers.

**Waldegrave Island (Figure 52)**

Waldegrave was named in honour of Admiral William Waldegrave (1753–1825), third in command at the battle of St Vincent, by Flinders when he landed on the main island on 10 February 1802:

> I found the island to bear a great resemblance to the Western Isle of St Peter, in its cliffy shores, granitic basis and its super-stratum of calcerous stone; in its vegetable productions, and in the surface being much excavated by the burrows of the sooty petrel [Short-tailed Shearwater]

The mesa-like form of the island is accentuated by the contrast between the gently undulating upper platform and the steep coastal perimeter. The visible bulk of the island is a thick mantle of calcarenite covering a dome of granite, the upper surface clothed with a deep blanket of soil and the few undulations caused by a bulge in the underlying rock or embryonic dunes.

The initial rapid erosion of the outer calcarenite fringe has exposed the hard core of this old hill as a low lip, protecting to some extent the softer overlying rock from incoming breakers. The underlying granite is most apparent on the northern shoreline, remaining buried for most of the southern coast. The calcarenite is thickest along this coast, reaching a height of 37 m. It meets the sea without the shielding granite and has been eroded into soaring, undercut cliffs, arches and sea caves. In the more sheltered zones, particularly at the north-eastern tip, broad, sandy beaches have developed. Stranded beaches nestling in small coves far above normal sea levels may be artefacts of great ocean storms or relics of former higher sea levels.

Biologically, the island reflects its relatively temperate locality. Lush spring growth on a large island so close to land was irresistible to early pastoralists, and the natural vegetation was cleared over extensive areas and introduced pastures grazed by stock (leaving a legacy of exotic weeds) until Waldegrave's dedication as a Conservation Park in 1967. A large proportion of the island was little disturbed, however, and the native vegetation may reclaim its former territory. Twenty-six plant species were recorded during the survey. These occur in five distinctive groupings, two dominated by introduced pasture grasslands and by heavy infestations of African Boxthorn. The predominantly native groupings include two tall shrublands; one characterised by stands of Native Juniper, a distinctive spreading shrub with clusters of small white flowers and bluish-purple berries, and the other by aromatic Coast Daisy-bush, which tends to dominate the sandier coastal zones. On uncleared areas of limestone-based soils is a low shrubland dominated by saltbush. The ground beneath the shrubs is honeycombed with the burrows of about 88000 Short-tailed Shearwaters, which visit the island each year to breed.

Waldegrave supports a population of Cape Barren Geese and, after the Sir Joseph Banks Group, it is the second most important breeding area for this species in

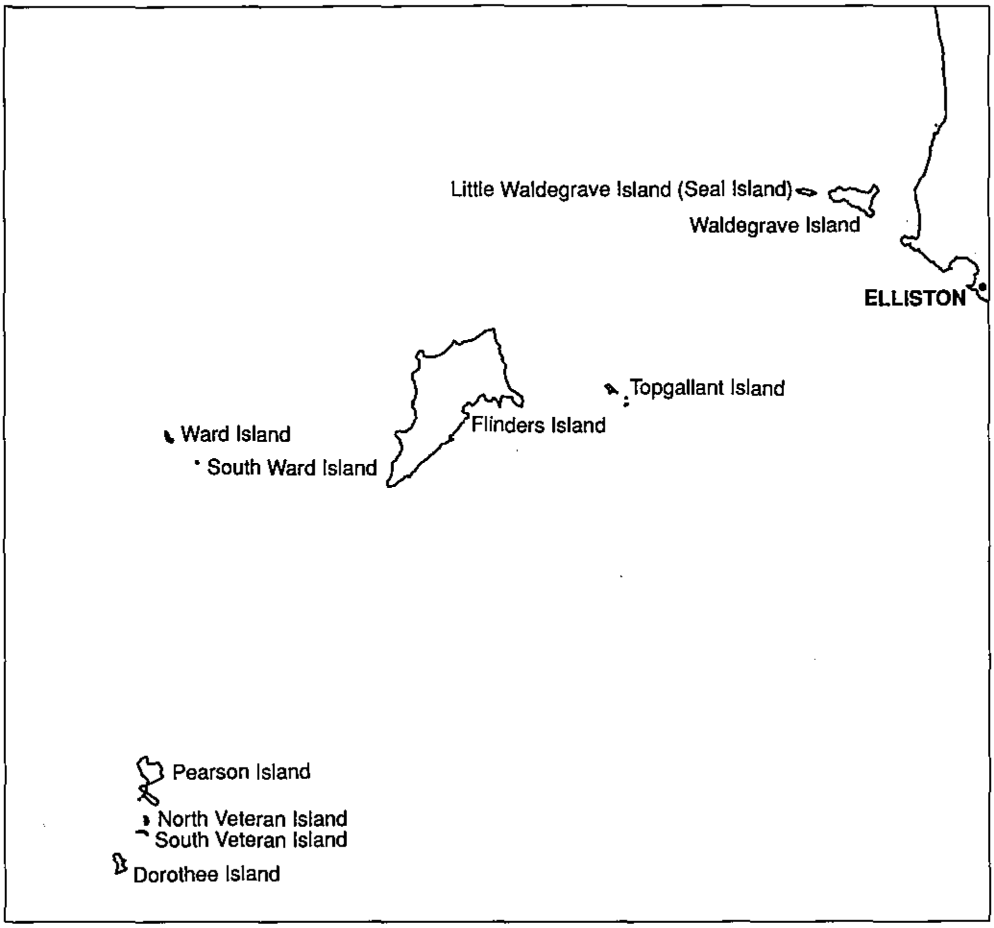



**Figure 52.** Map of Investigator Group.

South Australia. About 20 breeding pairs and a large number of non-breeding birds use the safety of the island in summer as a night roosting site, from which they fly to mainland swamps and fields to drink and graze. The first winter rains provide enough grass and water to allow the birds to remain on the island. Breeding birds (which maintain pair bonds throughout the year and probably mate for life) begin their reproductive cycle with territorial disputes and nest-building. About six weeks after hatching, juvenile Cape Barren Geese leave the care of their parents, gathering in small groups. Over the next six to eight weeks they perfect their flying skills to escape the island drought and join nomadic juvenile flocks on the mainland's greener pastures. The young birds remain in these flocks for three or so years then, when they reach sexual maturity, seek a mate and lose their neighbourly tolerance.

Since competition from introduced grazing animals was removed, the open grasslands provide a bonus food source for the geese. Other birds also gained some advantage after this initial disruption. Masked Plovers (Plate 78), Galahs, White-fronted Chats and Little

Grassbirds forage for seeds and insects or take advantage of the shelter. Australian Kestrels hover overhead, poised to plummet on an unwary insect or reptile. Coastal species are also well represented: Black-faced Shags and Sooty Oystercatchers occupy roosting and feeding territories, along with gulls and terns, and White-bellied Sea-eagles and Ospreys hunt over the shores and surrounding waters, retreating to nests and roosts on the craggiest sections of cliff.

**Plate 78.** The Masked Plover (*Hoplopterus miles*). Photo DENR

Waldegrave also hosts an unusual predator, the Barn Owl. Most island animals are active only during daylight hours, but Waldegrave is one of a few islands to retain a large population of Bush Rats, relicts of the more temperate climate enjoyed when the island was a mainland hill. Waldegrave's Bush Rats have adapted to its harsher environment, forsaking moist forest undergrowth for dry coastal shrublands, and their presence is often indicated only by the flattened runways and tunnels they construct in the thick grass, hiding their movement from one bush to the next. Distinguished by their delicate features and soft, grey-brown fur, Bush Rats are rarely seen by day, foraging under the cover of darkness for insects and plant material ... and providing enough food to maintain the population of Barn Owls.

The main island can be reached easily via the relative shelter of the channel, aiming for a landfall on the sandy, north-eastern beaches. The swells diffract around the entire coast, resulting in some degree of surge and complicating not only rock 'jump-offs' but also beach landings, often resulting in wet feet at the very least.

**Little Waldegrave Island (Figure 52)**

The granite rise lying to the west of the main Waldegrave dome offered little protection to the calcarenite mantle that once filled out its contours and linked it to the larger island. The soft, crumbly rock was quickly reclaimed by the waves, surviving only as the small, hard core of Little Waldegrave or Seal Island.

The spray from erupting surf drifts over the granite and meets the sharp rim of the calcarenite cap, leaving the rocks perpetually damp. Beyond the direct impact of waves, this saline drenching excludes all but the most salt-specialised organisms. Plants dwarfed by the salt, pruning winds and skeletal soils cling to crevices along this most severe zone. Species such as dull-green Southern Sea-heath, which offers a display of dainty pink blooms each year, and Sea Celery grow in the most formidable sites.

The calcarenite rim and the low heath reduce the impact of the salt spray and allow more luxuriant growth inland, aided by a comparatively deep soil layer. The survey recorded nine other plant species; the island once supported a low saltbush shrubland, but it has been infiltrated by colonising weeds such as African Boxthorn and Common Iceplant.

Little Waldegrave is a favoured retreat for the local population of Australian Sea-lions, which can be seen basking on the warm granite shelf or, on cold, blustery days, retreating to the shelter of the taller shrubs further inland. Sharing this windswept haven are five species of birds. Rock Parrots flutter among the shrubs, while a small flock of Cape Barren Geese grazes on fresh green shoots. Ocean birds use the island as a nightly roosting site, and Little Penguins to find enough soil to excavate burrows. No reptiles were discovered during the survey, though more thorough inspection may reveal a few species.

## Flinders Island

At 3642 ha, Flinders Island (Figures 52 and 53) is one of the State's largest offshore islands. Located 28 km west-south-west of Cape Finnis, this diamond-shaped island dominates the Investigator Group. Rising from a scalloped coastline, its thick calcarenite platform undulates gently over an underlying mass of granite.

Depending on the thickness of calcarenite and shelter from prevailing swells, the coastline varies from broad, sandy beaches to rocky headlands and continuous walls of cliffs, some up to 62 m high. Inland, landforms are less distinctive; small intrusions of granite rise above the calcarenite as low hills on the south-eastern side, the tallest reaching 66 m. Though no watercourses have developed, inland seepage has formed two saline pans at the northern end. The island rises from a low, windswept plain at the south-western coast to the tallest cliffs along the north-eastern extremities. Predominantly south-westerly winds on the lower western coast have formed dunes; other than drifting sand, soil types include shellgrit, extensive beds of rich red loam and a sandy loam originating from broken-down calcarenite. Large quantities of gypsum have formed in the saline lakes.

Matthew Flinders reached the island on 10 February 1802 and named it after his second lieutenant, Samuel W. Flinders. A party went ashore to examine the island, returning with several specimens of a small kangaroo (Tammar Wallaby) they had shot. No evidence could be found of the island having been visited before, either by Europeans or by Aboriginal people. Records indicate the island remained undisturbed until around 1826, when an Irish sealer named Bill Brien carried off an Aboriginal woman and established a small seal-skin harvest there. In 1942, the 863-tonne steel steamship *Kapara* (chartered to Coast Steamships and servicing the west coast of Eyre Peninsula) ran on to a reef off the island's south-east coast and, while the crew reached safety, the badly holed vessel sank. Two of the ship's boilers are still visible today.

In 1845, Edward John Eyre described Flinders Island, with its fresh water, readily available timber and good anchorage, as being adapted to whaling; the local waters were frequented by the docile Southern Right Whale. A Right Whale fishery was subsequently developed, though little is known of its success. Early maps show a whaling station off a small cove on the south-east coast during the 1850s: the remains of a dry stone granite wall can be found there, and may relate to this enterprise.

In 1845, the *South Australian* heralded an era of pastoral use, continuing to this day, with its description of the island as very pleasant, with good grass, wood and water. The first pastoral lease, granted to Messrs Lechmere in 1845, changed hands several times until Flinders came under the control of Anton Schlink in 1867. The island carried 4000 merino sheep and Schlink's lease saw the construction of a woolshed (possibly that still in use on the island), a stone barn, drafting yards and brush fences. The natural water supply from springs on the cliff faces was supplemented by shallow wells and the island's

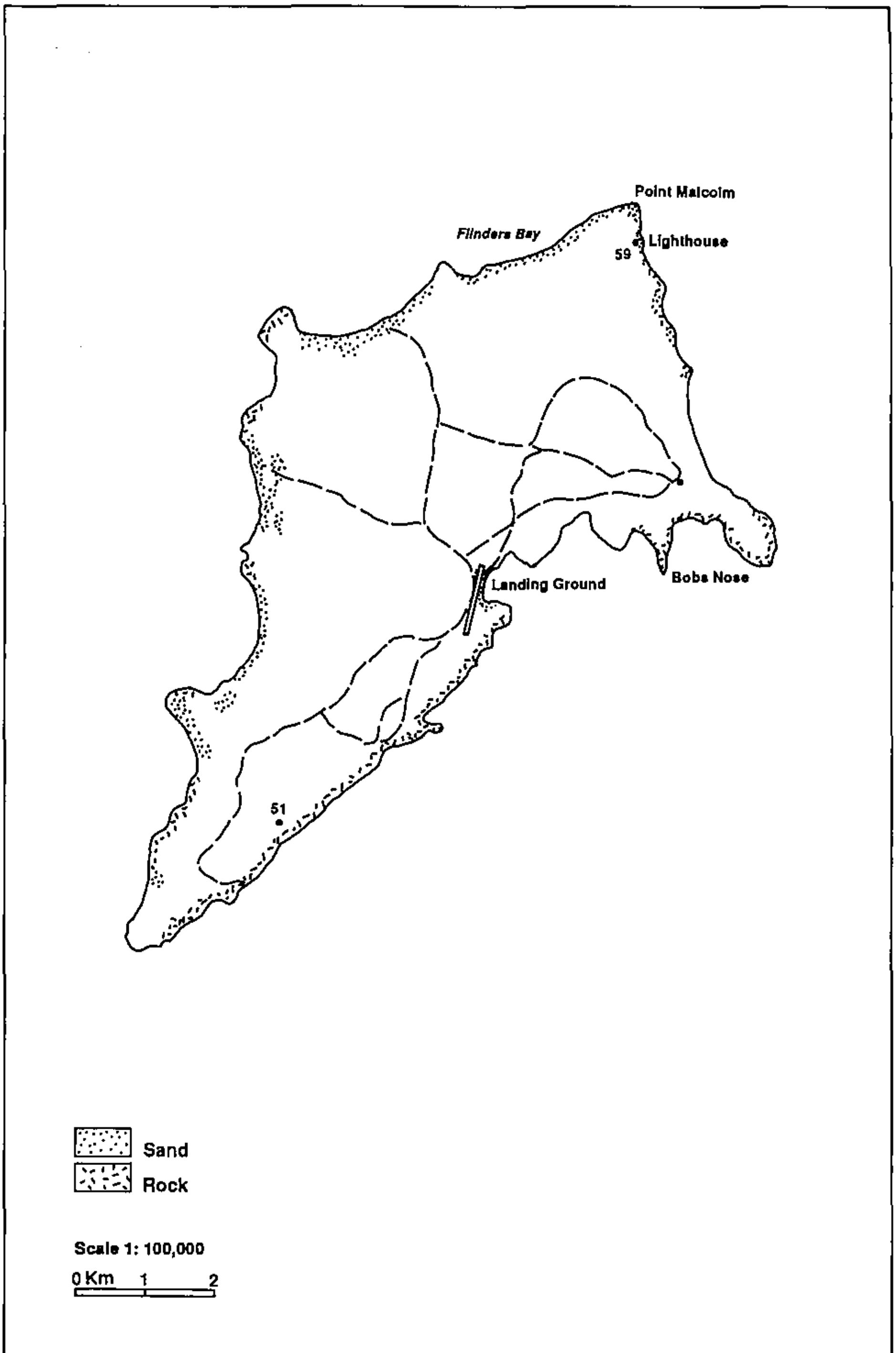



Figure 53. Map of Flinders Island.

residents lived in two buildings, one a four-roomed home of stone with a thatched roof. A garden and fowlhouse were also established. Isolation was the principal drawback; it was very difficult to get workers to remain on the island because of its loneliness, and Aboriginal people were employed there as shepherds.

Though Schlink at one time had four sizeable vessels operating out of Port Lincoln, it appears there was not a boat moored at the island. When he required a vessel a signal fire was lit on a prominent headland, named Bob's Nose after Schlink's first horse—which could be seen on occasions standing on the spot, and which is said to have lived for 36 years.

Schlink tried to graze his surplus merino flock from Flinders on Pearson Island, but failed because of Person's unfavourable, rocky and dry nature It was also impossible to yard the stock, and some were simply abandoned. Despite this disappointment, Schlink went on to become a major property and stockowner on the West Coast mainland, at one time running 60000 sheep.

Members of the Schlink family, including William's eldest son Anton, leased Flinders Island until 1911. A guano mining operation in a large cave on the north-east coast may have been initiated by the family, and signs of this activity can still be found at the cave. A rotting stack of guano-filled sacks sits on an old pallet of sticks and a number of dates have been carved in soft sandstone at the cave entrance; the only one still legible reads 1892. The family's last lessee, William, cleared the majority of the island and added wheat production to its agricultural economy. Wheat played an important role until the coastal shipping trade ceased, redirecting priority to wool production. The Pastoral Lease for Flinders Island changed hands many times up to the present, and the current lessees live in Streaky Bay and continue to run the island as a sheep property, with some low-key tourist use.

The unfortunate side effects of these endeavours saw the complete disruption of a unique island community. The many features that made Flinders Island so attractive to exploitation also provided habitats essential for the survival of many native plants and animals. The rich, red soil that supports fine crops and grasses once supported a eucalyptus woodland of which only a few stands of the mallee, Yorrell, remain. Native vegetation now clings to a few pockets of agriculturally unsuitable land, mainly the granite rises, salt pans and coastal dunes. Tall stands of melaleucas, predominantly Dryland Tea-tree, crowd on sheltered patches of deeper soil. Tea-tree thickets are often infiltrated by a shrub understorey of Native Juniper, Coast Beard-heath and Leafless Cherry; more open and sandier areas are marked by an underlying heath including a variety of lower shrubs such as saltbushes, Sheep Bush, Common Fringe-myrtle and Coast Daisy-bush, different shrub layers often entwined with the climbers Old Man's Beard and blue-flowering Love Creeper. The granite outcrops support a 'woodland' of Drooping She-oak, a species that can also be found scattered through the more protected patches of clifftop heath.

The most diverse coastal heath is confined to more sheltered sites. Species colonising rockier areas include Kangaroo Thorn, Cockies Tongue (Plate 79), Small Hop-bush, Common Correa and Turkey Bush, and many of the shrubs common to the melaleuca patches are also found in this heath. The few taller She-oaks share prominence with occasional Dryland Tea-trees and Weeping Pittosporum: where conditions are more severe, taller shrubs give way to a low heath of more salt-tolerant plants such as Bassia, Ruby Saltbush, Bower Spinach and Nitre-bush. On the rim of the taller cliffs, where the wind scours the rock of loose soil, the roots of a few hardy plants penetrate any soil-filled crack or depression: here Cushion-bush, Sea-heath and Nitre-bush catch windblown sand in their branches, forming low mounds. The slow accumulation of sand increases the plants' stability and potential for growth, and extensive mounds allow the gradual infiltration of less hardy species, slowly pioneering a change from bare rock to heath. Low, gnarled Native Pines survive in dense clumps on the clifftops; taller groves of this pine, depleted by clearing, burning and for use as fence posts, may have once graced the lowlands.

**Plate 79.** Cockies Tongue (*Templetonia retusa*). Photo A. Prescott

The extensive areas of coastal dunes harbour the greatest remaining expanses of natural vegetation. Beyond the easy reach of high tide, salt-tolerant Two-horned Sea Rocket and thickets of Grey Saltbush tentatively invade the fresh sand. Resisting the abrasive winds on the face of the foredune is Spiny Rolling Grass or Spinifex, whose creeping network of stems and stiff, papery leaves slowly binds the flying sand into a stable nursery for other plants. Its success can be measured where Buckbush, Cushion-bush and Coast Daisy-bush have infiltrated from the relative shelter beyond the foredune. Coast Daisy-bush dominates the shrubland that develops in the lee of the first dune ridge, a community that gains in density, height and diversity as distance from the sea increases.

Other species found in this shrubland community include saltbush, Coast Beard-heath, Native Juniper, Dysentery Bush, Knobby Club-rush, Black-anther Flax Lily, Bower Spinach and Variable Groundsel. Where the salt pans border the dune fringe, the taller heath gives way to highly salt-tolerant seablites, Sea-heaths, Grey Samphire and Beaded Samphire.

The variety of species in the few remaining relatively natural areas hints at a once greater diversity. Few clues remain of the types of communities that once spread over the more fertile inland soils; most of the island is now a sea of introduced grasses and herbs, not only confined to the paddocks but also penetrating most vegetated areas, and any recolonising attempts—particularly by the persistent Coast Daisy-bush and Dryland Tea-tree—have been rebuffed by repeated burning and rolling, an economic necessity if the pasture is to support viable sheep grazing.

The most unfortunate consequence of the island's domestication is the demise of a variant of the Tammar Wallaby once found only on Flinders Island (see Chapter 2).

The bird population is diverse, particularly favouring coastal species for which extensive areas of little disturbed habitat remain. Migratory waders such as Turnstones and Red-necked Stints scurry along the waterline; Pied Oystercatchers forage for molluscs, snails and worms along sandy beaches, while closely related Sooty Oystercatchers search among rocks for limpets and mussels. Crested Terns stand in flocks on the beaches and Silver Gulls squabble over scraps around the house. Ospreys breed on the cliffs. A variety of birds inhabits the shrubland and other remnant vegetation: the Fan-tailed Cuckoo and the migratory Horsfield's Bronze Cuckoo (both parasitic species that lay their eggs in the nests of other birds); colourful Golden Whistlers and Red-capped Robins; Brush Bronzewing Pigeons and White-browed Scrubwrens were recorded during the brief survey. A longer and more varied list has been compiled from the observations of a number of earlier surveys. The island's open grasslands favour Galahs, Stubble Quail, Masked and Banded Plovers, White-fronted Chats and Australian Ravens foraging for seeds, insects and reptiles. Introduced birds include starlings, sparrows and, surprisingly, Australian Magpies, apparently released by an earlier lessee.

Reptiles are common, dominated by six species of skink that frequent most habitats. Visually outstanding are two species of brightly patterned *Egernia* and lumbering Shinglebacks, docile omnivores that feed on succulent leaves, flowers and the occasional snail. The Four-toed Earless Skink is a shy species, little seen due to its semiburrowing hunting through soft sand and leaf litter under cover of darkness. The remaining species are also difficult to see, their presence often marked by little more than a swift blur and a rustle of leaves.

Flinders Island is now managed as a combined farm and holiday retreat. Accommodation can be provided for up to 16 people at a time in two limestone cottages that once formed the shearers' quarters. Access by sea can be gained at Groper Bay (overlooked by the lessee's house) on the central east coast, and an airstrip near the house caters for light aircraft from Cummins.

Though it is still scenically spectacular, Flinders Island bears the scars of human activity. The most obvious relate to agriculture; the extinction of the Flinders Island Wallaby, and the introduction and establishment of feral populations of black rats and feral cats. The demise of the Flinders Island Wallaby is an example not only of how vulnerable and sensitive animal populations on islands are to disturbance, but also a dramatic display of the possible long-term consequences for species affected by similar circumstances on the mainland. Realising the wallaby's hopeless position, Mr P. Aitken, South Australian Museum Curator of Mammals on the Field Naturalists' Society survey in 1968, wrote that:

> ... the fact that this situation was allowed to develop is yet another tragedy in the already poor record of fauna conservation in South Australia.

The species, both natural and introduced, surviving today seem to have struck a fragile balance under the sympathetic management of the current lessees. The history of the island was seen as symbolic by Professor T.G.B. Osborn who, after a botanical survey with Wood Jones in 1924, commented on the impact of agriculture:

> Flinders Island has been the site, on a small scale, of the struggle that has gone on over much of Australia ...

## Topgallant Island (Figure 52 and Front Cover)

On 10 February 1802, sailing along the eastern flank of the Great Australian Bight, Flinders reached a remarkable chain of islets:

> The southernmost rock was like the image of a ship's sail. There are three rocks on its south side resembling ships under sail from which circumstance the small cluster received its name (Flinders, 1814).

The islets, 22 km south-west of Cape Finniss, gained the name Topgallant after the upper spars and rigging on a square-rigged sailing ship, the first part seen when such a ship appears on the horizon.

Their soaring, sheer profiles are the product of a massive bed of calcarenite. The last bastions of a once greater mass, these fragmented remains persist by virtue of an underwater ridge of granite. Waves bite into their bases with such vigour that the cliffs are undercut; the collapsed sections, which normally act as temporary breakwaters, are swept into the surrounding depths without trace. The largest remaining mass of about 20 ha forms the main island, whose encircling 75 m high cliffs round off to a summit platform 101 m above the waves. The southernmost rock, about 1.5 km distant, is a sharp pyramid 55 m high. The sea has sliced sections from the islets' flanks to expose the cross-bedded layers in the calcarenite, a feature confirming the rock's aeolian origin as windblown dunes.

Under attack from wind and spray, the softer layers have decomposed to a coarse sand accumulating in crevices provided by the harder, more limey layers. On the smaller rocks hardy plants cling tenaciously to these pockets, perhaps the last survivors from a time when the rocks were small islands with more soil and inhabitants.

The steepest sections of cliff are generally too exposed and too short-lived to cater for any life forms other than fast-growing ephemeral herbs or as surveillance perches for raptors. Where the cliffs begin to flatten, a heath of more salt-tolerant plants (of a similar though more diverse composition to the communities surviving on the smaller rocks) takes root. The soil layer deepens as the slopes round off to the summit plateau, allowing taller, more deeply rooted shrubs to grow.

Plant communities are relatively simple, a result of confined growth zones and high competition. There are, however, four distinct plant communities; all low shrublands, two dominated by chenopods, the remainder each by Nitre-bush or Pointed Twinleaf. In total 20 species were recorded, including infestations of African Boxthorn and Common Iceplant.

Twelve species of birds were found. This might appear to deny the islets' restricted habitats, but the islands may be used as a stepping stone from nearby Flinders Island to the mainland, or they may be part of extended feeding territories of Flinders Island birds — which could explain the presence of a flock of Galahs, Richard's Pipits and a White-faced Heron. The remaining species may simply be taking advantage of the group's isolation.

A thriving population of Marbled Geckos shelters beneath the abundant shingles of limestone. This tenacious lizard is possibly the last survivor of the vertebrate species originally marooned by the island's formation: there are no signs of mammal occupation, the absence of low rock platforms thwarting even sea-lions and fur-seals.

A combination of deep water swells, steep shores and sheer walls of rotten stone would certainly foil any landing attempts by boat and, without a helicopter, the group is best admired from a distance.

## Ward Island (Figure 52)

Reached by and given his mother's maiden name by Flinders, and lying 53 km west-south-west from Cape Finniss, Ward Island is the remains of a small hill now fragmented by almost 10 000 years of ocean erosion. The core of the old hill is the product of a volcanic intrusion that solidified to granite more than 1500 Ma. As with much of this now drowned plain, the rise was buried beneath dunes that consolidated to calcarenite; and, as with Topgallant, the waves pounded most of the young rock back to sand, leaving only a tall stump on the granite crown.

Ward Island's main dome covers about 20 ha, breaking the waterline as a jumble of rocks and low shelves constantly swamped by collapsing waves. Rising just beyond reach of the surge is the tall crest of calcarenite, its base (depending on the width of the granite and exposure to the prevailing swell) varying from a steep, compacted talus to sheer undercut cliffs. Low points and weaknesses in the granite fringe channel the surge into walls of water that explode at the foot of the calcarenite bed, quarrying deep overhangs and sea caves. The cliffs and talus slopes round off to a gently undulating summit platform, which carries a crust of soil and a few diminutive sand dunes, rising 49 m above sea level. A smaller islet—a hump of rock and soil 28 m above the waves—lies almost 2.5 km to the south-east, and there are a number of detached reefs and submerged rocks in the surrounding waters.

The vegetation surviving on this outpost is simple. The 12 species found grow in a low, salt- and wind-pruned heath and are dominated by three species. Saltbush is common over most of the island, favouring the deepest patches of the sandy loam soil where only it can tolerate the disturbance of a large Short-tailed Shearwater colony that breeds on the island. Saltbush also survives on the south-east islet and on a few of the larger detached rocks. Much smaller patches are dominated by Nitre-bush (generally favouring limey calcareous soils) and Pointed Twinleaf, prevalent on the orange, decomposed sandstone soils.

Where soils are too shallow to support the burrowing of shearwaters, the White-faced Storm-petrel digs its fragile nesting burrows. Like the shearwater, this smaller, more delicate bird only visits the islands to breed, though its migratory and general behaviour patterns are little understood. During the day the petrels fly far beyond the continental shelf to feed on plankton, only returning at night. Other birds sighted include the rare Osprey and a White-bellied Sea-eagle. Ospreys hunt only live prey, diving on fish, while Sea-eagles either hunt or scavenge dead animals; this lack of direct competition allows two large raptors to coexist on one small island.

A small colony of Australian Sea-lions has found enough ground beyond the reach of waves to establish a breeding colony. The survey did not find any reptiles on the island.

Access to Ward Island is complicated by the swell and the rocky coast, though not to the same degree as Topgallant Island. The survey was conducted by helicopter—no safe boat landing sites could be found.

## The Pearson Group

Over a period of 100 million years, beginning around 1580 Ma, Eyre Peninsula was subjected to widespread volcanism. Fractures and weak spots in the old crust oozed molten rock, often burying large areas until enough lava solidified to plug the vents. The lava then cooled to granite, often a non-foliated type that resists rapid erosion. Evidence of this activity is still visible, the resistant granite rising above the lowlands as isolated mountain ranges. Such granite domes possibly mark the actual fracture sites where the greatest quantities of lava lay, cooling slowly to dense formations accentuated by the more rapid erosion of the softer surrounding rock. These high, isolated peaks, differing geologically from their surroundings, are termed inselbergs or 'island-mountains'.

Most of South Australia's islands are the dry summits of taller granite inselbergs, though their true identities are often submerged or capped with the remains of a younger, more yielding rock such as calcarenite.

Occasionally, the inselbergs rose to such abrupt heights that soil or windblown sand found few footholds, the granite flanks remaining exposed and sheer. A few such peaks, encircled by the rising sea, remain prominent; the islands of the Pearson Group are classic examples.

Pearson Island rises as the main summit, the sea separating the inselberg's lower peaks into Dorothée and the Veteran Islands. From sea level the islands appear wedge shaped, their present profiles the products of greater erosion of the shores most exposed to the prevailing swell. These faces are marked by well-developed features such as tall cliffs and deep crevasses, a contrast to the sheltered eastern sides, which descend gradually into more subdued waters. From the air the islands are far from symmetrical: fractures and joints of varying strength have allowed the sea to infiltrate the inselberg structure, creating a contorted coastline of deep bays and chasms alternating with long fingers of rock that project stubbornly into the swells.

## Pearson Island

Pearson Island (Figures 52 and 54), named by Flinders after the maiden name of his brother-in-law's mother, is composed of one large northern land mass with two smaller rises lying in a narrow arc to the south. The smaller hummocks are linked by slender spits of rock. The most northerly, connecting the main section, is little more than a rock-choked channel, sluicing the surge through a barrier that effectively divides the island in two. The narrow arc cradles a deep, sheltered bay and a small beach at the apex, providing a safe anchorage and landing point.

Pearson Island covers 213 ha, its size and structure providing a wide range of habitats. The eastern shores rise gently from low rock ledges and broad, sweeping platforms that absorb the energy of diffracted swells, sparing nearby plants from drenching mists of salt spray. This face of the island remains in the lee of much of the prevailing weather.

On the main island mass two low valleys survive, one opening to a small bay to the north, the other to a small east-facing cove. Each is encircled by the main western range and divided by a ridge running north-east from the range. A rudimentary drainage system has evolved, the runoff from the impermeable ranges condensed into small creeks. The valleys have also retained much of the soil worn from the surrounding rocks.

Though predominantly granite, Pearson has retained thin scabs of calcarenite; where these occur coarse, gravelly granitic soils give way to finer calcareous sand. The most notable features are the sharp granite peaks, their general shape formed from a jumble of massive jointed plates on the lower levels and boulder-strewn summits. The highest peak is 238 m above sea level.

The typical and relatively simple island vegetation patterns, usually determined by salt influence and soil availability, are increased on Pearson by a far greater variety of landforms and soil types, which in turn create varying micro-

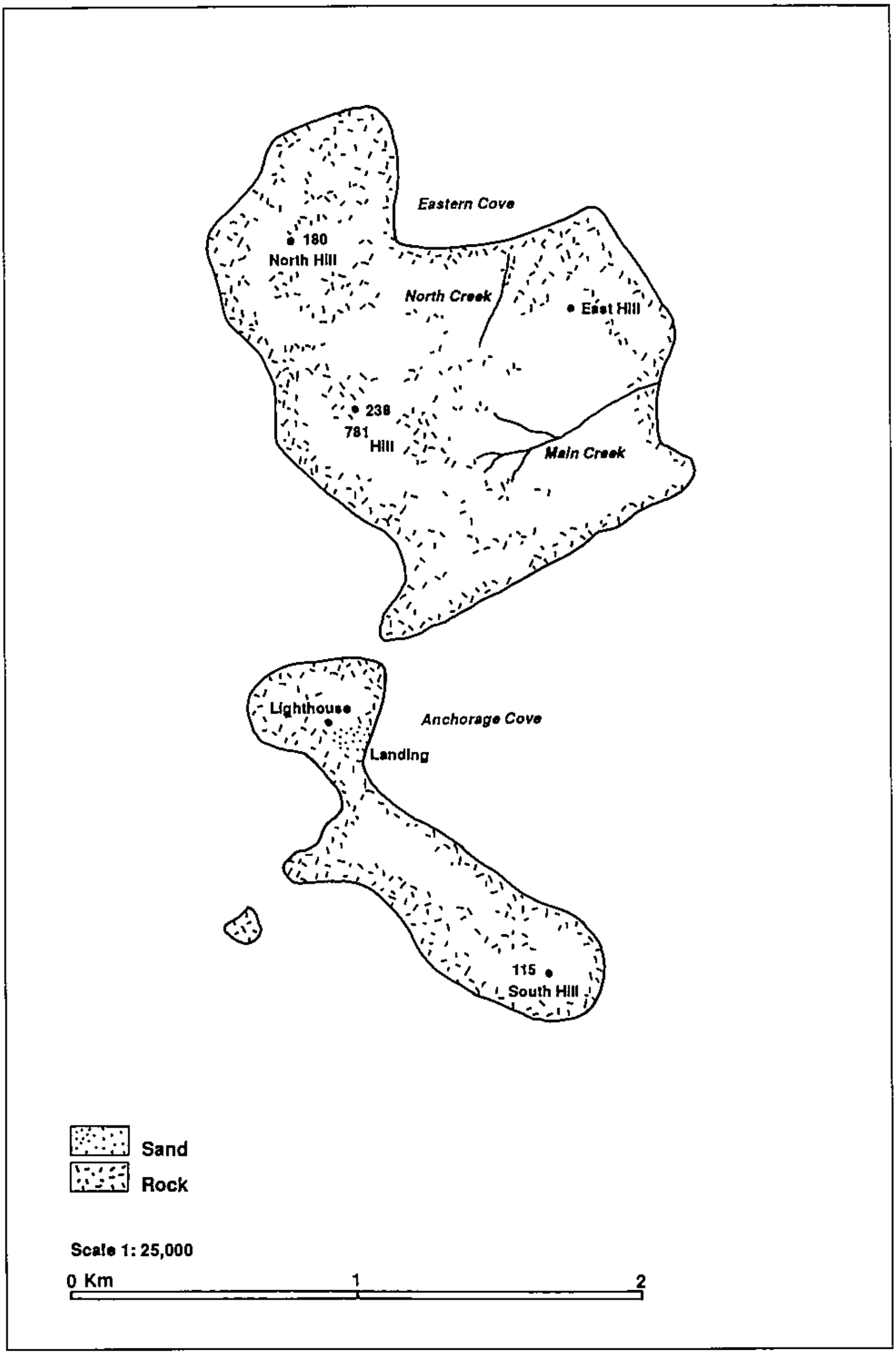



Figure 54. Map of Pearson Island.

climates of exposure, soil depth and moisture and a correspondingly high diversity of species.

Above 100 m a tall woodland of She-oak fills sheltered ravines. The trees grow on deep patches of granite-derived soil, and their density increases with altitude. Individual trees often reach 3 m in height, sheltering a thick understorey of species such as Dryland Tea-tree, Ruby Saltbush and Rock Fern.

Two melaleuca species occur on the island and grow in distinct scrubby patches. The most widespread is the Dryland Tea-tree, which grows in open thickets on slightly lower levels than the She-oak woodlands, and extends to areas of shallower soil. A dense scrub of South Australian Swamp Paper-bark lines Main Creek, which drains the eastern valley. The soils along the creek are highly saline which, combined with the shelter provided by the valley, forms a confined habitat suitable for this species.

Closer to the sea the vegetation takes on a more familiar heath and shrubland appearance. Twiggy Daisy-bush, a relative of the dune-favouring Coast Daisy-bush, dominates shallow granitic soils in more exposed areas, forming an open heath. Other heath species coexisting in this vegetation type include Common Correa, Shore Westringia and saltbushes. Grey Saltbush, which grows in dense patches favouring limestone-derived soils near the sea, has large grey leaves and carries dense clusters of minute red or yellow flowers. Marsh Saltbush grows in low shrublands on both limestone and granitic soils, reaching its greatest densities in deeper soil near the sea and often merging with the taller Daisy-bush heath.

The other major plant community occurs on the thinnest, most exposed soils on top of granite outcrops fronting the sea. A mat of Round-leaved Pigface pioneers the outer fringe of this low herbfield, gradually giving way to Karkalla (Plate 80) and Austral Stork's Bill.

Plant communities such as the She-oak woodlands, though occurring on the mainland, are greatly degraded by stock and rabbits. Pearson may harbour communities that resemble similar areas on the mainland before the invasion of sheep and rabbits, so the island's vegetation is of great interest to botanists. In addition to the absence of grazing, fires in 1923 (a deliberate act of vandalism) and in 1975 (the result of a lightning strike) have burnt sections of the vegetation and disrupted former plant communities.

Details of studies of the response of the Pearson Island plant communities to these fires are given in Chapter 2. Photographs taken in 1923 have been repeated over the years and show interesting battles between species as they compete for the new ground. Of further botanical interest was the discovery of a small stand of Cape Leeuwin Wattle (see Chapter 2).

**Plate 80.** Karkalla (*Carpobrotus rossii*). Photo A. C. Robinson

The island's structural variety is also reflected in its vertebrate inhabitants. The dominance of more rugged, granite-based habitats has allowed the continued survival of an increased range of relict species. On Pearson, these species coexist with many of the less specialised coastal species normally found in the more limited habitats on the calcarenite islands.

The Black-footed Rock-wallaby inhabits many isolated mountain ranges across Australia and, because of isolation, each population has tended to develop slightly different characteristics. A population of these wallabies once inhabited a minor range of granitic rocks on Eyre Peninsula. About 10500 years ago the sea rose, engulfing the lowlands until the range was completely severed from the mainland. The climate was also becoming more arid. The waters continued to rise for 4500 years, slowly reducing the height of the range and forcing the wallabies to compete for decreasing territories and changing food supplies. Already widespread and adaptable, they survived these changes.

Today, boldly patterned rock-wallabies enhance the rugged beauty of Pearson's granite peaks. Like many animal populations long isolated on remote islands, they show a surprising curiosity and lack of fear, expressed in their bold approaches to visitors. The animals are predominantly nocturnal, sleeping during the day in cool crevices or basking lazily in the morning and evening sun, particularly at hotter times of year. For an unknown reason the entire wallaby population was confined to the larger northern mass of the island, the wave-washed spit apparently denying them access to the southern hummocks.

This situation was of particular interest to botanists, who could compare the ungrazed vegetation on the southern portion to similar plant communities on the northern mass that were subjected to wallaby grazing. This situation came to an embarrassing and unfortunate end in 1960. A research team was conducting a major survey of the island and had captured six wallabies for closer study. The animals were taken back to a base camp, conveniently located above the landing beach on the middle hump on the southern side of the channel. All six animals — four females, a male and one of unknown sex — managed to escape and have now settled to a population of up to 150 animals, a density far higher than for a similar area of habitat on their original half.

The landing beach on Central Pearson Island always has a group of Australian Sea-lions lazing around, and a detailed survey in 1991 revealed that this is a breeding colony, with 35 adults and 29 pups (Gales, Shaughnessy and Gales, 1995).

The native Bush Rat maintains a healthy population on Pearson, as anyone who has camped overnight there can testify. The rats also present a fascinating insight into the long-term effects of genetic isolation and evidence of adaptive evolution (see Chapter 2). A rich variety of birds further boosts this island's appeal. The woodlands and shrublands shelter landbirds not normally associated with offshore islands, and the sound of wind sighing through the She-oak and Tea-tree glades is frequently broken by the melodious calls of the Golden Whistler during spring and summer; a flash of crimson flitting through the sun dappled light of the woodland floor marks the path of a male Red-capped Robin flushing insects from the leaf litter, and Masked Wood-swallows dodge and swoop after insects. Ocean and coastal birds are also well represented on the island among the 36 bird records, further evidence of Pearson's habitat diversity.

Years of intensive surveys have yielded a range of reptiles. Familiar island species such as the Marbled Gecko and Four-toed Earless Skink share limestone and granite refuges with more specialised species. The Thick-tailed Gecko may be found lurking in deep cracks or beneath rocks by day, or stalking boldly along the ground at night. If cornered, this species will raise itself on all fours and emit a sharp 'barking' noise as a deterrent. The Peninsula Dragon, whose name hints at the Pearson population's original ties with a common Eyre Peninsula species, frequents the granite outcrops. Dragons are often flushed from invisibility into a frantic retreat to the protection of the deep rock cracks they favour. The Four-toed Earless Skink was only one of five skink species coexisting on the island. All species are small and swift; their favoured habitats lie among tangled rocks or leaf litter under shrubs, a combination that makes capture and identification difficult.

The biological features of Pearson Island are of such interest that it is one of the most scientifically important of the State's offshore islands. Since Flinders's discovery of the island on 13 February 1802 the island has attracted many people, drawn by its rugged nature and isolation. Landings are usually possible; the most secure anchorage and favoured point being the large eastern bay with its small, sandy beach. The colony of Australian Sea-lions concentrated on this beach should be disturbed as little as possible. An automatic light operates on the central section of the island.

## The Veteran Isles (Figure 52)

To the south of Pearson Island the inselberg range rises above the surface as two smaller groups of islands. An old valley, now drowned by a 1 km wide stretch of water, rises to the northern of two close 'peaks' immediately south of Pearson. Named the Veteran Isles (no record of the derivation of the name can be found), the old summits rise steeply from the sea, the northern soaring to 82 m, the southern to 26 m and covering 14 ha in total.

The high, deeply corrugated surface of the northern island retains pockets of granitic soil. Gaining some reprieve from drifting spray, two simple types of low shrubland cling to these soil pockets on the upper platform, dominated respectively by Marsh Saltbush and Twiggy Daisy-bush. The southern island is denied any soil or vegetation by the powerful swells that thunder and hiss over the fragmented coast. In calmer times the effect of the sea may only be visible as a dampening spray of mist that leaves the rocks coated in glittering white crystals. In winter, however, storm waves bear down on the rock and almost submerge it, limiting animal life to transient species.

Vertebrates on the northern islet consist of birds and reptiles. Cape Barren Geese may simply visit the island as a stepping stone or as part of an extended feeding territory, returning to larger islands nearby to roost and breed. Species include shore feeding Sooty Oystercatchers, Little Penguins and Rock Parrots probably remain as residents. Reptiles are represented by the hardy Marbled Gecko, the Four-toed Earless Skink and the Peninsula Dragon (Plate 81) which, though normally only found on larger islands, may persist due to the abundance of its preferred habitat of granite rock cracks.

The southern islet is used as a haul out site by a small group of New Zealand Furseals, a species that seems to prefer apparently inhospitable, wave-torn rocks. The survey also noted a small group of Australian Sea-lions, a pair of Sooty Oystercatchers and a single Pacific Gull.

**Plate 81.** The Peninsula Dragon (*Ctenophorus fionni*). Photo S. J. Doyle

The islets always appear to magnify the effects of the swell, the steep shores stained high by the rise and fall of surge in all but the calmest weather. The survey was conducted by helicopter; a sea landing would certainly be hazardous.

## Dorothée Island (Figure 52)

Four kilometres to the south of Pearson, the inselberg rises as one last defiant summit before dropping into the depths. Dorothée Island's granite structure forms a spectacular series of crevasses and rocky points, giving the coast a jagged, dissected outline. When the lava originally cooled to granite, the flows solidified into broad sheets 2–3 m thick, each separated by gently arched joints. When waves first washed these rocks many millions of years later, the water penetrated the joints and through physical and chemical attack gradually widened them. The granite is of an extremely resistant type, but the presence of joints is a weakness the sea has exaggerated into the spectacular coastline apparent on islands in this group. On Dorothée this erosion pattern dominates the island structure, with the largest crevasse threatening to bisect the island and the remaining surface deeply incised by almost parallel trenches intersected by a network of lesser joints. The northern section of the 56 ha island rises to 140 m, then drops to the main crevasse before rising again at the southern summit to 102 m.

The upper platform retains some pockets of soil, predominantly coarse and granitic but with small patches of calcerous sandy loam. The deep hollowed joints retain enough soil and provide enough shelter to support five distinguishable plant associations encompassing 43 species. While the island's twin peaks are not removed enough from the sea's influence to support She-oak and Tea-tree woodlands, a diverse heath characterised by Twiggy Daisy-bush clothes the deeper, least-exposed granitic soils. Other heath species include Common Correa, Black-anther Flax Lily (Plate 82), Coast Beard-heath and two small patches of Cape Leeuwin Wattle.

A patch of calcareous sandy loam in a depression above the central crevasse on the northern half has been claimed by a dense heath of Grey Saltbush. Marsh Saltbush forms a low shrubland over granitic soils on the southern peak, where more salt-sensitive Daisy-bush heath is confined to the highest points, giving way to an encircling fringe of more tolerant saltbush. The thinnest soils are secured by low herbfields dominated by Rosy Stork's Bill. Any soil on top of the granite ridges nearer the sea is colonised by a lawn of highly salt-tolerant herbs, Round-leaved Pigface covering the ground in a mat of succulent leaves.

The only mammals present were New Zealand Fur-seals and Australian Sea-lions, the former grouping in a small colony along the main central crevasse on the eastern side, possibly using the island as a breeding refuge. The sea-lions were generally scattered in small groups in the vicinity of the fur-seals, the large eastern indentation providing the most sheltered locality on the island.

**Plate 82.** The Black-anther Flax Lily (*Dianella revoluta*). Photo P. D. Canty

Seventeen bird species were recorded. The heath is alive with Silvereyes questing for grubs and berries and Rock Parrots foraging for seeds, particularly those of Karkalla. The narrow neck of rock at the crevasse appears to separate the two sections of island into feeding territories for some species. Two Australian Kestrels hovered in the breeze over their hunting grounds at opposite ends of the island, while two White-faced Herons kept a similar distance while stalking through sheltered shallows for fish and crustaceans.

Other shore-feeding species also sharing the coastline were Sooty Oyster-catchers and a small group of Turnstones. Turnstones are another far-ranging migratory species, though following the reverse route taken by the Short-tailed Shearwater. They breed in Arctic and sub-Arctic areas during the northern summer, returning to the southern hemisphere for the remainder of the year, generally reaching Australian coastlines from September and leaving again in April. The shy and secretive White-faced Storm-petrel congregates in three separate nesting areas during its summer breeding period, digging shallow burrows in the shelter of shrubs. Two Barn Owls were disturbed from sleep in a granite crevice: these nocturnal hunters are usually associated with islands supporting small mammal populations that are similarly nocturnal. Possible food sources on Dorothée may include nocturnal reptiles and roosting birds, with an annual feast of night-flying Storm-petrels. Barn Owls may also fly to Pearson Island to catch Bush Rats.

Granite slabs and cracks provide refuges for the Peninsula Dragon and Marbled Gecko, while loose soil and leaf litter beneath the shrublands favours small, swift skinks, their smooth scales and short limbs streamlining movement through their cluttered habitat.

Dorothée's indented eastern coastline provides enough shelter to allow a cautious landing in all but severe swells. Care should be taken to avoid disturbing the sea-lions and seals — especially the latter which, though more timid than sea-lions, are also generally more aggressive when cornered. The breeding males are strongly territorial during the spring-summer breeding season, and females will defend young pups against intruders.

## Cap Island (Figure 55)

There are no major islands in the coastal waters south of the Investigator Group until the jutting finger of Coffin Bay Peninsula and the massive inselberg of Greenly Island. Between these, the continental shelf slopes gently to the broad, sweeping bays of south-western Eyre Peninsula, only rising above the ocean to form two small, widely separated islets.

Cap Island, named by Flinders on 16 February 1802, lies about 7.5 km offshore, west of Mount Misery. Its 8 ha rise forms a broad dome of light-coloured granitic gneisses and younger intrusions of more erodible 'foliated' granite. The granite platform rises abruptly to a thick mantle of calcarenite, reaching 28 m near the east coast. The island's name alludes to the cap-like profile of its calcarenite on granite structure.

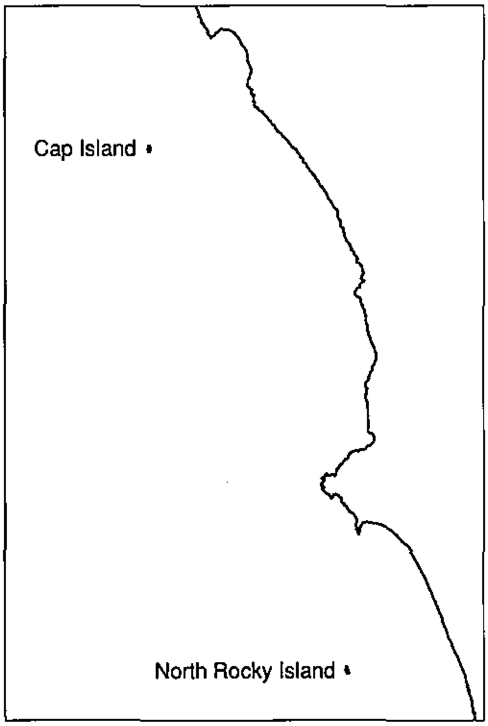



**Figure 55.** Map of Cap and North Rocky Islands.

The upper platform retains shallow pockets of salty soil, a product of the breakdown of the crumbly sandstone by wind and spray—which have also scalloped out sandstone from between the layers of more resistant calcrete along the island's steep flanks, perforating it with deep caves and overhangs. Cap Island's height does not allow plants intolerant to excesses of salt-laden wind to survive, and a simple community of 11 species competes for available soil: these include Marsh Saltbush, Round-leaved Pigface, Nitre-bush and Sea Celery, but the most common is salt-tolerant Grey Samphire, a low, gnarled shrub with long, segmented fleshy stems.

The upper reaches of the broad granite shelf are the limit of access for a scattered group of Australian Sea-lions, the shelter only enough for a temporary haul out and basking site. Primarily oceanic and coastal birds inhabit the islet, including a large breeding colony of White-faced Storm-petrels. Of special interest was the survey's collection of a body of the White-fronted Tern, representing the western-most record of this species in South Australia. No reptiles were discovered during the survey.

Cap Island is ringed with white water and surge, making a sea landing impossible under normal conditions; the survey was conducted by helicopter.

## North Rocky Island (Figure 55)

The name summarises this small islet, 13 km south of Drummond Point. A low hump of gneiss and granite, it bears no trace of a calcarenite mantle and the entire surface is exposed to incessant weathering. The sheet structure is clearly visible in the joints that crease and fragment the dome; thicker layers slowly fracture into huge blocks that lie stranded on the younger, underlying layers, awaiting the winter storms that will eventually sweep them away.

No soil remains, leaving the island devoid of vegetation. In calm weather North Rocky serves as a resting platform for a small colony of Australian Sea-lions, a large flock of Crested Terns and a few Silver Gulls.

Landing on the island by any method other than helicopter would require exceptional conditions.

## Greenly Island

Approaching Greenly Island (Figures 56 and 57) is like seeing *Uluru* rise from the desert. The island lies in deep water 30 km west-south-west of Whidbey Point and was named by Flinders on 16 February 1802, in honour of Sir Isaac Coffin's fiancée.

Like Pearson Island, Greenly is an isolated inselberg, once rising above a dry continental shelf in a similar fashion to Mount Greenly on the mainland. Whidbey Granite is the constituent rock, an even-grained massive granite of the Sleaford Complex dated at about 2350 million years old. The bulk of the island's 202 ha lies beneath the main peak which, from an eastern or westerly perspective, rises in a steep pyramid profile to 230 m; from other angles the island appears more elongated. The north-western tip drops steeply to a deep chasm that channels a torrent of surge, effectively separating the northern lobe. A small islet, Seal Rock, lies almost a km off the east coast; once a minor peak of the inselberg, it now rises 61m above the sea. Greenly's predominant soil is derived from eroded granite, ranging from a fine gravel to coarse sand. Remnants of calcarenite occur on the main island, with associated sand- and limestone-derived soils. Deposits of windblown sand also form beds on the main island.

The vegetation is comparable with that on Pearson Island, though less diverse. Greenly supports 56 species of plants. A woodland of She-oak clothes the heights of the main island beyond the reach of the most severe saline influences; only a small pocket occurs on the lower north island. Dryland Tea-tree grows as an understorey shrub in the She-oak woodlands, but becomes increasingly dominant and often forms dense thickets as the She-oaks thin at lower altitudes. Scattered through the thickets are Bower Spinach and Ruby Saltbush, which normally grow in low, ground hugging mats but are here are forced upward as tall climbers by the dense tea-tree.

On the north island, the highest soil pockets grade from an open tea-tree scrub to an open heath characterised by Twiggy Daisy-bush in varying densities, with other heath species forming the island's most extensive vegetation cover. Surprisingly, Coast Daisy-bush is entirely absent from the main island. Thin soils support a grassland of tussock grass, widespread on the main island but much less prominent on the north island. Saline environments near the coast support low herbfields characterised by Round-leaved Pigface, Austral Stork's Bill, Sea Celery and Karkalla.

Overall, the small north island has greater vegetation diversity than the larger southern section, an anomaly that can be attributed to the introduction of Kangaroo Island Tammar Wallabies to the southern island in 1905 to provide food for shipwrecked sailors (see Chapter 2). Features that differentiate the southern portion, such as the sparse woodland understoreys, large areas of grassland and absence of Coast Daisy-bush, demonstrate this animal's impact on the island ecology.

Greenly maintains a relict population of the Bush Rat in all habitats on both the northern and southern sections. Population density is high; an average of 13 rats per hectare. The island's other mammal inhabitants are New Zealand Fur-seals, in two colonies, and a dispersed colony of Australian Sea-lions.

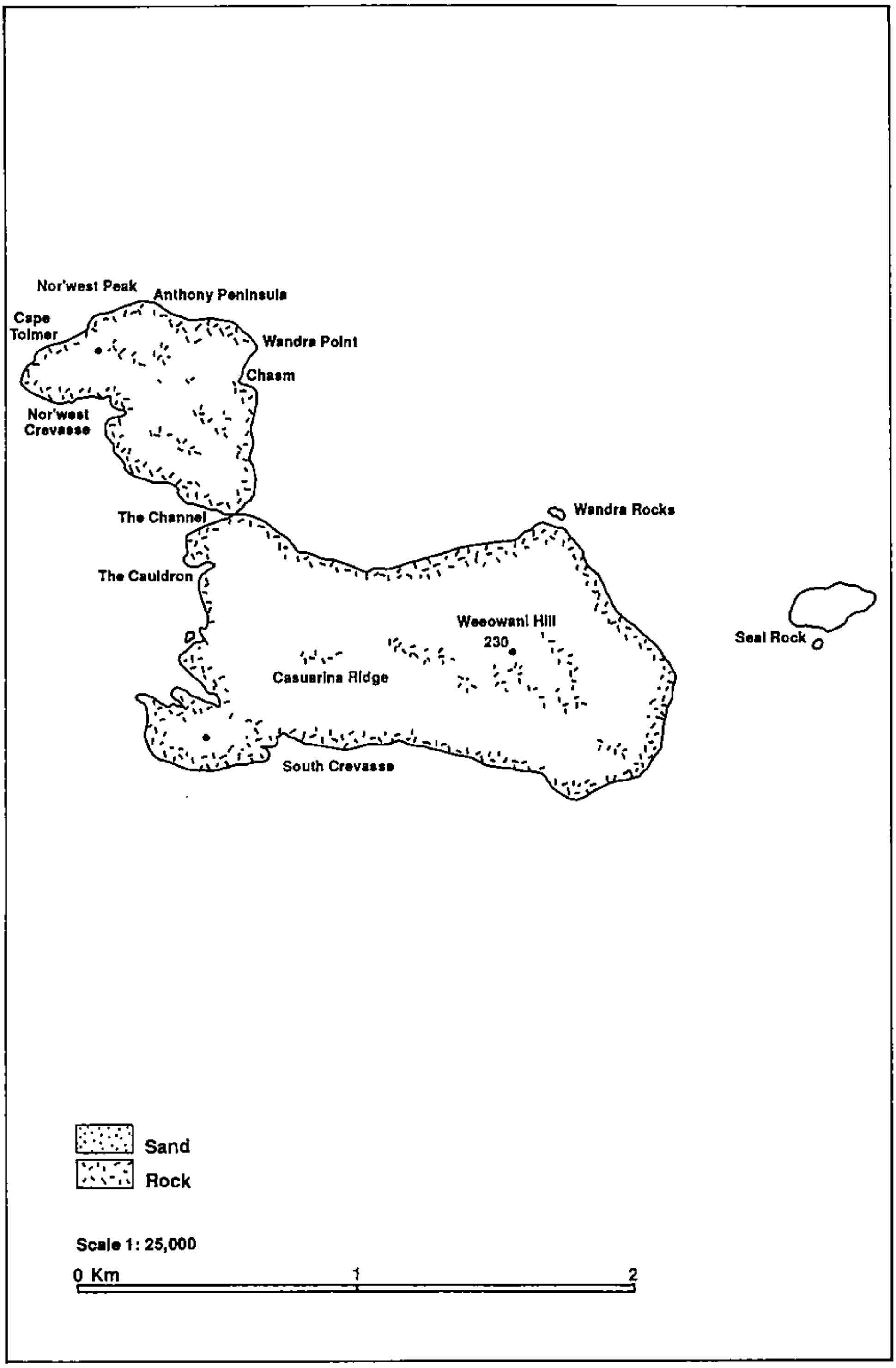



Figure 56. Map of Greenly Island.

Seventeen species of birds were recorded; two White-bellied Sea-eagles were sighted, and a nest was found on the summit. The eagles, which eat carrion, would certainly benefit from the occasional wallaby carcass. A White-faced Heron was flushed from the She-oak woodland on the main island and, as this species nests in trees, may breed on the island. A large colony of Fairy Terns breeds from August to January on Seal Rock, and Short-tailed Shearwaters nest in the deeper sandy soil pockets on the main island's steep southern face. The tea-tree scrub, She-oak woodland and heath are alive with the foraging and calls of Little Grassbirds, Silvereyes and Red-capped Robins.

Reptiles are represented by four species, including the Marbled Gecko, Four-toed Earless Skink and the large, brightly patterned Bull Skink (Plate 83). Access to the island is possible with care on the shores of the north-eastern bay.

**Plate 83.** The Bull Skink (*Egernia multi-scutata*). Photo S. J. Doyle

## Mount Dutton and Coffin Bay Islands

Within the sheltered waters of Mount Dutton and Coffin Bays are eight small calcarenite islands, while in the shallow tidal waters of Yangie Bay is the larger sandy and mudflat Yangie Bay Island. All the calcarenite islands have been substantially modified by a history of guano mining and grazing, but still provide valuable habitat for seabirds. Yangie Island, on the other hand, is much less modified and provides a glimpse of what the original She-oak woodland of Coffin Bay National Park must have been before more than a century of grazing by stock and rabbits.

### Mount Dutton North Island (Figure 57)

A small calcarenite rise, now fringed by the shallow waters of Mount Dutton Bay, forms a low islet about 500 m from the shore off the Bay's north-eastern lobe. Mount Dutton North Island is known locally as Jetty Island.

The island's thick calcareous sandstone is capped with a hard, cemented layer called calcrete, in many locations completely worn away to leave a honey-combed maze of overhangs, crevasses, caves and solution tubes. The coastal rim rises sharply as a perforated, undercut ledge broken occasionally by rubble that marks a collapsed cave or lip. The waves, driven by winds from the south, shatter into foam and spray that dampens the rocks, etching the stone into scalloped blades and needles. Inland, caution is still required, for this apparently solid island's interior is thoroughly undermined — miniature sinkholes appear unexpectedly in the rank vegetation, and the slosh and gurgle of surge can often be heard below.

The upper platform retains a bed of soil and is clothed in vegetation. Introduced plants such as African Boxthorn are most common, and, after winter rains, a luxuriant cover of foreign grasses and herbs appears.

The few native shrubs provide shelter and food for a sparse population of Singing Honeyeaters, and a breeding colony of Silver Gulls is scattered among the low coastal shrubs.

Access can be gained with a boat of shallow draught, though any wave motion means care must be exercised in climbing on to the ledge. Much of the coastal rock is rotten and may collapse under stress; this should be kept in mind when choosing a landfall.

## South Mount Dutton Bay — South, South-east and South-west Islands (Figure 57)

Cradled inside the mouth of Mount Dutton Bay are two unnamed islets and a bare rock. The small mounds of calcarenite and sand lie a short distance from a minor headland protruding near the southern tip of Horse Peninsula. The surrounding shallows and the proximity of the headland hint at a connection that persisted after this broad, shallow valley was first flooded; however, any connecting rock has since been eroded, possibly reformed into the sandbars that connect the islets' rocky cores and radiate along the tidal flows.

Pockets of shellgrit and more saline soil have been colonised by Grey Samphire, which grades to a low, gnarled shrubland of Coast Daisy-bush where the sand is deep enough — and high enough above the water table. Spreading shrubs of Nitre-bush favour limey soils on the highest sections of calcarenite and calcrete.

A variety of birds inhabits these small but relatively undisturbed islets. The smaller South-east Island provides a roosting platform for three species, including a flock of 200 Pied Cormorants. The larger South-west Island hosts the greatest diversity. The survey's approach to the rocky northern shore flushed a Sacred Kingfisher from a possible nesting hole in the well-perforated calcrete; this small relative of the Kookaburra shares a similar build, including a disproportionately large bill, but flashes bright colours of turquoise blue and green, black, white and cinnamon as it swoops on small fish, crustaceans and insects.

A pair of Pied Oystercatchers shares a coastal territory with a pair of Sooty Oystercatchers (Plate 84): the former is distinguished by a white breast and prefers to forage on sand, while the latter, all black, favours rockier shores. Small flocks of Red-capped Plovers scurry along the waterline searching for insects, molluscs and marine worms in the sand. Red-necked Stints and Grey Plovers, both visitors from the Arctic tundra, share sandbanks and beaches with the Red-capped Plovers. The South Rock is occupied by a pair of Pied Oystercatchers and an unusual flock of 41 Sooty Oystercatchers. Pied (larger in size, and with an orange-yellow patch separating the eye from the bill) and Little Pied Cormorants also roost here.

**Plate 84.** The Sooty Oystercatcher (*Haematopus fuliginosus*). Photo P. D. Canty

A puzzling discovery on the South-west Island came in the form of abundant rabbit dung without any sightings of rabbits themselves. An intensive survey of a small island should have yielded a live sighting or at least a warren if the animal was a permanent resident, and it must be assumed that rabbits can cross on sandbars at low tide. South-west is the only island to support any reptiles — two Marbled Geckos and a single Four-toed Earless Skink had expanded from their normal rocky haunts to hide under stranded driftwood.

The islands, though in shallow water and within walking distance of the mainland, are well away from access by road. The easiest approach would be by boat from Coffin Bay.

## The Brothers (Figure 57)

The Brothers are two small islets lying between Horse Peninsula and Eely Point in Port Douglas. They are streamlined by the action of waves and tide; the larger, 'Big Brother', is tear shaped, about 250 m long and 100 m wide, while 'Little Brother' (similarly shaped, almost 100 m long and 10–20 m wide) lies in the wake of the larger island, separated by a narrow channel and a shallow reef marking an earlier land bridge. Both are calcarenite rises, with an upper platform of thick calcrete that retains varying depths of soil, dropping to the waterline in a steep shelf that is typically weathered and undercut by the action of waves on the underlying calcarenite. Big Brother was mined for guano late last century, with scooped out hollows and piled rocks still visible.

Both islets are severely infested with weeds, the most dominant being African Boxthorn. The understorey is a seasonal crop of introduced grasses and herbs including Barley-grass, nettles, Fat Hen and Sow Thistle. Little Brother is almost bare calcrete, with boxthorn claiming most available patches of soil. A boxthorn eradication program was commenced by SANPWS in 1983 as a first step in restoring the islands.

Coastal birds are numerous, perhaps reflecting the islands' poor habitat for landbirds. The Brothers form major local breeding grounds for Crested Terns and the larger red-billed Caspian Tern, Silver and Pacific Gulls. The uncommon Eastern Reef Egret, differing from the White-faced Heron in having an overall dark slate-blue coloration, can be seen patrolling the shallows and is also known to breed here. Landbirds include shy Little Grassbirds, a large breeding population of Rock Parrots and Banded Landrails (not normally seen, due to their cryptic coloration and retiring nature). The islets were visited in January 1984 by members of the Australian and New Zealand Exploration Society, who were astonished to find Landrails leaving the cover of shrubs and boldly approaching them — one bird even accepted hand-held food. The Society's members also flushed four Barn Owls from a roost in the coastal cliffs.

Big Brother was the site of a significant palaeontological find early this century, possibly unearthed by guano miners. A cave was found to contain fossil bones of about six species, including an extinct kangaroo, a giant flightless bird and a sea-lion, dated from the late Pleistocene period around 20000 years ago.

Both islands are easily accessible by sea. Care should be taken to avoid disturbing breeding birds.

## Rabbit Island (Figure 57)

At 4 ha, Rabbit is the largest island in the Mount Dutton and Coffin Bay group. It lies on a shallow shoal a little over a km from the southern coast of Port Douglas. Its structure is similar to the other islands; a plateau of calcarenite capped with relatively thick calcrete, rising to 10 m. The surrounding shallows reduce wave impact, giving the coastal perimeter a steep but not sharply undercut rim. The calcarenite crumbles to a compacted talus slope marked with occasional boulders of calcrete, and the waterline is often softened by sand on the more sheltered eastern side. The upper platform retains a bed of soil, and was also subjected to guano mining late last century.

The removal of native vegetation and soil disturbance during guano mining may have allowed the massive invasions of weeds that also afflicts Rabbit Island. African Boxthorn once again dominates, sheltering the usual understorey of weeds including Tree Mallow, Barley-grass, Capeweed and pasture legumes. The island's sheltered locality would have been favourable to the retention of a diverse flora. A glimpse of the once greater diversity can still be found on a sandy area at the south-eastern end of the island, where a small stand of native vegetation escaped disturbance. A patch of Coastal White Mallee grows to 2.5 m and in its shade a shrubby understorey includes attractive species such as the Coast Beard-heath, Native Lilac, Common Everlasting, Black-anther Flax Lily and Feather Spear-grass.

Birds are representative of those inhabiting most of the islands in this group. The soft soil of the coastline allows Little Penguins to burrow, and the extensive shrubland provides refuge for Singing Honeyeaters. The Banded Landrail breeds on the island, as do Eastern Reef Egrets.

Reptiles are restricted to the Marbled Gecko and the Four-toed Earless Skink. The brown hares which, according to local legend, gave the island its name have not been seen for many years.

Access to Rabbit Island is not difficult, though the surrounding reefs and sandbars require a shallow draught for a dry landing.

## Goat Island (Figure 57)

Goat Island is a small, persistent calcarenite outcrop off the township of Coffin Bay in the convoluted channel that feeds Kellidie Bay. The calcrete cap drops to the sea in a tangle of vegetation and sharp rocks from a flat platform of outcropping rock and shallow soil.

Goat is possibly one of the most disturbed islands visited during the survey. Its decline began with the removal of most of the vegetation during guano mining late last century. Small piles of rocks that can be found were probably sorted from the guano by miners. Reports mention the island once supported a market garden, which would seem to explain the dense patch of cabbage-like plants that grow wild over much of the upper platform. The cabbages intermingle with other weeds such as African Boxthorn, Fat Hen, Mallow and nettles (mainly Scrub Nettle). The most visible native species is Nitre-bush, which spreads in thick clumps over the broken calcrete fringe.

The island provides a haven for the local Silver Gull population, which breeds among the lower shrubs. A surprise sighting was an Eastern Reef Egret disturbed at the water's edge. Another interesting find was the continued survival of Marbled Geckos and Four-toed Earless Skinks, both found taking advantage of the piled rocks.

Goat Island rises from a small surrounding shoal with a sandbar trailing to the east. A deep channel forks either side to the west, aiding access.

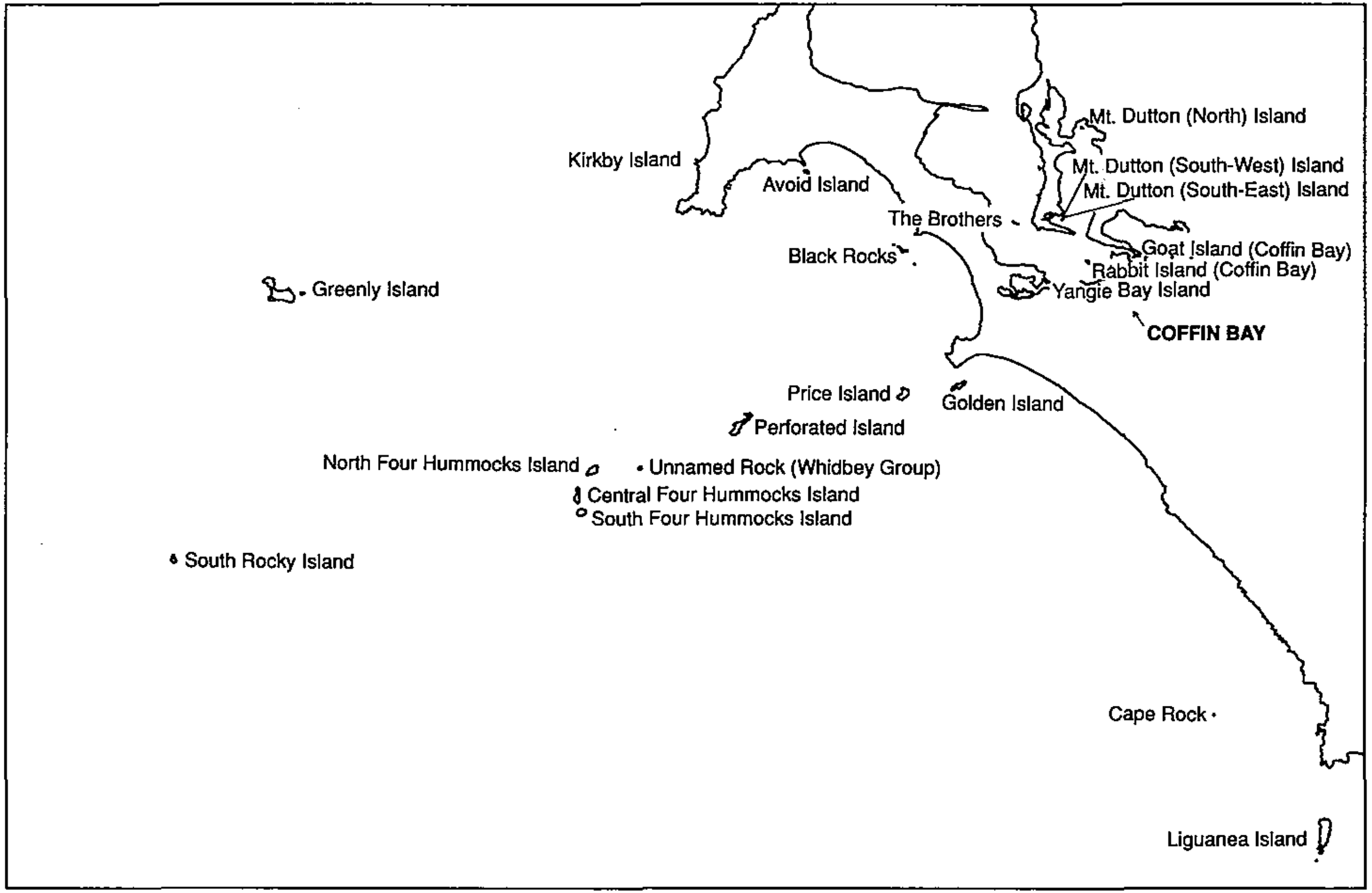



**Figure 57.** Map of Mt Dutton, Coffin Bay Islands and the Whidbey Group.

## Yangie Bay Island (Figure 57)

Nestled in the southern curve of Yangie Bay is a low, 5 ha mosaic of dry rock, meandering channels and regularly inundated mud and sand. This mass earns the title of island by virtue of a distinctly larger channel that separates it from the mainland, a barrier that varies considerably with tide. The core elements of the island are a group of scattered calcarenite rises, fringed by sediment deposits that have grown until each outcrop was connected.

The highly saline marshes that surround the rocky rises support a thick shrubland, dominated by Grey Samphire, that must tolerate regular inundation by tide. This broad fringe of vegetation delineates most of the island and helps protect plants on the rises from direct contact with the sea, aiding the survival of a diverse community whose composition is comparable to that once existing on the mainland.

The rises, blanketed in a shallow layer of dark, sandy soil, are dominated by Drooping She-oak (Plate 85), which grows in a tall woodland with a dense canopy. The ground beneath is clothed in native grasses, predominantly Coast Tussock Grass interspersed with annual daisies and herbs. Taller shrubs such as Fleshy Saltbush, Bower Spinach and Marsh Saltbush punctuate the grassland and occasionally cluster in patchy open heath.

Similar She-oak woodland once occurred widely on Coffin Bay Peninsula, but because of the luxuriant growth of grasses and semisucculent shrubs the woodlands were favoured sheep pasture. The degraded understorey and frequent burning to promote regrowth (then also heavily grazed by rabbits) has prevented regeneration by She-oaks, which are now confined to a few old and sparse stands.

**Plate 85.** Drooping She-oak (*Allocasuarina verticillata*). Photo A. C. Robinson

The significance of the Yangie Bay Island woodland is that it has never been grazed or burnt, taking on an appearance fitting early surveyors' and stockmens' descriptions. Limited grazing does occur; Western Grey Kangaroos and rabbits are occasional visitors to the island, crossing the mainland channel at low tide, but they appear to cause little damage. Kangaroos have been seen moving to and from the island at high tide, swimming confidently across the deep channel.

Birds sighted during the survey were predominantly woodland species (the tide was high at the time, and may have temporarily forced shore-feeding coastal birds to forage elsewhere). White-browed Scrubwrens and Yellow-rumped Thornbills are difficult to identify from a distance, but they are curious and will investigate anyone making squeaking sounds. The Scrubwren can be distinguished by its distinctive white stripes above and below the eye, while the Thornbill has an unmistakable bright yellow rump. A family of Superb Blue Wrens claimed a territory on the island; these small brown birds scurry and flit through their vigorously defended shrubby habitat, searching leaf litter for insects and trilling noisily. During the September–March breeding season the males moult to their striking blue plumage, though older males may retain their breeding plumage all year. The discovery of Emu faeces without a sighting of the birds themselves indicates further opportunistic visits by a large forager during low tide. No reptiles were found.

## The Whidbey Group

This group of islands was named by Flinders after his home town in England. Within Avoid Bay are two groups of islands, Avoid Island itself and Black Rocks. The main Whidbey Isles stretch in a chain south-west from Point Avoid. Price and Perforated Islands, closest to the shore, retain a considerable cover of calcarenite over their granite bases; as the chain stretches further into the Southern Ocean as the Four Hummocks, the covering has been stripped away to leave rounded granite inselbergs. At the end of the chain lies South Rocky Island, one of the most remote islands off the South Australian Coast.

### Avoid Island (Figure 57)

Avoid Island rises a few hundred metres from a small headland projecting into the northern curve of Avoid Bay. It has the interesting alternate name of Sudden Jerk Island, conjuring images of a dark night and a surprised ship's captain. There was a shipwreck here after which the island was named, but Sudden Jerk refers not to an unexpected impact but to the ship itself, which was locally infamous for an 'irregularity in its propulsion'. The bulk of the island is a gentle granite dome that rises smoothly from sea. The remains of a calcarenite mantle have been confined to a small cap that rises abruptly on the island's 23 m high summit.

A few pockets of skeletal soil lie on the upper surface of the calcarenite cap; the granite is swept clean of any irregularities by the surge. The deeper layers of soil support a low shrubland of Marsh Saltbush and, where it thins, a low herbfield of species such as Round-leaved Pigface and Austral Stork's Bill.

Both Silver Gulls and Rock Parrots breed on Avoid Island and other birds sighted during a brief survey in 1985 included Pacific Gulls, Crested Terns and Sooty Oystercatchers. An Osprey flew overhead, but no nesting site was found on the island. There were many small burrows on the island's northern slope, probably those of the Rock Parrot, but they may be the summer breeding burrows of a colony of White-faced Storm-petrels.

A triangular pool in a cleft in the granite at the eastern end of the calcrete cap would be about two m deep at its highest. The water appears to derive partly from rain runoff and salt spray, or from swells that reach over the granite base. The water tastes less salty than the seawater and is used by seabirds to wash. It is only possible to land on Avoid Island by boat in very calm weather.

### Black Rocks (Figure 57)

This broken chain of islets, rocks and reefs (Plate 86) lying 1 km off a small point on south-central Avoid Bay is composed entirely of calcarenite, and has the appearance of an old sea wall, battered and breached into scattered fragments. The islets (the largest of which is 47 m high) rise steeply from the sea, particularly on the most exposed faces, to a flatter platform. Layers of softer calcarenite are separated by harder bands of calcrete; the remnants of additional layered beds rise above a widespread lower platform on the larger islets. The softer calcarenite layers, more susceptible to erosion than calcrete, have been hollowed out to form caves and overhangs, and most of the shallow pockets of sandy soil originate from the decomposition of this rock.

Two simple but discernible vegetation groups occur over the islets. Pointed Twinleaf, a distinctive vivid green bush with fleshy leaves arranged in opposite pairs and bright yellow flowers, dominates. Deep soil accessible from the sea is utilised by Little Penguins, digging burrows about a metre in depth. Deep soil higher on the platform, especially on the most exposed faces, is excavated by Short-tailed Shearwaters during their breeding season. The smaller, more delicate White-faced Storm-petrels dig shallow nesting burrows, and occupy most of the islets' soil patches. Other species recorded include a pair of White-bellied Sea-eagles that nest regularly on one of the smaller stacks, and many Rock Parrots.

Access to the larger islets may be gained on the leeward side during calmer weather. Care should be taken when crossing the extensive reefs that link the islets.

**Plate 86.** View of Black Rocks from Coffin Bay National Park. Photo DENR

## Golden Island (Figure 57)

Golden Island, lying only 1 km south of Point Avoid, provides a spectacular glimpse of a rugged calcarenite island without the need for a long, hazardous boat voyage. The majority of the island's visible structure is a thick bed of calcarenite, dropping abruptly to the sea as sharp cliffs or steep slopes of jagged boulders and pulverised rock. The gently undulating upper platform slopes gradually from the tallest cliffs on the north-west side to the lower south-eastern corner. Two central sandhills are the highest points on the upper platform, both about 55 m above sea level.

Golden Island probably gained its name from the abundant freshly eroded calcarenite on the steeper cliffs. This Bridgewater Formation calcarenite was once more extensive, forming a sheet that covered much of coastal Coffin Bay Peninsula and the surrounding continental shelf. Most sections not immediately submerged by the rising sea were quickly eroded, and the retreat of the calcarenite bed that once completely blanketed Golden Island and joined it to nearby Point Avoid is marked by a submerged reef connecting the two. Golden Island's survival is due to a low sliver of resilient metamorphosed sediments of the Hutchinson Group, which bear the brunt of the surf.

The upper platform and the talus slopes retain thick pockets of soil that in turn support a simple, salt-determined shrubland. The majority of the upper platform was clothed in low, sprawling Nitre-bush, giving way to a fringe of Marsh Saltbush and Pointed Twinleaf that dominate the more exposed coastal fringe. A total of 16 plant species was recorded during the survey.

Bird records include resident species and, because of the island's proximity to the mainland, temporary visitors. Burrows riddle sandier areas, confirming the annual presence of breeding Short-tailed Shearwaters. Other breeding residents include Sooty Oystercatchers, Pacific Gulls, Rock Parrots and Welcome Swallows. Notable visitors included an

Osprey that may have been hunting over an extended territory centred on Perforated Island, where a pair is known to breed, White-faced Herons, Galahs and a Brown Falcon.

Nine Australian Sea-lions were seen using the sheltered northern side as a haul out and basking site. The grade of the rubble slope allows them access to the upper platform. Though no reptiles were discovered during the survey, a more intensive search would probably yield several species.

Access to the island can be gained on the sheltered northern coast, though swells diffracting through the separating channel may hamper attempts in rougher weather.

## Price Island (Figure 57)

A larger dome of Hutchinson Group rock rises 64 m from the water, 3.2 km south-west of Point Avoid (Plate 87). The 58 ha of Price Island (named after Thomas Price, a Premier of South Australia) meet the sea in a melée of jumbled black rocks and seething white water. This basement rock is a dark grey meta-siltstone, its layered structure hinting at its origin as water-deposited mud and silt. The rock also features finely disseminated iron oxide, giving it slightly magnetic properties. A thick mantle of Bridgewater Formation once extended over this, but now clings to the apex of the dome. The old hill's gentle contours survive only on the upper reaches, while the lower slopes have been carved into a sharp rim of cliffs and shattered scree.

Where the siltstone's layered structure is weakened, the sea has penetrated in troughs and crevasses channelling the surge into a wall of water that slams into the calcarenite wall. This combination has formed a spectacular crevasse and deep sea cave on the most exposed south-west tip. The sluicing chasm is roughly 2 m wide and 150 to 200 m deep, tunnelling 40 m into the rock. The upper platform is blanketed in sandy soil that has accumulated in frequent small rises.

A broader combination of area, altitude and soil depth has resulted in a mosaic of shrubland forms. The most widespread type is dominated by Marsh Saltbush, which favours the deeper soils. Where the soil is thin and exposure is high, particularly along the rim of the upper platform, Heath Bluebush grows in a low, gnarled heath. Between the harder sheets of calcrete on the eroded slopes, the softer Bridgewater Formation sandstone crumbles easily and provides a sandy bed for shrubs of Pointed Twinleaf. Seventeen other species were found, including Coast Daisy-bush (growing in scattered clumps on the sandy rises), Australian Hollyhock, Cushion-bush, Feather Spear-grass and Grey Samphire.

Short-tailed Shearwaters have excavated burrows throughout the deeper soil pockets, while more elevated sites have burrows attributed to the White-faced Storm-petrel. Little Grass-birds and Rock Parrots flitted between shrubs, while an Australian Kestrel and Welcome Swallows soared overhead.

**Plate 87.** Aerial view of Price Island. Photo A. C. Robinson

The island was the site for a now abandoned lighthouse. A windlass and stone shed foundations still exist on the clifftop at the northern end of the island, and a sling jetty is sited on rocks at the water's edge below the windlass.

Sea landings are possible on the protected northern side in calm weather. A reef extends for about 400 m from the northern point.

## Perforated Island (Figure 57)

Distance from the mainland and a deepening ocean seem to create increasingly spectacular islands. Perforated Island (Plate 88) lies 12.4 km west-southwest of Point Avoid, and is the outermost island supporting thick calcarenite in the Whidbey Group. Its 121 ha form a long, irregular shape, the coast deformed by deep bays. Towering walls of calcarenite perch precariously on a confined ridge of granite visible as a 3–5 m wide table that does not rise above the waterline. This limited support denies the cliffs any real protection from the deep water swells that form a continuous fringe of white water.

**Plate 88.** Aerial view of Perforated Island. Photo A. C. Robinson

At the waterline the cliffs are undercut, and many sea caves and overhangs have formed along the coast. The largest, a yawning hole 10–15 m wide and 30–40 m high, opens on the western face of the northern tip. The floor of the cave is under enough water to allow crayfishing boats to enter and set pots in calm weather. The island gains its name from a hole eroded right through the top ridge, forming a natural limestone bridge about 400 m from the northern point of the island. A tall stack has been severed from the northern tip of the island.

Above this wild coastal perimeter the island rises to a gently undulating plateau, its highest point 72 m above sea level. Soil depth varies over the upper platform, producing a similarly variable vegetation cover. The precipitous, exposed slopes grading from the cliffs to the upper plateau retain scarce pockets of skeletal soil into which the tenacious Cushion-bush sends its roots. This often grades into a Heath Bluebush dominated shrubland, or into the mixed shrublands of the more sheltered interior. The latter superficially appear to be characterised by either Marsh Saltbush or Pointed Twinleaf, but in fact conceal a surprisingly diverse range of species. A total of 31 plants was discovered, including species absent from other islands off Coffin Bay Peninsula; white flowering Coast Logania, Native Juniper or Boobialla, Thyme Riceflower, Cockies Tongue, Shore Westringia, and Narrow-leaved Spyridium. In places the shrubs grow so densely they form an interwoven mat up to a metre thick — so dense and impenetrable it is often possible to walk on top of it.

The presence of such variety and density of plants provides food and protection for a thriving population of Bush Rats, and Perforated Island is the only member of the Whidbey Group on which they occur. Fifteen species of birds were recorded including Ospreys, which nest on the northern stack; Short-tailed Shearwaters, Little Grassbirds, Rock Parrots and Silvereyes probably also breed here. Galahs, Little Ravens and Cape Barren Geese form a floating population that rotates between all the Whidbey Islands and the mainland, and the island may also support a breeding population of Fleshy-footed Shearwaters (see Chapter 2).

Access to the summit is impossible from the sea, but the beauty and grandeur of the coastline lose none of their impact from sea level. Deep water lies on all sides near the island, though a reef extends from just off the southern point for 1.6 km west, and many reefs lie to the south.

## 'Unnamed' Rock (Figure 57)

Beyond Perforated Island, the younger rocks of the Hutchinson Group and Bridgewater Formation fade into the deepening continental shelf. Seven km south-west of Perforated Island and 24 km in the same line from Point Avoid, a bare dome of rock breaks the water and rises 23 m above its surface. The mass is grooved and worn, licked by surge that leaves a high, wet stain even in moderate swells. This outcrop marks the first sharp summit of an inselberg range, part of the 2 350 million-year-old Sleaford Complex. These ancient rocks still stand over the young Hutchinson Group rocks that were themselves formed from the eroded sediments of the ancient Sleaford Complex.

'Unnamed' Rock provides a small introduction to the wild beauty of the Whidbey Granite inselbergs; the Four Hummocks, South Rocky and Greenly Islands. Like rafts, these islands carry a diversity of organisms and provide a microclimate still somewhat removed from total dominance by the sea. No non-marine life remains on this rock however; in lower swells it glitters beneath a thin crust of salt that dries and bakes in hot sun, and provides a temporary roost and basking site for sea-lions and sea birds.

## Four Hummocks Islands (Figure 57)

The inselberg that forms the Four Hummocks rises first 27 km west-south-west of Point Avoid; the two middle islands of the group lie 1 km south-south-west. Once a single unit, a deep crevasse now separates the two domes with a turbulent ribbon of water. Though smaller in area, the northern summit is 3 m taller, reaching 88 m. A 400 m gap separates the southernmost island, with an intervening rock that rises 15 m above the sea. The southern island is possibly the most spectacular in the group; almost a perfect cone, it soars above the waves to a height of 110 m.

The massive, even-grained granite that makes up the inselberg erodes slowly. Prodigious, bulging sheets armour the island's flanks and there are few free boulders; instead, pockets of granite soil blanket any protected depressions. A few thin scabs of calcarenite cling to the upper heights of all but the steep southern island.

Up to half of each island is bare granite. The few soil pockets support low open shrublands featuring Austral Stork's Bill and Marsh Saltbush. The north island provides the greatest area for plant growth, and accordingly supports the greatest diversity. A total of 22 species was discovered, compared with 17 on the central island (the northern section of the central island was inaccessible from the helicopter landing site, so was not sampled) and 16 on the south island. Other species found on all islands ranged from salt-tolerant herbs such as Angular and

Round-leaved Pigface to larger shrubs such as Nitre-bush and Ruby Saltbush. Many plants—including Cushion-bush, Common Correa, Climbing Lignum, Coast Tussock Grass and Black-anther Flax Lily—were present only on one or two islands.

Birds move more easily between the islands, with some species possibly island-hopping from the mainland. Cape Barren Geese breed in small numbers on each of the islands, and may desert the group during the drier summers in favour of lusher feed on the mainland. Short-tailed Shearwater burrows were found, but numbers are limited by the scarcity of deep soil. Species found throughout the Whidbey Group, such as Rock Parrots, Sooty Oystercatchers, Welcome Swallows (Plate 89), Pacific and Silver Gulls, Little Grassbirds and Australian Kestrels were all seen here. Less common sightings included an unidentified Raven and three White-bellied Sea-eagles. The starling is an unfortunate invader to these and many other offshore islands.

**Plate 89.** The Welcome Swallow (*Hirundo neoxena*). Photo P. D. Canty

Marbled Geckos were only found on north and central island, and the Four-toed Earless Skink only on the central island. Though their favoured shelter of rock shingles is not as widespread as on the more erodible calcarenite islands, it is likely that a thorough search would uncover both species on all of the Hummocks.

A more hospitable section of coast on the central island allowed a New Zealand Fur-seal and a small group of Australian Sea-lions access to basking sites, the latter climbing high to the shelter of a vegetated section.

An operating, 6 m high white lighthouse perches on top of the south island. The erection of a 3000-candlepower light on the southernmost of the Four Hummocks Islands was recommended by Commander Brewis in his 1912 report on South Australian lights, but the South Australian Government constructed a 700 candlepower light in 1914. The light consisted of a small cast-iron lighthouse, operated automatically from eight acetylene gas cylinders that had to be changed annually and, after a hazardous landing were hauled 320 m up the steep side of the island on a flying fox erected each year for the purpose.

In 1936 the Commonwealth took over the light, and decided to increase its power and to provide a more permanent means of transporting the gas cylinders from the servicing vessel to the summit of the island. The specifications for the new lighthouse included a new crane at sea level, improvement to the landing area with rungs secured into the rock face, a permanent aerial ropeway to the summit and the erection of a new tower and light. The contractor was to provide his own provisions, but:

'the island is inhabited by Seals, Mutton Birds and Cape Barren Geese, and probably fishing would be good. With shooting and fishing gear provided by the contractor, ordinary transported provisions could be supplemented in case of shortage'.

The new light was completed in 1940, but remained one of the State's most hazardous lights to service and it is only with the advent of helicopter servicing that maintenance of this station has become a more routine operation.

## Rocky Island (South) or South Rocky Island (Figure 57)[1]

On encountering this isolated island, protruding defiantly from angry water far from the mainland, it is difficult to imagine that a landscape dominated by such a volume of water had ever existed in any other form; that the continental shelf, now submerged 90 m deep, was once a broad plain of waving grass, shrubs and woodlands only a short geological time ago. Tall ranges rose abruptly from this plain, their highest peaks surviving inundation as islands and providing a link to the past in their visible geology and the survival of relict life forms.

South Rocky Island is the summit of such a range, a granite inselberg now shrivelled by the surrounding sea (see centre section). The nearest land mass, Greenly Island, lies 18 km north-north-east; Point Avoid on the mainland is 51 km east-north-east and, to the south, the sea stretches unimpeded to the Antarctic. Because of its distance from the mainland and the surrounding water depths, South Rocky has probably existed as an ocean-locked island for at least 12000 years.

Its steep, rounded flanks of resistant Whidbey Granite are cut by only a few deep crevasses and, though the dome curves 68 m above its turbulent coast, the entire surface and the organisms that still cling to it are strongly influenced by the sea. Searing, salt-laden winds have confined life to a narrow range of species.

Crevices, cracks and depressions have trapped a little granitic soil, with pockets of sandy soil hinting at the one-time presence of calcarenite. Eleven plant species were found, with a shrubland of Grey Saltbush (which normally prefers deeper, sandy soils) the most widespread. After rains, the island is softened by splashes of colour from the streaky pink blooms of Austral Stork's Bill, the bright yellows of Variable Groundsel and the lilac of Australian Hollyhock.

Species adapted to both land and sea utilise the isolation of islands such as South Rocky. Years of hunting have forced New Zealand Fur-seals to congregate and breed in the least accessible locations, and a large colony occupies suitable rock platforms beyond the immediate reach of waves on South Rocky. A smaller number of Australian Sea-lions basks higher, among the Grey Saltbush. Birds are confined to a few coastal species with a surprise sighting of a raven, perhaps a temporary visitor from nearby Greenly. No reptiles were found.

The island rises from deep water on all but the western side of the southern point, where a reef extends for about 400 m, and a submerged rock lies 2 km west of the northern point. Sea landings could be achieved with care on calm days.

[1]Plant and animal species lists for the remainder of the islands in this chapter are in Appendix E, Tables 19a, 19b, 20, 21a, 21b and 22.

Chapter

# 7 ISLANDS OF SOUTHERN EYRE PENINSULA

A wide variety of islands lies scattered around the southern tip of Eyre Peninsula. For the purposes of this account these 'Port Lincoln Islands' stretch from Cape Rock in the west, south to the Neptune Islands, south-east to the Gambier Group and north from Port Lincoln along the coast as far as Lipson Island. The Sir Joseph Banks Group and Dangerous Reef are, however, treated separately. The Port Lincoln Islands range from tiny wave-washed rocks such as Cape and Carcase Rocks and small, pristine islands such as Curta Rocks, North Neptune and Smith Island, to large islands with a long history of settlement and agricultural development, such as Thistle and Wedge Islands.

## Cape Rock

Cape Rock (Figure 57 and Plate 90) lies more than 8 km west-north-west of Cape Carnot, and in moderate to rough swells is marked by little more than a disturbed patch of white water. Its component rocks are presumably Sleaford Complex granites or gneisses which, in calm waters, rise 6 m above sea level. At such times it provides a roosting site for birds and a haul out platform for Australian Sea-lions.

## Liguanea Island

Liguanea Island (Figure 57 and Plate 91) lies 3.2 km south of Cape Carnot. This elongated island's 202 ha rise from a low ridge of distinctly banded and layered Sleaford Complex gneiss. Weaker layers and fractured joints have been penetrated and exaggerated by the sea into a jagged coastline of alternating crevasses and rocky spits, forming the base for a low dome of calcarenite that rises gently from beyond the waves to a relatively flat platform, reaching 39 m high near the southern end. Flinders named the island on 18 February 1802, for unknown reasons, after a town in Jamaica.

**Plate 90.** Cape Rock.
Photo A. C. Robinson

**Plate 91.** Aerial view of Liguanea Island.
Photo R. B. Jenkins

Liguanea's gentle contours and plentiful calcarenite have endowed it with a thick layer of soil that allows a virtually unbroken shrubland to carpet the upper platform. The two dominant species are Nitre-bush and Marsh Saltbush, the former growing over the higher central portion of the island, the latter forming a coastal fringe, particularly on the most exposed southern and western sides. Open patches of Coast Tussock Grass are scattered through the Nitre-bush shrubland and may indicate a thinning in the calcarenite and soil layers due to a more prominent rise of gneiss immediately below. Twenty-three plant species were counted, including Cushion-bush, Black-anther Flax Lily, Southern Sea-heath, Climbing Lignum, Rosy Stork's Bill and Thyme Riceflower.

The thick shrubland provides shelter and food for an abundant population of Bush Rats and, in turn, a resident Barn Owl that retires to a rocky cave or overhang during the day. Cape Barren Geese breed on Liguanea during winter, and Short-tailed Shearwaters, whose burrows perforate the deeper soil, in summer. Silver Gulls, Pacific Gulls and Crested Terns are common along the coast, as are Rock Parrots and Little Grassbirds in the shrublands. Sooty Oystercatchers and White-faced Herons share waterline rocks with scattered groups of Australian Sea-lions, particularly on the sheltered east coast. Additional survey work in 1990 revealed that this is a breeding colony supporting 30 adults and 23 pups (Gales et al. 1994). A visit to the island in January 1990 revealed a breeding colony of New Zealand Fur-Seals that were not recorded during the May 1980 survey; the first survey was outside the breeding season for these seals, or this could be a new breeding colony established in the intervening decade. No reptiles were found during the survey, though more extensive searching would probably reveal Marbled Geckos, Four-toed Earless Skinks and possibly Bull Skinks, which survive on similar large islands with thick shrublands and soil deep enough for its long burrows.

The surrounding waters are comparatively shallow; a low outcrop of gneiss extends from the southern end of the island for 600 m and is mostly submerged, apart from one rock that rises at its southern extremity. Landings could be made on the most sheltered eastern side in normal prevailing weather.

## Curta Rocks (Figure 58)

Extending more than 3.5 km south-southwest from the cliffed beaches east of Cape Tournefort is a chain of islets (Plate 92), perhaps the fragmented remains of a narrow promontory. The main supportive structure is an undulating ridge of Lincoln Complex granite, formed during a period of upheaval and volcanic intrusion known as the Kimban Orogeny and, at 1800 to 1580 million years of age, younger than the rocks outcropping further west. The Lincoln Complex rocks include foliated and porphyritic granites; where the granite ridge rises far enough above water, it carries a remnant crest of Bridgewater Formation calcarenite, the highest reaching 37 m above sea level. The origin of the islets' name is not known.

Salt spray drifts over the entire surface, restricting the range of plants and animals. The minor outcrops are frequently scoured and submerged by heavy swells, so cannot support resident non-marine species; much of the igneous platform on which the calcarenite perches is similarly affected. The two largest island masses retain a thick soil layer on the most protected beds of calcarenite, which in turn support most of the life forms inhabiting the group. The deep soil is anchored with shrublands of Nitre-bush and Marsh Saltbush, with patches of coarser sand supporting thickets of Grey Saltbush.

The islands are important refuges for local and migrating birds, and the deep soil pockets are a battleground for dominance between the vegetation, Little Penguins, Short-tailed Shearwaters and White-faced Storm-petrels, each claiming considerable territory. Rock Parrots, Richard's Pipits, Welcome Swallows, Little Grassbirds and Silvereyes still find space, while two species of skink capitalise on the soft soil beneath limestone shingles on the main north islet. Australian Sea-lions bask on dry rocks on the northern islet (a single New Zealand Fur-seal was seen on the southern islet).

Boat access might be possible via the northern and eastern shores, though submerged rocks and diffracted swells could deter attempts in any but the calmest weather.

**Plate 92.** Aerial view of Curta Rocks. Photo A. C. Robinson

## Wanna Stacks (Main Stack, unless otherwise stated) (Figure 58)

The southern coast of Port Lincoln Peninsula consists of smooth crescents of sand, sharp headlands, deep coves and abrupt cliffs, physical expressions of how different components of the coast's landscape resist ocean erosion. The most resistant are the hard granitic rocks that form undulating beds beneath much of the landscape and that persist as projecting headlands longer than softer rocks such as calcarenite.

To the west of Cape Tournefort, the rapid erosion of a thick calcarenite bed has stranded two humps of granitic rock as small near-shore islets. The smaller lies about 108 m off the south-east end of a sandy beach, a fragmented headland that survives as a chain of exposed rocks and a submerged reef in the separating channel. The 8 m high islet is predominantly granite or gneiss, with the remains of the once more extensive calcarenite sheet clinging to the leeward side. The larger, 55 m high islet rises on a similar dome of banded granite or gneiss 1.4 km south-south-east, and about 370 m from the nearby tall cliffs. Calcarenite also survives on the dome's leeward side, but the sheet is thicker and the island's remnant has been carved into a flat-topped, cliffbound 'stack'.

Calcarenite-derived soil survives in pockets on both islets. The smallest can only support clumps of Nitre-bush but more extensive soil pockets, a climate softened by altitude and relatively recent linkage to the mainland give the larger islet a surprisingly diverse flora of 28 species, including salt-tolerant Samphire, Karkalla, Saltbush, bluebushes, Coast Daisy-bush, Coast Beard-heath and Boobialla, which in turn shelter more sensitive species such as Cushion Fanflower and Thyme Riceflower. The smaller islet was only examined from the air, so accurate species records could not be made.

A pair of Sooty Oystercatchers and five Silver Gulls roosted on the smaller islet. The main island supports a resident population of Rock Parrots and possibly

Welcome Swallows, with a varying population of coastal birds. An isolated calcarenite stack surviving in the lee of the main island provides a nest site for Ospreys. The main island is inhabited by a small, swift, burrowing skink.

Swells break and diffract heavily around both islands' shores, hampering any landing attempts. The summit of the larger island was reached by helicopter, and it is doubtful if the surrounding steep cliffs would enable any access from the base. The islands can be more safely viewed by driving from Port Lincoln on the track to the lookout above Wanna Cove.

## Williams Island (Figure 58)

Williams Island rises from the sea floor 1.8 km south-south-east of West Point, the southernmost tip of Port Lincoln Peninsula, which provides a spectacular backdrop of tall, wooded inselberg ranges and rocky shores. The island's upper platform is a low bed of calcarenite resting on a U-shaped ridge of pink granite, dark-coloured porphyritic granite gneiss with intrusions by large, dark dolerite dykes. The open end of the U lies on the island's most sheltered northern coast, and is used as an occasional anchorage by fishing boats (Plate 93). The apex of the indentation cradles a broad crescent of sand, which slopes to the foot of an encircling wall of steep cliffs and talus slopes. Beyond the rim of igneous rock, the thin calcarenite bed begins either as a talus slope of fractured rock and scree or as low cliffs and overhangs. For the greatest portion of the island, the rock disappears beneath a thick layer of soil, thinning only for infrequent ridges of underlying rock.

The upper platform supports a dense shrubland of saltbush, dominated by Marsh or Grey Saltbush. In a few localities near the south-eastern tip of the island, the basement granitic rocks rise through the calcareous stone and soil to form low outcrops that in turn support a distinctive vegetation cover, predominantly a low herbfield of Austral Stork's Bill, and the island's 141 ha provide enough space and variation for a further 24 plant species.

Bush Rats abound in the thick shrubland, preyed on by another relict species, the Black Tiger Snake. The snakes on this island are large, doubtless reflecting their plentiful food, and are often seen basking between saltbush shrubs, and active even during colder weather.

Short-tailed Shearwaters breed on Williams Island. Attempting to cross the deep soil, saltbush-covered sites they prefer is difficult enough in the dense, gnarled shrubs that tear at skin and clothing, compounded by stumbles into burrows collapsing underfoot; but the knowledge that one of the world's most venomous snakes shelters in the burrows or lies curled beneath the shrubs makes for a harrowing journey. In total, 11 birds and three reptiles were recorded.

**Plate 93.** The beach on Williams Island. Photo P. D. Canty

The island was named by Flinders on 20 February 1802, after a member of the *Investigator*'s crew who drowned at Cape Catastrophe. Landfall can be easily made via the northern cove and beach, though

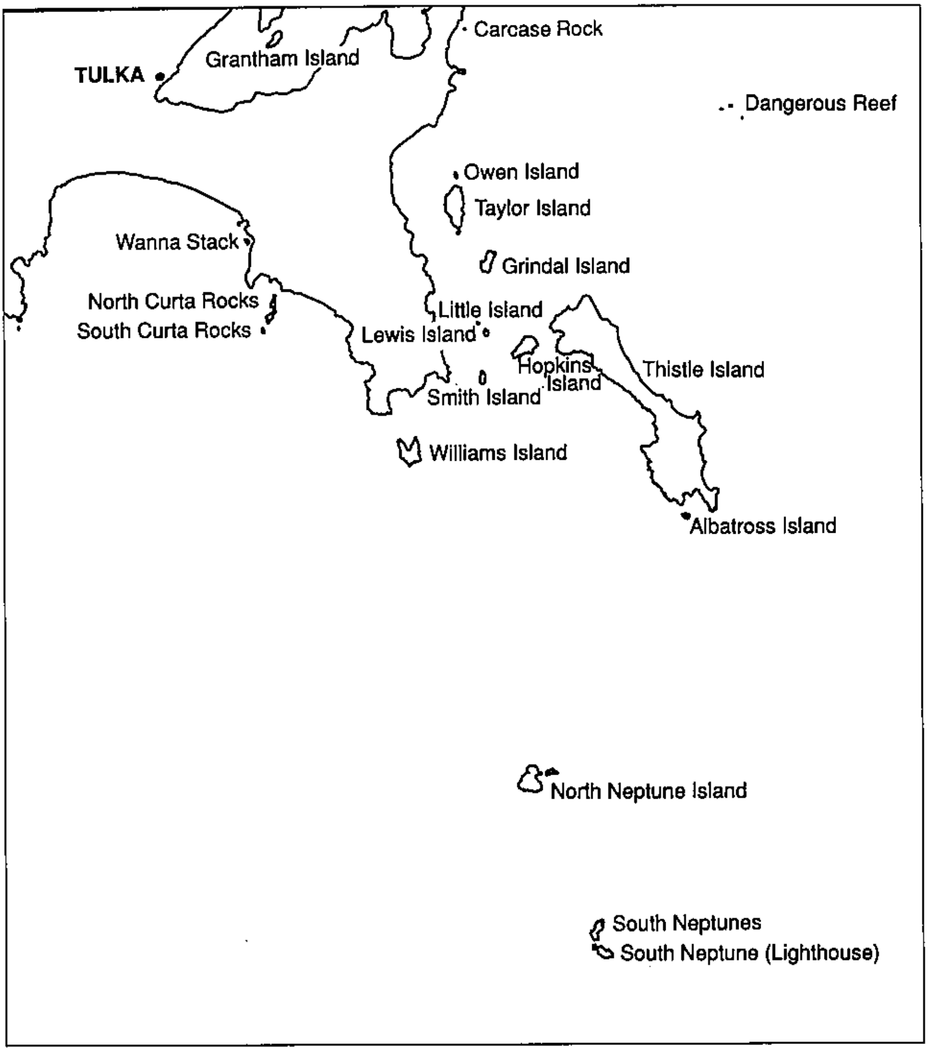



**Figure 58.** Map of Port Lincoln Islands and The Neptunes.

unnecessary forays into the interior should be avoided, not only to minimise the risk of snakebite on a remote island, but also to reduce damage and disturbance to the shearwater burrows. The snakes have an important role in maintaining the island's ecology, and should not be harassed or killed. Williams has an automatic light, serviced by helicopter, mounted in a white hut on the west summit; but despite the light, the fishing vessel *Nenad* ran aground on the beach in February 1968.

## Neptune Islands (Figure 58)

From the scattered islands spread across the mouth of Spencer Gulf, it appears this basin was once all but encircled by higher ground. The islands that remain do so by virtue of the resistance of their granite foundations. A once-widespread sheet of Bridgewater Formation calcarenite extended over this area, but its poor ability to withstand wave erosion meant the sheet has been reduced to the slabs raised beyond the waves on the highest domes of granite.

An inselberg cluster still projects from deep water beyond the immediate entrance to the Gulf, appearing as four islands clustered in pairs with a 9 km stretch of water separating each group. A minor outcrop of rocks up to 9 m high breaks the swells 6.5 km north-north-east of the northern islands.

The North Neptunes (27.8 km south-south-east of Cape Catastrophe) consist of a large island 49 m high and a small islet, 29 m high, 300 m off the main island's prominent north-eastern point. The islands combined cover 243 ha. The South Neptunes (38.9 km south-south-east of Cape Catastrophe) are more evenly proportioned: the northern island is 35 m high and covers 104 ha, while the southern rises to 37 m and covers 98 hectares.

There has been a lighthouse on South Neptune since 1901, and further details of the amazing life of the lighthouse keepers on this remote island can be found in Chapter 3. The lighthouse was automated in 1990 and South Neptune is now a Conservation Park managed by DENR, with a caretaker living in the light keepers houses. The North Neptune Islands and the northern island of the South Neptunes are declared Prohibited Areas under the *National Parks and Wildlife Act*, and permission to land must be obtained from the DENR office in Port Lincoln.

All the Neptunes are dominated by the igneous inselberg rock, a porphyritic granite gneiss and pink granite intruded with dolerite dykes. Thin remnants of calcarenite can be found in confined patches on the upper platforms, and the southernmost island of the South Neptunes contains a deposit of a rare iron-titanium oxide called pseudorutile.

The soils of all the Neptune Islands are predominantly granite-derived, though sandy soils occur over calcarenite beds and as wave-stranded beaches. Deep joints penetrating the inselberg structure have allowed the sea to sculpt spectacular coastlines that range from steep, faceted cliffs to gaping crevasses, platforms dissected and shattered into sheets and discarded boulders, and small coves protected enough to allow a sliver of beach or small boulders polished to glistening spheres by a gentle, gurgling surge.

The islands' low profiles offer little shelter from the walls of water that thunder on their south-western coasts. Fine mists boil into the wind, searing the heights beyond the surf with salt. However, the presence of granitic and calcareous soils in varying depths over wide areas opens niches to a range of specialised plants, each displaying adaptations to a harsh climate in a carpet of colour and form. The main North Neptune Island, the largest in the group, has 35 plant species (the small satellite islet was not surveyed); of the South Neptunes, the northernmost island harbours 28 species and the southern 13—a low figure that may be due to a combination of the disturbance caused by a manned lighthouse and airstrip, a goat population (eradicated in 1968) and vast numbers of burrowing Short-tailed Shearwaters. A cross-section includes Sea Celery, yellow-flowered Leek Lily and blue-flowered Black-anther Flax Lily. Coast Tussock Grass grows in patches that ripple in the wind, Salt Couch hugs the ground in a tangled lawn of ropy rhizomes, and Rat's-tail Fescue is an introduced grass from the Northern Hemisphere. Yellow 'Billy Button'-like daisies grow in thick patches over low muddy hollows, and colouring the taller heath are pink and white everlasting daisies and bright yellow Variable Groundsel. Heath shrubs are dominated by Coast Daisy-bush, Marsh Saltbush and Grey Samphire, but scattered Common Correa and Sticky Hop-bush occur in more sheltered zones. Deep sand pockets near the water are colonised by Grey Saltbush.

After sunset on North Neptune Island, the undergrowth comes alive with the scuttling forms of Bush Rats, and absence of contact with humans makes these attractive native rodents fearless. New Zealand Fur-seals and Australian Sea-lions are common on all islands, taking advantage of a secluded but centrally located island group for breeding and as a refuge. A major study of fur-seals and sea-lions on the northernmost island of the South Neptunes was undertaken by Dr Ian Stirling in 1969–70, and the derelict remains of his laboratory/accommodation hut and observation platform can still be seen.

A healthy population of White-bellied Sea-eagles patrols the group, with nesting sites confined to uninhabited islands. Other predatory birds—a single Peregrine Falcon, a Swamp Harrier and the more common Australian Kestrels were seen—are concentrated on the northern island in the South Neptunes. Landbirds include small flocks of Cape Barren Geese, confirmed as breeding on the North Neptunes, White-fronted Chats, Masked Plovers, Rock Parrots, Welcome Swallows, Silvereyes and Stubble Quails. Sparrows (the flock included an albino bird at the time of the survey) have somehow established themselves on the lighthouse island, but were not recorded elsewhere. Coastal and oceanic species are dominated by many thousands of Short-tailed Shearwaters; though only physically present over the summer breeding season (when they often crash into the glass surrounding the lighthouse beacon), their burrows are a permanent feature. The South Neptunes host Silver Gull and Crested Tern (Plate 94) breeding colonies, the former on the northernmost island, the latter on the small western islet off the lighthouse island.

**Plate 94.** The Crested Tern (*Thalasseus bergii*).
Photo P. D. Canty

Reptiles on the South Neptunes are limited to abundant Marbled Geckos. On the main island in the North Neptunes, they share habitats with Four-toed Earless Skink and Bull Skinks. Black-coloured snakes were first thought to be Tiger Snakes then identified to be Dugites—which would make this the only island occurrence of this species in South Australia, though populations are known from several islands in the Recherche Archipelago in Western Australia. Re-examination of the specimens has shown them to be Western Brown snakes which may have survived on this island due to its larger area and an abundance of food such as the Bush Rat and large Bull Skinks.

Flinders named the islands after Neptune, god of the sea, on 21 February 1802 on account of their apparent inaccessibility. Their isolation and violent coastlines seem to bear out this impression, though careful landings are possible on the more sheltered eastern coasts.

## The Gambier Group

### Wedge Island

The main eastern rampart of an old projecting range has been worn to the bold profile of Wedge Island (Figures 59 and 60). The Gambier Group, of which Wedge is a part, survived the sea's onslaught by virtue of its clustered domes of Lincoln Complex granites and gneisses: on these platforms rest the remains of an undulating bed of Bridgewater Formation calcarenite that once gave the range most of its substance. On Wedge, hints of its proportions can be gained by the ascent from the low northern coast to the 202 m heights of the south coast, where the contours plummet in near vertical cliffs to a fringe of wave-cut platforms and rubble laced with white water. Flinders gave the island its appropriate name on 24 February 1802.

Wedge's towering cliff faces always show fresh scars from fallen rock. The harder layers of cemented calcrete that sandwich the softer calcareous sandstone are often left projecting as terraced ledges when the intervening sandstone crumbles. Winds from the south-west intensify into strong updraughts as they encounter these sudden obstacles, carrying salty spray-dampened air to the rim of the upper platform. Vegetation can find few stable footholds that offer protection from the desiccating winds, and the cliffs are a wall of raw orange rock unbroken by green.

The wind is most intense at the sharp upper rim of the cliffs, scouring bare the rock, lifting sand particles in abrasive gusts that tear at soft leaves and bury plants beneath dunes. Plants such as the stalwart Cushion-bush, whose seedlings can grow in soil trapped by cracks in wind blasted rock, battle to reverse this erosion. Its leaves are minute, growing like scales over the white, rubbery branches; as the compact but densely branched plant grows, it deflects the stinging sand particles, accumulating a mound of sand beneath its sheltering branches and ensnaring this bonus growth area with quick-growing roots.

As the Cushion-bushes grow the severity of the microclimate decreases, allowing other, less hardy species to gain a foothold until a diverse low heath develops. The Cushion-bushes are not totally immune to salt, however; plants at the forefront of the heath suffer salt burns and dieback on their windward sides and, if this front line weakens too much, a particularly ferocious winter storm may uproot and destroy years of slow encroachment. Beyond this fringe, increasing shelter allows a tall open shrubland of Coast Daisy-bush to develop. Where the sand thins to rocky outcrops or to finer, more organic soils is a tall diverse shrubland dominated by Native Juniper. On Wedge, species such as stunted She-oaks, Umbrella Bush, Sticky Hop-bush and Island Bush-pea share this habitat, the most widespread natural community on the island.

The cliffs on the eastern flank are less severe and support pockets of heath that extend from the upper platform. The eastern portion of the island is the least disturbed, and shelters the greatest concentration of non-coastal species. Rock Parrots favour the lower coastal heath, Silvereyes dart from shrub to shrub in denser thickets and Grey Fantails inspect

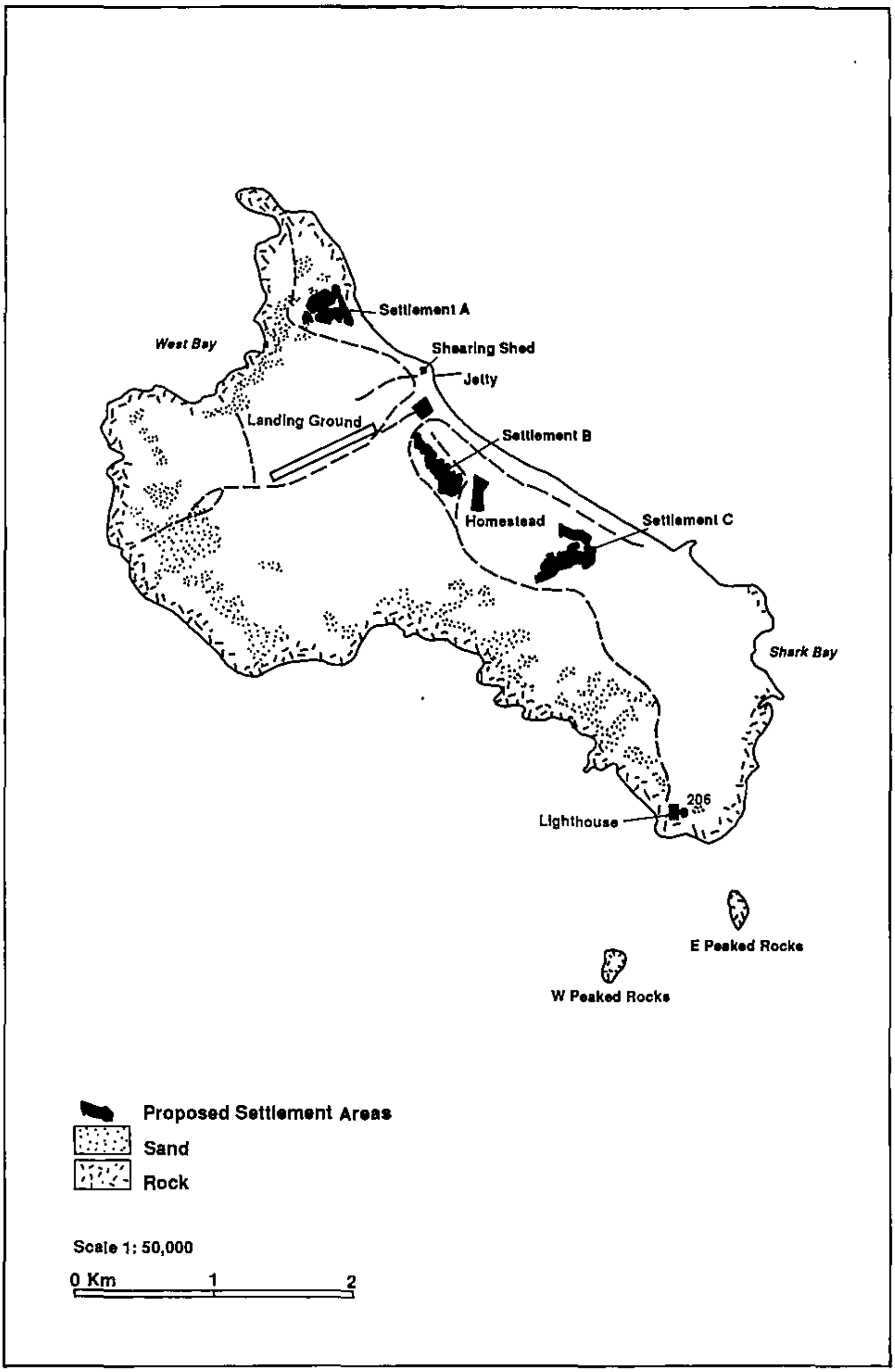



**Figure 59.** Map of Wedge Island.

squeaky imitation calls. The sheltered cliffs provide safe overhangs for the mud nests of Welcome Swallows, and a protected but still lofty nest site for a Peregrine Falcon. Black-footed Rock-wallabies were released on Wedge and Thistle Islands in 1975 in the hope of developing colonies apart from those of Pearson Island. The wallabies favour the sheltered overhangs on the eastern cliffs and appear to be well established. Outcropping limestone and deep soil provide refuges for four species of reptiles, and small burrows disappearing beneath rock slabs often contain the attractively patterned Thick-tailed Gecko or the Bull Skink.

The lower coastal fringe on the northern shores maintains a Coast Daisy-bush shrubland that grows close to quieter waters. Low cliffs give way to a broad, almost straight expanse of sandy beach along the central portion of this coast. The drainage patterns have formed salt marshes in an inland depression at the island's western end; their salt-crusted mud supports shrubs of Grey Samphire. Thin but sheltered soils are crowned by open stands of Dryland Tea-tree, in one patch of which the survey saw three Bush Thick-knees or Southern Stone-curlews. These birds, though large, are well camouflaged, and visitors can be surprised when one breaks cover, the shock reinforced by this bird's gangly body and oversized head.

An island of 947 ha and with a relatively temperate climate was an attractive proposition to a pastoralist. Its position 38 km west of Yorke Peninsula and close to Thistle Island and Port Lincoln also provided access to major agricultural centres. Not surprisingly, Wedge Island has experienced 130 years of pastoral use. The first recorded lessees were N.J. and J.H. Daw, who held a pastoral lease from 1858 to 1871. By about 1860 they had established a picturesque homestead and garden. Though details of the farming operation on this early property are unknown, it is likely that if sheep were grazed their diet would have lacked copper and cobalt. Affected animals were said to go 'silly' and would only recover with a spell of grazing on inland pastures. Transport difficulties obviously prevented such treatment on islands, so sheep grazing generally failed there. On Wedge Island, sheep that had gone silly with 'coast disease' usually ended up falling off the cliffs, but they were soon replaced by cattle or horses more tolerant of the island's 'coasty' conditions.

By the early 1880s, high hopes were held for the pastoral and agricultural success of the island. In 1883 Wedge was surveyed for closer settlement into nine sections of 80 to 100 ha by Government Surveyor Arthur Chamberlain. Though most of these sections were originally taken up by Thomas Cowan, a farmer of Islington, they were held from 1884 by John and William Haigh, stockowners of Port Lincoln, who also held leases for other islands in Spencer Gulf. A guano lease was also issued to William Haigh from 1883 for the taking of guano from coast reserves on several islands, including Wedge, in the vicinity. His operation, called Penguin Guano Ltd, mined material that was probably used for soil improvement on the Wedge Island property. The Haigh family held Wedge until 1909, when the estate was in the hands of executors. As a completion of the Right to Purchase Leases issued earlier for the land, the island was made freehold in 1912—indicating its viability for pastoral use compared with other islands, which have remained under leasehold tenure.

The next owner of Wedge Island was William Golley, who purchased it in 1915. Andrew Golley, most probably a relative, was involved in the property when it was next sold in 1935. The Golley family also held guano leases for Wedge in the 1920s: when Captain S.A. White, a noted ornithologist, visited the island in 1916 he referred to the Golley brothers who lived on it and who bred, 'a good stamp of pony'.

As were Thistle and Reevesby Islands, Wedge Island became well known for breeding horses to be sold for the Indian Army remount trade. The most common type of breed was a cross between Clydesdale and pony, and horses were kept commercially on the island until the mid-1930s. There are many reminders of this era, including buggies and carts, blacksmith's equipment and horse yards. Even after sheep replaced horses, 20 or so horses were used until fairly recent years for rounding up stock and carting hay.

Barley was also commercially grown on Wedge in the early years, with about a third of the island being arable; it is said the island produced better yields than on the mainland. Grain was bagged and shipped for sale, and hay cut for stock feed. The barley was winnowed, bagged and hauled on large slides down the northern cliff face to the beach. The substantial shed, built in the 1890s of stone on the cliff near the present jetty, was a storage shed for hay and grain; it later became a shearing shed.

Deliberate burning was carried out to control the spread of Coast Daisy-bush and, in the year following a burn, the feed would be good where this 'weed' had once existed. Other weeds such as Horehound and Milkweed are present on the island. Generally, however, there are still large areas of relatively natural vegetation on Wedge Island, and vertebrate pests such as cats, rabbits and foxes are absent: unfortunately, House Mice appear to have become established there since 1989.

When Don Cooper took over the property in the 1930s there were about 2000 goats on the island. The sale of their hides for about three shillings each was a great bonus for Cooper, funding the construction of the considerable amount of fencing needed. The goats were almost eradicated when members of the Royal Australian Air Force (RAAF) stationed on Wedge during World War II used them for target practice, and the last of the goats were removed about 20 years ago.

In 1935 Wedge Island was purchased by Don Cooper, who as a youth had become captivated with islands on his excursions sailing single-handed along the South Australian coast. As the market was declining for horses Cooper decided to try sheep on the island, using the recently developed soil-improvement technology that largely remedied coast disease. This involved drenching sheep every month for copper and cobalt deficiency, and though there was a good success rate about 10 to 15 per cent of the sheep would 'go silly'. In fact, so new was the technology at this time that sheep from Wedge Island were the first that had been successfully treated for coast disease to be sold at the Adelaide abattoirs. Wedge Island usually ran about one sheep to the acre, or 2000 sheep in a good year, but in a very dry year up to 600 would have to be destroyed so the limited summer feed would last. Cross-bred Border Leicesters were generally better adapted to the island conditions than Merinos.

Though a jetty was built on the northern shore by the RAAF in the 1940s, the transfer of stock on to boats has always taken place from the beach. Cooper recalls that on one occasion the five metre dinghy of the vessel loading his stock was in poor condition and sank, taking with it his rams. Generally, the cutter *Storm Bird*, skippered by Arnold Mittner, called for the Wedge Island sheep and wool clip and it was a sight to see the 15 or so lambs packed in the dinghy sitting on their tails, with one on the top by which Mittner ingeniously controlled the others. Horses were generally tied together, swum to the cutter and winched on board. In later years the lighthouse servicing vessel *Yandra* would call for the stock.

Though the isolation generally did not worry Cooper—on one occasion he did not leave the island for two years—the war years posed considerable difficulty for him. At this time his hard-working manager L.L. Rau enlisted for service and Cooper was left to operate the property single-handed; it took him three months to blade-shear the sheep.

The island was purchased by Norm Growden in 1952 and, though he continued to run sheep, he also developed the two homesteads as tourist accommodation, each capable of holding six people. This proved extremely popular with an entire 'Rent-an-Island' package sold, complete with flights to and from Adelaide and all food provided.

An automatic lighthouse operates on the south-east point, the island's most elevated site. Three islets lie south of Wedge, two almost immediately below the towering cliffs. As if to reinforce the light's warning the wreck of the *Saori* lies stranded on a ledge at the base of the cliffs. Leased by a private company, the South Australian Oceanographic Research Centre, this 20 m shark boat was washed ashore on 8 June 1975.

In 1987 Wedge Island was purchased by the Venture Corporation and three holiday home subdivisions were negotiated with the State Government. In addition to the two original houses, this will provide an additional 114 allotments. As part of the subdivision conditions no fences can be built round allotments, owners are encouraged to control introduced plants and revegetate with species grown from native plant seed stock from the island. There are special regulations relating to fire prevention and control, and a prohibition on the introduction of animals, firearms and large motor vehicles. The Corporation will control the island infrastructure and will be responsible for the erection of a choice of three standard holiday house types on the allotments. As part of the subdivision agreements, the remaining natural vegetation on the eastern end of the island was to be delineated and proclaimed a Conservation Park. By 1994 only two new houses had been built on the island, and future development rights have been purchased by a new organisation.

Despite its long agricultural history the island has not suffered greatly under the introduction of foreign species. The spread of pasture grasses and weeds such as Horehound have certainly displaced and confined some native species, but in general large areas of relatively undisturbed vegetation survive.

The island has also escaped the introduction of cats, rabbits and foxes—an absence that, combined with a disturbed but still viable natural ecosystem, has been utilised by DENR to establish new colonies of endangered species such as the Black-footed Rock-wallaby and Brush-tailed Bettong (discussed in detail in Chapter 2). Emus, Hairy-nosed Wombats and Western Grey Kangaroos have also been introduced at various times to add to the island's tourist attractions.

Access is available by plane or by boat at the jetty facilities on the north coast. The bay is also a popular anchorage for cruising yachts and fishing boats.

## South-west Rock and Peaked Rocks (Figure 60)

Smaller peaks of Lincoln Complex rocks surface in the vicinity of the main Wedge platform. Many are low and worn, barely disturbing the swells in calm weather. The larger outcrops are high enough above the sea to support a cap of calcarenite, which in turn retains some soil and a simple plant community. South-West Rock lies 3.2 km south-west of Wedge Island and is separated by a clear channel. The granite base features a massive joint or dyke of softer rock that has been eroded to divide the platform with a ribbon of channelled surge. A low cap of calcarenite clings to the highest levels of each portion, the highest rising 21 m above sea level.

Peaked Rocks are two granite platforms similar in proportions to South-west Rock, lying 925 m south-west and 460 m south-south-east respectively from Wedge Island's south-eastern extremity. Their remnant calcarenite cap rises to steep, conical summits respectively 65 m and 43 m high.

All three islets support varying communities of plants. They were inspected by helicopter during the survey, but time and difficult access prevented landing. All appear to support a low heath dominated by Cushion-bush in soil pockets on the calcarenite. The diversity of this community would vary according to the level of exposure, with low South-west Rock supporting less diverse vegetation.

Aerial counts for Australian Sea-lions have been regularly recorded for all the islets. The total population for Peaked Rocks has varied from six to 122 animals; South-west Rock from four to 73. South-west Rock may provide little more than a roost for seabirds, but the higher Peaked Rocks may harbour resident species such as the hardy Rock Parrot in addition to coastal birds.

The small area of the islets leaves them constantly ringed with rough water, making boat access doubtful, and their angular summits do not appear to provide suitable helicopter landing sites.

## North Islet (Figure 60)

North Islet, the largest of the islands surrounding Wedge, lies 2.3 km north-east of Wedge's northern point. The granitic base, which extends over 64 ha, carries a thinner but more uniform slab of calcarenite than its large southern neighbour. The island's plateau-like form ascends abruptly to 47 m from calcareous cliffs along the entire perimeter, as unbroken vertical cliffs or smaller ledges dissected by cones of rubble that mark collapsed sections. The gentle undulations of the upper platform retain a thick soil layer that was originally mounded into stable vegetated dunes. A large central portion of the island has now succumbed to a blowout of active sand that began in human interference.

Though North Islet had never been used for commercial agriculture, goats were introduced, possibly by sealers, around the 1820s as a source of meat for passing sailors. The island has no free source of water such as a spring or waterhole, so the goats obtained moisture from the succulent vegetation, avoiding the trampling and erosion that occurs at watering points: this may have been a major factor in helping the island maintain a relatively un-degraded vegetation cover. Their numbers reportedly fluctuated, with a maximum population of about 300 animals in 1894 that then fell to only two females by 1914—perhaps due to an increased demand for meat rather than a natural decline. In 1914 a male goat was introduced from Wedge Island to

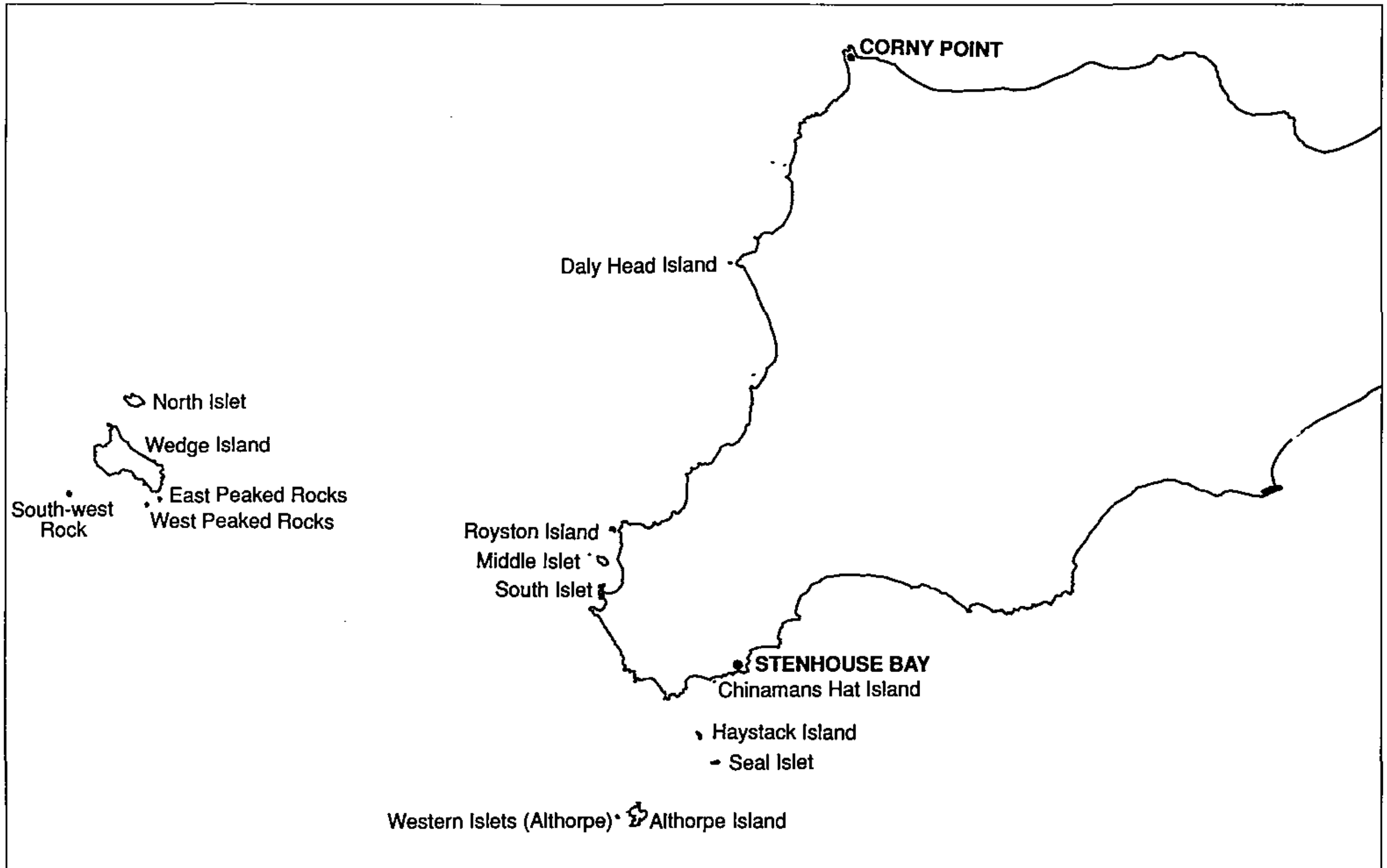



**Figure 60.** Map of Gambier Group and Yorke Peninsula Islands.

maintain the colony's viability and, it was hoped, to replenish the stock.

Tall stands of Drooping She-oak covered the sheltered central area, their shade and open understorey of wallaby grass forming a favourite retreat for the goats; despite this the trees remained undamaged until 1916. The goat population had remained low for years and some enterprising persons fired the wallaby grass beneath the she-oaks, initiating the events that led to the present devastation.

Without grass to anchor it, the sand began to drift almost immediately and so rapidly that the grass could not re-establish itself. Strong southerly winds blew such quantities of sand over the cliffs that observers on nearby Wedge said the island appeared to smoke. The She-oaks held on for a few years, but the gradual exposure of their roots thinned the stands until, about 40 years later, not a single tree remained. The wide blowout is now a desert of wind-sculpted sandstone, dunes and a spectacular 'forest' of calcified roots.

Perhaps in view of the island's reputation as a source of fresh meat, rabbits were introduced, possibly after the continued failure and eventual demise of the goat colony. The rabbits (still abundant) certainly affect the vegetation cover and hinder any reclamation of the blowout by seedlings. Surprisingly, a flourishing population of Bush Rats survives on the island. This species is partly insectivorous, which probably aids its survival against such an efficient herbivore as the rabbit. Ironically, the typically inquisitive island rats invaded the survey's camp and eagerly ate the leftovers of a rabbit stew!

Much of the vegetated deep soil is undermined by the burrows of Short-tailed Shearwaters. Marsh Saltbush is one of the few plants that can survive such disturbance, flourishing in dense shrublands wherever the shearwaters burrow. The sandy vegetated dunes carry a shrubland dominated by Coast Daisy-bush: rabbits seem to be confined to this area, out-competed by the shearwaters for warrens in deeper soil. The dunes, separated by flats of thin soil over sheet limestone, once hosted a community of small shrubs, herbs and grasses but are now heavily grazed by rabbits from the surrounding dunes and in summer are little more than bare earth.

Landbirds are restricted to Australian Ravens, Silvereyes and Masked Plovers; lack of water may tempt some species to migrate to Wedge Island during the height of summer. Reptiles include the Peninsula Dragon, found beneath loose limestone shingles resting on a limestone base, a refuge normally occupied by the Marbled Gecko (of which none were found). Other islands supporting populations of the Peninsula Dragon are predominantly granite, such as Pearson Island, on which the dragons find refuge in cracks in the granite sheets. Burrows beneath rocks partially buried in soil are often inhabited by the Bull Skink or the Thick-tailed Gecko (Plate 95), with larger rocks occasionally shared by both species.

**Plate 95.** The Thick-tailed Gecko (*Nephrurus milii*). Photo S. J. Doyle

The coastal zone is little disturbed and is inhabited by scattered Australian Sea-lions, White-bellied Sea-eagles, Pied Cormorants, Crested Terns, and Silver and Pacific Gulls. Welcome Swallows nest in the cliffs; what may have been a Peregrine Falcon was also seen, flushed from a distant cliff perch.

Landings are possible in moderate weather in the north-western bay. The cliffs can be climbed at various locations with care.

## Thistle Island (Figure 58)

During the latter half of February 1802, the *Investigator* anchored off the mainland at the western entrance to Spencer Gulf, in a channel— now called Thorny Passage —that winds past many islands. A cutter had been sent with eight men to search for water and a more suitable anchorage. On its return journey the cutter disappeared suddenly: Flinders's worst fears were confirmed when the craft was later found smashed, floating bottom-up. Rips are common in the passage and it was assumed an especially strong one had capsized the cutter, drowning all eight men. The headland near where the boat was last seen under sail was named Cape Catastrophe and the local islands bear the names of the drowned seamen; Williams, Lewis, Hopkins, Smith, Grindal and Little. Midshipman William Taylor and the ship's master, John Thistle, led the landing party and were similarly commemorated.

John Thistle was a friend of Flinders, in recognition of which his name was bestowed on a magnificent island. At 3925 ha, Thistle is the third largest island in South Australian waters, exceeded only by Kangaroo and St Peter Islands. Lying 7.4 km east of Cape Catastrophe, its elongated shape stretches from a broad north-western mass that both narrows and rises in a neck that peaks at 228 m before dropping to a broad, low south-eastern lobe. The island is about 16.5 km long, 4 km wide at the widest point of the north-western lobe, narrowing to a km along the neck then widening again to 4.5 km on the south-eastern lobe.

The remnant of a once more extensive mainland range, Thistle (Figure 61) survives by virtue of the massive domes of Lincoln Complex rocks that underlie a soft calcarenite mantle. The basement rocks are mainly a foliated gneiss with a mixture of other metamorphic rocks and dark-coloured intrusive rocks. The major outcrops of the hard Precambrian formations occur at the broad ends of the island, and the relatively thin calcarenite layer over these sections thickens dramatically at the high neck that connects the two sections. The soft calcarenite has been carved by the sea into towering cliffs that form the central coastline; the south-east coastline is most exposed and has weathered most rapidly and dramatically.

Flinders spoke of the island favourably, though he found no fresh water:

> The island was pretty well covered with wood, principally eucalyptus and casuarina (Flinders, in Lewis, 1918).

Navigators such as Flinders and Baudin reported many large colonies of seals occupying islands and surrounding waters along the coast of southern Australia, and so provided the first real impetus for settlement and exploitation of South Australia's coastal regions. The sealers were a rough breed of men, often escaped convicts and ships' deserters. In the late 1830s Captain John Hart, a South Australian Premier who was involved in the State's early whaling industry, visited islands in Spencer Gulf. He encountered many sealers and mentioned one on Thistle Island who was suspected of murdering his original companion, continuing the skin harvest with two

Aboriginal women. Hart felt the women were of Van Diemen's Land origin, due to their curly hair. The sealer had constructed a stone hut with a small but productive vegetable garden, cleared paddocks that were supporting crops of wheat and barley, and raised pigs, goats and poultry.

The plentiful supply of Southern Right Whales in these waters attracted the attention of northern hemisphere enterprises, whose over-exploited herds were diminishing. However, whaling was still highly profitable and Thistle Island gained a rotting memorial of whale bones and derelict buildings, still visible today.

Such a large and potentially productive island close to shipping routes offered promise for agriculture; pastoral settlement dates from the mid-1800s, when Richard Tapley took up the area under an Occupational Licence. The run was later operated in conjunction with Spilsby and Reevesby Islands and, from the 1850s, under pastoral lease. By the early 1860s, when surveyor G.W. Goyder valued the Thistle Island Run, the property was well developed. Improvements included a substantial six-room wooden house, shepherd's hut, stockyard and well. By this time, however, several owners had abandoned the run—probably due to the devastating effects of coast disease on their sheep. The lessee in the 1860s, James Sinclair, intended to restock the island and rotate 780 sheep between several properties on the mainland far enough from the coast not to suffer from the disease.

Thistle was also well known for breeding horses for the Indian Army remount trade, and it is said there were even chariot races held for recreation on a salt pan on the island.

Theo Modra took up the lease in the early 1960s; seeing the potential of access to the island by light aircraft, he built an airstrip soon after taking up the lease. He also built a new shearing shed and, for transporting stock in the early years purchased the ketch *Hecla* from the previous lessee in 1963, building a ramp near Whaler's Bay. After using the ketch for several years to travel, mainly in the summer months, between Thistle and Boston (where he also had a grazing lease) and Port Lincoln, Modra then hired privately owned barges. The wooden ketch *Hecla*, built in 1903, is now on display in a museum near Port Lincoln. Though no grain was cultivated for sale, Modra grew barley for stock feed and had to bring in farm implements such as tractors.

For some time after he took up Thistle Island, Modra and his family lived on the island and his children had correspondence lessons. In later years, for the benefits of his children's schooling and a better social life, he moved back to Port Lincoln.

Thistle Island was, until 1986, one of the few islands still run primarily as a pastoral concern. The island and homestead were also available to short-term visitors, who could fly to the island. In 1986 the island was sold to a development company, which created a 50-allotment subdivision along the coastal strip behind Whalers Bay. Most of the allotments have been sold, and 14 houses have been built: allotment buyers retain shares in the balance of the island, including the old homestead, and collectively manage the island with the Thistle Island Management Association Inc.

Thistle Island's long history of human occupation and exploitation has greatly altered its condition. Sealers presumably wiped out local populations of New Zealand Fur-seals (none exist in the area today), and large areas of eucalypt and she-oak woodlands were felled to fuel the

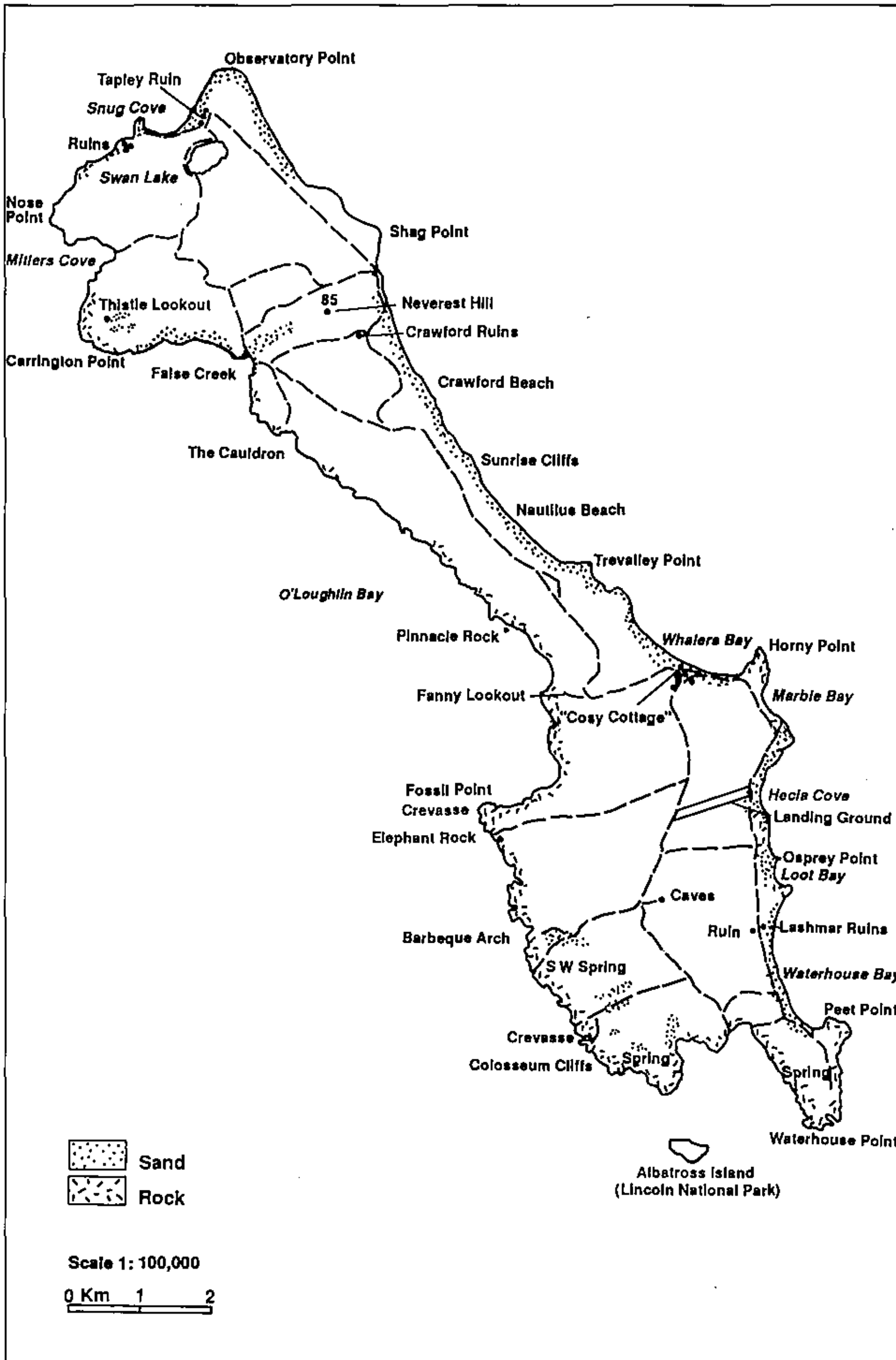



Figure 61. Map of Thistle Island.

sealers' and whalers' try-pots. Thistle once supported a population of the Tammar Wallaby, reported as being distinctive in appearance and peculiar to the island, that were hunted by sealers for food and later skins. When Captain John Hart visited the island in the 1830s, his party collected 7000 wallaby skins for the China market. The wallabies were finally driven to extinction in 1855 by a trapper working the island.

Pastoral use saw much of the remaining natural vegetation cleared and sown to pasture. The remaining patches and any regeneration are kept in check through regular burning. Ironically, while the island's animals and plants were suppressed, lessees attempted to introduce exotic native species. Such introductions included Brushtail Possums and Mallee Fowl in 1950, of which only the possums still survive, and in 1974, five Black-footed Rock-wallabies from Pearson Island were released as part of a SANPWS program. A further 10 animals were released the following year in a program that hoped to establish a second island colony of these distinctive wallabies in case the Pearson Island population, the only wild colony in the State, was wiped out by some catastrophe. In the 1980s a SANPWS survey counted 23 wallabies on cliffs along the south-western coast.

Thistle Island's vegetation cover is predominantly a pasture of introduced grasses and herbs. Remnant patches of native vegetation generally occur in less productive or accessible areas that escaped clearing. The extensive areas of sand dunes on both the northern and southern lobes still support a shrubland dominated by Coast Daisy-bush and Coast Beard-heath and, though still grazed and burned, much of this community appears in good condition. Possibly the least disturbed community forms a low heath on the steep calcarenite cliffs and slopes facing the sea. The most abundant species in this habitat is the distinctive Cushion-bush. Scattered patches of Coastal White Mallee occur north of the residence on the southern lobe and behind the north-western coastline of the northern lobe. Kangaroo Thorn is a common understorey plant in these patches, its dominance maintained by regular burning. Signs of Brushtail Possums and Rosenberg's Goanna are common in this habitat. The two salt pans, one at each end of the island, support a distinctive community of Grey Samphire that lines the edge of the lakes in a narrow, fringing shrubland. Near a ruined shearing shed and house at the northern end of the island is a grove of 5 m high Weeping Pittosporum; the tallest trees of this species encountered by the authors on any of the State's offshore islands or on the mainland. There are also some remnant She-oaks in this area.

Because of its size and the time constraints of the survey, Thistle could only be surveyed at points representing the best of the remaining vegetation. Forty-nine plant species were identified, the list including many uncommon island occurrences and hinting at a once greater diversity of plants.

The restricted nature of the survey also permitted only superficial wildlife observations. Landbirds seen include Singing Honeyeater, Silvereye, Welcome Swallow, Australian Raven, Marsh Harrier and White-browed Scrubwren. Three Ospreys were seen, and a pair is known to breed on Thistle.

Reptiles recorded were of common island species. Of great interest, however, is the (natural) population of Rosenberg's Goannas, which generally shelter in burrows and range over large areas in search of a broad diet that includes carrion and live prey such as other reptiles, insects and birds.

Access to the island can be gained by air or by boat at any of the more sheltered north-east coast beaches.

## Albatross Island (Figure 58)

To the west of Waterhouse Point, the south-east extremity of Thistle Island, is a small bay. Marking the western limit of the bay is a less prominent point, and 700 m south-south-east of it lies Albatross Island. The prevailing south-westerly swells pound this portion of the coast, exposing the gneissic bedrock as a broad shelf whose layered structure is shattered into a ramp of stepped shelves littered with blocks of stone. Albatross is a ridge of similarly battered metamorphic rock. The remains of a calcarenite mantle, little more than a streamlined mound of calcrete gravel, can be found on the most protected north-eastern end.

Storms have scoured the granite of any soil, leaving only skeletal residues trapped by the calcarenite to support the island's simple plant community. Species such as Mueller's Saltbush, Southern Sea-heath (Plate 96) and Round-leaved Pigface clothe the upper levels of the cap in a wind-pruned carpet. Where deeper soil pockets remain, particularly on the most sheltered north edge of the cap, larger clumps of Nitre-bush survive, as do Australian Hollyhocks, tangled mounds of Australian Salt-grass and Ruby Saltbush.

The island's 6 ha support a comparatively large Australian Sea-lion colony, its carrying capacity boosted by the entire island platform being both accessible to sea-lions and close to water. During the survey 19 bulls, 36 cows, 13 yearlings and 12 pups were scattered over the island.

Though no albatrosses were seen, coastal and oceanic birds predominate, the absence of taller shrublands even restricting the ubiquitous Rock Parrots. An unusually gregarious breeding colony of Pacific Gulls was found; this species usually breeds in isolated pairs, but the group on Albatross contained 35 adult birds and an uncounted number of mottled brown and grey chicks. Nests of grass and seaweed are constructed on the ground. Several burrows attributed to Little Penguins were excavated beneath the calcarenite rim.

The continual assault of large swells that diffract and run along the island's relatively uniform coast appears to prohibit access by boat.

**Plate 96.** Common Sea-heath (*Frankenia pauciflora*). Photo A. C. Robinson

## Hopkins Island (Figure 58)

Hopkins Island lies 1.3 km west of Carrington Point, a prominence on the northern lobe of Thistle Island. The coastal perimeter, unbroken by any major features, is a rim of exposed Lincoln Complex basement rocks. This wave-absorbing fringe soon disappears beneath a thick mantle of calcarenite that ascends abruptly from a barrier of calcrete boulders. The flat upper plateau, covering 162 ha, retains a thick soil bed and reaches 61 m above sea level. The island's name commemorates one of the seamen who drowned on 20 February 1802 near Cape Catastrophe.

A simple shrubland dominated by Marsh Saltbush grows where deep soil blankets the rock, covering most of the upper platform and usually reflecting an almost exclusive coexistence between Marsh Saltbush and the Short-tailed Shearwater, whose concentrated burrowing over the summer breeding period destroys shallow-rooted plants. The honeycombed surface of Hopkins hosts an estimated 69700 adult birds in 34800 burrows. In a few localities, ridges of underlying rock thin the soil layer and offer a sanctuary for more diverse plant communities. Grassy patches of tussock grass and clumps of Nitre-bush break the monotony on such outcrops, while the thinner, most exposed soils on the coastal perimeter are dominated by low Heath Bluebush. Weed species have infiltrated the vegetation, with dense stands of African Boxthorn the most obvious.

The winter rains transform a mat of shrivelled organic matter into a lush, spreading carpet of succulent Common Iceplant and rejuvenate Mediterranean grasses such as Red Brome and Rat's-tail Fescue. The initial success of these species may have been aided by attempts to graze the island, perhaps to supplement available pasture for the lessees of nearby Thistle Island. Concentrated patches of grass and boxthorn lie near the small sandy landing beach on the north coast.

Tedious and painfully slow access through the shearwater colony prevented a more extensive coverage of the island on foot. Notable sightings included frequent Bush Rats and a large specimen of an often associated species, the Black Tiger Snake. Many Australian Sea-lions were counted on the sheltered north-west coast during the initial aerial circumnavigation.

Landings are possible at the small beach on the north coast. The island is ringed by rocky shoals and emergent rocks.

## Smith Island (Figure 58)

Smith Island (commemorating one of the seamen who drowned off Cape Catastrophe on 20 February 1802) obstructs the narrow neck of Thorny Passage 1.8 km east of Cape Catastrophe. Its pedestal of Lincoln Complex rock is an abrupt outcrop, rising from depths of 18 m within only 180 m of its shores. Above the surface the sharp ascent continues, culminating in a flat-topped cap of calcarenite reaching 22 m above sea level. Most of the 4 ha upper platform is concealed beneath an unusually thick blanket of soil, thinning only to outcropping calcrete along the plateau rim.

The island's vegetation is diverse, with a total of 23 species, but most of this diversity is confined to the thinner soils of the calcarenite cap's outer perimeter. The deeper soils are typically clothed in saltbush, with Marsh Saltbush surrendering the deepest pockets to Grey Saltbush. The most level soil-covered sections appear to be riddled with abnormally large burrows, intermingled with smaller burrows inhabited by Short-tailed Shearwaters. It was not until a burrow collapsed under foot, exposing a disgruntled, dust-covered Fleshy-footed Shearwater, that the occupants of the large burrows could be identified. The bird was also incubating a large white egg, the first conclusive evidence of a breeding colony of this species in South Australia (see Chapter 2 for details). The island also provides an attractive breeding refuge for White-faced Storm-petrels, whose shallow, more fragile burrows can be found in soils that are too thin or inaccessible for the larger shearwaters.

Access to the island is complicated by a coastline that offers little or no shelter from ocean swells and swift tidal races.

## Grindal Island (Figure 58)

Grindal Island, 4.6 km north of Lewis Island, is a low 81 ha plateau of calcarenite over a broad basement of granite intruded by dark gabbro, a granular igneous rock. The island reaches an elevation of 26 m and its coastline, typical of islands in these more protected waters, is generally rounded with rock joints and weaknesses producing fine crevasses and indentations. A sweeping bay gives the west coast a concave outline, with a sudden sharp point and wave-cut ledge projecting from the north-eastern tip.

The gentle contours of the calcarenite mantle have allowed varying depths of soil to blanket a hard underlying crust of calcrete. The island has been semicleared and grazed in the past, possibly from nearby Taylor Island. A loading race, yards and a small concrete jetty can be found at the apex of the large western bay. No longer kept in check by sheep, introduced grasses grow tall and rank, restricting growth at their bases to a layer of moss up to 4 cm thick. The grasses penetrate all of the former natural plant communities, which fortunately retain a strong presence and appear to be regenerating. Grindal Island was added to Lincoln National Park in 1980.

The coastal fringe, where the sea's influence is strongest, generally supports a low shrubland dominated by Marsh Saltbush, though the taller inland vegetation extends to the coast along more sheltered sections. Most of the island is dotted with shrubs of Native Juniper or Boobialla with, as well as grass, an understorey of species such as Ruby Saltbush, Black-anther Flax Lily and taller shrubs such as Sticky Hop-bush and Kangaroo Thorn. Old Man's Beard forms a tangled canopy on some shrubs, and is most distinctive when its silky, white tufted fruits ripen. A woodland of She-oaks with an understorey of Cockies Tongue grows in the central, most protected confines of the island. Apparently once restrained by grazing and clearing pressures, the She-oaks are now extending their coverage. An unusual discovery was a concentrated patch of Weeping Pittosporum seedlings growing without any sign of adult trees: the seedlings could be regenerating from the root stock of a cleared thicket of mature trees. Weed species are widespread, including grasses such as Bearded Oats, Barley-grass, Rye-grass and Annual Cat's-tail, herbs such as Horehound, False Caper and Burr Medic, and tall shrubs of African Boxthorn.

The grass and shrublands provide abundant seeds, berries and insects for birds such as Silvereyes, Little Grassbirds and Rock Parrots. The survey noted an Australian Kestrel, a flock of Ravens and a small flock of Cape Barren Geese, and found evidence of breeding in the form of old nests. The lush winter grasses would provide a large food reserve for these grazing birds and their chicks. A large flock of Black-faced Shags roosts on the northern point, but seabirds are less dominant on these more sheltered 'backwater' islands.

The survey found two reptiles, both semiburrowing skinks with long, sinuous bodies, streamlined heads and small limbs.

Grindal Island is most accessible from the sheltered west coast. The jetty at the head of the bay is a convenient and easily located landing point.

## Lewis Island (Figure 58)

Lewis Island lies deeper within Thorny Passage, 2.8 km north of Smith Island. Sharing the structure of its neighbours, a cap of calcarenite rises on a rounded hump of Lincoln Complex metamorphic rock. Visually, the 39 m high island differs from others around it by having a peaked summit at its southern end rather than the usual plateau profile.

Lewis supports a diverse cover of plants dominated by a shrubland of Marsh Saltbush on deeper soil but also supporting at least 19 other species, including Sea Celery, Karkalla, Grey Samphire, Australian Hollyhock (Plate 97), Native Juniper, Austral Stork's Bill and Pointed Twinleaf.

The lower slopes of the calcarenite cap were once mined for guano; calcrete has been exposed by the removal of phosphate-rich fertiliser, and loose limestone rocks remain where they were sorted from the guano. A small sinkhole opens into an underground chamber into which guano was washed by natural drainage. Disturbance to the native vegetation has allowed weeds, particularly African Boxthorn, to infiltrate.

**Plate 97**. The Australian Hollyhock (*Lavatera plebeia*). Photo A. C. Robinson

There is enough undisturbed soil in the higher southern section to support the burrows of a breeding colony of White-faced Storm-petrels. There are many Little Penguin burrows in the crumbly sandstone beneath the upper calcrete rim, and a relatively high number of Silver and Pacific Gulls in the vicinity of the island; these species may breed on Lewis. Perhaps the guano deposits are the long accumulations of all these species—Black-faced Shags, notorious guano producers, also roost near the waterline.

The large numbers of loose limestone shingles provide refuges for nocturnal Marbled Geckos and Four-toed Earless Skinks. The Bull Skink is a more aggressive diurnal hunter, but stays within reach of its burrows to escape raptors.

Boat landings are possible in calm weather on the north-eastern coast, but the surrounding waters have strong eddies and tide rips, particularly in the channel separating Lewis and Little Islet.

## Little Island (Figure 58)

Little Island lies 926 m north of Lewis Island. Its visible structure is predominantly dark Lincoln Complex rock, eroded into deep indentations that almost bisect the island. Each section has a calcarenite cap that reaches 8 m above sea level.

Little Island was inaccessible even by helicopter, so the survey was confined to a low level fly-over. There is a shrubland of Marsh Saltbush, and vertebrates include a large colony of Australian Sea-lions, Sooty Oystercatchers and Pacific Gulls.

There is little in the way of sheltered coast, and swells and tidal streams combine in this treacherous stretch of water.

## Taylor Island

Taylor (Figure 58 and Plate 98) is a 243 ha elongated island stretching north-south, 2.3 km north-north-west of Grindal Island. Resting on an underlying rise of Lincoln Complex granitic rock, the calcarenite mantle forms a gentle hump whose northern summit is 69 m high. The coastline is rounded in outline but closer inspection reveals many crevasses, a few worn to small coves, some with embryonic beaches. The high cliffs of the eastern coast reflect its greater exposure; the western coast is less severe. A small islet immediately off the southern point is separated by a navigable passage. Owen Island lies 460 m from the northernmost point, to which it is connected by a submerged sandbar. The island's name commemorates William Taylor, Flinders's midshipman on the *Investigator*, who drowned off Cape Catastrophe.

**Plate 98.** Aerial view of Taylor Island. Photo P. D. Canty

The gentle contours of the calcarenite mantle have aided the retention of much of the soil to which this soft rock so easily decomposes. Only the more resistant layers of calcrete persist to form occasional rubbly outcrops. Proximity to and the shelter provided by the mainland have mellowed the sea's impact, allowing plant and animal communities comparable to those on the mainland to survive. Taylor's biological viability, size and access did not escape the notice of pastoralists, and much of the original vegetation has been cleared, replaced with a pasture of Bearded Oats. The pasture extends to the limit of the calcarenite in most places, with a narrow band of Nitre-bush and Pointed Twinleaf. Fortunately some large pockets of relatively intact native plant communities remain on the western side of the island, where tall shrublands of Native Juniper grade to Dryland Tea-tree scrubs as altitude and distance from the sea increase.

The most protected zones support an open scrub of Coastal White Mallee which, judging by the leaf litter and variety of understorey plants, appear not to have been burnt for many years. A few of the species encountered include Kangaroo Thorn, Dysentery Bush, Old Man's Beard, Yorrell, Native Lilac, Weeping Pittosporum and Cockies Tongue.

Western Grey Kangaroos and Brushtail Possums can be found in the remnant vegetation patches; the kangaroos were introduced to the island, but the possums are a natural population. Less common landbirds such as a Brown Falcon, a Grey Fantail, Golden Whistlers and a Richard's Pipit were also sighted. The island also has a good population of Rosenberg's Goannas.

## Owen Island (Figure 58)

Owen is a low, 8 ha granitic outcrop with a residual calcarenite cap. Separated from Taylor by 460 m of water, a submarine link survives in the form of a connecting sandbar that arcs from a sandy beach on Taylor's north-western tip, rising to a prominent sand spit and beach on Owen's south-western point. Sand is a dominant feature on Owen, with windblown drifts beyond the reach of the tide and surge providing a bed for a high diversity of plants. The island's small area and height of only 12 m would normally offer minimal protection, but the nearby bulk of Taylor and buffering by the mainland and outer islands greatly reduce the sea's impact.

Coastal sand is colonised by hardy pioneers such as Two-horned Sea Rocket, Grey Saltbush and Sea Spurge, leading into a more elevated shrubland of Nitre-bush and saltbush. Other, less dominant species include Karkalla, Black-anther

Flax Lily, Australian Hollyhock, Coastal Lignum, Native Juniper, Variable Groundsel and Bower Spinach.

The survey noted five species of birds, including resident Rock Parrots and summer breeding White-faced Storm-petrels. A pair of Pacific Gulls roosted with a large juvenile, still displaying its grey and brown plumage. The Southern Grass Skink, a small, dark brown skink with distinctive white lateral stripes, was also found.

Owen Island is quite accessible by boat.

## Carcase Rock (Figure 58)

A dark, rounded rock mass that breaks the water but would be completely covered by swell in rough weather, Carcase—its name perhaps suggesting the floating carcase of a harpooned whale—is used as a roosting site for seabirds and an occasional haul out for local Australian Sea-lions.

## Donnington Reef (Figure 62)

Donnington Reef is a small outcrop of granitic rocks, intruded by dark-coloured amphibolite dykes, rising 3 m above sea level, 555 m north-north-east of Cape Donnington.

Donnington was not visited during the survey, but appears to have some plant cover dominated by Nitre-bush, and would provide a roosting refuge and possible nesting sites for common coastal birds.

## Bickers Islands (Figure 62)

Bickers Islands are two small islands 926 m and 1.6 km beyond Surfleet Point, suggesting that they were once connected. They are the dry summits of a predominantly submerged rocky bank; its gentle ascent from the sea floor surrounds the islets with shallow water. The basement rock is Lincoln Complex granite gneiss, retaining a thin veneer of calcrete-capped calcarenite at higher levels. Small stranded sand beaches often mark high-tide zones on the coastal fringe, and soften the transition from bare granite to the vegetated sandy soil on top of the calcrete. The group was named by Flinders on 25 February 1802, after a town in Lincolnshire.

Bickers Islands lie in very sheltered waters so, despite their small size and low altitudes (each is about 9 m high) they harbour a relatively high number of plant species; 27 on the larger north island, 22 on the south island. The communities that could be mapped are a Marsh Saltbush shrubland on deeper sand at lower levels, and scattered shrubs of Native Juniper on high ground with a thinner soil layer over the underlying calcrete. Unfortunately, weeds such as African Boxthorn, Californian Lucerne, Common Iceplant and many other herbs and grasses have invaded. An unusual weed discovery was Smilax Asparagus, a climbing relative of edible asparagus.

Further unusual discoveries hinted at the island's possible use as a secluded feeding and roosting ground by a few mainland bird species. Scattered pine cones and casuarina cones found high on the islands, beyond the depositional range of tides, may have been brought from the mainland by parrots. Barn Owls may also carry food to the island; this may explain the discovery of a Barn Owl feather (no other signs of this species could be found), and holes on the north island appear to belong to the house mouse.

The north island was mined for guano early this century; production had reached about 325 tonnes by 1910, and the last mineral claims were held in 1925. Many weed species may have gained a foothold during this disturbance; house mice could have arrived in the hessian bags often used to store guano. A few rabbit bones are all that remain of an introduction attempt in the 1960s, when a Port Lincoln tourist operator put a group of black-furred rabbits on one island and orange-furred rabbits on the other.

The islands are easily accessible, though the water depth should be watched when approaching.

## Grantham Island

Cradled in the protective confines of Port Lincoln proper is Grantham Island, lying parallel to Murray Point on the northern coast of the harbour. Grantham's upper mantle of calcarenite forms a level platform over an underlying basement of Lincoln Complex granite. The island, which covers 40 ha and is 15 m high, was named by Flinders on 26 February 1802 after a place in Lincolnshire.

Grantham is an elongated island, rising from a rounded coast fringed by a low reef of exposed granite that leads to an almost continuous rim of minor calcarenite cliffs. Sand deposition on the northern tip has formed a beach that extends beneath the 500-m-wide channel to resurface on Murray Point. The effects of both sea and civilisation have been limited on Grantham. The vegetation is dominated by a healthy scrub of Coastal White Mallee with a rich understorey, and the trees thin to a Marsh Saltbush fringe infiltrated by introduced grasses along the coast. The sand deposits at the northern end support a confined shrubland dominated by Coast Daisy-bush.

Forty-nine plant species were recorded during the survey; an indication of the diversity that may once have occurred on the island, whose status as a local council recreation reserve has spared it great interference. A number of weeds can be found including African Daisy, a well-known Adelaide Hills invader, but their presence is offset by the variety of native species sheltering in the mallee, an environment further enhanced by an obvious absence of past fires. Scattered Glossy-leaved Red Mallees stand among the Coastal White Mallees; beneath, shrubs of Gold-dust Wattle, Wallowa Wattle, Jointed Native Cherry and Weeping Pittosporum, Coast Beard-heath and Sheep Bush intermingle with more dense thickets of Dryland Tea-tree and occasional She-oaks. Low shrubs include Coast Velvet-bush, Sticky Goodenia and Native Lilac. There is also an unusual abundance of climbing species, including Slender Dodder-laurel or Devil's Twine, Large Dodder-laurel, and Old Man's Beard.

The scrub rings with the calls of Grey Shrike-thrushes and Golden Whistlers, and the chatter of Silvereyes and Rock Parrots. The survey surprised a Stubble Quail and saw both Pied and Sooty Oystercatchers. A single Peninsula Brown Snake was encountered and, while it was the only reptile recorded during the survey of Grantham, the island's many suitable habitats and relatively recent connections with the mainland suggest that more intensive investigation could extend this list. Grantham Island is easily accessible.

## Boston Island

Boston Island (Figures 62 and 63) sprawls across the mouth of Boston Bay, its 809 ha bulk confining access to the channels at its northern and southern extremities, and a hilly profile up to 97 m high deflecting winds as well as waves. The island's undulations are the stumps of Lincoln Complex granitic domes intruded by amphibolite dykes, mainly blanketed by soil and, especially in the north-western section, by a crust of Bridgewater calcarenite. The coastline meanders through broad, sandy beaches and low, rounded

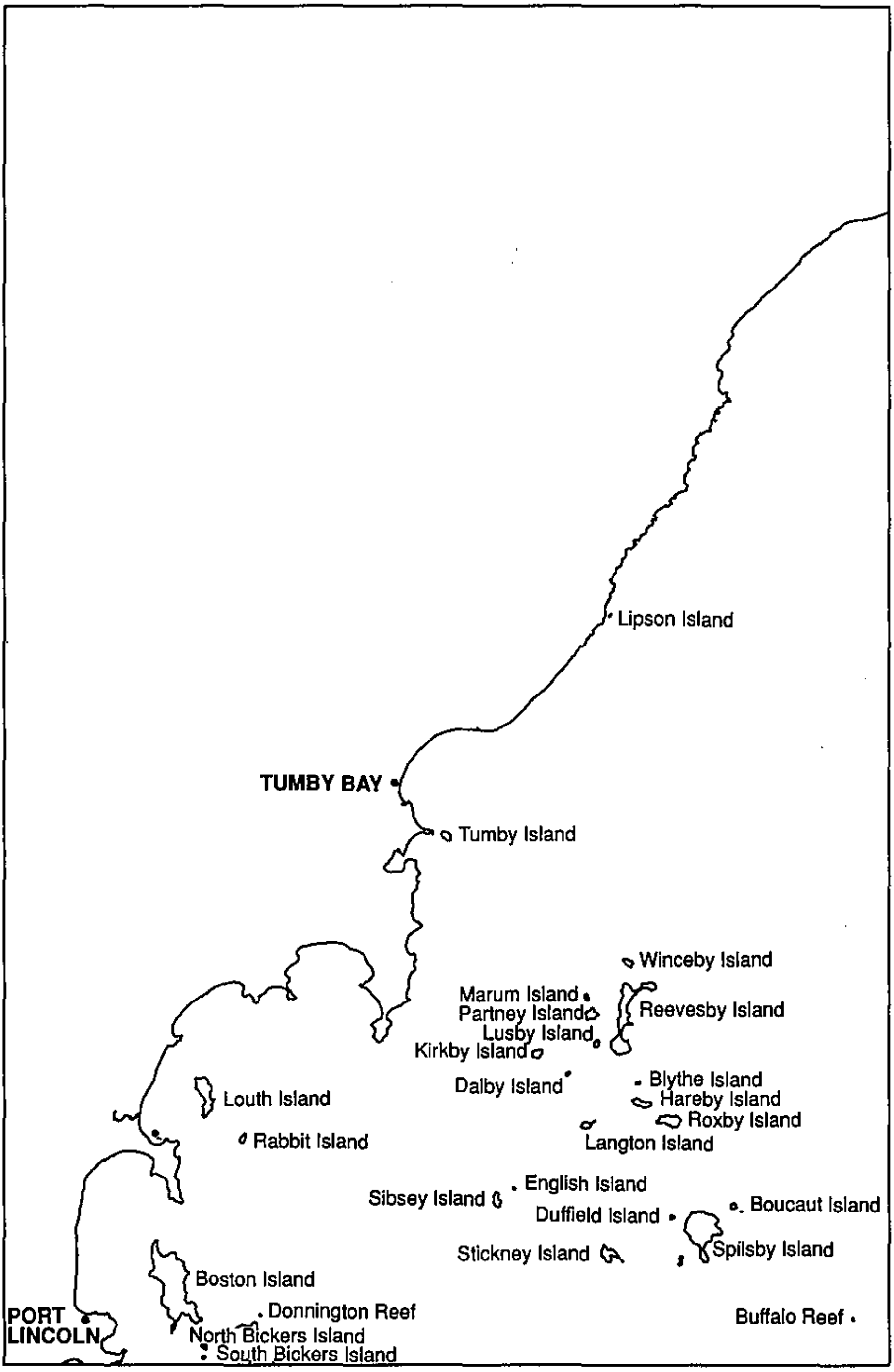



Figure 62. Map of Port Lincoln Islands and the Sir Joseph Banks Group.

headlands; the sharpest feature is Point Fanny, a long finger that projects from the south-western tip. The local Aboriginal tribe knew the island as *Kerrillyilla;* Baudin named it La Grange, but Flinders's name (given on 25 February 1802, after Boston in Lincolnshire) has endured.

In 1841 part of Port Lincoln township was surveyed on the island, but this move to attract settlement failed and the 65 ha blocks later reverted to broad agricultural use. Boston was settled in 1845 by Captain John Bishop, who brought other settlers to Port Lincoln on the *Dorset.* Subsequent members of the Bishop family have held sections of the island for 114 years, and a stone cottage, with a massive stone chimney and a floor of sawn circular pieces of local timber, dating from the island's first settlement is still habitable.

Also on Boston Island are the graves of Dr Benjamin Harvey and his wife, notable Port Lincoln citizens. Harvey was the first medical practitioner in Port Lincoln, arriving there in 1839, and a keen natural historian who made many zoological observations in the district. In the summer months Harvey and his wife enjoyed sailing to Boston Island, where they kept a small garden. When Mrs Harvey died of tuberculosis in 1842 she was buried in a green valley on the Port Lincoln side of Boston Island; Dr Harvey, who died in 1843, was buried by her side. The island is still run primarily as an agricultural enterprise, with sheep grazing the main pursuit. Tourists from nearby Port Lincoln visit the island in private and commercially operated vessels.

The vegetation has been managed to favour grazing, and the woodlands noted by Flinders have been reduced to a small pocket surrounded by grasslands. Coastal White Mallee and Yorrell shadow a simple understorey of species such as Sticky Wattle, She-oak, Rock Fern and Spiny Ray-flower. Scattered thickets of Dryland Tea-tree occur in more exposed areas close to the coast, and narrow bands of dunes fringing the sandy beaches support a shrubland dominated by Coast Daisy-bush. Depressions on the northern extremity, Point Maria, have concentrated saline runoff into small salt pans that support a low heath.

The thicker patches of mallee are havens for the few remaining wood and shrubland birds such as Port Lincoln Parrots, Bush Thick-knees and Singing Honeyeaters. Galahs, Elegant Parrots and Australian Magpies forage for seeds or insects over much of the island, returning to the trees to roost and nest. Sooty Oystercatchers, White-faced Herons, Black-faced Shags and a pair of rare Hooded Dotterels were seen on the coast, and a small flock of Australasian Grey Teal bobbed in the gentle swells off the east coast.

Tammar Wallabies were introduced to Boston from Kangaroo Island, and are now so numerous the island's owners have to fence off areas in which they are trying to grow trees for revegetation.

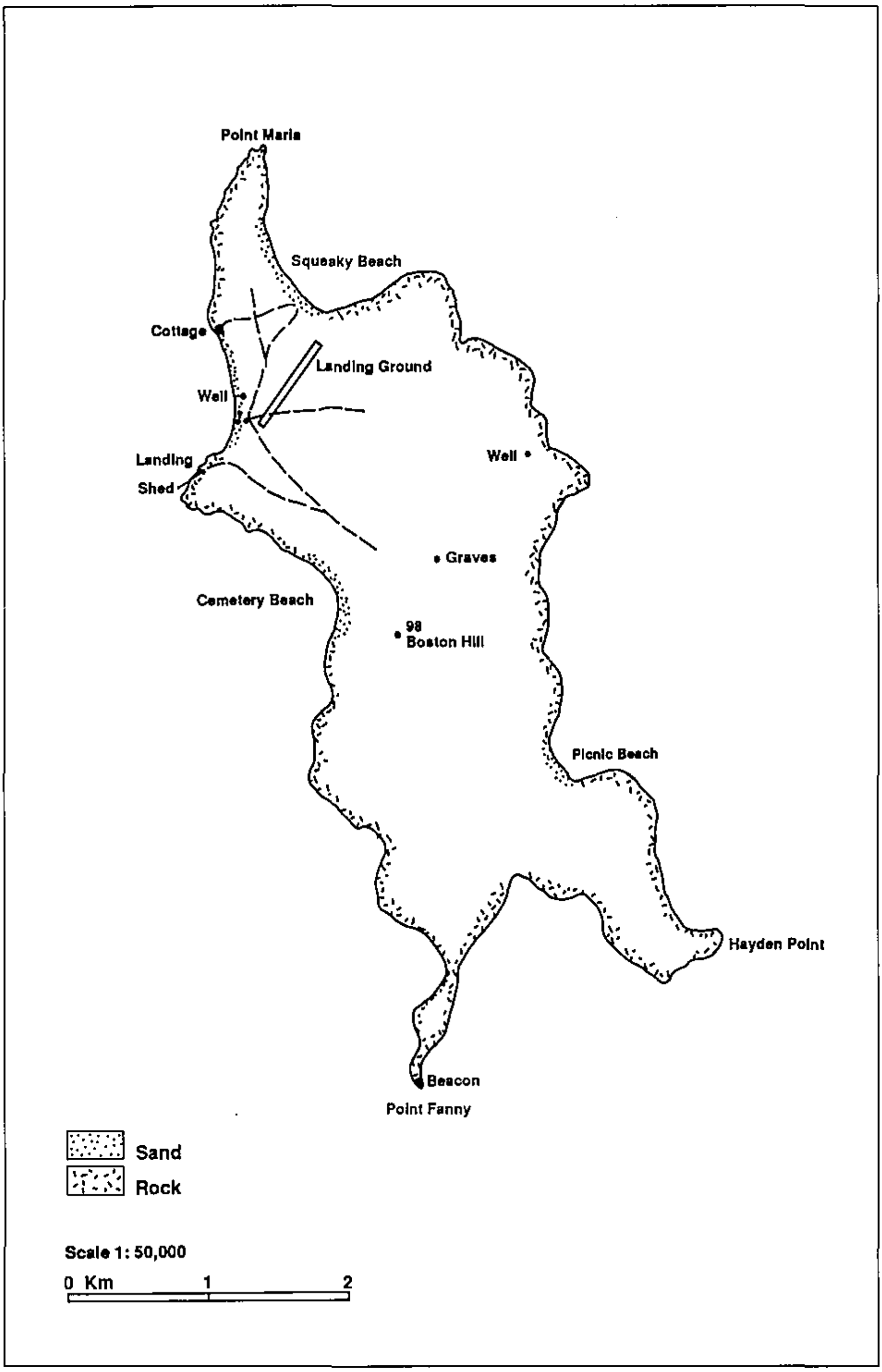



**Figure 63.** Map of Boston Island.

## Rabbit Island (Figure 62)

Rabbit Island lies 6.5 km north-east of Point Boston, the northern arm of Boston Bay. Its 20 ha rest on a rise of Lincoln Complex granitic rock reaching a height of 10 m. The island's profile is generally flat, though the most exposed eastern coast has been eroded to cliffs in contrast with the west coast's gentle descent to low rocks, sand hummocks and beaches. Rabbit was once mined for guano, which can still be found as a white layer coating the underlying granite.

Describing Rabbit Island as 'biologically disturbed' would be an understatement: vegetation clearance and soil removal by guano miners opened new ground to invasion by alien plants and animals, and the dominant vegetation is a tall shrubland of African Boxthorn with an understorey of Common Iceplant. Hardy native species such as Ruby Saltbush and Bower Spinach festoon the lower branches of boxthorns in this wasteland, and only the coastal zone is dominated by native communities including Marsh Saltbush, Nitre-bush, Coastal Lignum, Grey Saltbush, Australian Hollyhock, Sea Celery and Coast Daisy-bush.

Recovery is hampered by rabbits, which abound on the island and may have been introduced by guano miners. Succulent new growth on an island devoid of permanent fresh water is a sought-after source of both food and moisture, and if a plant is to survive it must have some defence such as very fast growth, thorns or unpalatability. Rabbit Island's vegetation tends to reflect species unsuitable to rabbits, or those capable of surviving high grazing pressure. The removal of rabbits, boxthorn and Iceplants could see a slow natural rejuvenation of both resident and colonising coastal species. DENR has been using the island as an experimental site for boxthorn control; if successful and economically feasible, the program may be extended to the many other islands with similar problems.

Islands close to the mainland offer excellent night roosting sites and breeding grounds for wide-ranging birds. The survey spent a night on Rabbit; at sunset the air was filled with sound and dark, wheeling shapes as resident starlings and Cape Barren Geese returned from foraging. Other birds recorded include White-faced Storm-petrels, an Australian Kestrel, breeding White-bellied Sea-eagles and Barn Owls. A large breeding colony of Silver Gulls occupies the low dunes along the west coast.

Access to Rabbit Island is rarely complicated by rough water, and is best attempted on the most sheltered west coast. Rocky shoals lie to the north and south.

## Louth Island

Louth Island's 182 ha rise (Figures 62 and 64) from the shallows of Louth Bay about 3 km south-east of Point Warna. Its resistant basement rock is a blocky, Lincoln Complex gneiss granite. Shallow waters buffer the coast from highly energetic waves, and the island's perimeter is characterised by low, rocky points and sandy bays, two of which almost symmetrically pinch the island into two lobes. A dry sandspit extends west from the north-west point. The most elevated points are two peaks, both about 23 m high.

Louth was not visited during the survey; its original character has been almost completely altered by agriculture, and what little native vegetation remains could be mapped from the air. Most of the island is covered in a pasture of introduced grasses extending to the coast.

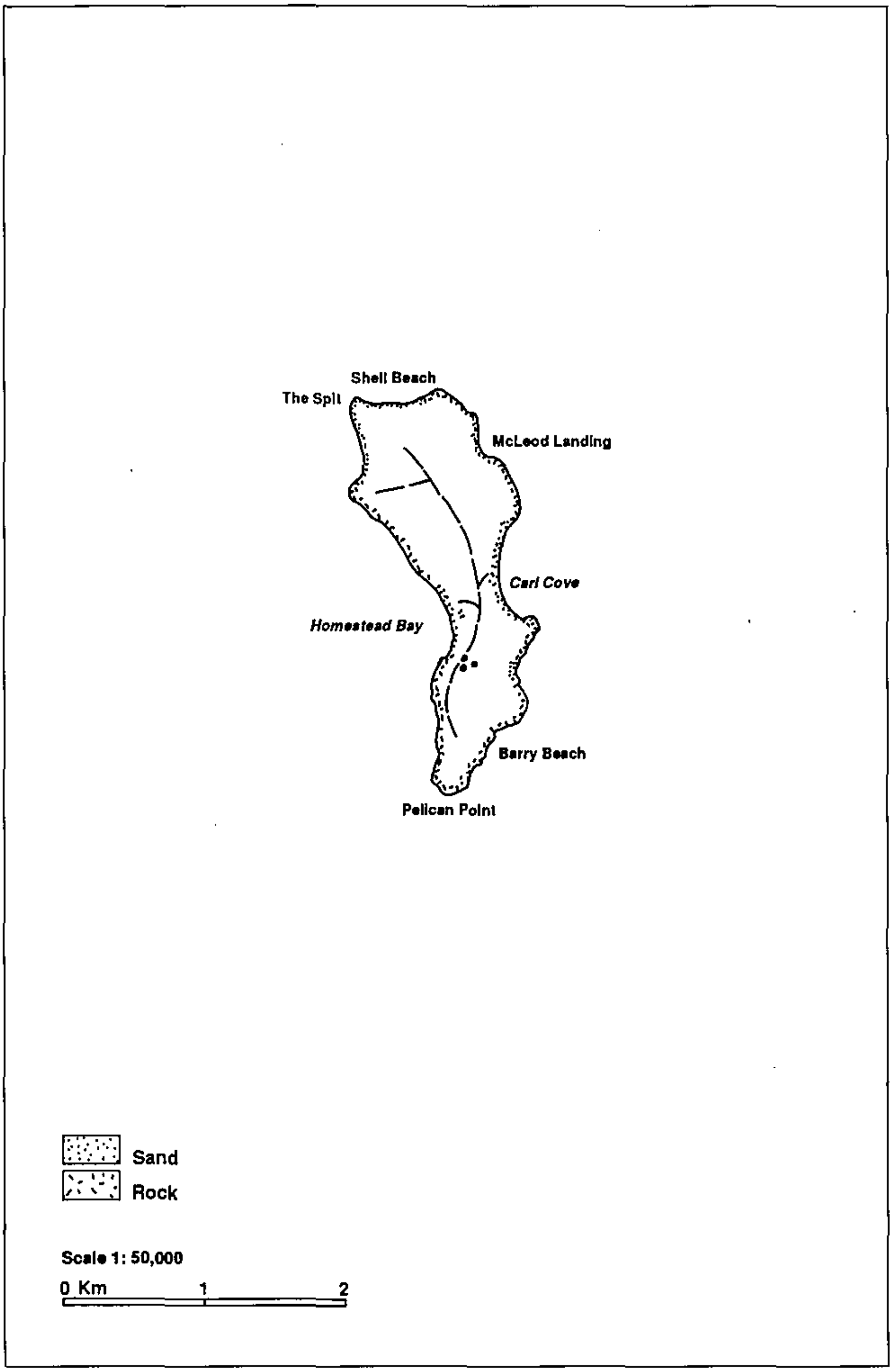



Figure 64. Map of Louth Island.

Small patches of eucalypts survive, possibly Coastal White and/or Red Mallee. Sandy accumulations, unable to support pasture, behind the beaches and the northern sandspit retain an open shrubland dominated by Coast Daisy-bush.

The resident bird population is comparable with similar islands in this region, with a bias toward species confined to the less disturbed coastal fringe and grasslands. The aerial survey sighted Cape Barren Geese and seed-eating Rock Parrots.

Louth Island, whose Aboriginal name is *Yarudu*, was named by Flinders on 26 February 1802 after a place in Lincolnshire.

## Tumby Island (Figure 62)

Tumby Island lies a few hundred metres off the headland that forms the southern extremity of Tumby Bay. The island appears to be based on calcarenite sandstone that supports a cap of reddish mottled iron-bearing clays and deep sand. The most exposed sections of coast on the south-eastern aspects have been carved into perpendicular cliffs, and a small arch has formed at the easternmost extremity. Dunes rise on the more sheltered northern coast from a sandy beach that trails beneath shallow waters to form two sandbars; one a sweeping arc connecting the island to the mainland, the other, intermingled with rocky outcrops, extending seaward from the north-eastern corner. Tumby, named by Flinders after a parish in Lincolnshire, covers 30 ha and reaches a height of 11 m.

Tumby was separated from the mainland only very recently in geological time and its vegetation reflects its youth, appearing little different from that on the nearby mainland. A total of 41 species was identified, ranging from familiar communities dominated by Marsh Saltbush on the clay and loam flats and Coast Daisy-bush on the deep sand dunes, to a eucalyptus scrubland sheltering a variety of trees and shrubs. Coastal White Mallee dominates, forming a low canopy broken by other species such as Ridge-fruited Mallee, She-oak, Southern Cypress Pine and Weeping Pittosporum. Open glades between the slightly taller trees are filled with tall shrubs of Dryland Tea-tree, Broombush (the tea-tree used in brush fences), Jointed Native Cherry and Umbrella Bush or Sand Wattle. Smaller shrubs such as Holly Grevillea, Needle Bush, Coast Tea-tree (a species normally found in the southern Mount Lofty Ranges and in Victoria), Cockies Tongue and Fringe-myrtle shelter a colourful community of low shrubs and herbs. Twiggy Guinea flowers and the yellow and red pea flowers of the Small-leaved Eutaxia mingle with clumps of Black-anther Flax Lily and Thyme Riceflower.

A large portion of the island's south-eastern corner once supported a flourishing thicket of African Boxthorn, which has now been bulldozed and burned as part of a SANPWS weed control program. The island also supports a colony of rabbits that has also been the subject of an eradication trial which, at the time of the survey, appeared effective.

The survey was conducted during dull weather with high winds, which may have reduced the activity and visibility of any small scrub birds, though the survey sighted large, easily visible species such as Singing Honeyeaters, Black-faced Wood-swallows and a Willy Wagtail, Black Swans, Australian Grey Teals, a White-faced Heron and a breeding colony of Little Pied Cormorants in hollows on the steep clay cliffs of the south-eastern tip.

Tumby Island can be reached from the mainland simply by following the connecting sandbar at low tide. A sea landing would require a boat of shallow draught.

## Lipson Island (Figure 62)

Lipson Island is a 1 ha ridge of Lincoln Complex rock barely separated from the southern tip of Lipson Cove. The remains of a connecting land bridge form a semi-submerged reef softened by a sandbar that sweeps to the island from the mainland beach. This bar is exposed to a varying extent by tides, and wind has lifted and deposited sand high on the island. Lipson Cove and island were named after Captain Thomas Lipson, one of South Australia's original settlers and the colony's first Harbourmaster, in 1872.

Lipson's sand provides a limited area for plant growth, supporting clumps of Nitre-bush, Mueller's Saltbush, African Boxthorn, Common Iceplant and a few other species.

The number of bird species roosting and breeding on the island indicates the that the sandbar is inundated deeply enough to bar predators such as foxes and cats. A large breeding colony of Crested Terns (Plate 99) claims any suitable patch of ground on the island's northern half, and feral pigeons and starlings roost on the island in large numbers; these species may also have transported the seeds of boxthorn and Iceplant to this and many other islands.

**Plate 99**. The breeding colony of Crested Terns (*Thalasseus bergii*) on Lipson Island. Photo A. C. Robinson

Chapter 8

# Islands of the Sir Joseph Banks Group

The European history of the Sir Joseph Banks Group begins in the journals of Captain Matthew Flinders, during his great voyage of coastal exploration in the *Investigator*. It is possible that these islands had been earlier visited by humans but, if Aboriginal people, sealers or whalers had set foot there, no evidence remains. On February 26, 1802 Flinders wrote:

> Three small isles had been seen from Thistle's Isle and their bearings set; and the discovery of them now augmented by several others, forming a cluster to the eastward of Point Bolingbroke. This was called the Sir Joseph Banks Group, in compliment to the Right Honourable President of the Royal Society to whose exertion and favour the voyage was so indebted.

Flinders was describing the panorama from the summit of Stamford Hill overlooking Port Lincoln, which he named in honour of his native county, Lincolnshire. He then sailed north to a small but particularly elevated island on the western edge of the group to take bearings of the other islands. He landed on Saturday 6 March and proceeded to take bearings, but the islands were so numerous his observations were not finished by dark. Flinders returned next morning, accompanied by the ship's botanists, among them Robert Brown. He noted the island's granitic basis, and that it was covered with a stratum of calcareous stone:

> The island was destitute of wood, and almost of shrubs; and though there were marks of it having been frequented by geese, none of the birds were seen, nor any other species of animal except a few hair seals upon the shore. This description, unfavourable as it is, seemed applicable to all the group, with the exception of Reevesby and Spilsby Islands, which are higher and of greater extent, and probably somewhat more productive.

Flinders charted 14 islands and 'believed there are more to the south-eastward'. He named many of them after Lincolnshire villages and parishes—the conspicuous domed island from which he made his observations was named Kirkby after one such village. Reevesby, the group's second largest island, was named after Banks' home and the largest, Spilsby, after the parish in which Arctic explorer Sir John Franklin was born.

The group in fact consists of about 20 islands, islets and reefs forming a relatively compact cluster about 50 km east-north-east of Port Lincoln. All the islands are comparatively low lying, with 'whaleback' profiles of much eroded peneplained granite or granite gneiss belonging to the Lincoln Complex of granitic rocks intruded during the Kimban Orogeny, 1600 to 1800 Ma. The granite is most often visible as the shore platforms that fringe the islands, sloping gently into the water. It has sometimes kaolinised to brilliant white jagged, reef-like rock in a weathering process that converts the large feldspar crystals in the granite to a white clay called kaolin. Mottled red and greenish iron-rich clays above the kaolinised granite are often exposed as low cliffs capped with calcrete.

Bridgewater Formation calcarenite has mostly been reduced to a patchy veneer of rubbly calcrete (largely obscured by up to 2 m of grey, sandy loam and unconsolidated sand) that is formed by water percolating through the calcarenite, dissolving the lime content and then concentrating it to form a continuous layer of denser stone. Other recent formations include beach and sand dunes, and clay and salt pan deposits on Reevesby and Spilsby Islands.

Biologically the group is far richer than Flinders's first impressions indicated. The islands are an important refuge for many species, forming the major breeding grounds in South Australia for the Cape Barren Goose. A breeding population of 1 500 out of a State population of approximately 3 000 birds was estimated after an intensive SANPWS research survey in 1979.

A total of 69 bird species has been recorded for the group, among which 22 are known to breed on the islands. The McCoy Society carried out a major survey of the group in 1936–37, but many of the species recorded then have not been sighted recently. These include Black Duck, Dusky Wood-swallow, Australian Magpie Lark, Little Black Cormorant, Glossy Ibis, Lesser Golden Plover, Fleshy-footed Shearwater and Eastern Curlew. Common during the 1936 survey but present in smaller numbers since are White-faced Heron, Red-necked Stint, Pied Oystercatcher and Greenshank.

The most common bird on the group is the Rock Parrot, which breeds on most islands. Other common species include shore-feeding Turnstones, Little Penguins (whose burrows are common along the coastal fringes), Welcome Swallows, Silver and Pacific Gulls, and Silvereyes. The Reef Heron, considered rare in South Australia, has been sighted on three islands.

House Sparrows have not been seen since permanent human occupation ended but may still occur on Spilsby, and starlings are widespread, roosting in African Boxthorn shrubs. Apart from competing with native birds for food and nesting spaces, starlings eat boxthorn fruits, whose seeds pass undamaged through the birds' digestive tract and are spread from one island to another, causing major infestations on most islands in the group.

Four species of mammals were recorded during the surveys, only one of which, the Australian Sea-lion, is native to the islands.

'Blue' chinchilla rabbits were introduced to a number of islands before 1932 by J.H. Kerrison, who leased Spilsby, Sibsey and English Islands. Kerrison intended to farm the rabbits for fur and meat, and even released animals on islands outside his lease. Up until the mid-1970s rabbits were still evident on Hareby, Lusby, Marum, Partney, Sibsey, Stickney and Spilsby Islands, but over-grazing, drought, disease and inbreeding seem to have taken their toll and recent reports indicate populations now survive only on Lusby, Stickney and Spilsby Islands.

House mice and feral cats were present on Reevesby Island as relicts of human occupation, but the last feral cat was eradicated in 1990. Sub-fossil bones of New Zealand Fur-seals, Tammar Wallabies and Stick-nest Rats have also been found in sand blowouts on Reevesby, but there are no definite records of their presence on the island during its initial settlement.

The reptiles of the Sir Joseph Banks Group were studied by J.A. Tubb in 1938, and in the 1980s by P. Mirtschin, G.R. Johnston and T.D. Schwaner, in addition to SANPWS surveys. Black Tiger Snakes and Death Adders are confined to Reevesby Island, and Rosenberg's Goannas were introduced to both Reevesby and Spilsby in unsuccessful attempts to rid these islands of snakes.

There are 12 species of lizards throughout the group, of which the Four-toed Earless Skink and the Marbled Gecko are most numerous and widespread.

Most of the islands in the group are comparatively small; this, and their low profiles, offer little shelter from the sea. Vegetation obeys the demands of salt, wind and a semiarid climate, covering most islands with a low shrubland dominated by hardy salt-tolerant species such as saltbushes. Where there is some sanctuary from severe stress, taller shrubs such as Native Juniper or Boobialla form thickets that in turn protect an understorey of more delicate species.

The largest islands support trees such as Coastal White Mallee and Drooping She-oak, and similar plant communities probably extended over the entire formation before the sea submerged the lowlands. Human interference has further hastened their demise on the largest islands; only a few clumps of eucalypts and she-oaks remain on Spilsby, and fewer still on Reevesby—most were cleared for pasture, fence posts, building materials and firewood. Much of the most productive ground on the larger islands is dominated by open grassland, some of which is succumbing to reclamation by native species, but aggressive exotic plants appear to be holding out and intense eradication programs will be required to re-establish more natural communities.

The value of the larger islands for grazing was exploited soon after settlement. Richard Tapley established grazing runs on Reevesby, Spilsby and Thistle Islands in 1838, and was issued Occupational Licences over these islands in 1843 under the newly gazetted Waste Lands Act. These licences were converted into 15-year pastoral leases in 1851, and he ran 1800 sheep on the three islands. Despite little natural water or suitable feed, coast disease caused by cobalt and copper deficiencies was absent, and the building of wells and clearing of native shrubs gave the islands a value far above larger but mineral-deficient mainland runs.

In 1865 the pastoral lease was divided into three sections. F.H. Dodd leased Reevesby, Hareby, Kirkby, Lusby, Marum, Partney and Winceby Islands; Henry Thirkell leased Spilsby, Roxby, Langton and Sibsey; and James Pollitt gained Thistle. The Spilsby run was transferred to James Owen in 1867 and the Reevesby run to Joseph Sawyer in 1871, but was cancelled in 1884 for unspecified reasons.

In 1884 all leases were transferred to a new Lands Department system that listed all of the islands of the group separately, enabling individual leases. William Haigh, a sheep farmer and boat owner, acquired the lease of Reevesby Island in 1884, and he and his family retained it until 1907. During this period the remaining leases changed hands often, with non-payment of rents (which were considered excessive) a common reason for surrender. Haigh increased his holding by leasing Spilsby in 1886, travelling between the islands and the mainland in his boat *Albatross*.

In 1898 Haigh formed the Penguin Guano Company and leased Winceby, Langton, Partney, Marum, English, Sibsey and Rabbit Islands for mining. The guano mines were given rights over all other land use.

Around the turn of the century several later leases were issued for the taking of guano on Kirkby, Dalby, Lusby, Hareby and Blyth Islands, but were cancelled in 1905 because no economic deposits remained. Reevesby, Spilsby and associated islands were then issued separate pastoral leases that included Henry and William Scrubby, who leased Spilsby from 1898 to 1911 and Charles and Richard Sawyer, who held the lease for Reevesby from 1905 to 1927.

The Sawyers lived on Reevesby from 1904 in a corrugated galvanised iron, gable-roofed house, home for the brothers, their wives and, by 1907, six children. Little remains of this residence save its foundations and a crumbling fire-place. Their accommodation improved over the next few years with the erection of a stone house, still standing at the southern end of the island, that was occupied by Charles Sawyer, gradually expanded with galvanised iron additions. A lighthouse began operation on Winceby Island in 1911, and is still working today.

The Sawyer family left Reevesby in 1921, when D.C. Mundy leased the islands in partnership with J. Warner; but the house was revealing its disadvantages and the large number of Common Death Adders in the area made it necessary to build a 'snake-proof' fence of flat iron around the house, poultry yard and garden. Still, hundreds of snakes were killed in and around the yard, earning it the nickname of 'Snake Park', and two goannas were brought over in 1922 to control the snake population.

Apart from Langton, the islands changed hands between 1926 and 1927. J.H. Kerrison leased Spilsby and attempted to supplement his income with chinchilla rabbit farming, but surrendered his lease to W.E. Scrubby in 1933.

A.D. McEvoy leased Stickney, Roxby, Reevesby and Winceby in 1927, acquiring leases, equipment and stock including 1600 sheep, 30 cattle, four horses and the sailing boat *Malcolm*. McEvoy moved to Reevesby with his wife and four children in 1927. His three daughters were virtually confined to the house area for fear of snakes, while his 11-year-old son, Clarrie, was given full run of the islands. Farm labourers and their families lived in the galvanised iron and wood building next to the homestead.

Island life was terribly isolated for Myrtle McEvoy, who had left her family and her piano, one of her great pleasures. The family travelled to the mainland each Christmas, and their only other contact with the outside world was a radio (Saturday night wrestling broadcasts were particularly popular with the men). Meat was the only fresh food; all vegetables, fruit and other supplies were shipped in on a fortnightly run into Tumby Bay or a twice-yearly Dalgety's run. Though the *Malcolm* went regularly to Tumby Bay and Port Lincoln, it was not uncommon for workers' families to remain on the island for extended periods: Mrs Hurrel, wife of one of the workers, did not leave the island for 12 months.

A further 101 ha were cleared south of the homestead and cropped, but after several bad seasons and sheep deaths from bloat, the islands were abandoned some time in 1934.

C. Darling, who held the McEvoys' mortgage, took over the lease. Reevesby had begun to deteriorate, with the house and buildings in need of repair and native vegetation reclaiming cleared land. The island was cleared again; wheat, oats and barley were grown, mainly for stock feed (though in a good season, 400 bags of barley were shipped from the island). Sheep and cattle were the main produce, and the absence of foxes meant poultry farming could also be an economic concern.

N.J. Heinonen, a Port Lincoln fisherman, bought the islands from Darling in 1950. He brought the first tractors to the islands, but made few other changes to the farm or to farming methods. In an attempt to reduce Black Tiger Snake numbers Heinonen introduced six goannas from Thistle Island, and Mrs Iris Keating (née Heinonen) recalls that on the way from Thistle to Reevesby in their boat *Amphitrite*, the Heinonens stopped at Port Lincoln, where some tourists were heard to remark that the caged reptiles were being taken to Reevesby Island to feed the poor family living there.

Heinonen died in 1964 and the islands were acquired by Mrs D.E. Hammat of Port Lincoln. They were run from the mainland until 1968, when the Hammats further improved the house with electric lights, a new stove and hot water supply. Grazing and cropping continued but the only crop grown was oats, used primarily for fodder.

Spilsby Island was acquired by P.L. Jacobs in 1964, and in 1966 growing recognition of their conservation value saw Blyth, English, Duffield, Sibsey and Boucaut proclaimed Flora and Fauna Reserves. In 1967 Dalby, Hareby, Lusby, Partney, Winceby, Kirkby, Langton, Roxby and Stickney were proclaimed Flora and Fauna Reserves over existing leases. The proclamation of the South Australian National Parks and Wildlife Act in 1972 included Blyth, English, Duffield and Sibsey as the Sir Joseph Banks Group Conservation Park; Mrs Hammat's leases were purchased before they expired, with Reevesby the last island to be included in the park in 1974.

Spilsby is the main remaining island not in the park (other excluded sections are several lighthouse reserves). It was acquired by Wedge Island Nominees Pty Ltd in 1980 for 'grazing and tourism purposes', and the homestead could be rented for 'exclusive holidays'.

## Kirkby Island (Figure 62)

Kirkby Island lies 5.5 km west of the southern tip of Reevesby and 10.5 km east of Point Bolingbroke, the nearest point on the mainland. The 27 ha island is dome-shaped, rising from the sea in a coast unmarked by bays or points. The main component of the dome is pink, sheet-weathered Lincoln Complex granite intruded by dykes of younger grey granite and amphibolite. There is a thin cap of rubbly calcarenite and calcrete about half a metre thick on the east coast and, while the island's summit height of 26 m is lower than that of many more southerly islands in the Port Lincoln area, it has a more prominent profile than most of the islands in the Banks group.

There are thin pockets of soil in the fragmented calcarenite, though this layer is often punctuated by exposed sheets of underlying granite. The island was frequently grazed, but a surprising total of 67 plant species has been recorded. Most of the surface is low shrubland, dominated by Marsh Saltbush but supporting a wide diversity of less abundant species. Native Prickly Spear-grass, Cottony Spear-grass and Spiny Rolling Grass compete with introduced barley grasses, fescues and others. Herbs such as pink flowering Australian Bindweed, papery white and pink-tinged flowering Everlasting Daisy, yellow flowering Variable Groundsel, white and lilac flowering Early Nancy and Black-anther Flax Lily add winter and spring colour to the heath, especially where runoff is concentrated on the edges of the exposed granite sheets.

The jumbled rocks and coarse soils that mark the transition from wave-washed granite to calcarenite shelter dense clumps of Nitre-bush, with stands of Australian Hollyhocks, compact Southern Sea-heath and succulent mats of Round-leaved Pigface and Karkalla. Other weeds include Common Iceplant, Scarlet Pimpernel, African Daisy and African Boxthorn. Smaller native Australian Boxthorn, distinguished by its size and by its finer branches, spines and leaves, is also present.

Kirkby (named by Flinders after a village in Lincolnshire) supports a breeding population of Cape Barren Geese and there is enough soil to support the shallow nesting burrows of summer-breeding White-faced Storm-petrels. Deeper soil on the eastern side is claimed by a large nesting colony of Little Penguins, and Black-faced Shags, Pied Cormorants also add to the island's supply of guano.

The survey found Marbled Geckos beneath loose limestone rocks on sheet limestone around the coastal fringe.

Access to Kirkby is possible in calm seas; there are no major coastal landforms large enough to provide real shelter. There are shoals close to the north-eastern and north-western sides, and a detached rock 8.5 m high lies 740 m to the north-north-east.

## Sibsey Island (Figure 62)

Sibsey Island lies 13.5 km south-east of Point Bolingbroke and 25 km north-east of Cape Donnington. The island (named by Flinders on 21 February 1802 after a parish in Lincolnshire), which rises steeply 25 m from the sea, is unlike any other major island in the group in that its massive bulk of granitic rock carries little calcarenite or soil. Guano was mined from the northern slopes of the island at the turn of the century, and the remains of an old cart for hauling sacks of guano can still be found. Sibsey covers about 30 ha, its outline indented by small, beachless bays encircled by steep ramps of granite.

Sixty plant species have been recorded. The major community is a low shrubland dominated by Marsh Saltbush, with densities increasing in the vicinity of water collection and runoff points. These remain moist enough to support species such as Knobby Club-rush, Toad Rush and Yellow Button Daisy. Patches of open grassland infiltrate the heath with native species such as Coast Tussock Grass, Common Wallaby Grass, spear-grasses and Common Wheat-grass intermingled with a similar variety of exotic grasses.

During the wetter months, when the grasses are lush and rank, Spilsby—like so many in the Sir Joseph Banks Group—is a scene of great activity as pairs of Cape Barren Geese re-establish pair bonds, select and defend territories, build nests and rear their young (Plate 100) before the grasses dry in the heat of summer. Silver Gulls also breed on the island, their shallow nests clustered where shrubs are low enough not to inhibit visibility. Caspian Terns are also present on the island, probably breeding here in spring.

**Plate 100.** Chicks of the Cape Barren Goose (*Cereopsis novaehollandiae*).
Photo A. C. Robinson

Deep water provides relatively easy access on any sheltered sides. An automatic lighthouse powered by solar energy has recently been erected on the highest part of the island.

## English Island (Figure 62)

English Island is a low, rounded hump 1.2 km east-north-east of Sibsey Island. Most of the island is greyish-pink granite with a remnant patch of calcarenite on the southern section; the northern section is blanketed by white guano embedded with large rounded boulders of basement rock, and there is little 'soil' apart from the guano layers. English Island, which rises from deep water to 5 m and covers about 3 ha, commemorates T. English, a Member of the Legislative Council from 1865 to 1885.

A large breeding colony of Australian Sea-lions occupies much of the surface, as do breeding Black-faced Shags and Pied Cormorants. With so many adverse influences from clumsy bodies, high concentrations of animal excrement, salt spray and lack of soil, the continued survival of the island's 10 plant species is a source of amazement. Typically stalwart species such as Nitre-bush, Mueller's Saltbush and Common Iceplant cling to more sheltered crannies, with unexpected finds including Australian Hollyhocks, Spear-grass, Common Wallaby Grass and Variable Groundsel.

English's small size and rounded coastline offer little to deflect the swells that diffract along the entire perimeter, and the survey managed a difficult landing with a small dinghy in a relatively low swell.

## Stickney Island (Figure 62)

Stickney Island, named by Flinders on 21 February 1802 after a parish in Lincolnshire, lies 8.3 km east-south-east of Sibsey Island. Its 70 ha are deeply indented by two bays. The larger, opening to the south-east, has eroded a distinctive long finger of land, called Linklater Point, on its northern flank. The point ends in a small islet connected only by drying rocks. The sea has carved an opposite bay on the north coast, but its location on the lee side has lessened the rate of erosion. Wave action in the south-east bay, while still strong, has been reduced and confined enough for a boulder beach to form; the rocks, worn of sharp facets, are piled on the underlying granite. The northern bay, where waves are further diluted, has formed a small sand beach at its apex. Sand deposition extends beyond the high tide mark by virtue of the wind and supports a small but distinct plant community. Sand deposition has also occurred along the tip of Linklater Point.

The island's main rock component is Lincoln Complex pink and grey granite gneiss, with a prominent pegmatite vein stretching for about 200 m along the north coast. The granite, which is exposed in several inland locations, supports a thin calcarenite cap and soil layer. The highest point on the island is 30 m above sea level.

Stickney has several distinct native plant communities. The two most widespread are typical shrublands of Nitre-bush (Plate 101) and Marsh Saltbush, with sand deposits supporting a restricted community dominated by Coast Daisy-bush and Grey Saltbush. Runoff from the exposed granite sheets supports small pockets of lush growth with less hardy species such as Blackberry Nightshade, a type of soursob and King Island Melilot Lucerne.

The island was often used to supplement winter grazing for sheep from nearby Spilsby Island, and has been cleared so that most of the upper platform is clothed in open grassland and remaining native communities are heavily infested with weeds.

**Plate 101.** Nitre-bush (*Nitraria billardierei*). Photo P. D. Canty

The vegetation is further suppressed by a population of chinchilla rabbits, released on the island by Spilsby lessee J. Kerrison, who hoped to supplement his income with a fur and meat harvest. Rabbit numbers had plummeted between SANPWS surveys in 1979 and 1980, but this trend may be cyclic, coinciding with drought.

Bird sightings were also typical of this island type, with 18 species recorded. Landbirds include Rock Parrots, Little Grassbirds, Silvereyes, Welcome Swallows and Richard's Pipits, and a large breeding population of White-fronted Chats. A breeding pair of White-bellied Sea-eagles was also seen.

Landings are usually possible in the north bay. Apart from a gradual descent in the two bays, the sea floor drops steeply around the island.

## Spilsby Island

At 468 ha, Spilsby Island (Figures 62 and 65) is the largest island in the group. It is also the highest, reaching 41 m at its northern end. Spilsby dominates the southern end of the group and is situated 30 km east-north-east of Cape Donnington and 25 km south-east of Point Bolingbroke, the two closest mainland points.

The island rises from a great plate of granitic rock, undulating beneath a cap of calcarenite and loamy soil of varying depth. There are extensive outcrops of kaolinised granite along the western coastline, eroded by wave action into an irregular coastline cut back to form small bays rimmed with jagged, rough-edged rock. The north-west coast is the most protected, and enough sand has been deposited to form an exposed beach more than 1 km long, with three parallel lines of dunes extending more than 300 m inland. Internal drainage patterns have formed a small saltmarsh behind the dune line.

Spilsby has been grazed since 1838 and is now mainly cleared pasture. The homestead lies behind the north-western sand dunes, with a stone implement and shearing shed. Where the basement granite outcrops in broad sheets, stone walls have been built to trap runoff in dams: an elaborate stone tank was constructed in the northern dunes to collect water from a now disused well. The island, which is not included in the Conservation Park, was grazed until 1987 and the house rented to tourists. In 1987 the island was sold and a 42 allotment subdivision created on the northern side. Most of the allotments, including the old homestead on a 10 ha allotment, were sold in 1988; to date, only one house and a shed have been built.

Little remains of the native vegetation. Woodlands of She-oaks and eucalypts have been reduced to small stands at the north-eastern end; the most intact natural community binds pockets of sand along the coastal fringe, reaching its most extensive area over the north-east dunes. The commonest species in the dune shrublands is the Coast Daisy-bush. There are 78 plant species in total; though by

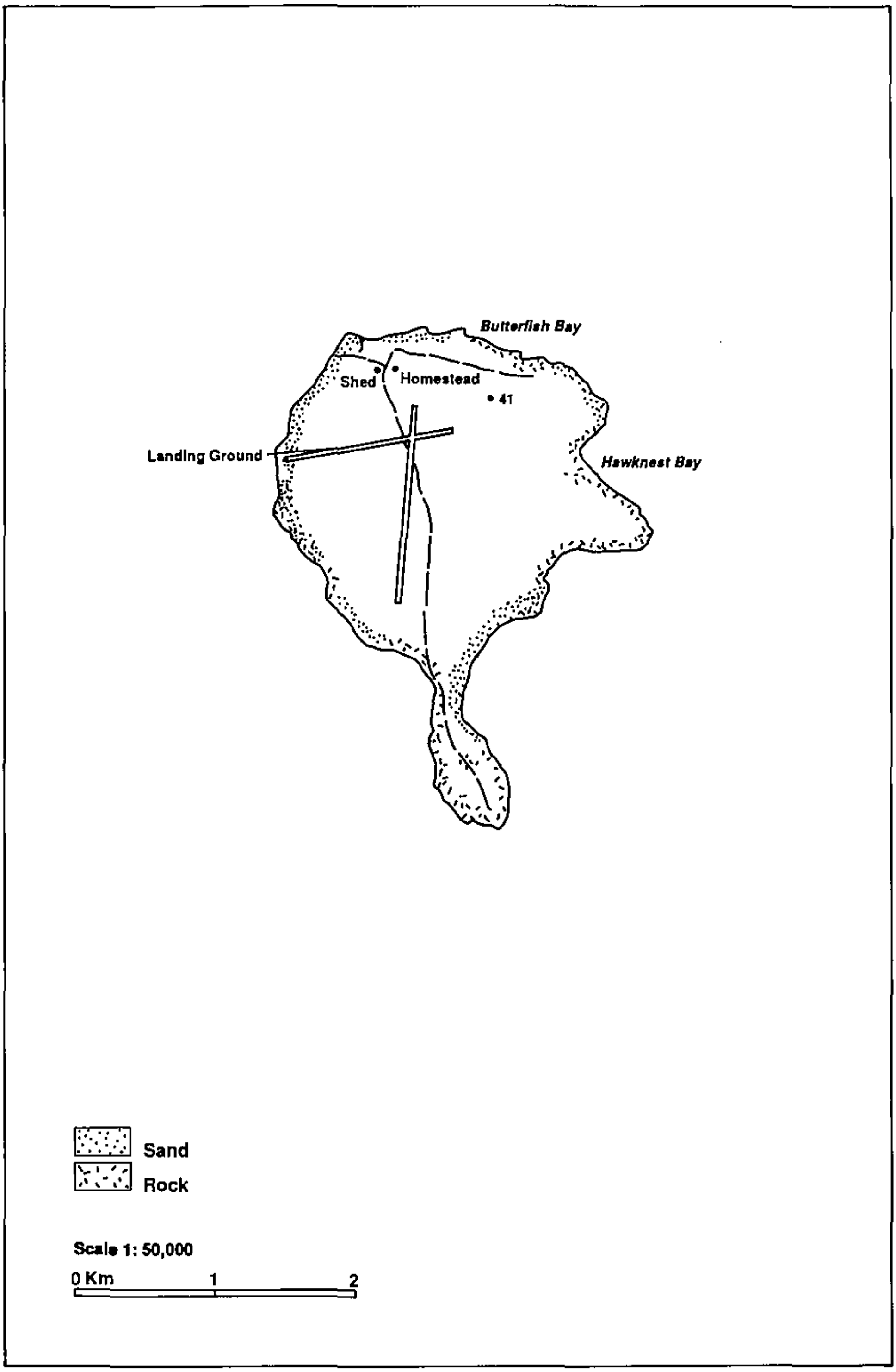



Figure 65. Map of Spilsby Island.

weight of numbers the native species are restricted, the island manages to retain an interesting diversity. Small herbs such as fragile pink stonecrop, Native Bluebell and Thyme Riceflower add colour to the shaded understorey beneath taller shrubs. Larger species include Large-leaved Bush-pea, hop-bush, Christmas Bush and Rock Wattle, twined with Australian Bindweed, Climbing Saltbush and Old Man's Beard.

## Boucaut Island and Seal Rock (Figure 62)

Boucaut Island lies 2.3 km north-east of Spilsby Island, to which it is connected by a submerged reef. Named after Judge James Penn Boucaut, it is a relatively low, flat island reaching 7 m and, with neighbouring Seal Rock, covering 16 ha. Its coastline is rounded, rising from shallow water as a rim of exposed granite that grades through stranded sand beaches to a calcrete cap with a thin layer of loamy soil. Low cliffs of iron-rich and kaolinised granite fringe the north-west coast, and the only irregularity is a tide-dependent rock isthmus that juts from the south-east coast, connecting Boucaut with a satellite islet, Seal Rock, which is mainly bare with possible remains of a calcarenite cap and sand deposits.

Boucaut's outer fringe of soil supports a shrubland of Nitre-bush, while deeper inland soils are clothed in Marsh Saltbush. Forty-six species were recorded, and Seal Rock appears to support at least a few clumps of Nitre-bush on the sand deposits.

Boucaut Island has a large breeding population of Rock Parrots (Plate 102), and reptiles such as Marbled Geckos and Four-toed Earless Skinks.

The island is accessible, but care should be taken in observing water depth over the shallow reefs.

**Plate 102.** The Rock Parrot (*Neophema petrophila*). Photo P. D. Canty

## Duffield Islet (Figure 62)

Like Boucaut Island, Duffield is a small (7.5 ha), low-lying (9 m high) companion of Spilsby Island attached by a submerged reef about 750 m from Spilsby's north-western tip.

The basement rock of Duffield (whose name commemorates W. Duffield, MP 1857–71 and MLC 1873–80) is granite with a calcarenite cap. The coastal rim is predominantly exposed granite, but there are stranded sand beaches along the edge of the calcarenite, forming embryonic dunes on the north-eastern edge. A large pegmatite dyke runs along this shore near water level.

Duffield's 24 species of plants form low shrubland communities typical of a small island environment where the sea is a major influence, and include Marsh Saltbush, Nitre-bush, Round-leaved Pigface, Southern Sea-heath, Native Juniper, Bower Spinach, Desert Spear-grass, Austral Stork's Bill and Cushion-bush.

There is a breeding population of Cape Barren Geese, though the number of dead juvenile birds found during the survey indicates there may not always be enough green feed to last the new generation to maturity. Bird species are typical of this island type, with land and seabirds breeding on the island.

Unusually for such a small island, Duffield supports a small but apparently viable population of Shingleback Skinks. This species also occurs on nearby Spilsby Island, and it is possible one of the island lessees introduced some animals to Duffield. Recent studies have shown that this population is closely related genetically to the Spilsby population and that it shows a high level of body deformities, characteristic of an inbred population.

## Hareby Island

Hareby Island (Figure 62 and Plate 103) is one of the string of islands that forms the northern cluster of the Sir Joseph Banks Group. From the air it is obvious that, though these islands are separated by water, they are closely related by virtue of a broad connecting submarine rise.

Hareby (named by Flinders after a place in Lincolnshire) is a flat, elongated island based on granite with a calcarenite cap, covering 53 ha and reaching a maximum height of 15 m at its eastern end. Low cliffs surround the island and a large, sandy beach that is part of a sandbar connecting Hareby to Blyth Island extends 900 m along the northern edge. Most of the coastline is exposed granite which, at the western end, extends as a drying reef for 200 m west along a submerged ridge that leads to Smith Rock and eventually to Langton Island.

The island has 34 plant species, forming a thick shrubland of three main communities. Deep, unconsolidated sand along the coast is dominated by Coast Daisy-bush; the outer fringe of the calcarenite platform is characterised by clumps of Nitre-bush; and inland, where soil is deepest, chenopod shrublands are dominated by Marsh Saltbush.

**Plate 103.** The coast of Hareby Island. Photo A. C. Robinson

Twenty-one birds were recorded by the survey: typical species such as Cape Barren Geese, Welcome Swallows, Silver and Pacific Gulls, cormorants, Rock Parrots, Little Penguins and Silvereyes share territories with less common Banded Landrails and Stubble Quail. An Eastern Reef Egret was seen wading through shallow tidal pools, and tidal zones are combed by Black-fronted and Red-capped Dotterels, Turnstones and migratory Greenshanks.

Hareby has a population of Black Tiger Snakes afflicted by various deformities, particularly of the skeleton. Perhaps these animals are displaying symptoms of at least 6000 years of inbreeding, which may ultimately lead to their natural extinction.

The island also supported rabbits under J. Kerrison's optimistic plans for a skin and meat industry, but these are now extinct. Landings can be made at any point on the most protected northern coast.

## Roxby Island (Figure 62)

Roxby Island, the southernmost rise of the now predominantly submerged northern range system, lies 1 km south-east of Hareby island and 6.5 km north-north-west of Spilsby. Roxby, named by

Flinders after a Lincolnshire village, is 1500 m long east to west and about 400 m wide, covering 92 ha and reaching 23 m above sea level.

Roxby is based on a granite core, exposed as shore platforms fringing the western coast. Most of the other coastal exposures are composed of bleached kaolinised granite eroded into an irregular coastline. Clay, mottled dark red from iron, overlays the granite and is exposed in the low cliffs that run along the northern and eastern sides; stranded sand beaches blanket the underlying granite on the southern and western coasts, and a low ridge marking an old stable dune runs along the length of the island. The submarine rise continues as a shallow reef, extending 800 m south-south-east from the island's southeastern point.

Roxby, like most of the group's islands, was used as an intermittent grazing area by lessees of Reevesby and Spilsby Islands, but does not appear to have suffered any clearing or major weed infestations. Instead, the island's 72 plant species are grouped into plant communities of mostly native species.

Loamy soils support a thick shrubland of Marsh Saltbush; sandier soils around the central dune support a tall shrubland characterised by Native Juniper, but closer scrutiny reveals a more complex and diverse composition, with the deepest sand deposits marking the old dune crest dominated by Coast Daisy-bush. The survey identified four species of *Acacia* including Spike Wattle and Umbrella Bush, two sub-species of hopbush, Weeping Pittosporum, purple, daisy-like Fuzzweed, white and pink everlasting daisies and bright yellow Variable Groundsels, Desert Spear-grass, Coast Tussock Grass and Spiny Rolling Grass. Even Rock Fern grows in moist pockets.

Twenty-three species of birds were seen, many of which breed on the island. Possible vagrant species include a small flock of Galahs, Little Ravens and the an Eastern Reef Egret. Sharp-tailed Sandpipers seen on the beach are a migratory species from Siberia.

Roxby supports a healthy population of Black Tiger Snakes, which may reflect the island's relatively large area. There are several species of skinks, including the intricately patterned Spotted Ctenotus. Access to the island is easiest along the north-eastern coast.

## Langton Island and Smith Rock

Langton Island (Figure 62 and Plate 104), 4.6 km west of Roxby Island, is the above-water summit of a ridge than runs south-west from Hareby island. Smith Rock is a smaller exposure of the same ridge, 925 m north-east of Langton.

Langton Island (named by Flinders after another Lincolnshire village) covers 26 ha and is relatively flat, reaching a maximum of 12 m. It is based on granite, with a calcarenite mantle 3 to 4 m thick and cliffs of kaolinised granite, clay and calcrete along the north coast. A rocky point, blanketed in sand and guano, extends 200 m from the eastern tip.

Smith Rock is composed of granite and supports no vegetation; it is almost completely submerged during high tides and heavy swells.

**Plate 104.** Aerial view of Langton Island. Photo P. D. Canty

Langton Island was visited by the State Mining Engineer in 1942, following the discovery of wolfram (iron-manganese tungstate, used as a source of tungsten). Department of Mines records show that 186.5 kg were recovered from the north coast of the island between 1942 and 1944, completely removing this small deposit. Guano mining was also carried out on the island.

Forty species of plants were identified, in three main communities. The sand spit supports an open shrubland of Coast Daisy-bush; thinner soils, particularly along the coastal rim, are dominated by sprawling clumps of Nitre-bush; and this zone grades to a low shrubland of Marsh Saltbush.

The shrublands are a winter breeding and grazing ground for a large population of Cape Barren Geese, while the guano deposits on the sand spit are mainly the products of a large flock of Pied Cormorants. A colony of Australian Sea-lions was seen basking on the point; Sea-lions and seabirds probably use Smith Rock as a haul out and roosting site during calmer weather.

Reptiles include small, cryptic species such as the nocturnal Marbled Gecko and small, swift skinks.

Access is best on the sheltered sections of coast on the north side of the eastern sand spit. Water depth should be observed when approaching this reef-fringed coast.

## Blyth Island (Figure 62)

Blyth Island (possibly named after Sir Arthur Blyth, a Minister of the Crown and Agent-General) consists of a ring of low sandhills with a maximum height of 12 m. The sand is deposited on a low platform of granite that outcrops only in a few places on the beach, while the dunes form a ring with a central depression about 9 m below the rim. Blyth, which covers 5 ha, lies 750 m north of Harby Island, to which it is connected by a shallow sandbar. The sand deposits extend northward from Blyth toward Reevesby island, separated by only a narrow channel called McCoy Passage.

Beyond a broad fringe of bare sandy beach, Blyth's vegetation clings to the dune ring. Stabilising the most exposed face are species such as Grey Saltbush, Spiny Rolling Grass and Cushion-bush. The central bowl supports a wider range, from typical deepsand species such as Coast Daisy-bush, Coastal Lignum and Bower Spinach to less common species such as Coast Ballart and Australian Salt-grass.

The bird population is one of great variety for such a small island, with 16 species recorded, though each is represented by fewer individuals than similarly diverse larger islands. The island seems capable of supporting only one pair of Cape Barren Geese, but its deep, compacted sand is well utilised by Little Penguins and White-faced Storm-petrels.

Three species of reptile inhabit the island, including the uncommon Southern Grass Skink, distinctive with its white lateral stripes. Access can be gained with a boat of shallow draught, as the coast is fringed with sandbars and reefs.

## Dalby Island (Figure 62)

Dalby Island, 3.7 km west-south-west of Reevesby Island's southern lobe, is low (11 m above sea level), flat, roughly hemi-spherical and covers 5.5 ha. Low dunes back a small beach on the north-western side, and granite gneiss extends from beneath the sea to the calcrete layer around the remainder of the island, at times forming low, rounded cliffs.

Dalby was named by Flinders after a parish in Lincolnshire and, though small, supports 41 plant species—a richness that seems to contradict the apparent dominance of Marsh Saltbush and Nitre-bush.

Two pairs of Cape Barren Geese with chicks were the only landbirds recorded during the survey; there are nine other species, all coastal birds, including large gull and cormorant populations. Marbled Geckos share limestone slabs with the small Striped Wall Skink. These lizards manage to coexist on such a small island because the geckos are nocturnal and the skinks are diurnal.

Dalby is steep on all sides except on the south-west, where a patch of rocks lies close offshore; this north-western side contains a beach that is the best site for landing.

## Reevesby Island

Reevesby, (Figures 62 and 66) covering 344 ha, is the second largest island in the group and easily the longest, extending 6 km north–south. The nearest point on the mainland is Point Bolingbroke, about 16 km west of Reevesby's southern lobe.

The complex outline of Reevesby (named— and misspelt by Flinders on 6 March 1802 after Sir Joseph Banks' residence, Revesby Abbey, in Lincolnshire) is not totally a product of destructive erosion. The island was originally separated into four sections by rising sea levels, but sand deposited in the shallow channels reunited the exposed land masses into a continuous chain. Reevesby is an example of a 'tied island', a linkage that probably occurred in the past few thousand years: a similar process may be taking place between Hareby and Blyth Islands.

The original four islands are strung out along Reevesby's spine, separated by narrower necks that mark sand deposits (Plate 105). The four lobes are also distinguished by their granite, gneiss, amphibolite and calcarenite cap structure. Elevation ranges from 9 to 12 m, with the highest point a rounded, 25 m high hill on the southern lobe. Long, curved sand beaches are most developed on the eastern side of the island at McCoy and Haystack Bays. Three salt pans have developed to the north and south of the beach that connects the southern lobe to the central section of the island.

Reevesby Island has been used for agriculture since 1838, and much evidence still remains. The northern portion of the central part of the island was first cleared and fenced, but is now overgrown with native vegetation. The ruins of a small stone hut and well, built by the Sawyer family in 1904, lie at this end. About 1911 a second, more elaborate stone house was built next to the claypan at the northern edge of the southern lobe, and subsequent lessees have added improvements and associated buildings.

**Plate 105.** McCoy Bay on Reevesby Island
Photo A. C. Robinson

The homestead (surrounded by a low, flat iron 'snake-proof' fence), an implement shed and a shearing shed are still intact, maintained by DENR. A tennis court, now overgrown, was built on the

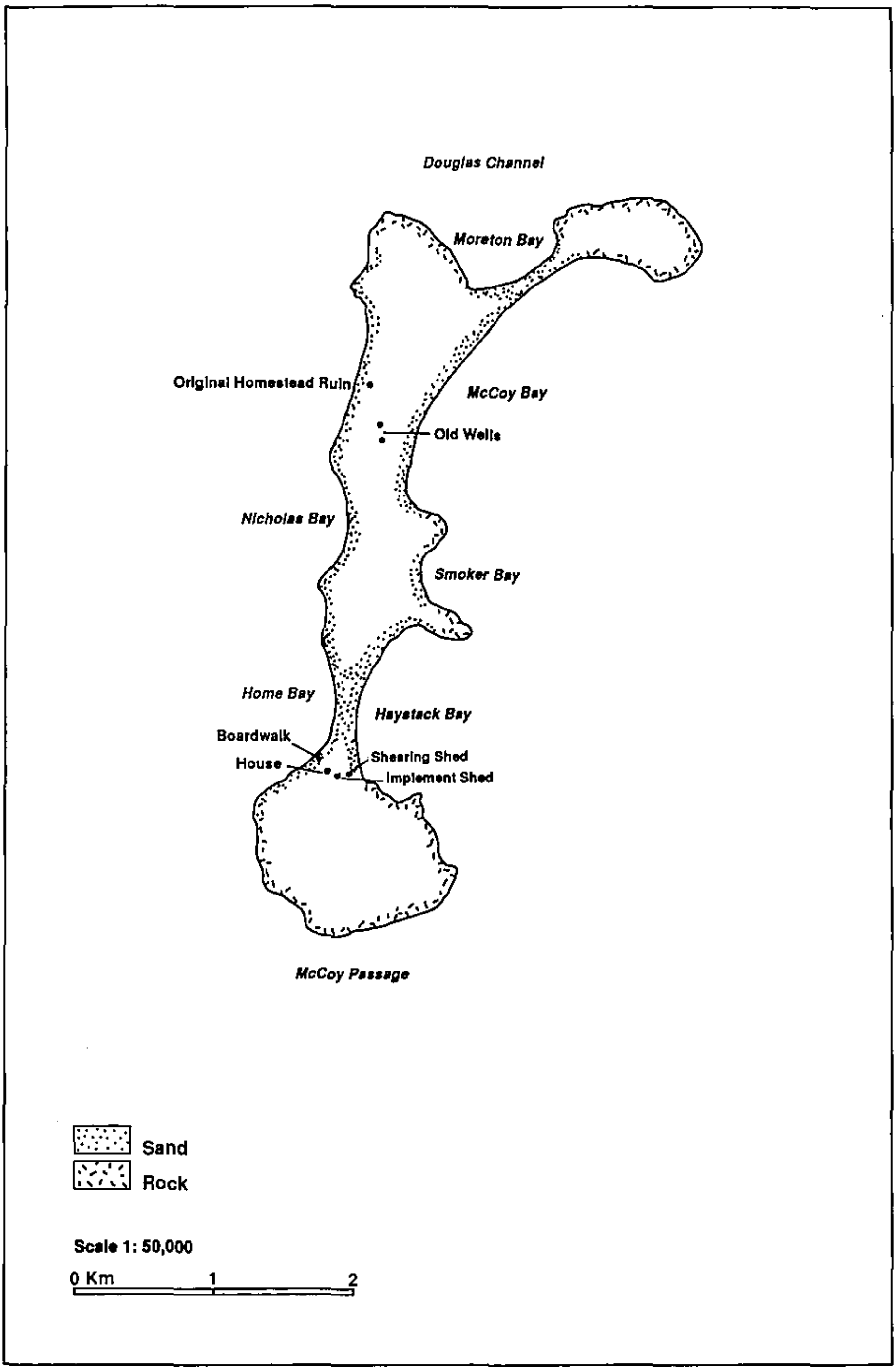



Figure 66. Map of Reevesby Island.

claypan, and the whole area is littered with discarded farm and household equipment and there is a large rubbish dump in the middle of the claypan. Other remains include a long-drop toilet, two large water tanks and a garden that includes a stand of tall eucalypts. The island's southern lobe was most recently grazed and cropped, and has less native regrowth, widespread grasslands and African Boxthorn infestations.

Most of the natural plant communities (the survey identified 117 plant species) have been extensively altered by agriculture. Much of the island is covered in introduced grassland dotted with pioneering shrubs of Native Juniper, dense stands of which have recolonised much of the cleared land. Low shrublands of Marsh Saltbush and Nitre-bush are also expanding into the neglected pastures. Dune deposits and the connecting sand necks support a typical tall shrubland of Coast Daisy-bush, while the salt pans, fringed by gnarled samphire bushes, are possibly the least altered native community.

Introduced cats and mice were seen during the survey, though cats were eradicated in 1990 before a SANPWS/DENR program to re-establish the Greater Stick-nest Rat on Reevesby. The so far (1996) very successful establishment of the Reevesby Island population provides some insurance against loss of the only natural population, on the Franklin Islands (see Chapter 2). The success of the program can be judged by the many rat tracks on the sandy parts of the island, sightings of rats in daylight hours and even a family of rats living in a large stick-nest in the old kerosene refrigerator in the island house.

Thirty-one bird species were recorded, including uncommon species for the group such as a Black-shouldered Kite, a Brown Hawk and three Barn Owls. Silvereyes, Little Grassbirds, Rock Parrots, Richard's Pipits, Welcome Swallows, White-fronted Chats and Cape Barren Geese abound, as do the usual coastal birds. White-faced Storm-petrels breed on the island in summer, their shallow burrows perforating much of the former cleared ground. Stubble Quails, Galahs, Australian Kestrels and Black-shouldered Kites benefit from the grasslands, which provide a concentrated source of seeds, insects and mice. The introduced eucalypts in the homestead garden are utilised by the local Little Raven population, which regularly congregates there.

Black Tiger Snakes and Rosenberg's Goannas were the only reptiles seen during the survey. The island still supports a large number of Common Death Adders, which have been particularly common in the samphire swamp next to the southern house. A total of 13 reptile species has been recorded from Reevesby—predominantly skinks, with one gecko and a legless lizard as well as snakes and goannas.

Landings can usually be made at some point on the coast in most weather.

## Lusby Island (Figure 62)

Lusby Island is a low, flat 14 ha island lying to the west of Reevesby Island's southern lobe, to which is connected a reef of patchily drying rock and sand. Lusby (named by Flinders after a village in Lincolnshire) rises 9 m from a rounded coast of pink gneissic granite to a calcarenite cap. An old sand dune, now fixed and covered in loam, forms a low rise in the centre of the island. Sand deposition on the north-eastern coast has formed a small beach, fringed by a sandbar and small sand dunes that reach 3 m. The remains of a fisherman's shed overlooks the east coast.

Twenty-nine plant species were identified, in communities typical of this island type. Most of the calcarenite platform is blanketed in relatively deep loam supporting Marsh Saltbush shrubland. Thinner coastal soils are claimed by clumps of Nitre-bush and coastal dunes by Coast Daisy-bush.

Rabbits were released on Lusby by Kerrison before 1932. Fortunately, most of the colonies have died out and the survey saw no live animals. Fresh diggings were found in 1980, but these rabbits now appear to be extinct.

Lusby has 15 bird species including Silver Gulls, Little Grassbirds, Silvereyes and starlings. The shallow, protected waters around the island provide fishing grounds for Australian Pelicans, Black-faced Shags and Pied Cormorants.

Reptiles consist of the Marbled Gecko and two short-limbed, semiburrowing skinks, the Southern Four-toed Slider and Four-toed Earless Skink.

Landings should be attempted with care; there are many reefs around this island. Drying rocks form patches to the west, north and north-west.

## Marum Island (Figure 62)

Marum Island is about 900 m north of Partney Island, to which it is connected by a shallow sandbar. The tear-shaped island covers 10 ha, rising from a granite base to an 11 m cap of calcarenite and sand. The south-western side of the island is scarred by old guano mines. One large cave on this side is 15 m wide, 6 m deep and 1 to 2 m high. It has three seaward entrances and a vertical entrance 5 m from the lip of the island. Great quantities of guano in these caves and on the surface were extensively mined, and trenches and piles of discarded limestone rocks are visible on the upper platform. A 46-m-long stone jetty was built to service the mine, though no sign of it is visible today. Production of guano and rock phosphate totalled 153 tonnes in 1909 and 61 tonnes in 1910.

The island was named by Flinders after the residence of Sir Joseph Banks' London agent, Mr Stephenson.

Marum's plant cover consists of 37 species in two main communities. Along the coastal rim, among clumps of Nitre-bush, are species such as Karkalla, Southern Sea-heath, Climbing Lignum and Bower Spinach. Most of the island is dominated by Marsh Saltbush intermingled with mats of Common Iceplant and Ruby Saltbush, Australian Hollyhock, Variable Groundsel, Buckbush, Australian Boxthorn, Desert Spear-grass, Toad Rush and Leek Lily. Mining and grazing have left a legacy of weeds, including not only Common Iceplant but also many grasses and herbs; the low native shrubland is dwarfed by tall African Boxthorn bushes whose seeds are spread by Common Starlings.

The island once supported a colony of rabbits, but bleached bones are now the only signs to be found. A small population of Cape Barren Geese breeds on the island, and there is a large, noisy breeding colony of Silver Gulls. A smaller number of the larger Pacific Gulls also breeds here, as do Richard's Pipits, Silvereyes and Rock Parrots. A single Eastern Reef Egret was also seen.

Though no reptiles were found during the survey, five species are known to occur on Marum—the Marbled Gecko, the Four-toed Earless Skink and three other small skinks: the Southern Four-toed Slider, the Dwarf Skink and the Striped Wall Skink.

The surrounding waters are generally protected by the bulk of nearby Reevesby and Partney Islands, allowing landings in most weather on a protected section of coast.

## Partney Island (Figure 62)

Partney Island lies 4.6 km north-east of Kirkby Island and 1.5 km west of central

Reevesby Island. It is roughly star-shaped, covering 40 ha and rising gently to 9 m. Partney (the name commemorates the place where Flinders was married) is based on a concealed granite platform visible only as a narrow strip above the waterline. The well developed calcarenite cap covers most of the island, even extending into the sea at the north-eastern corner and the westernmost point of the west coast, where it is more than 3 m thick. Only one small beach with a spit of sand and gravel has formed on the north-eastern corner; the rest of Partney's coastline is littered with granite and calcrete boulders, and the island is joined to Marum by a submerged sandbank.

Partney was used for grazing by the lessees of nearby Reevesby Island, and appears to have been cleared of native shrubs and sown with pasture to improve its carrying capacity. Though 52 species of plants were identified, many are exotics that cover most of the island in a grass herbfield. The only communities dominated by native species are pockets of Nitre-bush shrubs and a strip of Coast Daisy-bush behind the northern sand beach.

Regrowth of native vegetation on Partney was further suppressed by a colony of rabbits, also released by Kerrison. Once again the animals failed to survive, leaving only skeletal remains and collapsed burrows.

The grasses are grazed by Cape Barren Geese, and Partney supports a significant breeding population in winter. The deep soil of the upper platform has many burrows of Little Penguins and White-faced Storm-petrels, and Rock Parrots and White-fronted Chats are common. The island has four species of skink and one species of gecko.

Partney lies in relatively sheltered waters, allowing landings in most weather.

## Winceby Island (Figure 62)

Winceby Island (named by Flinders after a Lincolnshire parish) lies 1.3 km north of Reevesby Island and is the most northerly island in the group. It covers 30 ha and rises gently to 10 m.

The basement rock is a pink and grey granite, visible only as a wave-washed shelf along the coastal perimeter and disappearing inland beneath a cap of calcarenite, which retains a thin, brown sand loam—and guano deposits, for which the island was mined earlier this century (shallow cave workings can be found in calcarenite near the southeastern end). The only beach is a small deposit on the northern coast.

Winceby's main natural plant community (which contains 44 species) is a low shrubland dominated by Marsh Saltbush. Much of the western half of the island has been overwhelmed by Common Iceplant and African Boxthorn.

The survey recorded 24 bird species, including a large breeding colony of Black-faced Shags at the north-eastern end (their guano covers a large area in a conspicuous white sheet), a large population of Starlings, Silvereyes and Little Grassbirds. Less common sightings included a dead Banded Landrail chick and a Grey Fantail.

Five reptile species have been recorded for the island; Black Tiger Snakes, Marbled Geckos and three species of small skinks.

A small section in the middle of the island has been excluded from the Conservation Park as a Lighthouse Reserve, where a white light shines from a white-painted metal framework tower 8 m high (Plate 106). Because of its importance as a sea bird breeding area, Winceby Island has been zoned a 'Restricted Access Zone' and prior permission to land must be obtained from the Port Lincoln office of

DENR. Though there is deep water all around the coast, the rocky shore makes landings difficult.

**Plate 106.** Winceby Island lighthouse. Photo A. C. Robinson

## Buffalo Reef (Figure 62)

Buffalo Reef, the easternmost component of the group, lies 43.5 km east of Cape Donnington and 11.5 km south-east of Spilsby Island, its closest neighbour.

The reef is a low, flat outcrop rising only 3 m above the sea and is certainly submerged by high seas. The rock is composed of pink porphyritic granite in sharp contact with biotite gneiss and intruded by pegmatite.

This stump of land, in favourable seas, supports a varying population of Australian Sea-lions. Regular aerial counts have been made, and numbers vary from 10 to 135 animals. Seabirds may use Buffalo Reef as a temporary roost.

## Dangerous Reef (Figure 58)

Dangerous Reef lies 15.5 km south-south-west of Stickney Island and 17.5 km east of the nearest point on the mainland. The reef (which covers about 12 ha) is a chain of four large rocks, the tallest 3 m high and the remainder barely dry, that consist of granite and pegmatite, the surface exposures of an isolated inselberg ridge.

There is no calcarenite, and any soil is the broken down by-product of sea-lion and seabird excrement. Vegetation, consisting of Mueller's Saltbush and a straggling herb, Leafy Peppercress, occurs only on the large central island.

The air is rich with the sounds and smells of concentrated wildlife. The reef supports a large breeding colony of Australian Sea-lions. Black-faced Shags crowd the eastern end of the main islet, whose rocks are whitewashed with guano; balanced on and between them are untidy nests of seaweed. The young shags, covered in mottled brown down, squawk aggressively. While one adult bird minds the nest, the other spends the day hunting fish, consuming about a fifth of its body weight in fish (contrary to popular belief, most of the fish eaten are non-commercial varieties), some of which are only partially digested and regurgitated later for the hungry chicks. In between are nesting colonies of Silver and Pacific Gulls. Gulls are the main predators in this colony, standing patiently beyond the reach of protective adult shags or soaring overhead, searching for addled eggs or dead chicks.

A red-painted metal frame lighthouse, built in 1911, stood 13 m above the sea-lion colony on the main rock, and was used by the late Basil Marlow, former Curator of Mammals at the Australian Museum, as a base for his pioneering studies of the behaviour and ecology of the Australian Sea-lion (see Chapter 2). Dangerous Reef is now recognised as the second largest breeding colony of Australian Sea-lions in the world, with from 200 to 250 pups produced in most seasons (Gales, Shaughnessy and Dennis, 1994).

The reef was proclaimed a Bird Protection District in 1900, making it one of the State's earliest wildlife conservation areas. The old steel light tower has been replaced with a white fibreglass tower (Plate 107), and the battery-generated light with a solar-powered unit serviced by helicopter.

In 1989, most of Dangerous Reef was proclaimed an addition to the Sir Joseph Banks Group Conservation Park, including a marine area of 2 km around the reef to allow DENR to control people wishing to view or catch Great White Sharks in this area—one of the few places in the world where there is a realistic chance of attracting these solitary predators to a boat. Because of the perceived tourist value of viewing the sharks of Dangerous Reef, in 1990 a Port Lincoln-based company, Lincoln Cove Developments Pty Ltd, was licensed to moor an underwater viewing platform off Dangerous Reef. This venture proved uneconomic, and the platform was soon removed.

Any boat landings on Dangerous Reef, which is a Prohibited Area, require prior approval from the Port Lincoln office of DENR. Care should be taken in approaching sea-lions during the breeding season, as males will vigorously defend their territories and females their pups. Approaching the breeding shags too closely will scare the adults from the nests... an opportunity of which hungry gulls are quick to take advantage.

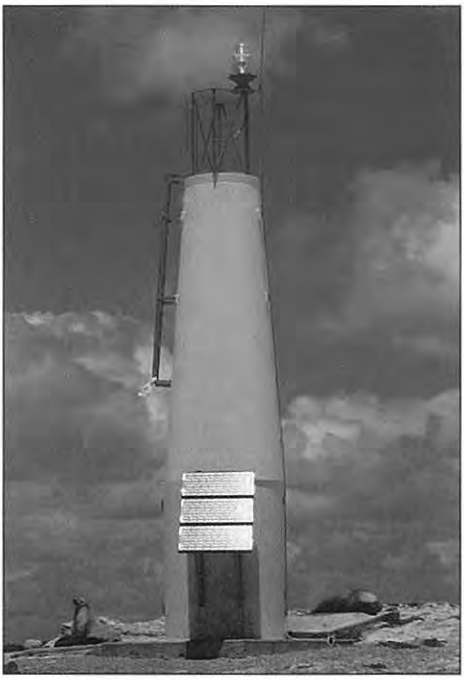


**Plate 107.** Solar-powered lighthouse and sea-lions on Dangerous Reef. Photo A. C. Robinson

Chapter 9

# ISLANDS OF YORKE PENINSULA

The 20 islands of Yorke Peninsula are found in Spencer Gulf, off its western coast, and off its southern tip, and range from the inshore mangrove fringed Bird Islands to the rugged Althorpe Islands. The 'vegetated sand spit' of Troubridge Island is unique among South Australian Islands in being artificially made, while 2000 ha Wardang Island has the dubious distinction of being the most degraded of the larger South Australian offshore islands.

## Bird Islands and Bird Reef (Figure 67)

This group of islands at the southern end of Wallaroo Bay is the remnant of a low prominence of land that was only submerged during the final stages of the sea level rise 6000 years ago. The amount of land exposed varies greatly with the tide, but the group basically consists of two vegetated islands and a bare drying reef that marks the outer limit of the shallows, 2.5 km from the mainland.

The islets are based on cores of hard rock, possibly very old Precambrian volcanic rocks (more than 570 million years old). It is only on the outer reef that these core rocks are exposed to any great extent; the tide deposits sand and fine silt in the shallows that fringe the inner islets, blanketing the rocky outcrops with low sand dunes and mud flats.

The mud flats are regularly inundated by tides, and the dunes are composed of sand lifted from wave-deposited beaches. Salt in varying concentrations is the basic limiting factor for plants on these islets; the deepest sand deposits may be the least saline environments, but complicating factors such as poor water retention and lack of stability require colonising vegetation to have broad root systems that can trap fresh water and bind the sand to prevent erosion. The leaves must carry on photosynthesis without the water losses tolerated by plants in more favourable environments, and must be capable of withstanding corrosive, burning winds of salt spray and stinging sand.

The characteristic odour of the tidal mud flats testifies to their richness in organic matter, and they provide a highly productive food supply for any organisms able to survive alternate inundation in seawater and exposure to drying sun and air. Conditions that fluctuate from not quite marine to not quite dry land has opened niches to species originating from both sea and land, especially the Grey Mangrove.

As the land rises toward the summit of the island, the ground is inundated for increasingly shorter periods and becomes less waterlogged. In many ways this may be an even harsher environment: the ground is exposed to long periods of hot, drying sun; water drawn to the surface by evaporation leaves a concentrated crust of salt that is not diluted by a cleansing flush of fresh seawater; and only small, hardy plants survive here, characterised by twisted woody trunks and branches, carrying bundles of succulent green cylinders that on close examination consist of a series of tightly packed segments. The dominant species in this habitat is Grey Samphire.

The islets' south-western shorelines face the prevailing winds and waves. Waves tend to be diminished by the surrounding shallows, and do not scour away the mud and sand to bare rock. Instead, they deposit coarse sand and shellgrit that is graded into a central dune ridge by the wind. The characteristic species of this formation is Coast Daisy-bush.

The nutrient levels of the tidal mud flats are reflected in the densities of invertebrates that thrive in the ooze. Such an abundant food source, combined with shelter and protection offered by the mangroves, also provides a refuge for schools of fish fry and crustacean larvae, tapped in turn by birds.

Many offshore islands usually host a solitary White-faced Heron, but more than 20 birds were sighted on these islets. Herons also prefer to nest in trees, and the presence of mangroves may have increased the area's attractiveness. A Sacred Kingfisher, a Great Egret and Black-fronted Dotterels were also seen. Deeper water is fished by Pied Cormorants, Pelicans, Black Cormorants and Black-faced Shags. Crested Terns breed on the island, and Silver Gulls may also nest here. Landbirds include Rock Parrots, and Singing and Purple-gaped Honeyeaters.

The low tide exposes enough land to allow foxes to reach the islets, though the continued presence of ground-nesting birds such as Crested Terns may indicate these invasions are infrequent.

Bird Islands are easily reached at high tide, but tidal movements should be monitored; low tide could strand a boat and mean a long wait or a long walk back to the mainland.

# Goose Island Group

Goose Island is the largest of a scattered group of islets marking the remains of a land bridge that once connected Point Pearce to Wardang Island in a long peninsula. Point Pearce and its extension of islands form a protective arc around Port Victoria.

## Goose Island (Figure 67)

Goose Island, 4.5 km west of Point Pearce, is separated from the northern point of Wardang Island by a 550 m wide channel of shallow water underlain with sandbars and reefs.

A reef of Precambrian metamorphosed sediments runs north of Wardang Island and, where this harder rock outcrops high enough above sea level, it retains some of the softer formations that, before the sea encroached, blanketed the older underlying rock in a more extensive mantle.

Goose Island's 2 ha are thickly capped with a bed of red calcareous clay up to 6 m thick, and a crust of calcarenite and calcrete rising to 26 m above sea level. The coastline is irregular and worn; waves have exposed the basement rocks as an encircling platform that meets the clay and calcrete cap in low cliffs scattered with shallow caves and overhangs. More sheltered sections of coast have small sand beaches, and sand blown inland by wind softens the abrupt transition from the basement rock to the cap rocks.

The island's vegetation is severely degraded, and it is believed goats were kept on the island more than 50 years ago. The dominant plant is African Boxthorn, which covers much of the island in tall thickets. The most intact native communities are found along the coast, dominated by clumps of Nitre-bush and pockets of Marsh Saltbush shrubland further inland. Other native species such as Ruby

Saltbush, Karkalla, Australian Hollyhock, Bower Spinach, Climbing Lignum and Variable Groundsel compete for niches within these communities against exotics such as Common Iceplant, Capeweed, Slender Thistle, False Caper, Hedge Mustard and Great Brome grass.

Scotch College, Adelaide, has maintained a field station on the island for many years, and observations by teachers, students and visiting researchers have resulted in comprehensive species lists, especially for birds. Common sightings include Little Penguins, which burrow beneath the hard calcrete cap; Black-faced Shags and Pied Cormorants (Plate 108), roosting on coastal rocks with Pied and Sooty Oystercatchers; Silver Gulls, which breed here in large and apparently increasing numbers; and large numbers of breeding Crested Terns. The shrublands support Singing Honeyeaters, Silvereyes and Australian Kestrels. Feral pigeons, sparrows and starlings are also well entrenched on the island.

Reptiles include the Marbled Gecko, three species of skink, including a single Shingleback (seen only once, in 1972) and a 'brown snake' that may be the Common Brown Snake.

**Plate 108.** Pied Cormorants (*Phalacrocorax varius*).
Photo A. C. Robinson

Goose Island's mammals are all introduced species: there is a healthy population of house mice and at one time a population of rabbits, but neither live animals nor signs of activity have been seen for many years.

Wardang Island and islands in the Goose Group experienced human contact long before the arrival of Europeans. The local Aboriginal tribe, the Narangga, was reported to use Wardang as a burial ground, walking and swimming across the channel from Point Pearce to this and the other islands. Landings can be made on the north-eastern coast.

## Little Goose Island (Figure 67)

Also known by its Aboriginal name of *Muldoora,* Little Goose Island lies 250 m north-north-east of Goose Island, to which it is connected by a reef that dries partially at low tide. It is geologically similar to Goose Island, with basement rocks that represent an above-water rise of the common reef of metamorphic rock. This rock forms a fringing shelf, jointed and worn into loose boulders, rising to a cap of calcrete and clay.

The island supports a healthy stand of African Boxthorn, spread there in the faeces of starlings, but the vegetation is generally far less degraded than on Goose.

A large colony of Pied Cormorants breeds on the island, as do Crested Terns and possibly Silver Gulls. Feral pigeons and starlings roost and breed in boxthorn bushes and in suitable rock cracks. A single Reef Egret was also seen.

The island is reported to support an unidentified species of mouse, most likely the house mouse, but no reptiles.

The surrounding sheltered waters permit landings in most weather.

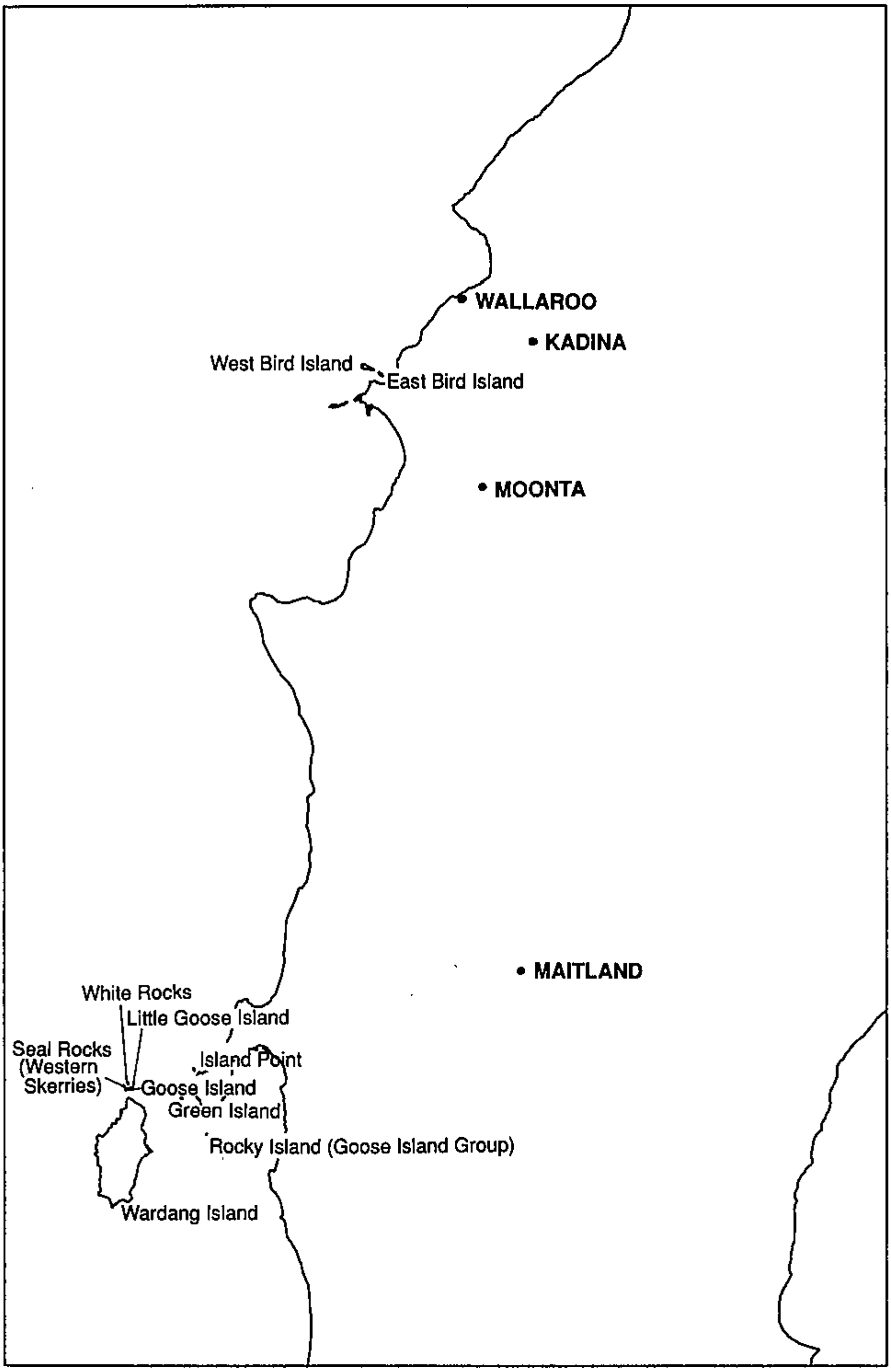



**Figure 67.** Map of Yorke Peninsula Islands

## White Rocks (Figure 67)

White Rocks is an elongated band of rocky reef and large boulders lying 370 m north-west of Goose Island. The southern half is low and frequently washed by the sea in rough weather. The northern end is more elevated, but subjected to considerable drenching from spray in storms. The higher rocks provide an isolated roosting site for seabirds, whose presence is indicated by a thick coating of guano. Australian Sea-lions also bask on the rocks, and have polished the guano —whose brilliant white coating gives the rock its name—to a high lustre.

The reef is composed of metamorphic rock, guano deposits and sandy soil cracks; vegetation cover amounts to four small, severely wind- and salt-pruned African Boxthorn bushes, a single specimen of Two-horned Sea Rocket and a few clumps of Sea Celery.

Black-faced Shags breed and roost on the rock, and are the main guano contributors. A pair of Pacific Gulls was breeding during the survey and had a downy chick. Feral pigeons inhabit suitable rock cracks, but whether they remain in stormier weather is not known.

Landings can be made on the north-eastern coast.

## Seal Rocks (Figure 67)

The three islets (Narang, Wirruna and Winnima) that comprise Seal Rocks are low outcrops of metamorphic rock separated from Goose Island by a channel known as Pungari Sound.

There is little doubt heavy swells would virtually submerge these islets, but they offer roosting sites for birds such as Black-faced Shags and Pied Cormorants and haul out sites for Australian Sea-lions. The largest, southernmost islet, Winnima, supports a population of Feral pigeons.

The islets were not visited during the survey, but their small areas would offer little protection from incoming swells, restricting landings to calm weather.

## Green Island (Figure 67)

Green Island is a small, rocky mass about 1 km west of Point Pearce Peninsula, composed predominantly of Precambrian rocks with coastal sand deposits. The upper platform is a jumble of rounded boulders, made more colourful by the bright orange lichens coating them. Several boulders have been honeycombed with chambers by unusual erosion patterns.

The island is joined to the mainland by a submerged sandspit covered with sea grass, making it possible to wade to the island at low tide (though the sand is very soft in places). This sandbar rises to a beach on the island's north-eastern side, and is overlooked by two derelict, iron-roofed huts, an older one is built from limestone rocks and mortar and a more recent one of concrete. Other foundations indicate more structures formerly stood here, and there are several small rock jetties or breakwaters at the southern end of the beach.

Green Island may have once supported vegetation of similar diversity and structure to that on Island Point, but it has been virtually destroyed by rabbits and possibly sheep or goat grazing. Remnants of the original vegetation survive on the southern edge but the remainder has almost been completely replaced by introduced weeds, and recovery by the native vegetation is impaired by the presence of a small colony of rabbits.

Though eight bird species were recorded, individual numbers are not high, perhaps reflecting the island's poor condition and possible frequent human visits; the survey found some recently dead rabbits lying on the ground, and saw Pied Cormorants, Silver Gulls, Crested Terns, Silvereyes, a pair of Caspian Terns (nesting on the beach) and feral pigeons.

The only reptile species found was a single Marbled Gecko beneath rubbish near the huts.

## Island Point (Figure 67)

Island Point is an apt title for this projection off the north-west coast of Point Pearce Peninsula. The small islet is barely separated from the mainland, being connected at low tide by a rocky reef.

Island Point is of a similar structure to the other islands in the area, with a base of metamorphic rock and a cap of calcarenite, calcrete and soil. The more exposed coastline has weathered the metamorphic base to a broad shelf of jointed rock dissected into piles of loose boulders. Rocks beyond the reach of normal high tides are 'painted' with the same orange lichen as found on Green Island. The calcarenite rises beyond these in a slope of compacted rubble and large, jagged chunks of calcrete to the upper crust of solid calcrete, appearing as a fringing rim around the dome of soil that covers the most protected central heights.

Island Point's plant community closely represents the structure and diversity originally found on islands in this area. There are two discernible shrublands; a lower heath on the slopes facing the open sea, and a taller shrubland in the shelter below the calcrete rim on the eastern half. The more exposed community is dominated by Marsh Saltbush intermingled with salt- and wind-tolerant species such as Southern Sea-heath, Round-leaved Pigface, Cushion-bush, Beaded Samphire and Bower Spinach. The taller shrubland is characterised by Native Juniper, but includes Weeping Pittosporum, Umbrella Wattle, Pointed Twinleaf, Australian Broomrape, Southern Trefoil, Thyme Riceflower, Black-anther Flax Lily, Feather Spear-grass, Australian Hollyhock and many other species. The less overwhelming invading weeds were represented by a few bushes of African Boxthorn, Common Iceplant and other exotics.

Bird numbers are low—perhaps because of the island's exposed nature—though reptile species are diverse for such a small island, indicating its relatively recent separation from the mainland. Rabbit bones found could mean the animals could cross at low tide or that they were deliberately introduced (or even that they are the remains of a carcase brought over by a bird of prey wishing to eat in seclusion), but they have not survived.

Access can be gained across the channel at low tide, or in a boat with shallow draught via the most sheltered north coast.

## Rocky Island (Figure 67)

Rocky Island rises 1.4 km south of Point Pearce, above a shallow bank of reefs and sandbars between the Point and Wardang Island.

The island is a low hump of metamorphosed rock, eroded for the most part into a barren pile of fragmented boulders. Depressions retain some soil that is heavily impregnated with guano, and more elevated deposits support scattered Mueller's Saltbush, African Boxthorn and Mallow. The southern rock spit is subject to tide and wave inundation, but pockets of soil have been colonised by clumps of highly salt-tolerant Beaded Samphire and a single plant of Austral Seablite.

Islands coated in thick guano deposits typically support large colonies of cormorants or shags, and Rocky is inhabited by about 600 Black-faced Shags, which roost and breed here. Other confirmed nesting species include a small group of Crested Terns (Plate 109), Caspian Terns and feral pigeons. The island is too small and exposed to maintain mammals or reptiles.

Rocky Island can be approached from Port Victoria through Rocky Island Channel, and in calm weather a landing can be made with care among shallow rocks on the east side.

**Plate 109**. A breeding colony of Crested Terns (*Thalasseus bergii*) on Rocky Island. Photo P. D. Canty

## Wardang Island

At 2 023 ha, Wardang (Figures 67 and 68) is by far the largest island in the Port Victoria area, lying 5 km west-south-west of Point Pearce. Wardang is also known as 'Wauraltee Island'; both are Aboriginal names, *Wardang* meaning 'crow' and *Wauraltee* 'bandicoot island'.

The local Aboriginal tribe, the Narangga, has a story about the formation of the islands in this area, described in Chapter 3. Studies of Wardang's geological history have revealed an eventful past almost as evocative as the Aboriginal creation story.

The island rests on a sprawling bulge of Precambrian rock, once thought to be granitic but now recognised as metamorphosed volcanic rock, possibly welling to the surface during the huge outpouring of lava over much of the Gawler Craton 1 525 Ma. This rock, a dark pink to grey rhyodacite, is frequently interrupted by incongruous rock types, appearing in bands that range from broad dykes to fine veins that result from magma being forced under great pressure into the older, solidified rhyodacite.

During the Permian Period, around 280 Ma, great sheets of ice advanced to cover a considerable part of South Australia. The stranded rock fragments, called glacial erratics, and deposits of ice-eroded sediment provide the most widespread clues to the extent of the ice cap and its behaviour. Wardang Island has deposits of glacial till (an unsorted mixture of clay, sand, gravel and boulders deposited by the ice) exposed on the south-eastern coastline in the vicinity of Cliff Point; broad grooves on bedrock surfaces, gouged by rocks embedded in the ice, indicate a north-north-westerly ice movement. Chemical analysis of erratic boulders littering the east coast beach indicates a close affinity with the granite outcropping at Cape Willoughby on Kangaroo Island, further confirming the north-westerly ice movement.

Two to three Ma, at the close of the Tertiary, the ocean (higher than it is now) deposited a layer known as Hallett Cove Sandstone on Wardang. This sandy limestone, formed on the sea floor, contains abundant fossils and is visible as a prominent layer about 4 m thick in the cliffs at the southern end of the island.

Evidence of Pleistocene sea level fluctuations can be seen on the east coast of Wardang, north and south of Bird Point, where there is a series of parallel north-south ridges extending up to 500 m

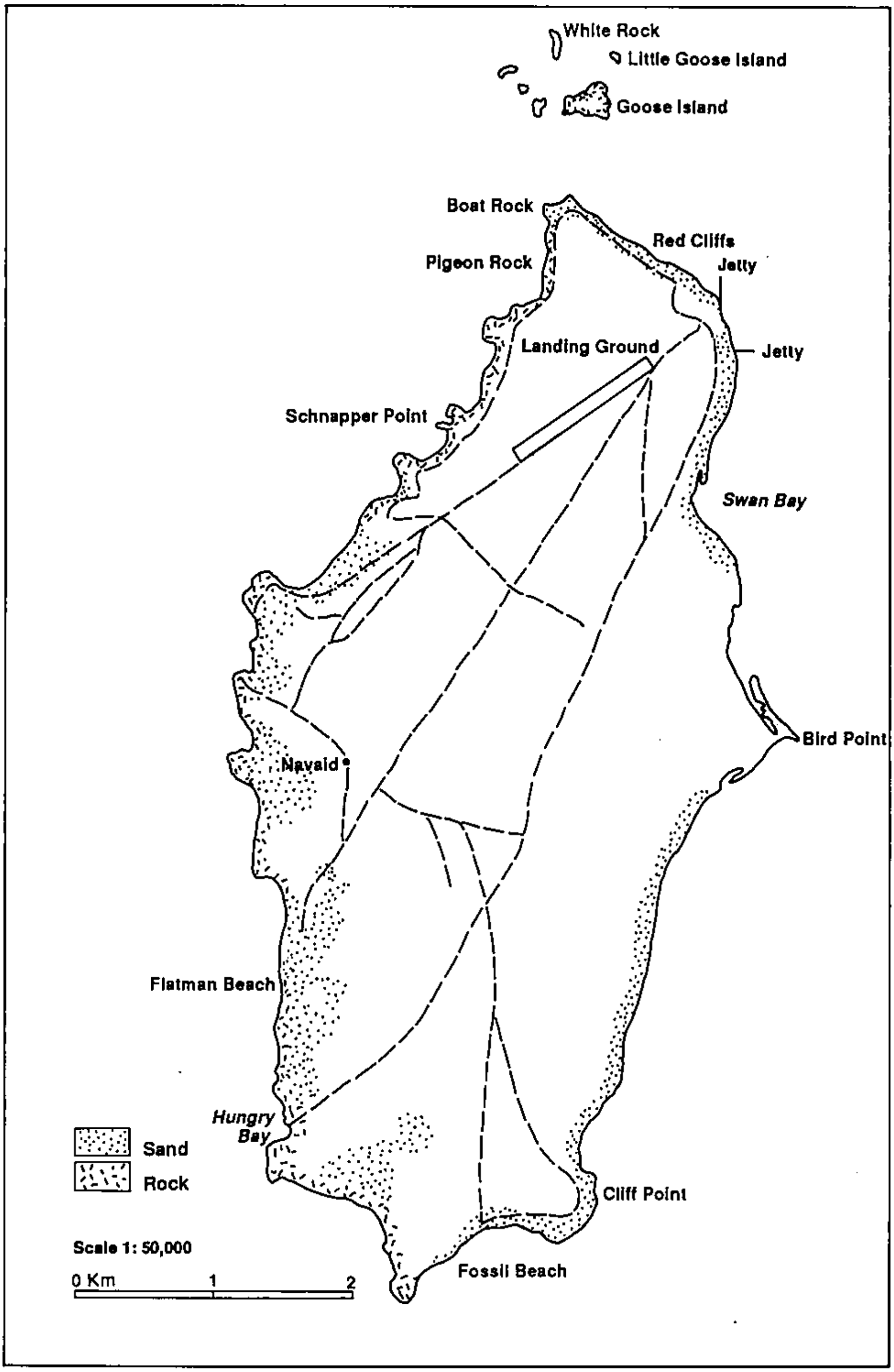



Figure 68. Map of Wardang Island.

inland. Extensive deposits of Bridgewater Formation calcarenite were also formed during the Pleistocene, and today a hard layer of calcrete caps the calcarenite.

Wardang undulates gently, its highest elevations along the western side reaching 29 m. The western and southern coastlines are the most exposed, and have been carved into alternating rocky headlands and small, sandy beaches. The more protected east coast is generally low, its subdued nature allowing sand to build up in the form of offshore sandbars, long, sandy beaches and fringing salt marshes. Prevailing south-westerly winds have carried sand inland from the western beaches, creating a stable dunefield.

Wardang Island's human history is almost as confused as its geological past. The local Aboriginal tribe, the Narangga, is believed to have used the island as a burial ground and to have fished in the surrounding waters. European influence arrived in 1861, with the issuing of a pastoral lease, for about 80 square km and for a 14-year term, to Stephen Goldsworthy of Moonta. In 1865 the island's carrying capacity was assessed at 80 sheep per square mile (30 per square km), and Wardang supported intensive pastoral use, with much of its natural vegetation cleared for sown pasture. A consent included in the lease recognised the importance of the island to the local Aboriginal people, allowing them full and free rights of access, the right to erect wurlies and other dwellings, access to springs and surface water, and the right to take wild birds and animals for food.

Goldsworthy, who resided on the island, held leases until 1884, when the lease was transferred to the Yorke Peninsula Aboriginal Mission. The Mission at Point Pearce grazed sheep on the island when feed and water were sufficient; animals were transported in a large punt. In the following years, men's living quarters and shearing sheds were constructed and to ease the water problem, raised iron roof-like rain catchments were also built. Attempts to find water underground proved futile.

In 1910, Broken Hill Associated Smelters Ltd began to quarry lime sand on Wardang Island for use in the smelters at Port Pirie: lime is used in the smelting of iron ore to lower the temperature at which the ore will melt, and had previously been shipped from Germany. A settlement was established on the island for the quarry workers and included amenities such as a school and dairy; water was shipped in, gardens were planted and trees grown for windbreaks.

The sand was quarried from cliffs up to 20 m high at the northern end of the island. Picks and shovels were the only excavation tools at first, but later dynamite was used and large quantities of sand were loaded into horse-drawn trucks and taken to the jetty. From here barges towed by tugs carried the load to Port Pirie, on the return journey carrying water and firewood.

In 1918 it was found that the lime content of the mobile sand dunes at the southern end of the island was even higher than the fossil dunes at the northern quarries. Not requiring crushing, the loose sand was more easily collected, and tram lines and a kerosene-powered locomotive replaced the horse-drawn trucks; later, a fleet of tip trucks and an overloader were used, enabling a continuous flow of sand from pit to barge.

By 1951 about 900000 tonnes of lime sand had been removed. Mining continued until 1968 when the mobile dunes had vanished, leaving only the fixed, vegetated dunes. Alternative high-grade deposits were found at Coffin Bay.

Rabbits had been introduced to the island and, due to its relative isolation, Wardang was used to conduct experiments aimed at reducing rabbit numbers on the mainland. During the 1940s, rabbits were caught in large wire netting enclosures and infected with myxomatosis, but the experiments were only partially successful.

There may have been some pastoral use of the island during the mining era, though there was no continuous occupation by the Point Pearce Mission and Wardang was generally abandoned to pastoralism as well as mining. Several tourist ventures failed, and the island has since been returned to Aboriginal control.

When clipper ships were calling for wheat at Port Victoria on the western coast of Yorke Peninsula, nearby Wardang Island earned a reputation as a major hazard to ships entering the port. It is even claimed that this area fell into such disfavour that some French sailing ship operators refused to accept charters to load at Port Victoria (Parsons, 1976). However, despite the 18 or so mishaps recorded in the area there was no loss of life.

The first vessel lost near Wardang Island was the small steam launch *Tippara*, which sank off the south-west of the island in 1877. In October 1882 the 1260 tonne iron barque *Aagot* was driven on to rocks on the western side of the island; she was a total wreck and, when the rough conditions abated the crew fastened a line ashore and managed to reach safety. In 1912, another wheat ship to meet her end on Wardang's shores was the SS *Australian*, a steamship of 357 tonnes that was loaded with 3000 bags of wheat when she struck the south-eastern corner of the island. Captain Gustafson and the crew managed to reach Port Victoria by rowboat.

The *Songvaar*, a Norwegian iron ship of 2162 tonnes, was another wheat cargo vessel wrecked off Wardang. The three-master went down in calm weather on her own anchor off the north coast of the island in April 1912, having loaded 40700 bags of wheat. There were many fruitless attempts to refloat her over the following year, until she capsized in a strong gale. She was subsequently blown up with explosives to clear the waters of danger. The wheat schooners *Monarch*, wrecked in 1909, and the *MacIntyre* were also shipping casualties on Wardang. Captain Gustafson, having already experienced one mishap off Wardang in the SS *Australian*, witnessed another shipwreck in 1918. This time he captained the 593 tonne *Investigator*, an iron steamship owned by the Adelaide Steamship Company. The vessel, carrying 203 tonnes of phosphate, was a total loss after running aground on the island. The last vessel to be wrecked off Wardang Island was the three-masted schooner *Moorara* (owned by the Aboriginal Community Council of Port Pearce, and used to carry water from Port Victoria to Wardang), which capsized off the east coast of the island in August 1975.

Most of the island is clothed in introduced grassland, with any regeneration by native species checked by large numbers of rabbits. The island was not surveyed, but some basic biological survey work has been carried out as part of a proposal to restore the island's natural ecosystems. The main natural remnants of native plant communities still predominate in relatively unusable areas such as the salt marshes, dunefields and cliff areas. Dunes are mainly vegetated by daisy bushes and salt marshes by Grey Samphire. Other native species are a few isolated She-oaks; Umbrella Wattle (some mature trees, most dwarfed by continual rabbit grazing); and thin clumps of Marsh Saltbush. The native Garland Lily, a species with reddish purple to pink flowers, may survive in the grasslands.

Widespread weeds include Common Iceplant in thick mats around the coast, Sea Spurge in the salt marshes, and many clumps of African Boxthorn, Tree Tobacco and Horehound.

The most common native animals on the island are birds. Though Little Penguins were the only species noted during the preliminary survey, the comprehensive list compiled by Scotch College for nearby Goose Island would include many species common to both islands. Emus, numbering 10 at the time of the survey, were introduced for a tourist venture in the early 1970s.

Mammals are all introduced species, including Tammar wallabies, rabbits, feral cats, two camels and eight donkeys. There is a variety of reptiles.

The highest point on the island's west coast is crowned by an 8 m high lighthouse, mounted on a white-painted metal framework tower. The light first operated in 1909.

### Daly Head Islet (Figure 60)

Daly Head Islet, named after Sir Dominic Daly, is the westernmost extremity of a predominantly submerged reef extending from Daly Head. The islet was not landed on during the survey, but was overflown briefly. The main geological component appears to be ancient Lincoln Complex granite (distinctly jointed and eroded to block-like boulders and lesser fragments that litter the coastal perimeter) forming the basis of the reef. A small cap of rubbly calcrete and calcarenite may cling to the summit.

The upper levels of the islet are dotted with clumps of Nitre-bush, hinting at deposits of skeletal soil. The main inhabitants of the islet are Silver Gulls and Crested Terns, both breeding on the island in large colonies.

It is possible to wade out along the reef to the islet at low tide or to land a small boat on the most protected north-east coast. Care should be taken not to disturb the birds during their respective winter and spring breeding seasons.

## Pondalowie Bay Islands

### Royston Island (North Islet) (Figure 60)

Royston Island lies close to Royston Head, the northernmost extremity of Pondalowie Bay. A shallow, partially drying reef connects the two.

Royston (named by Flinders after Lord Royston, eldest son of Lord Hardwicke —after whom Flinders named Hardwicke Bay) rises on a pronounced ridge of Lincoln Complex granite. Waves have scoured much of the initial slopes to smooth ramps, often deeply incised where joints in the rock have been penetrated and exaggerated by the surge. Dislocated boulders form an untidy fringe beyond the reach of normal swells. Rounded granitic detritus mingles with softer, jagged fragments of the calcarenite cap that crowns the central summit, and the remains of the once more widespread calcarenite layer are thick, soaring abruptly from a talus slope of broken rock through layered cliffs and overhangs, marking the harder calcrete beds, to a relatively flat, plateau-like summit 38 m high.

Nineteen species of plants were recorded during the survey. The summit plateau is characterised by a low, windswept shrubland of species such as Marsh Saltbush and Coast Daisy-bush. Less abundant in these communities are Southern Sea-heath, Round-leaved Pigface and Pointed Twinleaf. Jumbled rocks and deeper soil pockets on the talus slopes shelter shrubs of Nitre-bush, Native Juniper, Cockies Tongue and African Boxthorn, yellow-flowering

Sticky Goodenia, Austral Stork's Bill, Coastal Lignum and Ruby Saltbush. The calcrete ledges are festooned with climbing Bower Spinach.

Little Penguins are perhaps the island's most numerous birds; Silver Gulls may breed here in large numbers, but Royston is generally occupied by small numbers of each species. The abundance of loose rock and the island's relatively recent severance from the mainland has promoted a large population of Marbled Geckos.

Royston is probably most accessible by small boat via the north-eastern coast.

## Middle Islet

Middle Islet (Figure 60 and Plate 110), as its name suggests, lies in central Pondalowie Bay, separated from the mainland by a rocky channel. Middle is the largest island in the Pondalowie group; based on a broad granite platform with a mantle of calcarenite, it reaches an elevation of 31 m. A small drying reef lies 740 m west.

**Plate 110.** Aerial view of Middle Islet. Photo P. D. Canty

The upper calcarenite platform is crowned with extensive dunes which, though bare and windswept on the south-eastern fringe, support a rich heath community. A total of 28 plants was identified, the heath supplementing a more typical island community of plants such as Marsh Saltbush, Round-leaved Pigface and Karkalla, Southern Sea-heath and Ruby Saltbush. The heath is dominated by Coast Daisy-bush, but includes Port Lincoln Wattle and Umbrella Bush, Leafless Cherry, Coast Beard-heath, Southern Trefoil, Thyme Riceflower, Black-anther Flax Lily, Cushion Fanflower and Knobby Club-rush.

Middle Islet's greater area and variety of habitats have attracted a diverse range of birds, from landbirds such as Silvereyes, Australian Ravens, Rock Parrots, Singing Honeyeaters and Welcome Swallows to feral pigeons and starlings. Fewer coastal species were sighted on the island.

Marbled Geckos are present and there are signs of Painted Dragons, less common island residents that favour sandy terrain with dense shrub growth where they can excavate burrows supported by plant roots. Adult male Painted Dragons have a colourful patterning of black-edged white spots on a background of orange on the flanks and blue-grey along the back, a blue throat and bright yellow chest and shoulders. The females are similarly patterned, but are predominantly a dull brown colour.

Access to Middle Islet is possible on the more protected north-east coast.

## South Islet (Figure 60)

South Islet or West Bay Island lies off the southern extremity enclosing Pondalowie Bay, a headland that also delineates West Bay to the south. A neck of drying rock and sand connects the islet to the mainland.

The islet (18 m high on its north-western coast) persists by virtue of a low granite basement that carries a wedge-shaped slab of calcarenite. On the most exposed western and northern coasts the sea has undermined the soft calcarenite, leaving sheer cliffs. The eastern coast is comparatively sheltered but is still washed by diffracted swells that have buried the granite beneath a bed of sand, and have also undercut the calcrete to form low cliffs and ledges.

South-westerly winds have scoured much of the sandy soil from those aspects of the islet, leaving only skeletal pockets and mainly bare rock. A low, open heath clings to any soil-filled hollow and crack, absorbing the brunt of salt- and sand-laden winds. Hardy plants colonising this zone are characteristic of any saline rocky coastal or island environment; Round-leaved Pigface, Creeping Brookweed, Marsh Saltbush, Southern Sea-heath and Bassia.

The eastern half of the islet, lower and more protected than the west coast, seems to have gained much of the soil eroded from the exposed portion. South Islet's separation from the mainland occurred fewer than 6000 years ago and its close geographical similarities to the nearby mainland have endowed it with a community of plants virtually unchanged since separation. The structure and component species are virtually indistinguishable from those growing on nearby West Cape and similar habitats elsewhere in Innes National Park.

Of the 40 species encountered, most are found in this rich heath. Taller shrubs such as Port Lincoln Wattle, Leafless Cherry, Coast Beard-heath, Dryland Tea-tree, Native Juniper, Coast Daisy-bush and Cockies Tongue dominate thick clumps of vegetation that are a mosaic of many species. A variety of colours and textures is added by smaller shrubs, herbs and grasses such as Coast Velvet-bush, Common Correa, daisies including Hills Daisy, with its dense heads of white flowers, yellow flowering Pleated Podolepis and Variable Groundsel, Cushion Fanflower, Clustered Sword-sedge, Thyme Riceflower and Feather Spear-grass. Such dense clumps of vegetation are an excellent medium for vines and creepers, and many are entwined with Bower Spinach and Slender Dodder-laurel.

Landbirds are scarce on South Islet, though an absence of sightings may reflect the weather prevailing during the survey, disturbance by humans (the islet is quite accessible at low tide) or a combination of many factors. Ospreys, rare and shy birds, have nested on the island's western tip but in recent years increasing interference has meant nesting has not succeeded.

Ease of access is demonstrated by the abundant signs of kangaroos. West Cape was reported to have been used as a natural trap by local Aboriginal people, who herded kangaroos from the surrounding scrub on to the narrow cape where they were speared easily. The islet may have provided a similar natural trap and holding area.

South Islet has an automatic lighthouse on high ground on the north-west coast.

## Chinamans Hat (Figure 60)

Chinamans Hat is a small islet about 350 m offshore, east of Cape Spencer and Cable Hut Bay.

The islet appears to be totally composed of calcarenite with distinct horizontal layers of hard calcrete. The coastal perimeter rises abruptly as a rim of broken cliffs to a broad platform. This platform is generally flat but rises again to form a central 11 m summit in the centre of the island, in an abrupt cone that gives the islet a distinctive profile and an appropriately descriptive name. An arc of submerged rock connects it to a nearby headland to the west and extends east of the islet.

Calcarenite weathers easily to sand, providing the islet with a rudimentary soil. However, its small area means only highly salt-tolerant plants can grow here. The 11 species found include Sea Celery, Marsh Saltbush, Round-leaved Pigface, Ruby Saltbush, Grey Samphire, Nitre-bush and Bower Spinach (Plate 111). The only exotic species is Common Iceplant.

The decomposed calcarenite and broken calcrete slabs support burrows dug by Little Penguins, the islet's most numerous native birds. Rock-clinging marine molluscs provide a food source for a pair of Sooty Oystercatchers, which claim the entire island as their feeding and possibly breeding territory. Feral pigeons have taken advantage of the many overhangs and crevices for safe roosts and nesting sites.

Access to Chinamans Hat is best gained by small boat, taking care to avoid the shallow rocks and reefs in the surrounding waters.

**Plate 111.** Bower Spinach (*Tetragonia implexicoma*). Photo P. D. Canty

## The Althorpe Islands (Figure 60)

The Althorpe Group consists of three main islands: Althorpe, the southernmost and largest, 8 km south-south-west of Cape Spencer; Haystack, 7 km north-east; and Seal, 6.5 km east-north-east of Althorpe Island. Several small islets and rocks lie in the vicinity of Althorpe and Seal Islands.

The Althorpe Islands are spectacular expressions of the sea's erosive power. Their visible structures are the remains of granite inselbergs, once prominent hills on a dry continental shelf with contours rounded by a thick sheet of Bridgewater Formation calcarenite. The rising sea levels left only the summits exposed, stripping the soft calcarenite to leave a crumbling cap above more slowly weathering granite.

### Seal Island (Figure 60)

Seal Island rises on a particularly elevated hump of Lincoln Complex grey biotite gneiss intruded by dark amphibolite dykes that run roughly north–south; one is about 200 m wide. The gneiss's lines of weakness have been exaggerated by the sea into deep grooves that eventually slough off great blocks of rock. The broadest joints and dykes have been worn to deep indentations, or completely penetrated to form the segmented islets off Seal Island's western point. These indentations also channel the swells into a surge that reaches the island platform, and during winter storms walls of water reach Seal's 30 m high calcarenite cap in an explosive impact that undermines the harder bands of calcrete. The fringe of the cap is strewn with jagged fragments of rock from collapsed overhangs, much of which will be swept away by the next storm.

Salt-laden winds have crumbled the calcarenite, loosening the sand grains that make up this rock to expose a forest of calcified roots—reminders of a deeper, more extensive rock and soil layer with a cover of long-vanished plants.

A simple plant community survives on Seal: only 10 species were found, all capable of surviving the extremes of an unpredictable environment. Clumps of Nitre-bush sprawl over jagged calcrete fragments, and salt-drenched soils are anchored by Grey Samphire, Round-leaved Pigface and Sea Celery. Pockets of soil on the main crests harbour low shrubs of Marsh and Ruby Saltbush, and enough rainfall will stimulate the growth of pink-flowering Australian Hollyhocks.

Guano-whitened rocks on the eastern tip of the island mark a favoured cormorant and shag roosting site; 30 Black-faced Shags were seen there during the survey. Crumbling rock and soil are excavated into burrows by Little Penguins—reaching these burrows from the island's steep, surge-polished granite flanks is in itself an admirable achievement—which breed on the island, as do Sooty Oystercatchers, Rock Parrots and possibly Silver Gulls; a less common species found during the survey was a colony of breeding Fairy Terns (Plate 112). Galahs flushed from the island possibly use Seal and Haystack Islands as stepping stones between Althorpe Island and the mainland.

Three Australian Sea-lions were seen basking close to the water but, while the island's name suggests the one-time presence of a much larger colony, no evidence remains to support this.

**Plate 112.** Nest of the Fairy Tern (*Sterna nereis*) on Seal Island. Photo P. D. Canty

Access to Seal Island might be gained via the north coast, but the coastline offers little shelter from direct or diffracted swells in all but the calmest weather.

## Haystack Island (Figure 60)

Highly reminiscent of Perforated and Topgallant Islands off Eyre Peninsula, Haystack Island rises from the sea as a narrow wall of sheer cliffs, undermined, indented and marked by fresh scars and rockfalls. The island's dramatic profile demonstrates the impact of the sea on soft calcarenite, where little protection is offered by a supporting granite ridge that lies mainly below sea level.

The island has been eroded to a series of tall lobes connected by thin necks of rock that narrow to an almost knife-edge ridge. The lobe summits are rounded and the tallest, 43 m high, is crowned with a cairn topped with a wooden staff. Calcrete layers are prominent in the calcarenite and, on top of the domes, form a series of stepped terraces that retain soil and fragmented rock.

A simple shrubland of 11 species clings to the summit ridge. Gnarled bushes of Marsh Saltbush, Grey Samphire and Nitre-bush dominate deeper soils, with Cushion-bush, Round-leaved Pigface and Southern Sea-heath surviving in shallower, rocky soils.

The thin soils over the domed summits are enough for the shallow burrows of the White-faced Storm-petrel, a migratory species only resident on the island during the summer breeding season. A large midden of shell fragments was found on the highest dome, indicating a Pacific Gull feeding site; these gulls pluck large shellfish from tidal pools and, unable to break the thick shells with their beaks, carry them high above a rocky surface, on to which they are dropped. The number of shells found suggested a feeding ground favoured by many generations of gulls.

The cliffs offer an isolated and lofty vantage point for White-bellied Sea-eagles, their presence confirmed by a maintained nest.

Haystack offers little in the way of accessible basking rocks, but the fringing wave-cut reef is possibly a rich fishing ground for the occasional Australian Sea-lion. No reptiles were found on the island, though a more intensive search might uncover a small population of the hardy Marbled Gecko.

Access can be gained to the summit ridge in one location on the east coast via a cone of rubble, though care is needed; much of the rock is loose and crumbling. A dry landing would require calm seas.

## Althorpe Island (Figure 60)

From any perspective, Althorpe Island (named by Flinders on 20 March 1802 after a parish in Lincolnshire) offers a grand panorama (Plate 113). From the sea it soars from a line of black rock and boiling foam, through scalloped cliffs of orange calcarenite to a flat, plateau-like summit 93 m above sea level. On the summit platform is an airstrip, a row of neat cottages and an elegant, 20 m high white lighthouse. Althorpe's 96 ha meet the sea as a shelf of Lincoln Complex granitic rocks with amphibolite dykes.

**Plate 113**. Aerial view of Althorpe Island. Photo P. D. Canty

Jointing in this massive granite hump has contorted the coastline with gaping, many-branched crevasses and chasms that alternate with long fingers of rock, in turn dissected into segmented chains of islets. A larger bay on the north-eastern coast cradles a crescent of sand; though bounded by cliffs, this bay provided the only safe access to the island before the advent of aircraft. A jetty was also built and along with a narrow switch-back path that ascends the rockface, equipment and supplies were lifted to the summit on a flying fox and in a rail car.

The lighthouse was constructed in 1879 after the wreck of the barge *Fairfield*, travelling from Adelaide to Wallaroo in 1874. The lighthouse and three keepers' cottages were built from limestone and sandstone quarried on the island, and are now listed on the Register of State Heritage Items.

In 1919 a solitary grave, supposedly that of a whaler, was found not far from the jetty on a ridge a short way up the cliff. A crudely worked timber cross was inscribed 'To the memory of G. Peterson aged 48 years; died October 31th 1838'. Another source gives different particulars: 'To the memory of T. Petersen, aged 18 years, died October 8th 1838'.

When visiting the island early this century, Sir Joseph Verco was told by a sailor on his boat that some years earlier he had found a petrified body in a guano cave. Verco, however, seemed to doubt the truth of this story.

Althorpe's was one of the last staffed lighthouses in South Australia, but with the installation of automatic lights on Southern Yorke Peninsula at Cape Spencer and West Cape, its importance declined. The light was finally converted to automatic operation and the island was transferred from the Commonwealth to the State Government. It was added to Althorpe Islands Conservation Park in

1991, but negotiations are continuing over the future management of the heritage-listed buildings on the island.

Much of Althorpe's vegetation has been degraded by goat herds kept by early lighthouse keepers. Only a small herd remained in the 1980s, however, and goats have since been eradicated. An introduced grassland of Bearded Oats, Great Brome and Ryegrass covers much of the north-west portion of the platform, extended by the airstrip across the island. The grasslands intermingle with scattered shrubs of Marsh Saltbush, which may eventually reclaim this zone. More natural Marsh Saltbush shrublands occur in confined patches elsewhere on the summit plateau. A formation known as 'The Knob' at the southern tip of the island is a large lobe of the summit platform pinched to a narrow neck at its northern end by two deep chasms. A shrubland of Marsh Saltbush crowns the small plateau cap on the Knob.

The survey identified 26 plant species: the eastern half of the island supports a dense shrubland of Nitre-bush, with individual shrubs large and luxuriant, perhaps reflecting the shelter and deep soil provided by the lofty plateau; the fringing cliffs support a sparse cover of low, salt-tolerant shrubs dominated by Cushion-bush.

House mice and house sparrows seem to be inevitable introductions to any island settlement, and a population of feral cats remains as a reminder of early keepers' pets: other exotic species such as African Boxthorn, Common Iceplant and starlings, all evident on Althorpe, seem capable of colonising islands without any help from humans.

The island's commonest bird species in warmer months is the Short-tailed Shearwater; an estimated population of 22400 birds completes an annual migration to the Arctic and returns to Althorpe to breed. Other common breeding species include Little Penguins, Welcome Swallows and Sooty Oyster-catchers. A small flock of Galahs, which may fly between Althorpe and the mainland, is known to nest in the cliffs by the jetty.

Reptiles are not common on the island, and their numbers may be lowered by predation from house mice and cats.

Access to the island can only be gained by air or from the north-eastern beach.

## Althorpe Island: Western Islets (Figure 60)

A series of joints or dykes crossing a small granite rise close to the western shores of Althorpe Island has been eroded to deep crevasses that segment the outcrop into five islets. The northern cluster of four islets is so narrowly separated that it is possible to leap from one to another or by using rock fragments as stepping stones; only the passage separating the northernmost islet is too wide for these techniques.

All the islets are granite based, but only the central two of the northern cluster retain any calcarenite. The southernmost calcarenite cap has been weathered to mostly broken slabs of sharp calcrete, while the more northerly of this pair has a more intact cap of a similar appearance to Chinamans Hat Island, with calcarenite sandwiched between layers of calcrete. The remaining islets are bare granite, swept clean of any loose calcarenite or granite fragments.

There is enough soil on the two calcarenite caps to support a few low sprawling shrubs of Nitre-bush. A small colony of Australian Sea-lions inhabits this islet group, with a large breeding colony of Crested Terns nesting on the most extensive calcarenite-capped islet, which also has a small population of Marbled Geckos.

Boat access to these islets would be unlikely in all but the calmest swells.

## Troubridge Island (Figure 69)

Tidal streams gushing into the Gulf of St Vincent through Investigator Strait eddy past Troubridge and Sultana Points, depositing extensive banks of sand. Low, rocky shoals, possibly of Tertiary age (40 to 30 million years old) and sandy marine limestone dot these waters, acting as additional sand traps. Troubridge Island (named by Flinders on 24 March 1802, after Admiral Sir Thomas Troubridge) lies 7 km east of Sultana Point. It is a crest of sand, its core permanently dry and vegetated, that rises from the heart of a broad sandbank. The surface of Troubridge Island is composed entirely of sand, burying deeply any evidence of a possible rocky foundation. At high tide the 5 m high island occupies 2 ha, the extensive fringe of shallowly submerged sand flats increasing this area dramatically at low tide.

Troubridge Shoals were notorious traps for vessels heading to and from Port Adelaide in the early years of the colony. The brig *Dart* was one of the first vessels to run aground on the shoal, on 23 March 1838. The barque *Parsee* came to grief on the shoal on 17 November of the same year. Another ship was wrecked in 1839, amid the remains of the *Dart* and *Parsee*. In September 1849, the 356 tonne barque *Sultana* went aground on the shoal near the point that now bears its name. Though the *Sultana* could not be refloated, several barges and a 15 m cutter named, appropriately, *Mercy* were salvaged from the hull. One of the worst mishaps on the shoal was the wreck of the 356 tonne immigrant ship *Marion* on 29 July 1951; fortunately, most of the 360 on board were rescued by the Government schooner *Yatala* and several Port Adelaide ketches. Some passengers took to the ship's lifeboats and ended up landing as far away as Rapid Bay, Cape Jervis and a bay on the southern tip of Yorke Peninsula, later named Marion Bay. In terms of loss of life the most disastrous wreck in this vicinity was the capsizing of the 3670 tonne steamship *Clan Ranald* off Troubridge Point on 31 January 1909, with the loss of 40 of the 63 on board.

In 1851, after the Chamber of Commerce recommended that Flinders's charts of the Troubridge Shoal area be re-examined, a survey was carried out by Captain Thomas Lipson, then Adelaide Harbour Master. Lipson found that Flinders' charts were exacting in the boundaries of the shoal but that, in deference to the Chamber of Commerce, it was also recommended a lighthouse be established.

The large sum of £9000 was included in the 1852 Government estimates to provide for a lighthouse, two keepers' cottages and requisite water tanks. The contract to design and build the lighthouse was won by a British firm headed by Alexander Gordon, a world-renowned exponent of prefabricated cast-iron lighthouses, and site selection and construction supervision was carried out by Robert Hyndman. The location chosen for the 23.7 m high lighthouse tower was on the southern end of the eastern and outer shoal, and the necessary equipment and materials had to be brought to the site by ship. The lighthouse was completed and ready for operation by January 1856, with the keepers in their accommodation—one cottage for the head keeper, and two attached assistant keepers' cottages. The timber-framed buildings have been modified over the years, with at one time part of the duplex used as a schoolroom.

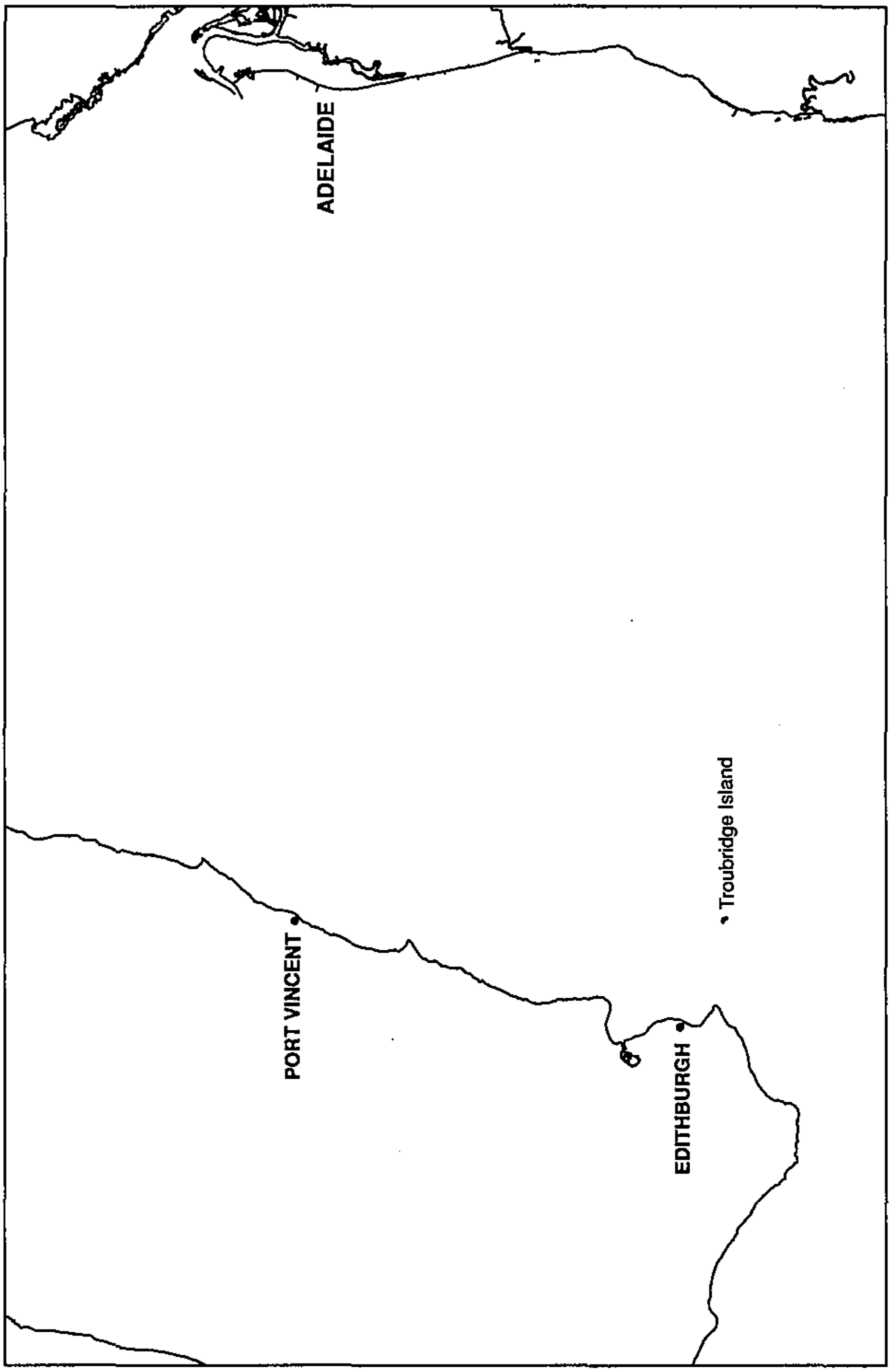



Figure 69. Map of Troubridge Island.

The lighthouse is the island's most outstanding feature. A prefabricated cast-iron tower, it is painted red with a central white band. Working life for the keepers was routine and demanding:

> The night watch was to be shared by three keepers in six hour shifts and apart from maintaining the light and intelligence duties, they were responsible for the general maintenance of the buildings. Communication with the [Trinity] Board as well as the delivery of provisions [were] initially made every three months (Brasse, 1983).

The lighthouse was serviced by boat and trips were not without risk. In March 1867 the head keeper, Mr Ormond, his wife and the second keeper were lost at sea while making the 7 km journey from Edithburgh.

Lighthouse keepers were warned not to remove vegetation for fear of the sand blowing away. Troubridge's low profile makes it particularly vulnerable to high seas and flood tides that regularly alter the shape of the island, and in 1904 the foundations of the cottages were so damaged by high seas they had to be rebuilt. In 1902 an unusual disaster befell the lighthouse when the light apparatus was completely wrecked by an earthquake and a severe fire, originating from the kerosene operated light, ignited the lantern room.

Between 1925 and 1931 a new lantern was installed and the weight driven machinery replaced by an electric lamp and motor—one of only a few powered by a wind generator.

With the installation of a major light at Troubridge Hill on the mainland, the island light has been reduced in capacity and only serves local traffic. The station was converted to automatic operation in 1981, and everything apart from the lighthouse (which is listed on the Register of State Heritage Items) was sold to DENR as a Conservation Park. A resident caretaker is responsible for the buildings and carries out observations of bird life.

In 1988 the island was made a Prohibited Area under the *National Parks and Wildlife Act* to protect the resident seabird population. Public access is, however, still allowed under controlled conditions and permits are issued from the DENR office at Stenhouse Bay in Innes National Park.

A high proportion of the island's 31 plant species is exotic. Indeed, all the plants now found on Troubridge were 'introduced' in the sense that those reaching the newly formed sandbar as seeds were carried by the wind, the tide or by birds. Some certainly reached the island with humans, either as escaped garden plants or as seeds stuck in clothing or machinery.

The island's vegetation, whether of native or exotic species, is very important in keeping this dynamic area of shifting sands above the sea. Old aerial photographs show that the north-western side of the island has eroded by more than 250 m in a south-easterly direction since 1953 (DENR, 1995).

The most visually dominant plants are tall shrubs of African Boxthorn, overshadowing native shrubs such as Marsh Saltbush, Nitre-bush, Coast Daisy-bush and Coast Ballart. Other native species such as Grey Saltbush, Karkalla, Bower Spinach, Black-anther Flax Lily, Spiny Rolling Grass and Two-horned Sea Rocket must compete for footholds against exotic Tree Mallow, Common Iceplant, Winter Grass, Stinging Nettle, Common Sow-thistle, Soursob, Tree Tobacco, Chickweed and Nettle-leaved Goosefoot.

What Troubridge lacks in exciting flora is more than compensated by a rich and populous bird community; the island's extensive drying sand flats supply abundant marine food to shore-feeding birds (Plate 114). Breeding colonies of about 10000 pairs of Silver Gulls, 180 pairs of Pied Cormorants, 100 pairs of Crested Terns, 600 pairs of Black-faced Shags and 2000 pairs of Little Penguins claim much of the dry land and vegetation for their nesting sites. The sand flats are scrutinised by busy flocks of dotterels, plovers, Turnstones, Greenshanks, sandpipers and oystercatchers searching for molluscs and other marine invertebrates. Many of these shore feeders only visit Australian coastlines during the southern summer, returning to their Northern Hemisphere breeding grounds for the northern summer. The island has few landbirds, with infrequent sightings of Silvereyes and a small number of Rock Parrots. The remains of Barn Owls were an interesting find; these nocturnal hunters may have fed on roosting birds such as the more than 10000 Starlings, from the nearby Yorke Peninsula mainland, that roost there at night.

Troubridge supports Marbled Geckos and Shingleback Skinks, which may have been introduced by human occupants as it seems unlikely that many opportunities would arise for a natural accidental arrival.

Troubridge is most accessible at high tide, when 1–2 m of water cover the fringing sand flats.

**Plate 114.** Pelicans (*Pelecanus conspicillatus*) and Black-faced Shags (*Leucocarbo fuscescens*) on the beach at Troubridge Island.
Photo A. C. Robinson

Chapter

# 10 ISLANDS OFF THE COAST OF KANGAROO ISLAND AND FLEURIEU PENINSULA

## West Bay Islet (Figure 70)

West Bay or Paisley Islet is an extremity of the southern headland encircling West Bay on Kangaroo Island's west coast. The islet's separation is tide and wave dependent; a narrow connecting neck of rock is quite visible at low tide.

The basement rock is a finely layered Kanmantoo Group metasandstone, with softer layers worn to a series of continuous parallel grooves running the length of the islet and continuing on to the mainland. Though low, the most elevated central portion retains a thin mantle of Bridgewater Formation calcarenite with a harder capping layer of calcrete. A few pockets of skeletal soil lie in calcrete depressions.

This section of coastline intercepts the full force of south-westerly gales, and a low prominence such as West Bay Islet is particularly vulnerable: much of the metasandstone base is lost beneath the churning surge that fills the air with flying spray and drenching mist. Surprisingly, plants exist in the thin soils. Only highly salt-tolerant species clinging to any available crack and pruned by the wind survive on the limited nutrients and fresh water. The resulting community is unexpectedly attractive, a low carpet of spreading shrubs blending in a mosaic of pastel greens with occasional splashes of colour from flowers.

The most exposed fringes of the calcarenite cap are colonised by Round-leaved Pigface, a creeping succulent with almost iridescent pink flowers, and Sea Celery. This herbfield gives way to a denser, more complex community of shrubs as distance from the sea increases. Species include dwarfed Marsh Saltbush, Nitre-bush, Southern Sea-heath and Ruby Saltbush. After rains, heads of Feather Spear-grass sway above the heath and patches of bright yellow mark flowering Variable Groundsel.

The islet provides a more secure roost and feeding site for coastal birds such as terns (a colony of Crested Terns nests here in most years), Red-capped Dotterels and Sooty Oystercatchers. Land birds noted during the survey—Rock Parrots, Welcome Swallows and a Richard's Pipit—would, along with the coastal birds, have to abandon the islet to seek shelter inland during severe storms, and breeding activity would favour the calmer summer months. There always seems to be a small number of bull Australian Sea-lions on the island, and it is interesting to note that the ground is littered with sea-lion bones; perhaps this is where old bulls from the breeding colony at Seal Bay come to die (Plate 115).

The Four-toed Earless Skink, a long, slender lizard with shiny scales and diminished limbs, was the only reptile found.

West Bay Islet can be easily reached on foot via the rock isthmus at low tide, but has been proclaimed a Prohibited Area to protect the breeding seabirds; permission to visit must be obtained from the DENR office in Kingscote.

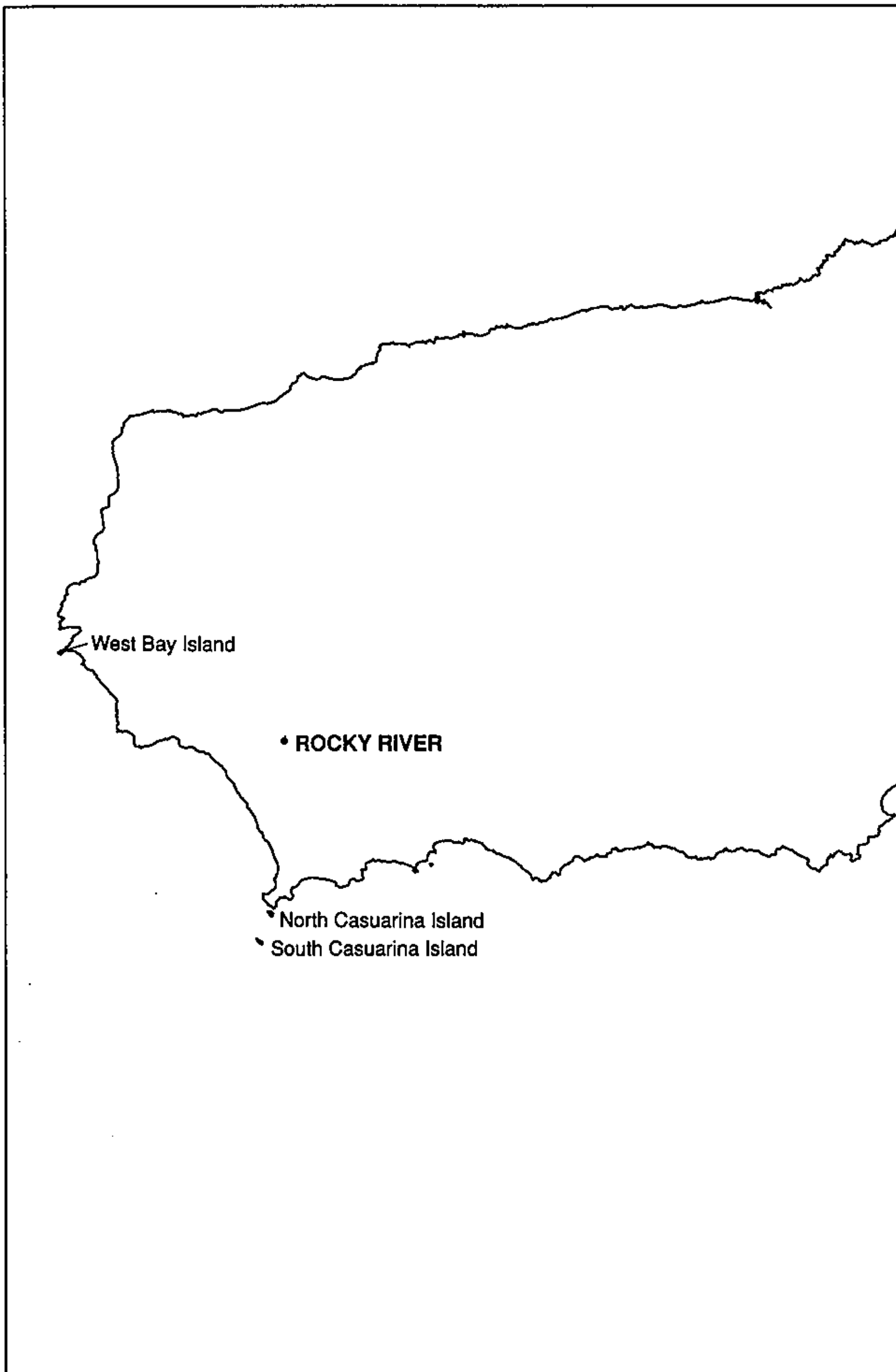



**Figure 70.** Map of West Kangaroo Island coast.

## Casuarina Islets (Figure 70)

Casuarina Islets (named by Baudin on 3 January 1803 after one of the ships in his expedition) are two islets lying south of Cape du Couedic. North Islet lies 370 m and South Islet 2.3 km south-south-west of the cape.

### North Casuarina Islet

Most of the islet is a rounded hump of Kanmantoo Group metasandstone, with cross-bedding outlined by darker minerals (Figure 70 and Plate 116). A large sheet of calcarenite blankets a similar meta-morphic base on nearby Cape du Couedic, and doubtless extended in a similar depth over the Casuarina Islets and the intervening ground before the rising seas reclaimed this soft rock. Much of both islets' surfaces are rounded and swept clean of eroded debris by storm waves. North Islet, however, retains a thin cap of calcarenite on its most protected eastern half. The islet covers about 2 ha and reaches an elevation of 29 m.

With a harsh climate and skeletal soil, vegetation is simple and sparse. A total of nine species was identified in a low, salt-blasted herbfield of Round-leaved Pigface, Sea Celery, Beaded Samphire and Bower Spinach. More sheltered hollows with deeper soil hold sprawling Nitre-bush, Ruby Saltbush, Variable Groundsel and Feather Spear-grass.

North Islet's most imposing inhabitants are a breeding colony of New Zealand Fur-seals. This species appears to prefer the most rugged and isolated rocks, perhaps a legacy from the days of seal hunting when animals were tame enough to be approached and killed with a club. Today their numbers are increasing, but they are still wary and take to the water quickly if approached. A small group of the more curious Australian Sea-lions also shares basking sites.

Small breeding colonies of Silver Gulls, Pacific Gulls and Crested Terns claim nesting territories over the upper levels. Land birds are represented by small numbers of Rock Parrots and Welcome Swallows; the survey team saw a single Richard's Pipit.

The only reptile found was a single Marbled Gecko, located beneath a loose limestone shingle with a cluster of its round, fragile eggs.

The coastline is ringed with detached rocks and rough surge, but landings may be possible in calm weather.

**Plate 115**. Head of a dead bull Australian Sea-lion (*Neophoca cinerea*) on West Bay Islet. Photo P. D. Canty

**Plate 116**. Aerial view of North Casuarina Island. Photo P. D. Canty

### South Casuarina Islet (Figure 70)

Similar to North Casuarina Islet, this is a hump of metasandstones rich in biotite, a dark, mica-related mineral. Dykes have metamorphosed to greenish-black amphibolite, zig-zagging across the western end of the island. The original bedding surfaces of the sedimentary rocks are clearly visible, dipping at a very shallow angle north-westward. The deeper, more exposed waters have scoured any sign of calcarenite from this islet. It covers about 2 ha, with an elevation of 35 m.

Increased exposure and lack of soil are reflected in plant diversity; only four species were found in a confined herbfield dominated by Round-leaved Pigface with clumps of Sea Celery, Ruby Saltbush and Austral Seablite.

A large non-breeding colony of New Zealand Fur-seals inhabits the islet. Signs of breeding birds are less obvious on this island, possibly due to a more restricted selection of nesting sites. A few less steep rock shelves provide accessible waterside foraging to Turnstones and Sooty Oystercatchers; the only land birds sighted were Welcome Swallows, and a single Four-toed Earless Skink was the only reptile found.

Landings may be possible in calm weather, though most of the islet's features can be appreciated without setting foot on land. A spectacular chasm following a joint line or dyke penetrates the east coast; ledges on its steep walls are used by fur-seals. Strong tide rips occur south-west of this islet. Because of the importance of the Casuarina Islets for fur-seal and seabird breeding sites, they have been made Prohibited Areas. Permission to visit these islands must be obtained from the DENR office in Kingscote.

## Nobby Islet (Figure 71)

Nobby Islet lies 9.2 km east of Point Ellen and only a few hundred metres from the sheer cliffs of the nearby coast. The 12 ha islet, almost a flat-topped cylinder of rock, appears to be entirely composed of Bridgewater Formation calcarenite and rises abruptly to 75 m.

The crumbly cliffs erode to perpendicular faces marred by bright orange scars that mark fresh rockfalls. Debris cones are confined to the most sheltered northern point; collapsed sections on all other faces are washed into the surrounding depths. The summit platform is gently terraced by resistant layers of calcrete that retain bands of sandy soil.

Little vegetation can maintain a foothold on the cliff faces, but the summit supports a rich community with few weeds. Clumps of Coast Tussock Grass shimmer in the wind over much of the summit, fringed with a taller shrubland dominated by Coast Daisy-bush. The 25 other species identified included Dryland Tea-tree, Coast Beard-heath, Common Correa, Cotton-bush, Thyme Riceflower, Pointed Twinleaf, Black-anther Flax Lily, Common Wallaby Grass and Downy Dodder-laurel. This diversity indicates Nobby Islet's relatively recent separation from the mainland and its isolation from the more damaging effects of the sea by virtue of its height.

Few birds inhabit the summit area, perhaps because there is less exposed habitat on the nearby mainland. However, species sensitive to disturbance utilise the island; an Osprey nest is perched below the northern rim, and White-faced Storm-petrels nest in shallow burrows over the entire summit plateau.

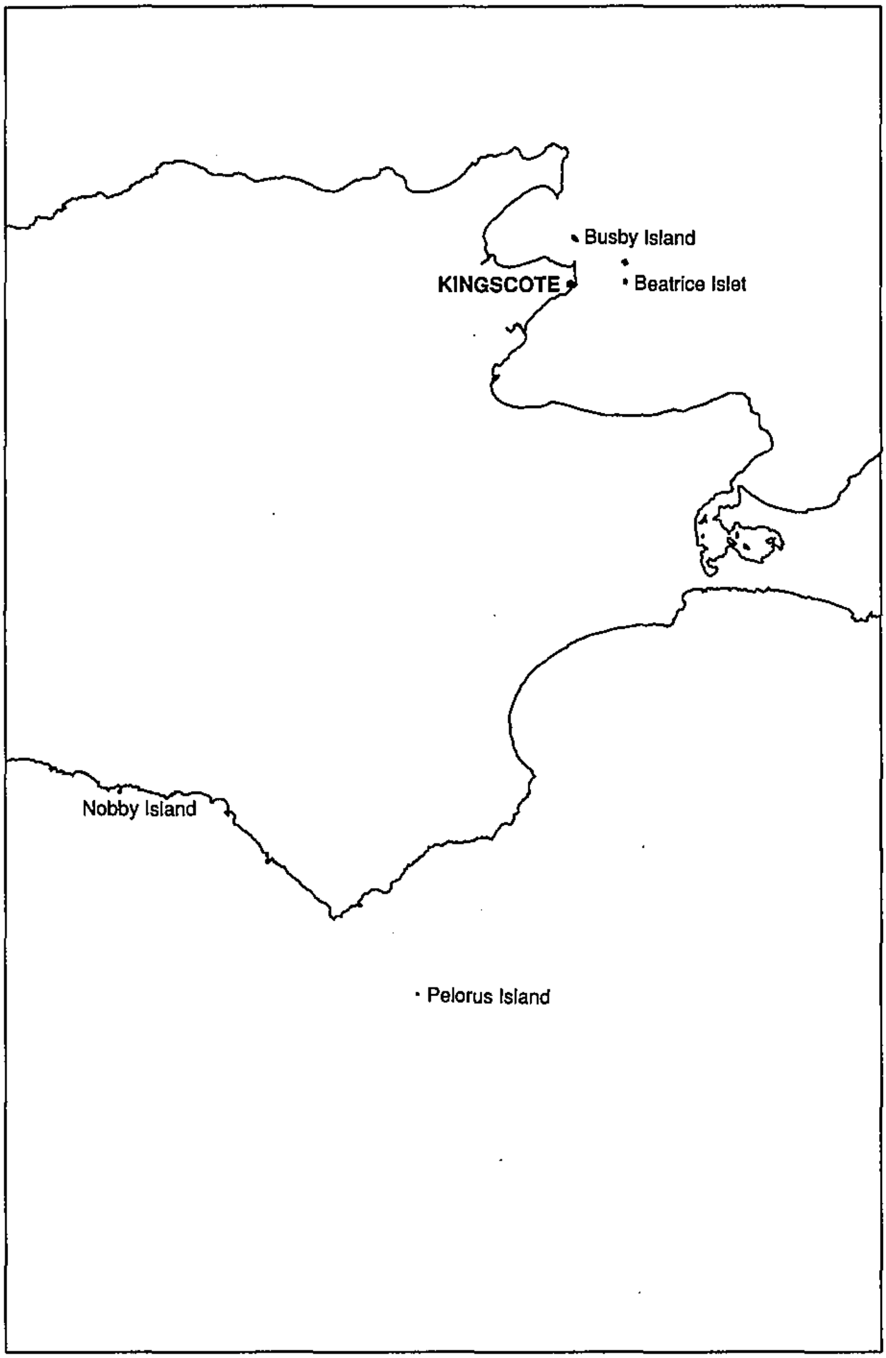



**Figure 71.** Map of East Kangaroo Island coast.

The nocturnal Marbled Gecko, a common island inhabitant, and the Bull Skink are abundant.

Nobby Islet lies off a particularly rugged and isolated section of coast and is surrounded by rocky shallows. The survey was carried out with a helicopter; no routes to the summit from sea level could be detected, and there are overwhelming obstacles, such as rotten crumbling rock and sheer faces with many fragile overhangs, to any attempt to scale Nobby's cliffs.

## Pelorus Islet (Figure 71)

Pelorus Islet is an isolated hump of Delamerian granite, the remains of a volcanic intrusion some 506 million years old, now swamped and polished by deep water 8 km south of Cape Gantheaume. The rounded 12 m high summit is scoured of any soil and small eroded fragments, leaving only a few large boulders.

In rough weather the sea breaks spectacularly over the rock, reported by *The Australian Pilot* to send curtains of spray into the air more than twice the islet's height. Residents of Pelorus are temporary oceanic species that can take advantage of the refuge it offers in calm weather. A group of New Zealand Fur-seals and a large flock of Crested Terns were using the islet for this purpose when the survey flew over the area.

Continuous swells would hinder any landing attempts, and the islet can be viewed easily from a boat. A reef with several above water rocks extends east of the islet, and an above water rock lies close to the south-west side. A pelorus is an instrument attached to a ship's compass to enable bearings to be taken; the islet's name may reflect its use as a navigation landmark.

## Busby and Beatrice Islets (Figure 71)

On the north-east coast above Kingscote, Beatrice Point to the south and Cape Rouge to the north enclose the Bay of Shoals. Cape Rouge and nearby North Cape project prominently into Investigator Strait, disrupting tide and current flows and allowing much of the finely suspended soil and sand particles to settle. Tidal movement creates a complex submarine dunefield of sandbars, channels and, in the least disturbed areas, flats of fine, sticky mud. The shape of the bay creates patterns in water flow, often leading to localised areas of quiet water amid streams of faster-flowing currents. So much silt may be deposited in these locations that deposits can grow large enough to break the surface of the water at low tide. Once exposed to drying sun and wind, sand particles can be lifted and piled above the reach of high tides, forming a cay. A growing cay is still tenuous—a particularly violent storm or spring tide can obliterate it—but if it survives the emerging sand begins to establish a new environment. Seabirds are quick to realise its potential, seeking its water-bound and predator-free security for roosting and, if it is stable and spacious enough, as a regular breeding site. Wading birds exploit a new source of molluscs, worms and other invertebrates.

The cay may now be permanently dry on the surface, but it has a high salt content, and sea water penetrates to form a tide-determined saline water table. Increasing sand depth and periods of rainfall will leach much of the surface salt away and establish a freshwater table. Though still harsh, the growing islet is developing an environment favourable for terrestrial plants, and seeds left stranded in the tidal jetsam, arrive on the wind and on the legs or in the gullets of birds can germinate.

As these pioneering plants colonise the new ground, they not only secure the sand with their roots and increase the islet's stability but, through the slow accumulation of dead leaves, sticks and bird guano, they also mulch the sand, increasing its fertility and forming new soil. This initial plant community will nurture a new, more diverse group of species increasingly remote from the effects of the sea.

Such a group of islets has formed in the Bay of Shoals, with two main formations, Busby and Beatrice Islets. Busby or Bushy Islet (Plate 117), though covering a broad area, reaches an elevation of only 1 m where sand forms low dunes. Most of its surface is still within the reach of high tide, but not to the extent that the sand and mud are eroded. A low shrubland of highly salt-tolerant succulents such as Grey Samphire, glassworts and Austral Seablite cover these flats densely. The low dunes may escape tidal inundation but they are limited in area, supporting marginally less salt tolerant Nitre-bush and African Boxthorn.

Beatrice Islets are two separate sand rises of similar origins to Busby. The Beatrice Group, however, suffered disaster after a well intentioned attempt in the early 1970s to remove an infestation of South African Boxthorn. A bulldozer was used to uproot and remove the boxthorns, but the sudden removal of the shrubs and the soil disturbance left the islets susceptible to erosion, and tides and rough weather reduced once stable vegetated islets to bare, wave-washed sand spits. Unsuccessful attempts have been made to plant typical salt-tolerant colonising species in the hope of re-anchoring areas of sand and initiating deposition, and to encourage more extensive reclamation.

The subdued shallows of the Bay of Shoals attract flocks of fish- and plant-feeding birds. Black Swans, Chestnut Teal and Australian Pelicans are often seen in the waters around these islets, and Busby Islet is a significant seabird breeding site with about 600 pairs of Black-faced Shags, 300 pairs of Pied Cormorants (Plate 118), 30 pairs of Sacred Ibises, 600 pairs of Silver Gulls and 10 or so pairs of Australian Pelicans nesting there most years. Egrets wade the shallows in search of fish; Pied Oystercatchers favour sandy coastlines, and large numbers probe the mud and sand in search of molluscs.

**Plate 117.** Aerial view of Busby Island. Photo P. D. Canty

**Plate 118.** Part of breeding colony of Pied Cormorants (*Phalacrocorax varius*) on Busby Island. Photo P. D. Canty

Oystercatcher nests are also found on Busby. Sooty Oystercatchers normally inhabit rocky shores, but birds can also be seen around Busby, perhaps indicating abundant food. Land birds using the islet include Rock Parrots, Little Grassbirds and Welcome Swallows.

Busby Islet lies about 1.5 km north of Beatrice Point, and Beatrice Islets about 4 km east. Beatrice Islets and Point were probably named after HMS *Beatrice,* which carried a survey party to South Australia in the 1870s. The origin of Busby is not known.

Because of the importance of Busby Islet as a bird breeding site, it has been made a Prohibited Area. Permission to visit this island must be obtained from the DENR office in Kingscote.

## Backstairs Passage and Encounter Bay Islands

The Pages, at the southern entrance to Backstairs Passage, are composed of metamorphic rocks.

The Encounter Bay Islands, five small islands close to the western shores of that bay, consist of granite, the remains of intrusions of molten magma forced through the surrounding Kanmantoo Group rocks during the folding and faulting of the Delamerian Orogeny 500 Ma. The Encounter Bay granites were buried beneath glaciers during the Permian Ice Age 280 Ma, embedding the ice with granite fragments, including huge boulders, as it ground over the rock. The extent of ice movement can be gauged by where these distinctive light-brown rocks were finally dumped by the melting ice: Encounter Bay granite boulders have been found at Cape Jervis, at Hallett Cove and as far away as Yorke Peninsula near Cape Fowler.

Granite tends to weather to large, angular boulders in a process, begun when the granite is still covered with sediment, by moisture percolating along joint planes in the granite. The most recent major sea level rise isolated many of the granite intrusions as islands, eroding sediments and soil to leave boulder-strewn rock cores as the main components of these islands.

### The Pages (Figure 72)

The Aboriginal story of the formation of The Pages, handed down by the Kaurna Tribe of the Adelaide Plains, is detailed in Chapter 3. From Kaurna descriptions of much lower sea levels, the legend may have originated around 8400 years ago when The Pages were first separated from the mainland.

The Pages lie in the middle of the southern entrance of Backstairs Passage, separated from the mainland to the north by 13.5 km of water and from Kangaroo Island to the south-west by 15 km. The islands form a chain a little over 3 km long from North Page Island to the southern reef. Flinders named this group on 7 April 1802 because of their guiding position to Backstairs Passage.

The islands are the exposed summits of a predominantly submerged ridge of Kanmantoo Group rocks, distinctly and finely layered, with bands running across each island in a common direction. The layers weather to angular fragments, developing little soil; quantities of broken rock are retained on the islands' rounded summits while the coastal fringe is swept clean of eroded debris by heavy swells. Tension cracks (in other words, across the strata planes) formed in the rock during its folding and metamorphism some 500 Ma have allowed the sea to carve deep chasms that pinch the islands' profiles. North Page reaches an elevation of 24 m;

South Page, 20 m (Plate 119). The southern reef, which has been eroded into two sections is about 1 m high and is regularly inundated by swells.

**Plate 119.** Aerial view of South Page Island. Photo P. D. Canty

The reef is bare of vegetation, but the two main islands support a patchy herbfield that survives on the skeletal soil and under the limitations of a particularly forceful stretch of ocean. Five species of hardy salt-tolerant plants are found on each island: Round-leaved Pigface, Variable Groundsel (Plate 120) and Nettle-leaved Goosefoot are common to both, while Sea Celery and Southern Sea-heath are only found on North Page; Ruby Saltbush and Leek Lily seem to be confined to South Page.

The islands' most obvious inhabitants are large numbers of Australian Sea-lions, the largest breeding colony of this species in the world, with approximately 300 pups on each island over the breeding season (Plate 121). Basking sea-lions can be found over the entire island surfaces, and their lumbering bulk doubtless inflicts further pressures on already stressed plant communities. The islands are too poor in vegetation and water to attract land birds from the distant mainland and Kangaroo Island, but seabirds such as Silver Gulls and Crested Terns are common, both breeding on the main islands. Other species appear to breed infrequently and many are only occasional visitors.

The islands are generally fringed by rough water, preventing boat landings in all but the calmest weather. An automatic lighthouse has recently been constructed on South Page Island, and is serviced by helicopter.

## West Island (Figure 72)

West Island lies 1.5 km south-west of Rosetta Head (The Bluff). The island,

**Plate 120.** Variable Groundsel (*Senecio lautus*).
Photo P. D. Canty

**Plate 121.** Part of the breeding colony of Australian Sea-lions (*Neophoca cinerea*) on South Page Island.
Photo A. C. Robinson

which covers 10 ha and rises to 40 m at its south-west corner, is a rounded hump of jointed granite with cliffs of dissected rock rising on all sides except the northern end, where steep slopes are strewn with granite boulders. This rocky fringe grades to a relatively flat summit with extensive beds of shallow soil intermingled with broad sheets of exposed granite. Several gullies on the north-western side have deeper soil and some protection from wind and salt spray; one of the gullies has a small brackish soak.

West Island attracted little European attention until the latter part of the 19th century, when it was found that its granite was most suitable for building purposes. Despite the difficulty of removing the stone from the island, in 1883 when a contract was let for the construction of Parliament House in Adelaide, Architect-in-Chief Edward John Woods specified marble walls and granite foundations. The contractors, Kapunda Marble and Building Company, utilised Kapunda marble for the walls and West Island granite for the base. A small quarry was established on the northern end of the island and 340 $m^3$ were moved in the first stage of construction.

During this period a small stone hut was constructed in a gully on the north-eastern side of the island. It included a fireplace, though there is now little timber on the island. Goats were once recorded as being on the island, and may have been introduced to provide fresh meat for quarry workers.

Quarrying continued for subsequent additions to Parliament House in 1936, for which a second hut was built near the quarry on the north side of the island. These additions opened on 5 June 1939, exactly 50 years after quarrying began.

West Island was proclaimed a Government Reserve in 1913 to give the Government control of the granite supplies and, once quarrying had ceased, the Adelaide University Regiment used West Island until 1964 as a target for gunnery practice during field exercises on Newland Head.

In 1960 the South Australian Field Naturalists Society planted Drooping She-oaks on the island in the first of a number of tree planting exercises. In 1964 the Underwater Research Group of the South Australian Museum used West Island as a base for marine ecology research; the most recent hut near the quarry was refurbished for use as a field station, and a jetty was built nearby. Rabbits had been introduced at some stage; 300 were counted in 1969, but a concerted program of poisoning and shooting eliminated them by 1971.

West Island was proclaimed a Conservation Park in 1972 under the newly gazetted *National Parks and Wildlife Act*. Abalone research is carried out in surrounding waters by the Fisheries Department, and an Aquatic Reserve was proclaimed for 100 m around the Island in 1971.

A total of 31 plant species has been identified on West Island. Many are exotics, most reaching the island as a result of frequent visits and disturbance by humans and their survival aided by heavy grazing of native species by goats and rabbits.

The most exposed south-western face of the island supports a low herbfield of creeping Round-leaved Pigface and Bower Spinach, with an occasional prominent Milk Thistle. To the north-east, across the top of the island, the impact of salt spray decreases and a grassland of introduced species dominates. Grasses include Great Brome, Coast Barb-grass, Barley-grass and Rye-grass. A large, almost pure stand of Tree Mallow is one of the major weed problems in this community.

The north-eastern slopes offer the most sheltered environment, particularly in the crevices between boulders where Coast Tobacco, Austral Stork's Bill and Climbing Lignum can be found. The She-oaks were planted in this area with later additions of Coast Tea-tree, Native Juniper, Norfolk Island Hibiscus and mallee. Isolated bushes of African Boxthorn still occur on the island, despite control attempts.

In 1973 six Black-footed Rock-wallabies from Pearson Island were introduced, with a further release of seven animals in 1975. The wallabies did not breed, and are now extinct.

Seabirds are West Island's most visible and important inhabitants. Large breeding colonies of Little Penguins, Silver Gulls and Crested, Fairy and Caspian Terns use much of the surface for nesting. A major banding study was carried out on terns by Joan Paton from 1964 to 1975, and is being continued by others. Crested Terns from West Island seem to be particularly wide-ranging, with recoveries from as far away as the east coast and up to southern Queensland in fewer than 12 months.

The island supports three species of reptiles. The Four-toed Earless Skink is a familiar island species, but White's and Cunningham's Skinks are normally associated with forests and rock outcrops, and this is the only South Australian island population of these species. Both White's and Cunningham's Skinks are diurnal; White's is smaller, more lithe in build and with smooth shiny scales and attractive spotted patterning. Both species shelter in granite crevices, but Cunningham's Skink is less willing to venture far from these retreats; perhaps its larger size makes it more visible to predators. White's Skink eats insects, but Cunningham's Skink, which favours fruit and seeds, has ridged, spine-bearing scales over the tail that allow it to wedge itself in rock cracks, where it reacts to attempts to remove it by inflating its body and jamming its rough scales hard against the rock, making it impossible to budge.

Access to the island is best made via the landing jetty on the northern end of the island. Care should be taken not to disturb nesting birds.

## Wright Island (Figure 72)

Wright Island lies 650 m north-north-east of Rosetta Head. A typical dome of Encounter Bay granite, it rises to 24 m over rounded flanks strewn with boulders. The most exposed east coast has been worn to steep sheets of jointed granite; the summit culminates immediately above this coast, and slopes more gently to the western and northern shores. Indenting the north-western corner is a small beach of sand and granite pebbles. There is a thin layer of soil on the leeward side of the summit, but it is frequently interrupted by exposed granite outcrops and boulders.

Wright Island was not visited during the survey, but it is comparable with other Encounter Bay islands and shares many plant and bird species common to the other islands. From aerial photographs, the dominant plant species appears to be African Boxthorn.

Wright Island was named after Captain Joseph Wright, in charge of a whaling station at Rosetta Head owned by the South Australian Company. Wright is easily accessible from the north-western beach in any small craft.

## Granite Island

Granite Island (Figures 72 and 73) lies about 500 m offshore from Victor Harbor, and is one of the State's best known and most visited islands.

Granite, which rises from a broad rounded basement of Encounter Bay granite, covers 32 ha, making it the largest

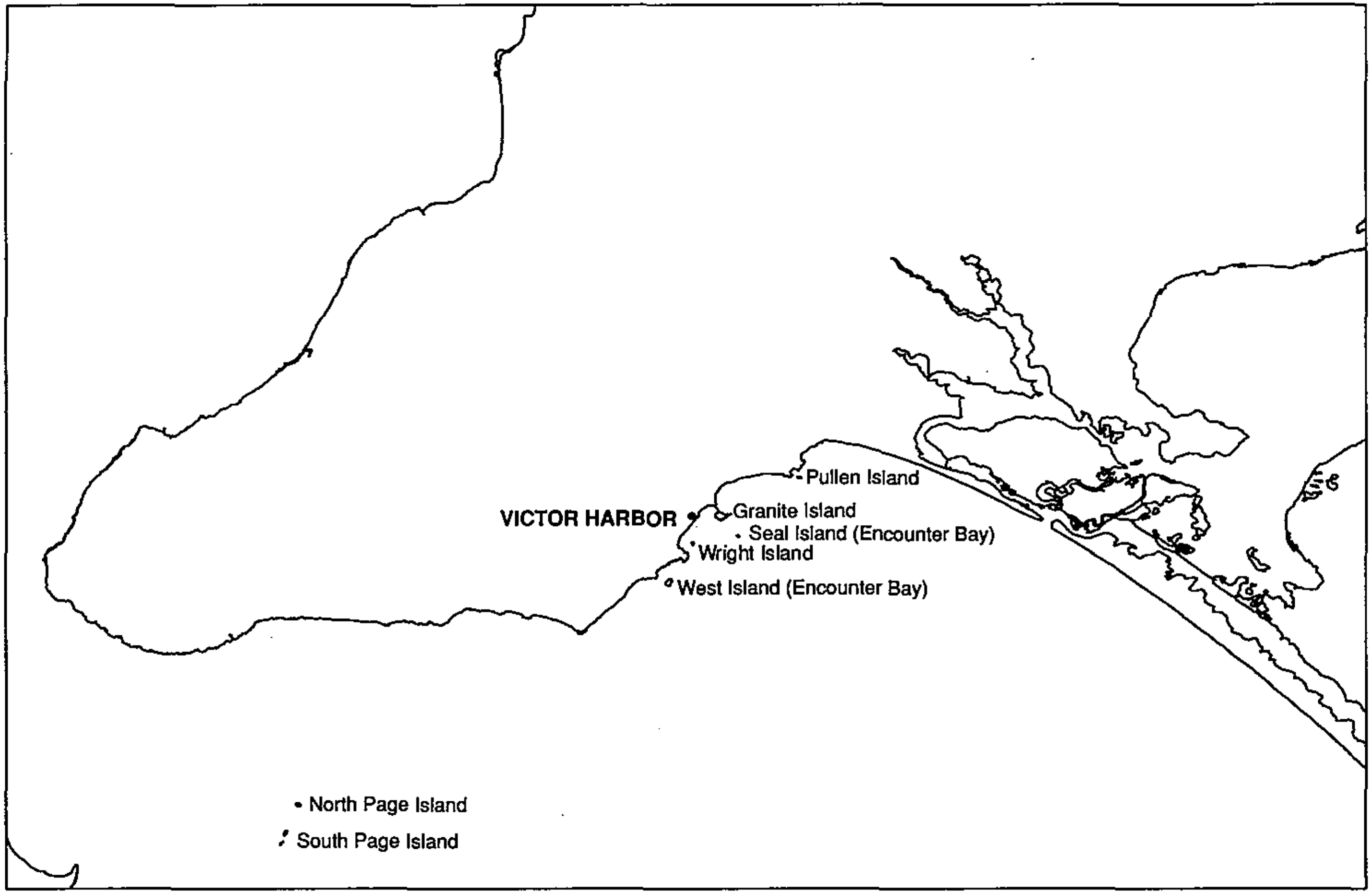



**Figure 72.** Map of Fleurieu Peninsula Islands.

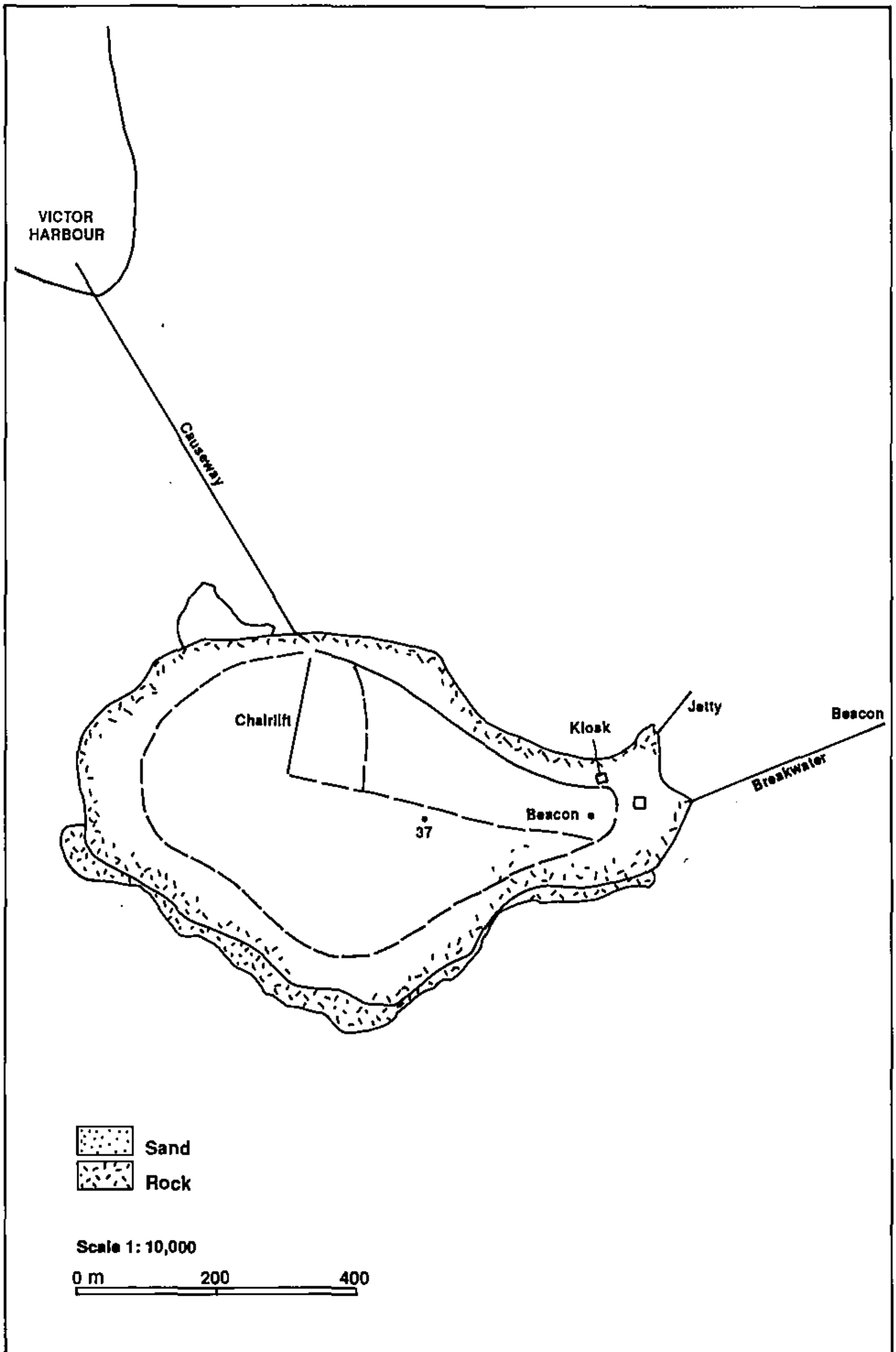



Figure 73. Map of Granite Island.

of the Encounter Bay group. A thick layer of soil blankets the granite core above the boulder-strewn coastline, giving the island a more gently rounded profile. The flattened summit is 34 m above sea level.

Granite Island's proximity to the mainland and a shallow dividing channel would have provided easy access to local Aboriginal people, who may have hunted fish and birds and collected eggs. The abundance of Southern Right Whales in the local waters made Encounter Bay a profitable haunt for whalers, and a whaling station was established on Granite Island by Captain John Blenkinsop, an experienced whaler from Sydney, in 1837, with two whaleboats engaged in fishing. A rival company was established at Encounter Bay, also in 1837, by the South Australian Company, using The Bluff as a lookout.

There was fierce competition between the two companies, to the point where accusations and conflicts were so common they tended to hinder the efficiency of both operations. Tragedy struck the Granite Island fishery when Captain Blenkinsop and the colony's first Judge, Sir John Jeffcott, were drowned near the Murray Mouth in a whaleboat. Further trouble developed when the whalers of the island fishery decided to abscond and, in the process, tapped the casks and drained the oil. The Chief Leadsman, John Dutton, learned of the plot and caught the whalers in the act, whereupon he tied them up ready to be taken to Adelaide by ship. Some of the whalers managed to get free, however, and attempted to reach the mainland. The crossing causes little difficulty at low tide, but on that occasion the water was deep and one man slipped into a hole and disappeared.

At a coroner's inquest the following month it was claimed that Dutton was responsible for the man's death. The finding led to a public outcry and, when Dutton was tried on a charge of manslaughter in November 1939, he was found not guilty.

The whaling station was eventually closed and its operations combined with that of the Encounter Bay fishery. Granite Island was said once to have been covered with eucalypts and she-oaks, but as a legacy of the fires of the trypots no such vegetation remains on the island today.

Victor Harbor was appraised in the 1830s as a favourable site for a port, but it was not until after the decline of Port Elliot as a centre of Murray River trade that the harbour, in the sheltered lee of Granite Island, was proclaimed a port in the early 1860s.

Granite Island not only provided protection from the Southern Ocean, but also housed installations for the once-bustling coastal and overseas shipping port of Victor Harbor. A jetty and pier were built in the early 1860s, and in 1875 the jetty was extended to form the familiar causeway linking Granite Island with the mainland. A shipping wharf stretching from the island's northern shore was completed in the same year. In 1878 construction began on a substantial screw pile jetty, and in 1879 a breakwater was begun to protect this expensive installation. An impressive engineering feat, the breakwater was built of 203000 tonnes of granite quarried from the island, and was completed in 1882. Four workmen were killed during construction, three by an explosion while preparing a shot for blasting. A 1.6 m railway line was also installed to transport the rock fill. Later, a horse-drawn operation transported goods between the mainland and the island and small locomotives were used for shunting merchandise for shipping.

A lighthouse was installed to provide safe passage. The first light was built on a 5 m high tripod at the seaward end of the breakwater. The fixed white light, visible for 8 km, came into operation in December 1881. A more powerful kerosene-powered light, housed in a wooden building, was erected in 1892 on the highest point on the eastern end of the island, and replaced in 1951 with an automatic gas-operated light.

Victor Harbor's role as an important local port fell into decline by about 1910, and since 1914 parts of the island, including the lighthouse, screw pile jetty and causeway, have been under the control of the Department of Marine and Harbours. The jetty is today used by commercial fishing vessels and recreational anglers.

In the late 1800s, Granite became an important tourist attraction and recreation area; by 1910 the island had been placed under the control of the Railways Department, and major provisions for tourists were undertaken. The Department cleaned up debris remaining from the building of the jetty and breakwater more than 20 years beforehand, constructed a pathway around the island, planted additional trees, built swings and seats, a kiosk and a ramp to the top of the eastern end of the island.

Access for holiday makers was facilitated with the construction of a causeway in 1872, and South Australian Railways commenced a passenger service in 1894, using horse-drawn trams to transport visitors. In 1910 a double-decker car that could carry 43 passengers was installed; the service was discontinued in 1954, replaced by a disguised tractor pulling four carriages. More recent facilities include a chairlift, new walking trails, seats, shelters and public conveniences administered by the District Council of Victor Harbor.

Though it is virtually devoid of native vegetation, Granite Island offers fishing, dramatic coastal scenery and native fauna, including a large natural population of Little Penguins. In 1970 a small group of Tammar Wallabies and in 1971, Kangaroo Island kangaroos were introduced. Both species thrived, but an attempt to introduce Cape Barren Geese was unsuccessful. The kangaroos were removed in the early 1980s due to the damage they were causing to trees being planted on the island; the wallaby population posed a similar threat and was removed in 1991. Granite Island is the most accessible of South Australia's offshore islands, and the easiest place to see Little Penguins in the State.

## Seal Island

Seal Island (Figure 72 and Plate 122) lies 4 km west of Rosetta Head. The island is a 1 ha mound of tumbled granite bounders scoured of soil, and reaches 12 m above sea level.

Seal Island has no vegetation, it supports a breeding colony of Silver Gulls. The island's name suggests the onetime presence of a sea-lion or fur-seal colony, which may have been exterminated by whalers or sealers in the early 1800s.

**Plate 122**. Seal Island from the north. Photo A. C. Robinson

The island's small area and exposed locality hinder landing attempts in all but the calmest weather. Most of its features can be seen without landing, but care should be taken in negotiating the surrounding reef and detached rocks.

## Pullen Island (Figure 72)

Pullen Island lies 500 m offshore from the town of Port Elliot. The island is a 1 ha hump of Encounter Bay granite, eroded to jumbled boulders that reach a height of 6 m. Boulder heaps at the eastern and western ends are constantly washed by the sea, but a high point in the centre retains some soil. A boulder-strewn sand patch has formed on the central north coast, affording the only landing point for small boats in calm weather.

Pullen Island was probably visited by Aboriginal people to collect seabirds and their eggs, and may have been an important source of food in summer months. Europeans have had little involvement with the island; it was originally named Lipson island after Captain T. Lipson, the colony's first Harbour Master, but in 1839, when Colonial Marine Surveyor W.J.S. Pullen surveyed the south coast, he renamed it after himself.

In 1948 Pullen Island was declared a closed area for birds under the *Animals and Birds Protection Act 1919–46*. It remained vacant Crown Land until 1967, when it was proclaimed a Fauna Conservation Reserve. With the passage of the *National Parks and Wildlife Act* in 1972, it was re-dedicated Pullen Island Conservation Park.

Most of the island's surface is scoured of soil and subject to drenching salt spray and strong winds. The soil pockets in the central portion support Native Juniper, African Boxthorn, Tree Mallow and Buckthorn, an escaped hedge plant.

Pullen Island has long been recognised as an important refuge and breeding area for seabirds, with large numbers of breeding Silver Gulls and Little Penguins. Observations by people who have known the area for many years suggest that fewer seabirds frequent the island now than in the past, possibly because of the large numbers of feral pigeons that now roost and breed there. Starlings also roost on the island.

Chapter

# 11

# ISLANDS OF THE SOUTH-EAST COAST

During the Pleistocene epoch, glacial and interglacial phases in the great Northern Hemisphere Ice Age caused fluctuations in sea levels around the world. Periods of glacial intensity, when sea levels fell, alternated with warmer periods when the ice sheets melted and sea levels rose. Falls in sea levels of up to 150 m exposed large areas of the continental shelf, subjecting the sandy floor of the shelf to wind erosion and piling sand and the lime-rich fragments of shells into a series of dune ridges, now a crumbly rock known as Bridgewater Formation calcarenite.

In the south-east, a series of parallel dune ridges between Naracoorte and the coast recorded at least 20 sealevel stands between 690000 years ago and the present. A section of this dune system is known as the Robe Range, which formed 40000 to 100000 years ago and once extended the length of the coast from Cape Jaffa to Cape Banks. This old coastal barrier was eventually breached and partially submerged by rising sea levels 6 000 to 7000 years ago, forming such major features as Rivoli Bay.

A few larger masses of calcarenite are now surrounded by ocean, forming dissected islets and reefs. Three major remnants—Margaret Brock Reef, Baudin Rocks and Penguin Islet—occur off the South East coast.

## Margaret Brock Reef (Figure 74)

Margaret Brock Reef is the northernmost visible remnant of the Robe Range, and the outermost extremity of this reef lies about 7 km west of Cape Jaffa.

Much of the reef is submerged and extremely treacherous. Its history of shipwrecks includes the *Maria* in June 1840, and a barque — after which the reef was named — on 23 November 1852. One of South Australia's most tragic shipping mishaps occurred off Carpenter Reef, north-west of Cape Northumberland, when on the night of 6 August 1859 the luxurious three-masted, iron-hulled steamship *Admella*, which had traded for most of her two-year life between Adelaide and Melbourne, struck the reef and broke into three main pieces. At one point about 70 of the 113 on board clung to pieces of the wreck about 2 km from shore, within full view of settlers on the beach and several vessels standing nearby, all powerless to help because of the strong swell. Over the next seven days many of the unfortunate people perished through exhaustion and exposure, and on the eighth day only 21 or so almost lifeless survivors were rescued by boats from the mainland.

A plaque near the Cape Northumberland lighthouse commemorates the bravery of lighthouse keeper Benjamin Germein, who saved many from the wreck. Largely as a result of the wreck of the *Admella*, pressure was brought to bear for the erection of a lighthouse, which was constructed on an area of drying rock in the Margaret Brock Reef and became operational in January 1872. This was one of the few Australian lighthouses where the keepers resided in the light tower itself.

In 1966 the hazardous waters of the reef claimed the lives of two lighthouse keepers, who were assumed to have drowned while fishing nearby. Something was suspected to be amiss when it was discovered the lighthouse was unattended, and it was decided to automate the lighthouse soon after this incident.

In 1973 the Margaret Brock Reef lighthouse was replaced by a mains electricity operated light at Robe. An ambitious project by the Kingston Branch of the National Trust, with the assistance of the Commonwealth Department of Transport, saw the dismantling of the historic keepers' accommodation and the lantern room of the lighthouse. The structures have been reassembled on the foreshore of Kingston, and all that remains of the 1872 lighthouse on the reef is the base and platform, which now house a small beacon.

The reef would provide little more than a temporary roost for seabirds during low tide and calm seas, and a possible feeding ground for Australian Fur-seals.

## Baudin Rocks (Figure 74)

The eroding effects of a rising sea level during the Holocene Period are in evidence further south from Margaret Brock Reef where, as with Rivoli Bay further south, the Robe Range suffered extensive submergence and breaching, resulting in the gradual formation of Guichen Bay. Here, stretching 2 to 5 km south-west of Cape Thomas, lie Baudin Rocks or the Godfrey Islands (Plate 123). The rugged, fragmented group of dry rocks and submerged reefs is composed of Bridgewater Formation calcareous sandstone, and has all but succumbed to the sea.

Totalling about 5 ha, the group consists of two larger and many smaller islets. The highest elevation is 12 m. Baudin Rocks were named by Flinders after Nicolas Baudin on 13 April 1802, not long after the two explorers met in Encounter Bay. Godfrey is attributed to Colonel Frome who, in 1843, named the group after Godfrey Thomas, a step-brother of Governor Grey.

Long before its European 'discovery', however, Baudin Rocks were important to the local Aboriginal people and in 1937 anthropologist Norman Tindale recorded a number of Aboriginal songs known to Milerum, an old man of the Tanganekald tribe. One of these, a short song, belonged to the Baundik tribe and concerned the Baudin Rocks. Tindale (1941) states that the meaning of this song word for word was obscure to Milerum, but though it only has a few words it had 'a great deal of meaning' to the Baundik people. It is connected with a legend of 'the Emu and the Native Companion'. The song tells how the emu people were trapped on Baudin Rocks by a sudden rise of water, supposed to have been caused by the native companions, who watched from Kripangulu and saw the enraged male parading about ('stepping out') in a display of anger at the trick played on him by his traditional enemies:

**Song of Baudin Rocks**

| | | |
|---|---|---|
| **'Tununa** | **'bial 'bial** | **'nawurinje** |
| Look-out (From Kripagnulu, near Mount Benson | Place name (Baudin Rocks) | 'big island' |
| **'gari bu:l** | **(h)'edno** | **'garibi'o:ni 'maiba** |
| a few long steps (emu strides) | eternnoija full of rage | and stepping out (gari = emu) |

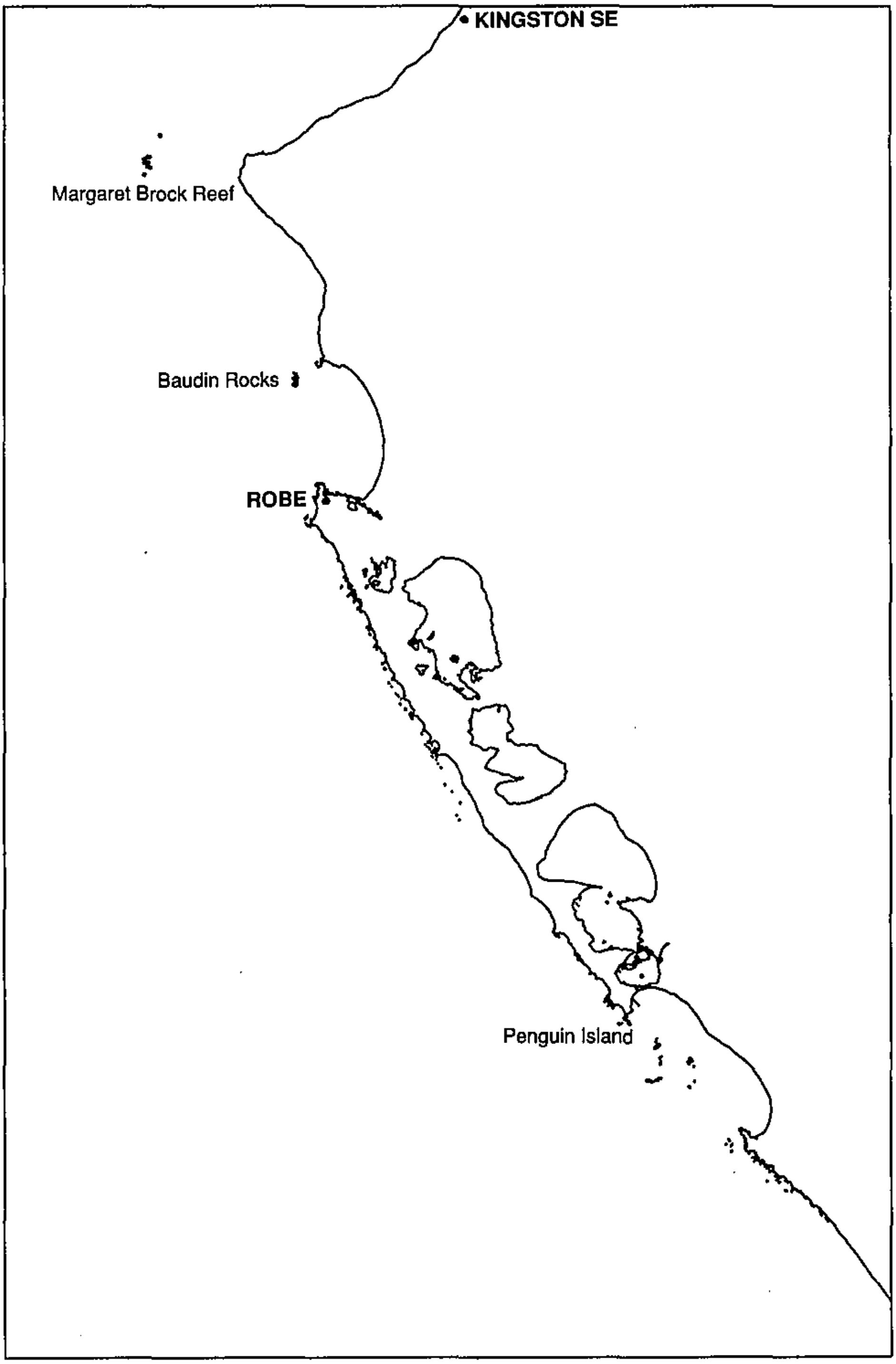



Figure 74. Map of South-East Coast Islands.

The island's low aspects and fragmented nature offer little protection against the Southern Ocean. Only the two larger islands are vegetated, and growth is restricted to the leeward, east-north-east side, covering about half of the total surface area. Much of the plant cover is low, sprawling Nitre-bush. Other species include Bower Spinach, Austral Seablite, Southern Sea-heath and a single bush of African Boxthorn. A few unidentifiable senescent annual species were also found, and possibly included Variable Groundsel. Only the smaller northern islet could be reached during the survey. The larger south island is reported to have many shrubs of the native Australian Boxthorn.

**Plate 123.** The beach on Baudin Rocks. Photo DENR

Few bird species were recorded during the survey. The larger islets support large populations of Little Penguins; a large Crested Tern colony is known to breed on the larger islets, but no birds were present during the survey. Other species seen were a flock of more than 200 feral pigeons, flushed from sheltered rocky roosting sites. A single nest, assumed to belong to a sparrow, was found in the African Boxthorn bush, and regurgitated pellets containing the bones of small mammals indicate the occasional presence of a predatory bird from the mainland. No reptiles were seen.

The smaller northern islet is the most accessible in the group, having a sandy beach on its north-western corner. Care should be taken to avoid disturbing nesting birds.

## Penguin Island (Figure 74)

Penguin Island is a series of obstinate calcareous sandstone remnants of the Robe Range jutting into the northern limit of Rivoli Bay off Cape Martin. The island has been progressively isolated from the cape by the sea, beginning 6000–7000 years ago with the most recent rise in sea levels. The less resistant stone is now visible as an extensive fringe of wave-washed reefs and shore platforms.

The island is dominated by two large outcrops, known unofficially as Inner and Outer Penguin Island. Only Outer Penguin Island existed until 1968, when a fierce storm crumpled a weak zone and severed what is now the inner island from the Cape, leaving a channel about 40 m wide. These two sections are surrounded by vertical cliffs that rise 10 to 15 m above the sea, except for the south-western end of the outer island where the ground drops steeply to a rocky spit. Here, the continued abrasive action of south-westerly swells has worn the cliffs down to an expansive shore platform. Minor outcrops and tide-determined shelves bridge the main sections, which form a chain about 400 m long and up to 150 m wide.

The island's limited area and dissected nature offer little refuge against severe conditions. The vegetation is typically salt-tolerant, covering most of the higher ground and becoming more dense in deeper pockets of sandy soil. Native species include Grey Saltbush, Fleshy Saltbush, Austral Seablite, Bower Spinach and Leafy Peppercress. Introduced species include several Athel Pines, African Boxthorn and mallows.

Penguin Island, as its name suggests, is a major local haven and breeding ground for seabirds, including not only the Little Penguin but also Silver Gulls, Crested Terns and Short-tailed Shearwaters. The island's proximity to the mainland and its rich bird life have made it an ideal site for regular long-term monitoring and study of seabird breeding. The Crested Tern colony in particular has the distinction of supporting the longest running tern-banding program in Australia, beginning in 1953. Mammal records include rabbits, several specimens of which resided on what is now the inner island when it was separated from the mainland, and occasional visits by Australian Fur-seals.

The island's known human utilisation, other than by ornithologists, includes the erection of a lighthouse on what is now the outer island in 1878, as an aid to the then bustling shipping activity at Beachport. A new, automatically operated light was established on Cape Martin in 1960 to replace the Penguin Island light. All that remains of the 1878 lighthouse is its supporting stone tower, a stone hut and a landing jetty.

Recognising the importance of Penguin Island as a seabird haven, the Government set aside what is now the outer island as a Wildlife Reserve in 1961. On attaining 'island status', the inner island was added in 1970 to what is now Penguin Island Conservation Park.

Access can be hampered by tides and weather: reports suggest that at least the inner island can be reached on foot at low tide. Boat access to the outer island could be made by using the old lighthouse jetty on the more protected eastern side. Care should be taken to avoid falling into penguin and shearwater burrows, or disturbing nesting birds.

# Part Three

# The Future

Chapter

# 12

# CONSERVATION MANAGEMENT

Some of South Australia's offshore islands are among the least disturbed areas in the State. It is now virtually impossible to find areas on the mainland that have not been affected to some extent by Europeans and their introduced plants and animals. Interestingly, many of the islands have not been subjected to the pressures of an Aboriginal population for at least 15 000 years, whereas there is little doubt that much of mainland South Australia had been extensively modified by Aboriginal use of fire before European settlement (this aspect of offshore island ecology is discussed by Hopkins and Harvey, 1989). From a conservation point of view, therefore, these last tiny pieces of unmodified Australia are of very great significance. They are also of great value as scientific reference benchmarks against which we can begin to examine the ecology of change free from modern human influence.

Apart from their intrinsic value as pristine natural areas, many plant and animal species depend to a greater or lesser extent on the islands for important parts of their life histories. Island animals often occur at quite high population densities and, because of their long periods of isolation from humans and, in some cases, a range of other predators, island animals can be very tame—a characteristic that has great appeal to visitors, but one that by the same token has led very quickly to the complete extinction of many island animal populations. The fate of the Dodo on Mauritius may be well known, but island species are still becoming extinct all over the world. In South Australia a number of island wallaby and bettong populations have been lost in historical times, while species such as the Cape Barren Goose, the Australian Sea-lion and the New Zealand Fur-seal still seem to be recovering from the effects of human exploitation.

It is not, however, possible or even desirable to try to lock up our islands again; after all, they are an important part of the State's natural heritage and we have every right to experience these magic places. What *is* needed is a new realisation of the fragility of island ecosystems and an increased respect from visitors, both for the land itself and its associated plants and animals.

If we are to manage our offshore islands properly in the future, the first step we must take is to develop some sort of objective classification of the conservation value of all islands. A systematic collection of data from all the islands such as has been outlined in this book allows us for the first time to attempt such a classification.

The information is more detailed for some islands than others, and there will always be a large element of subjectivity in the type of classification outlined below, but it will serve as an initial guide to the relative value for conservation of each of our 150-odd islands.

A series of 20 parameters has been developed, each of which was scored on a scale of 1 to 5 for each island, giving a possible total score of 100 (Table 9).

**Table 9.** Values used to derive the 'conservation value index' for each island

| | | Score | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| **Physical parameters** | | | | | | |
| (a) | Island area (ha) | 0–10 | 11–20 | 21–50 | 51–100 | > 100 |
| (b) | Distance from mainland (km) | 0–5 | 6–10 | 11–20 | 21–30 | > 30 |
| (c) | Age of isolation (years BP) | 5000 | 5000–6000 | 6000–8000 | 8000–10000 | >10000 |
| (d) | Degree of disturance | Totally altered | Human influences predominant Remnant natural patches | Semi-natural Native flora and fauna present | Semi-natural Flora and fauna predominant | Natural landscape |
| (e) | Land tenure | Vacant security | Freehold Crown Land | Leasehold | NPWS Reserve | Prohibited Area |

| | | Score | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| **Biological parameters** | | | | | | |
| (f) | Number of floristic groups | 1 | 2–3 | 4–5 | 6–7 | >7 |
| (g) | Number of structural vegetation groups | 1 | 2–3 | 4–5 | 6–7 | >7 |
| (h) | Percentage of island covered with 'natural' vegetation | 10 | 11–20 | 21–50 | 51–90 | 91–100 |
| (i) | Total native plant species | 1–10 | 11–20 | 21–50 | 51–100 | > 100 |
| (j) | Total native mammal species | 1 | 2 | 3 | 4 | 5 |
| (k) | Total native bird species | 10 | 11–20 | 21–30 | 31–50 | > 50 |
| (l) | Total native reptile species | 1 | 2–5 | 6–10 | 11–20 | > 20 |
| (m) | Weed index (Introduced spp.: total spp. × 100 ) If no introduced species score 5 | 41 | 21–40 | 11–20 | 6–10 | 0–5 |

Table 9. (cont'd)Values used to derive the 'conservation value index' for each island

| | | Score | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| (n) | Introduced mammal index (if no introduced terrestrial species recorded, score 5) | 41 | 21–40 | 11–20 | 6–10 | 0–5 |
| (o) | Introduced bird index | 41 | 21–40 | 11–20 | 6–10 | 0–5 |
| (p) | Number of breeding mammals | 1 | 2 | 3 | 4 | 5 |
| (q) | Number of breeding birds | 1–3 | 4–6 | 7–10 | 11–20 | <21 |
| (r) | Number of vertebrates dependent on islands | 1 | 2 | 3 | 4 | 5 |
| (s) | Number of rare or endangered species (plants or vertebrates) | – | – | – | – | 1 |
| (t) | Aesthetic value | Little aesthetic value | Other examples in region | Best in local region | Best in South Australia | Best in region |

The ranking is biased toward biological factors and includes the number of floristic groups; the number of structural vegetation associations; the number of plant, mammal, bird and reptile species; the number of breeding mammals and birds; an index of the proportion of introduced to native plant, bird and mammal species; the number of vertebrates (such as seals, breeding seabirds and so on) dependent on the islands; and the number of rare and endangered species. There are also a number of physical factors considered, including island area, distance from the mainland, age of isolation, degree of human disturbance and present land tenure. Finally, there is one category in which an arbitrary aesthetic value is derived for each island. The conservation rankings for the 113 vegetated islands in South Australia for which we have biological data are shown in Table 10.

Not unexpectedly, the six most important islands from a conservation point of view are North Neptune, Pearson, Greenly, Franklin, Dorothée and Perforated. None apart from Franklin, and briefly, Pearson have ever been farmed or grazed, so are in as near to natural condition as possible.

Islands scoring between 60 and 68 also include a significant number of remote and relatively pristine islands such as Lacy, South Neptune, Liguanea, Masillon, Dog, Fenelon, Central and South Four Hummocks, Curta Rocks, Eyre and North Four Hummocks. In addition, they include three of the larger islands with significant agricultural development—St Francis, Flinders and Reevesby, and Roxby, Sibsey and Langton in the Sir Joseph Banks Group, which have been grazed in the past. Despite these European influences, however, all these islands retain enough of their natural environment to be rated very significant for conservation.

All of these first 23 islands, with the exception of Flinders, are part of the State's network of Conservation Parks managed by DENR, as are a large proportion of the other islands in the list. Clearly, special conservation management and some control of the impact of visitors is required on all of these high-ranking islands and the significance of the larger islands degraded by agriculture means that special efforts should be made to return them to a more 'natural' state.

At present, visitor use of most of these islands is limited to fishermen and cruising yachtsmen, but the development of Wedge, Spilsby, Thistle and Flinders for tourism on the basis of the schemes outlined in Chapters 6, 7, and 8, makes the other islands of the Gambier Group, Sir Joseph Banks Group, Port Lincoln Islands and the Investigator Group potentially accessible by boat for tourist operations. It is a significant challenge for conservation and tourism authorities to develop this potential for island wilderness visits sensitively, while ensuring the significant biological and scenic attributes of South Australia's diverse offshore islands will remain undisturbed and, if possible, improved for future generations of visitors.

The management of European cultural heritage on the islands is beyond the scope of this book, but visitors need to be aware of the historic remains at many sites. Some structures are in good condition—these include lighthouse complexes, which may include keepers' cottages and various separate stores. Other structures are fragile, and the ruins of an early sealer's hut may be only a small mound of stones.

**Table 10.** Conservation Index ratings for 113 vegetated South Australian offshore islands.

| Island | Conservation ranking | Island | Conservation ranking |
|---|---|---|---|
| North Neptune | 96 | Hopkins | 51 |
| Pearson | 86 | Dalby | 51 |
| Greenly | 77 | Marum | 51 |
| Franklin | 76 | Haystack | 51 |
| Dorothée | 71 | North Casuarina | 51 |
| Perforated | 68 | North Page | 51 |
| St Francis | 67 | South Page | 51 |
| Lacy | 67 | Golden | 50 |
| South Neptune | 67 | Partney | 50 |
| Roxby | 67 | Althorpe | 50 |
| Liguanea | 65 | Nobby | 50 |
| Masillon | 64 | Germein | 49 |
| Dog | 63 | South Casuarina | 49 |
| Fenelon | 62 | Olive | 48 |
| Flinders | 62 | Lewis | 48 |
| Central Four Hummocks | 62 | Middle | 48 |
| South Four Hummocks | 62 | Little Waldegrave | 48 |
| Curta Rocks | 62 | Troubridge | 47 |
| Sibsey | 62 | Wanna | 46 |
| Langton | 62 | South | 46 |
| Eyre | 61 | Busby | 46 |
| Reevesby | 61 | Jones | 45 |
| North Four Hummocks | 60 | Owen | 45 |
| Waldegrave | 59 | Yangie Bay | 44 |
| Kirkby | 59 | West Bay | 44 |
| Hareby | 59 | Baudin Rocks | 44 |
| Egg | 57 | Royston | 43 |
| St Peters | 57 | Chinamans Hat | 43 |
| North Veteran | 57 | Bird | 42 |
| Wedge | 57 | Goose | 42 |
| Thistle | 57 | Cap | 41 |
| West (Isles of St Francis) | 56 | Grindal | 41 |
| Evans | 56 | Penguin | 41 |
| Topgallant | 56 | Unnamed (Baird Bay) | 40 |
| South Rocky | 56 | Taylor | 40 |
| Williams | 56 | Grantham | 40 |
| Boucaut | 56 | Boston | 40 |
| Duffield | 56 | West (Encounter Bay) | 40 |
| Goat | 55 | Eba | 38 |

**Table 10. (cont'd)**Conservation Index ratings for 113 vegetated South Australian offshore

| Island | Conservation ranking | Island | Conservation ranking |
|---|---|---|---|
| Smith | 55 | Tumby | 38 |
| Stickney | 55 | Wardang | 38 |
| Winceby | 55 | Rocky (Goose Group) | 37 |
| Freeling | 54 | Rabbit (Port Lincoln) | 36 |
| Lusby | 54 | Island Point | 36 |
| Lounds | 53 | The Brothers | 35 |
| Purdie | 52 | Louth | 35 |
| Ward | 52 | Island A | 34 |
| South Neptune (Lighthouse) | 52 | Pigface | 32 |
| English | 52 | Rabbit (Coffin Bay) | 32 |
| Spilsby | 52 | Lipson | 32 |
| Blyth | 52 | Bickers | 31 |
| Seal | 52 | South Mt Dutton Bay | 28 |
| Hart | 51 | Green | 28 |
| Price | 51 | North Mt Dutton Bay | 27 |
| North (Gambier Group) | 51 | Island B | 26 |
| Albatross | 51 | Island C | 24 |

It is important not to disturb these vulnerable sites; archaeological research is still being carried out on many of the islands and the ruins are often the earliest remains of European contact with South-Australia. Many of the sites are included in the State Heritage Register and are protected by the *Heritage Act 1993*. Please help preserve these historic places for future generations.

A detailed discussion of future directions for island management in South Australia is also beyond the scope of this book, but those interested in further reading on this important topic are referred to Robinson (1989) for an overall summary and the *Draft Management Plan for the Sir Joseph Banks Group Conservation Park* (SANPWS, 1990).

# BIBLIOGRAPHY AND FURTHER READING

Commonwealth Department of Transport (NAVAID) Miscellaneous files, notes on Lighthouses, and lists of Lighthouses in SA.

Crested Penguin from St Francis Island 1913. *Transactions of the Royal Society of South Australia* 37, 452.

Dangerous Reef, The Pages and Casuarina Island granted status of bird-protected districts 1909. *Transactions of the Royal Society of South Australia* 33, 372.

Department of Environment and Natural Resources, State Heritage Branch 1988 (unpub.) *Shipwreck Database: a register of South Australian shipwrecks from 1837 to 1988.*

Department of Environment and Natural Resources, State Heritage Branch 1991. *Wardang Island Maritime Heritage Trail.* Government Printer, Adelaide, South Australia.

Department of Environment and Natural Resources 1993. 'Site survey report on a former sealing site, Thistle Island'. *Austral Archaeology,* Government Printer, Adelaide, South Australia.

Department of Environment and Natural Resources 1995. *Troubridge Island Conservation Park Management Plan.* Government Printer, Adelaide, South Australia.

Department of Environment and Planning 1989. *Assessment Report for the proposal 'Old Part Victor', Granite Island.* Major Projects and Assessments Branch, Adelaide, South Australia.

Discovery of Port Lincoln District 1920. In: Flinders Centenary, *Proceedings of the Royal Geographical Society of Australia, South Australian Branch* 5, 45–54.

Encounter Bay: the meeting of Flinders and Baudin commemorated at the Bluff 1920. In: Flinders Centenary, *Proceedings of the Royal Geographical Society of Australia. South Australian Branch* 5, 58–68.

Hydrographic Department, British Admiralty 1918. *Australia Pilot: South Coast of Australia.* Taylor, Garnett, Evans and Co, London.

National Parks and Wildlife Service of South Australia 1977. *Management Plan: Seal Bay and Cape Gantheaume Conservation Parks, Kangaroo Island.* Government Printer, Adelaide.

National Parks and Wildlife Service of South Australia 1983. *Draft Management Plan: Island Conservation Parks of Backstairs Passage and Encounter Bay, The Pages, West Island, Seal Island and Pullen Island.* Government Printer, Adelaide.

National Parks and Wildlife Service of South Australia 1990. *Draft Management Plan: Sir Joseph Banks Group Conservation Group, Spencer Gulf.* Government Printer, Adelaide, South Australia.

New bird-protection reserve 1910. *Transactions of the Royal Society of South Australia* 34, 277.

South Australian Department of Lands 1974. *List of Islands of South Australia: Location, Ownership, Description.* Adelaide, SA.

South Australian Parliamentary Papers 1865–1866. *Valuation of Pastoral Runs.* **30A.**

ABBOTT, I. (1980) The floras of 37 South Western Australian Islands, *Western Australian Herbarium Research Notes* 3, 19–36.

AITKEN, P.F. (1968) A report on the numerical status of *Wallabia flindersi* (Wood Jones) with recommendations for the conservation of this species and some additional notes on the fauna and flora of Flinders Island. Unpublished report *South Australian Field Naturalists' Society.*

ANDERSON, B.H. (1938) The Sir Joseph Banks Islands: reports of the Expedition of the McCoy Society for field investigation and Research, Part I: 7, Decapoda. *Proceedings of the Royal Society of Victoria* 50, 348–352.

ANGAS, G.F. (1847) *Savage Scenes of Life in Australia and New Zealand* 2 vols, Long; Smith, Elder and Co.

ANGROVE, R. (1982) Notes on a nesting colony of the Black-faced Shag *South Australian Ornithologist* **29**, 16.

ASHBY, E. (1929) Bird notes (Cape Barren Goose on Wardang Is). *SA Orn.* **10** (7), 238.

ASLIN, H.J. (1972) Nest-building by *Leporillus conditor* in captivity. *South Australian Naturalist* 47 (2), 43–46.

ASLIN, H.J. (1985) ed. *A List of Vertebrates of South Australia,* Biological Survey Coordinating Committee, Department of Environment and Planning, South Australia.

BAILLIE, P.J. (1974) *Smoke Rings Port Lincoln.* Port Lincoln Times, Port Lincoln.

BAILLIE, P. (1978) *Port Lincoln and district: A Pictorial History.* Lynton, Blackwood, S.A.

BAILLIE, P. and HALDENE, R. (1972) *Port Lincoln Sketchbook.* Rigby, Adelaide.

BARNETT, B., and SCHWANER, T.D. (1985) Growth rates of captive-born tiger snakes, *Notechis ater serventyi* from Chappell Island: implications for field and laboratory studies. *Trans. Roy. Soc. SA* **109**, 31–36.

BATES, R.J. (1981) Ixodia. *Journal of the Society for Growing Australian Plants, South Australia* 8 (12), 276–281.

BELPERIO, A.P. (1979) Negative evidence for a mid-Holocene high sea level along the coastal plain of the Great Barrier Reef Province. *Marine Geology* **31** 1–M9.

BELPERIO, A.P., HAILS, J.R., and V.A. GOSTIN (1983) A review of Holocene sea levels in South Australia. In: D. Hopley, ed. *Australian Sea Levels in The Last 15000 Years: A Review.* Department of Geography, James Cook University of North Queensland Monograph Series Occasional Paper **3**, 37–47.

BELPERIO, A.P., HAILS, J.R., GOSTIN. V.A. and H.A. POLACH (1984) The stratigraphy of coastal carbonate banks and Holocene sea levels of Northern Spencer Gulf, South Australia. In: J.R. Hails and V.A. Gostin, eds. The Spencer Gulf Region. *Mar. Geol.* **61**, 297–313.

BENSON, W.N. (1911) Note descriptive of a stereogram of the Mount Lofty Ranges, South Australia. *Trans. Roy. Soc. SA* **35**, 110.

BEST, L. (1986) Management and research of marine mammals in South Australia. In: P.D. Shaughnessy, ed. Report of CSIRO Marine Mammal workshop, March 1986. *CSIRO Division of Wildlife and Rangelands Research Technical Memorandum* **26**, 20–21

BERMINGHAM, K. (1972) *The Third Eleven: Tales of Robe and Millicent.* South Eastern Times, SA.

BLACKBURN, M. (1938) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research Part I: 3. Hydrozoa. *Proc. Roy. Soc. Vic.* **50**, 312–328.

BLAKERS, M., DAVIES, S.J.J.F. and P.N. REILLY (1984) *Atlas of Australian Birds.* Melbourne University Press.

BLISSETT, A.H. and WARNE, K.R. (1964) Molybdenum and tungsten in the south eastern portion of Spilsby Island (Sir Joseph Banks Group). *Mining Review,* **121**, 70–77.

BLISSETT, A.H. and WARNE, K.R. (1965) Reconnaissance for scheelite deposits in the Sir Joseph Banks Group of islands. *Min. Rev.*, **122**, 84–98.

BLOOM, A.L. (1971) Glacial-eustatic and osistatic controls of sea level since the last glaciation. In: K.K. Turekian, ed. *The Late Cenozoic Glacial Age.* Yale University Press, New Haven.

BOEHM, E.F. (1942) Crows in South Australia. *SA. Orn.* **16** (1), 10–11.

BONEY, Y. (1978) *The Geology of Wardang Island, Yorke Peninsula, South Australia.* BSc (Hons) thesis in Geology, University of Adelaide.

BONNIN, M. (1968) The Baudin Rocks: a further report. *SA Orn.* **25** (2), 49–50.

BONNIN, M. (1969) Breeding of the Bridled Tern in South Australia. *Emu* **69** (4), 243.

BONNIN, J.M. and ANGOVE, R.C. (1980) Wedge Island. *SA Orn.* **28** (4), 104–106.

BONNEY, N.B. (1974) Caring for those rarer plants. *SGAP Journal SA* **6** (6), 128–129.

BORROW, K.I. (1947) *Whaling at Encounter Bay.* Adelaide Pioneers' Association of SA, Adelaide.

BOOTHBY, P.G. (1983) *A Mineralogical and Geochemical Investigation of the Insular Phosphate Deposits from the Sir Joseph Banks Group of Islands and Bickers Island in Spencer's Gulf, South Australia.* Unpublished Honours thesis, Flinders University of South Australia, Adelaide.

BRASSE, L. (1982) Troubridge Island: the built environment *South Australian Parks and Conservation* **5** (1), 1–4.

BRASSE, L. (1983) *SA Heritage Register Nomination Reports: Troubridge Island.* Unpublished report, Heritage Unit, Department of Environment and Planning.

BREWIS, C.R.W. (1912) *Preliminary Report on the Lighting of the North Coast of Australia: Recommendations as to Existing Lights and Additional Lights; and Remarks on Lighthouse Service and Coastal Requirements, Northern Territory (Cape Wessel to Cape Fourcroy).* Department of Trade and Customs, Government Printer, Melbourne.

BRISCOE, D.A., CALABY, J.H., CLOSE, R.L., MAYNES, G.M., MURTAGH, C.E. and G.B. SHARMAN (1982) Isolation, introgression and genetic variation in rock-wallabies. In: *Species at risk: Research in Australia.* Ed. R.H. Groves and W.D.L. Ride, Australian Academy of Science, Canberra.

BROOKS, C.C. (1967) *Final Technical Report, SML 146, Spilsby Island.* Unpublished report for Kennecott Explorations (Aust) Pty Ltd.

BROWN, J. and NEVE, M., eds. (1984)*Voyage of The Beagle.: Charles Darwin's Journal of Researches.* Penguin, London.

BROWNE, W.R. (1920) The igneous rocks of Encounter Bay, South Australia. *Trans. Roy. Soc. SA* 44,4–5.

BURN, R. (1973) Pearson Island expedition, 1969. 10: Opisthobranchs. *Trans. Roy. Soc. SA* 97 (3), 201–205.

BUTLER, A.J., DEPERS, A.M., McKILLOP, S.C and D.P. THOMAS (1977) A survey of mangrove forests in South Australia. *SA Nat.* **51** (3), 34–49.

BUTLER, A.J. (1982) What barnacles, sea squirts and sponges tell us about parks: studies of marine communities near Troubridge Island. *SA Parks and Cons.* **5** (1), 6–9.

CALLISTER, D. (1991) Exploitation of the Short-tailed Shearwater in Tasmania. *Traffic Bulletin* **12**, 5–11.

CHAPPELL, J. (1974) Late Quaternary glacio- and hydro-isostasy on a layered earth. *Quaternary Research.* **4**, 429–440.

CHAPPELL, J. (1976) Aspects of late Quaternary paleogeography of the Australian east. In: R.L. Kirk and A.G. Thorne, eds. *The Origin of the Australians,* 11–22. Australian Institute of Aboriginal Studies, Canberra.

CHAPPELL, J. and THOM, B.G. (1977) Sea levels and coasts. In: J. Allen, J. Golson and R. Jones, eds. *Sunda and Sahul: Prehistoric Studies in South-east Asia, Melanesia and Australia,* 275–291. Academic Press, London.

CHILTON, C. (1922) The flora and fauna of Nuyts Archipelago and the Investigator Group 1: Amphipoda and Isopoda. *Trans. Royal Soc. SA* **46**, 34–38.

CHRISTENSEN, P.E.S. (1980) The biology of *Bettongia penicillata* Gray 1837 and *Macropus eugenii* Desmarest 1817 in relation to fire. *Bulletin, Forestry Department of Western Australia* **91**.

CLARK, J. (1938) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research I: Formicidae *Proc. Roy. Soc. Vic.* **50**. 356–382.

CLELAND, J.B. (1923) The flora and fauna of Nuyts Archipelago and the Investigator Group 9: Birds of the Pearson islands. *Trans. Royal Soc. SA* **47**, 119–126.

CLELAND, J.B. (1923) The flora and fauna of Nuyts Archipelago and the Investigator Group 14: Basidiomycetous fungi of Pearson Islands, Great Australian Bight. *Trans. Roy. Soc. SA* **47**, 365–366.

CLELAND, J.B. (1924) Birds of the Encounter Bay district. *SA Ornithologist.* 7 (6), 172–184.

CLELAND, J.B. (1949) Fauna and flora of the Greenly Islands 2: flora. *Records of the South Australian Museum* **9** (2), 349–351.

CLELAND, J.B. (1968) *Galenia secunda* and *Atriplex hastata. SA. Nat.* **43** (1), 28.

CLOSE, D. (1982) The birds of Troubridge Shoal. *SA Parks and Cons.* **5** (1), 4–5.

COCKBURN, R. (1925–1927) Pastoral pioneers of South Australia Vol. 2. Publishers Ltd, Adelaide.

COCKBURN, R. (1877–1932) *What's in a Name? Nomenclature of South Australia: authoritative derivations of some 4000 historically significant place names.* Ferguson Publications, Adelaide 1984.

CONDON, H.T. (1938) The birds of Reevesby Island, Sir Joseph Banks Group, SA. *SA Orn.* **14** (7), 187–192.

CONDON, H.T. (1951) Notes on the birds of South Australia: occurrence, distribution and taxonomy. *SA Orn.* **20** (3–6), 27.

COOPER, J.A., FANNING, D.M., FLOOK, M.M., and R.L. OLIVER (1976) Archaean and Proterozoic metamorphic rocks of Southern Eyre Peninsula, South Australia, *Journal of the Geological Society of Australia* **23**, 287–292.

COOK, P.J., COLWELL, J.B., FIRMAN, J.R., LINDSAY, J.M., SCHWEVEL, D.A. and C.C. von der BORCH (1977) The late Cainozoic sequence of Southeast South Australia and Pleistocene sea-level changes. *BMR Journal of Australian Geology and Geophysics* **2**, 81–88.

COPLEY, P. B. (1988) *The Stick-nest Rats of Australia: final report to World Wildlife Fund (Australia),* Government Printer, Adelaide.

COPLEY, P. B.(in press) *The Status of Seabirds in South Australia: A Review.* Australian Nature Conservation Agency, Canberra.

CORNELL, C., trans. (1974) *The Journal of Nicolas Baudin.* Adelaide Libraries Board, Adelaide.

COTTON, B.C. (1938) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research, Part 1. 5: Mollusca 1: The Spermatophore of *Rossia australis* Berry. *Proc. Roy. Soc. Vic.* **50**, 338–343.

COTTON, B.C. (1939) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research Part 2. 4: Mollusca 2: General. *Proc. Roy. Soc. Vic.* **51**, 159–178.

COTTON, B.C. (1960) Rare shells recently dredged off St Francis Island, South Australia. *SA Nat.* **34**(3), 47.

COX, J.B. (1978) Short-tailed Shearwater colonies of the southeast. *SA Orn.* **28** (1), 16–17.

COX, J.B. and MAY, I.A. (1977) Further records of white-fronted terns. *SA Orn.* **27** (6), 224–225.

CRAWLEY, M.C. and WILSON, G.J. (1976) The natural history and behaviour of the New Zealand fur seal (*Arctocephalus forsteri*). *Tuatara* **22**, 1–29.

CSORDAS, S.E. (1963) The history of fur seals on Macquarie Island. *Vic. Nat.* **80**, 255–258.

CUMPSTON, J.S. (1974) *Kangaroo Island 1800–1836.* Roebuck Society Publications, Canberra.

DAILY, B., FIRMAN, J.B., FORBES, B.G. and J.M. LINSAY (1976) Geology. In: C.R. Twidale, M.J. Tyler and B.P. Webb, eds. *Natural History of the Adelaide Region.* Royal Society of South Australia, Adelaide.

DARWIN, C.R. (1839) *Journal of Researches into the Geology and Natural History of the Various Countries visited by HMS* Beagle. Henry Colburn, London.

DELROY, L. (1974) Birds of the Investigator Group, with special reference to Flinders Island. *SA Orn.* **26** (7), 167.

DELROY, L. (1974) Flinders Island wallaby. *SA Nat.* **49** (1), 15.

DELROY, L.B., EARL, I., RADBONE, I., ROBINSON, A.C. and M. HEWETT (1986) The breeding and re-establishment of the Brush-tailed Bettong, *Bettongia penicillata* in South Australia. *Australian Wildlife Research* **13**, 387–396.

DELROY, L.B., ROBINSON, A.C. and M.H. WATERMAN (1989) Monitoring of Cape Barren Goose population in South Australia II: The 1987 breeding season and further banding recoveries. *SA Orn* **30**, 184–189.

DEWHURST, I.E. (1939) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research, Part 2. 1: Geology. *Proc. Roy. Soc. Vic.* **51**, 143–148.

DIXON, S. (1920) *The Full Story of Flinders Chase, Kangaroo Island.* Field Naturalists' Society of South Australia (reprint), Adelaide.

ECKERT, J. (1970) Birds of the Investigator Group (with special reference to Flinders Island). *SA Orn.* **25** (7), 201–205.

ECKERT, J. (1971) Birds of the Franklin Islands and Eyre Island, South Australia. *Emu* **71**, 61–64.

EDWARDS, R. (1972) *The Kaurna People of the Adelaide Plains.* South Australian Museum, Adelaide.

EDWARDS, H. (1978) *Australian and New Zealand Shipwrecks and Sea Tragedies.* Hutchinson, Sydney.

ELLIS, R. (1958) Birds seen on a trip to Troubridge Island, South Australia. *SA Orn.* **22** (5/6), 68.

EYRE, E.J. (1845) *Journals of Expeditions of Discovery into Central Australia and Overland from Adelaide to King George's Sound in the year 1840–1.* 2 vols. T.W. Boone, London.

EVANS, J.B. (1967) *An Economic Assessment of Molybdenite and Scheelite Mineralization, Spilsby Island, South Australia.* Unpublished report for Kennecott Explorations (Aust) Ltd.

FATCHEN, T.J. (1982) Vegetation distribution and change of offshore islands of the Investigator Group and Whidbey Isles, Great Australian Bight. *Trans. Roy. Soc. SA* **106**, 39–60.

FAWCETT, S.G.M. and WACE C.E. (1938) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research Part 1. 2: List of Vascular Plants. *Proc. Roy. Soc. Vic.* **50**, 306–311.

FENNER, C. (1926) The first discoverers of South Australia: the tercentenary of Nuyts. *Proceedings, Royal Geographical Society of Australia, South Australia Branch* **27**, 23–28.

FENNER, C. (1931) *South Australia: A Geographical Study.* Whitcombe and Tombs, Melbourne.

FINLAYSON, H.H. (1948) Notes on some birds seen on Flinders and other islands off the Eyre Peninsula coasts, February-March, 1937. *SA Orn.* **14** (6), 141–146.

FINLAYSON, H.H (1946) Notes on a few birds seen on Eyre Peninsula and its islands. *SA Orn.* **18** (3), 22–23.

FINLAYSON, H.H. (1948a) Greenly Island, South Australia. *SA Orn.* **18** (8), 72–73.

FINLAYSON, H.H. (1948b) Greenly Island, South Australia. *Walkabout* **14**, 35–38.

FINLAYSON, H.H. (1951) Further notes of some birds seen upon islands off the Eyre peninsula coasts. South Australia, with remarks on the soil erosion of North Gambier Island. *SA Orn.* **20** (1), 3–5.

FINNIS, H.J. (undated) *Early Settlers on the Islands in Bass Strait,* Pioneers Association of Victoria SAA 1384/50.

FLINDERS, M. (1814) *A voyage to Terra Australis.* Long, Nicol, London.

FRANCIS, L.S. and F.M. (1951) The Little Penguin on Granite Island. *S.A Orn.* **20** (2), 21.

GALES, N.J., SHAUGHNESSY, P.D. and T.D. DENNIS (1994) Distribution, abundance and breeding cycle of the Australian Sea-lion *Neophoca cinerea* (Mammalia: Pinnipedia) *Journal of Zoology, London* **234**, 353–370.

GIBSON, E.S.H. (1946) Singing sand. *Trans. Roy. Soc. SA* **70** (1), 35–44.

GILL, C.L. (1980) Observations on the Eastern Reef Egret in the Eyre Peninsula region. *SA Orn.* **28** (4), 107.

GILL, T. (1902) A brief account of explorations of the South Coast of Western Australia and South Australia prior to 1801. *Proc. Royal Geog. Soc. Aust. SA Branch Branch* **5**, 113–115.

GILL, T. (1908) A cruise in the SS *Governor Musgrave* (with notes on the physical geography and early history of Kangaroo Island, and some of the islands in Spencer's Gulf: also reports on the ornithology, botany, geology, and on the aborigines of the localities visited). *Proc. Royal Geog. Soc. Aust. SA Branch* **10**, 90–219.

GLAUERT, L. (1925) The flora and fauna of Nuyts Archipelago and the Investigator Group 17: Scorpions, with descriptions of some species from other localities in South Australia. *Trans. Roy. Soc. SA* **49**, 85–87.

GOYDER, G.W. (1864–65) Detailed description and valuation of pastoral runs. SAA 1439/M.

GUEST, J.S. and ROBERTSON, D.B. (1939) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research Part 2. 5: Pisces. *Proc. Roy. Soc. Vic.* **51**, 179–186.

GULLAN, P.K. (1978) Vegetation of the Royal Botanic Gardens Annexe at Cranbourne, Victoria. *Proc. Roy. Soc. Vic.* **90**, 225–240.

HALE, H.M. (1924) The flora and fauna of Nuyts Archipelago and the Investigator Group 16: Crustacea. *Trans. Roy. Soc. SA* **48**, 67–73.

HAILS, J.R., BELPERIN. A.P. and V.A. GOSTIN (1983) Holocene sea levels of Upper Spencer Gulf, South Australia. In: D. Hopley, ed. Australian Sea Levels in the Last 15000 years: A Review. Dep. Geog. James Cook Univ. Nth. Qld, *Monogr. Ser. Occas. Pap.* 3, 48–53.

HALLS, C. (1971) The voyage of the *Gulden Zeepaard. Proc. Royal Geog. Soc. Aust. SA Branch.* **72**, 19–35.

HAMBRIDGE, C.M. (1946) The nomenclature of the coastline of the South East portion of South Australia. *Proc. Royal Geog. Soc. Aust. SA Branch* **47**, 39.

HARRISON, R.J. (1969) *The Biology of Marine Mammals.* Academic Press, London.

HAYMAN, R.J. and HENTY E.E. (1939) The Sir Joseph Banks Islands: reports of the Expedition of the McCoy Society for Field Investigation and Research. Part 2. 2: Survey of the Vegetation Community on Reevesby Island. *Proc. Roy. Soc. Vic.* **51**, 149–156.

HEINRICH, R. (1976).*Wide Sails and Wheat Stacks, Port Victoria.* Centenary Committee.

HILL, G.F. (1938) The Sir Joseph Banks Islands. Reports of the Expedition of the McCoy Society for Field Investigations and Research. Part 1 9: Isoptera. *Proc. Roy. Soc. Vic.* **50**, 353–355.

HILL, D.L. and HILL, S.J. (1975) *Notes on the Narangga Tribe of Yorke Peninsula.* Lutheran Publishing House, Adelaide.

HODGE, C.R. (1931) Encounter Bay. *Proc. Royal Geog. Soc. Aust. SA Branch* **32**, 113–123.

HODGE, C.R. (1932) *Encounter Bay, the Miniature Naples of Australia.* Self-published, Adelaide.

HORNER, F. (1987) *The French Reconnaissance: Baudin in Australia 1801–1803.* Melbourne University Press, Melbourne.

HORNSBY, P.E. (1978) Notes on the birds of Pearson Island. *SA Orn.* **27** (8), 280–284.

HOWCHIN, W. (1909) Geological observations on some of the localities visited by the *Governor Musgrave* Party in January 1907. *Proc. Royal Geog. Soc. Aust. SA Branch* **10**, 204–219.

HOWCHIN, W. (1910) The glacial (Permo-carboniferous) moraines of Rosetta Head and King's Point, South Australia. *Trans. Royal Soc. SA* **34**, 7.

HUDSON, P., MIRTSCHIN, P. and C. GARRETT (1981) Notes on Flinders Island (SA): its reptiles and birds. *SA Nat.* **56** (2), 21–31.

HUTCHINS, B.R. and PARKER, S.A. (1976) First record of the Erect-crested Penguin *Eudyptes sclateri* from South Australia. *SA Orn.* **27** (4), 146–147.

INNS, R.W., AITKEN, P.F. and J.K. LING (1979) Mammals. In: *Natural History of Kangaroo Island.* Royal Society of South Australia, 91–102.

JACK, R.L. (1919) The phosphate deposits of South Australia. *Bulletin, Geological Survey of South Australia* 7.

JENKIN, C.R. and WATERMAN, M. (1963) An expedition to Eyre Peninsula and offshore islands. *SA Orn.* **24** (1), 45–48.

JESSOP, J.P., ed. (1989) A list of the vascular plants of South Australia (Edition III) *Journal of the Adelaide Botanic Gardens* **12**, 1–163.

JOHNS, R.K. (1968) Guano deposits, southern Eyre Peninsula *Min. Rev. Adelaide.* **125**, 144–155.

JOHNS, R.K. (1970) Spilsby Island molybdenite-scheelite deposit: diamond drilling operations. *Mineral Resources Review* **128**, 11–25. SA Dept. Mines, Adelaide.

JOHNSTON, G.R. and ELLINS, P. (1979).Reptiles of the Sir Joseph Banks Islands, South Australia. *Herpetofauna* **10** (2), 9–12.

JORDON, D. (1995) Red-tailed Tropicbirds and other birds of South Neptune Islands. *SA Orn.* **32**, 41.

JOSEPH, L. and REID, J. (1977) Birds of the Goose Island Group: some further remarks. *SA Orn.* **27** (6), 225.

KERSHAW, R.C. (1975) A note on *Discocharopa insularis* Cotton (Mollusca: Pulmonata). *SA Nat.* **49** (4), 65–66.

KERSHAW, R.C. (1976) A commentary on *Insullaoma* Iredale (Gastropoda: Pulmonata: Punctidae). *SA Nat.* **50** (3), 51–53.

KING, J.E. (1964) *Seals of the World* British Museum (Natural History), London.

KING, J.E. (1969) The identity of the fur seals of Australia. *Australian Journal of Zoology* **17**, 841–853.

KINSMAN, J.E. (1973) *Photo-Geological Interpretation of the Islands of the Western Continental Shelf, South Australia.* Dept. Mines and Energy, Adelaide.

KIRKPATRICK, J.B., MASSEY, J.S. and R.E. PARSONS (1974) Natural History of Curtis Island 2: Soils and vegetation, with notes on Rodondo Island. *Proceedings of the Royal Society of Tasmania* **107**, 131–144.

KLEEMAN, A.W. (1937) The nature and origin of the so-called diorite inclusions in the granite of Granite Island. *Trans. Roy. Soc. SA* **61**, 207–220.

KLOOT, P.M. (1983a) Early records of alien plants naturalised in South Australia. *J. Adelaide Bot. Gard.* **6**, 93–131.

KLOOT, P.M. (1983b) The role of common iceplant (*Mesembryanthemum crystallinum*) in the deterioration of medic pastures. *Australian Journal of Ecology* **8**, 301–306.

KOME SAROFF, M.B. (1976) The Commonwealth Lighthouse Service, its formation and early development. *Victorian Historical Journal*, 75–104.

KOSTOGLOU, P. and MCCARTHY, U. (1991) Whaling and Sealing Sites in South Australia. *Australian Institute for Maritime Archaeology* **6**, 1–77.

KRAEHENBUEHL, D.M. (1968) Notes on the natural history of the Coobowie-Edithburgh district, Yorke Peninsula, South Australia. *SA Nat.* **42** (4), 87–90.

LAMPERT, R. (1981) The Great Kartan Mystery. *Terra Australis* **5**, Department of Prehistory, Research School of Pacific Studies, Australian National University, Canberra.

LARRETT, M.J.W., and SPENCER, W.G. (1971) Contributions to Australian Mineralogy 3: Pseudorutile from South Neptune Island, South Australia. *Amdel Bulletin.* **12**, 74–80.

LAUT, P., HEYLIGERS, P.C., KERG, G., LOTTLER, E., MARGULES, L., SCOTT, R.M. and M.E. SULLIVAN (1977). *Environments of South Australia.* CSIRO Division of Land Use Research, Canberra.

LEA, A.M. (1922). The flora and fauna of Nuyts Archipelago and the Investigator Group 4: Coleoptera. *Trans. Roy. Soc. SA* **46**, 295–303.

LEA, A.M. (1923). The flora and fauna of Nuyts Archipelago and the Investigator Group 11: *Coleoptera* of Pearson Island. *Trans. Roy. Soc. SA* **47**, 355–360.

LEA, A.M. (1923). The flora and fauna of Nuyts Archipelago and the Investigator Group 12: stomach contents of Pearson Island birds. *Trans. Roy. Soc. SA* **47**, 361.

LEA, A.M. (1972). The flora and fauna of Nuyts Archipelago and the Investigator Group 4: Coleoptera. *Trans. Roy. Soc. SA* **46**, 295–303.

LEES, Capt. F.R. (1916). Report on the Western Coast of South Australia. *Proc. Royal Geog. Soc. Aust. SA Branch* **17**, 134–136.

LEWIS, J. (1918). President's annual address, October 31 1918. *Proc. Royal Geog. Soc. Aust. SA Branch* **19**, 1–95.

LEWIS, J. (1919). The South Australian Coastline (including details of Flinders Journal) *Proc. Royal Geog. Soc. Aust. SA Branch* **20**, 5–52.

LINDSAY, H.A. (1949). Greenly Islands. *Proc. Royal Geog. Soc. Aust. SA Branch* **50**, 33–41.

LINDSAY, H.A. (1950). Report on liberation of lowan (mallee-fowl) on Thistle Island. *SA Nat.* **25** (2–4), 28.

LING, J.K., and WALKER, G.E. (1976). Seal Studies in South Australia: progress Report for 1975, *SA Nat.* **50**, 59–68, 72.

LING, J.K., and WALKER, G.E. (1977). Seal Studies in South Australia: progress Report January 1976–March 1977. *SA Nat.* **52**, 18–27, 30.

LING, J.K. and WALKER, G.E. (1978) An 18-month breeding cycle in the Australian sea lion. *Search* **9**, 464–465.

LING, J.K. and WALKER, G.E. (1979) Seal Studies in South Australia: progress report April 1977-July 1979. *SA Nat.* **54**, 68–78.

LONEY, J.K. (1975)*Wrecks on the South Coast of South Australia.* Self-published, Apollo Bay.

LONEY, J.K. (1981) *An Atlas of Australian shipwrecks.* Self-published, Adelaide.

LONEY, J. and STON, P. (1980).*Australia's Island Shipwrecks.* Neptune Press, Belmont, Victoria.

LORDS COMMISSIONERS OF THE ADMIRALTY. (1918) *Australia Pilot 1: South Coast of Australia from Cape Leeuwin to Cape Northumberland.* Taylor, Garaet, Evans and Co. Ltd., London.

LOTHIAN, T.N. (1958) Scale and rust specimens from Wright Island, Encounter Bay. *SA Nat.* **33** (2), 22.

LOTHIAN, T.N. (1959) New records of naturalised plants, together with lists of plants from Wright Island, Encounter Bay, *SA Nat.* **33** (3), 39–42.

LOTHIAN, T.N. (1960) Plants from Wright Island and Encounter Bay 2: original vegetation. *SA Nat.* **34** (4), 53–55.

LOTHIAN, T.N. (1961) Additional notes on plants on the islands in Encounter Bay. *SA Nat.* **35** (4), 59–60.

LUDBROOK, N.H. (1963) Correlation of the Tertiary rocks of South Australia. *Trans. R. Soc. SA*, **87**, 5–15.

LUDBROOK, N.H. (1980) *A guide to the geology and mineral resources of South Australia.* Dept. Mines and Energy, Adelaide.

MACATHUR, R.H. and WILSON, E.O. (1967) *Theory of Island Biogeography.* Princeton University Press, Princeton USA.

MCEACHERN, J. and TOWLE, E.L. (1979) Ecological guidelines for island development. *IUCN Publications New Series 30.*

McGILP, J.N. (1947) The Southern Stone-curlew (*Burhinus magnirostris*). *SA Orn.* **18** (5), 44–46.

McLAREN, V. (1977) *The Cape Jaffa Lighthouse Story, Kingston.* National Trust of South Australia, Kingston.

McLEOD, J. and CARMICHAEL, E. (1972) *Yorke Peninsula Sketchbook.* Rigby, Adelaide.

McNEIL, R.D. (1966a) Progress report: 1 August 1965–1 February 1966, Sir Joseph Banks Special Mining Least 85. Unpublished report for Kennecott Explorations (Aust) Ltd.

McNEIL, R.D. (1966b) Technical report: 1 February 1966–1 August 1966, Sir Joseph Banks Special Mining Lease 85. Unpublished report for Kennecott Explorations (Aust) Ltd.

MAGUIRE, A. (1920) An account of a trip to St. Francis Island in 1909. *Proc. Royal Geog. Soc. Aust. SA Branch.* **21**, 70–72.

MAHONEY, D.J. (1938) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research Part 1. 1: General Introduction. *Proc. Roy. Soc. Vic.* **50**, 303–305.

MAIDEN, J.H. (1907) Australian pioneers following Flinders and Brown. *Proc. Royal Geog. Soc. Aust. SA Branch* 9, 31–34.

MAIDEN, J.H. (1908) A contribution to the botany of South Australia. *Trans. Roy. Soc. SA* 32, 265–269.

MAJOR, R.B. (1973) *Preliminary Report: Geology of Islands of the Western Continental Shelf of South Australia.* Dept. Mines and Energy, Adelaide.

MANNING, G.H. (1986) *The Romance of Place Names of South Australia.* Gillingham Printers, Adelaide.

MANNING, G.H. (1990) *Manning's Place Names of South Australia.* G.H. Manning, Adelaide.

MARDEN, J.H. (1907) Australian pioneers following Flinders and Brown. *Proc. Royal Geog. Soc. Aust. SA Branch* 9, 31–34.

MARLOW, B.J. (1968) The sea-lions of Dangerous Reef. *Australian Natural History* 16, 39–44.

MARLOW, B.J. (1972) Pup abduction in the Australian sea-lion *Neophoca cinerea. Mammalia* 36, 161–165.

MARLOW, B.J. (1975) The comparative behaviour of the Australasian sea-lions *Neophoca cinerea* and *Phocarctos hookeri* (Pinnipedia: Otariidae). *Mammalia* 39, 159–230.

MARLOW, B.J., and KING, J.E. (1974) Sea-lions and fur seals of Australia and New Zealand: the growth of knowledge. *Australian Mammalogist* 1, 117–135.

MAWSON, S. (1907) Geological features of part of Eyre Peninsula. *Trans. Royal Soc. SA* 31, 71–76.

MAWSON, P.M. (1971) Pearson Island expedition, 1969. 8: Helminths. *Trans. Roy. Soc. SA* 95(3), 169–183.

MAWSON, D. and SPRIGG, R.C., (1950) Subdivision of the Adelaide System. *Australian Journal of Science* 13, 69–72.

MAY, I. (1978) Little Penguin breeding on South Australian mainland, *SA Orn.* 27, 286.

MELLOR, J.W. (1907-1908) Ornithological notes on an expedition to Kangaroo Island and Spencers Gulf. *Proc. Roy. Soc. SA* 10, 185–199.

MILLER, P.G. (1972) Spilsby Island molybdenite-scheelite deposits. *Min. Res. Review.* 132, 81–88.

MILNES, A.R. (1967) Spilsby Island reconnaissance report to KEA on the rock types on Spilsby Island and possible correlations: appendix to Brooks (1967) (unpublished).

MILNES, A.R., COMPSTON, W., and B. DAILY (1977) Pre- to syn-tectonic emplacement of Early Palaeozoic granites in Southeastern South Australia. *J. geol. Soc. Aust.* 24, 87–106.

MIRTSCHIN, P.J. (1981) Black tiger snakes from the Sir Joseph Banks Islands. *SA Nat.* 55(4), 58–61.

MIRTSCHIN, P.J. (1982) The Gould's goanna, an Australian native, alien to Reevesby Island. *SA Nat.* 57(1), 18–19.

MIRTSCHIN, P. and DAVIS, R. (1982) *Dangerous Snakes of Australia: an Illustrated Guide to Australia's Most Venomous snakes.* Rigby, Adelaide.

MITCHELL, F.J. and BEHRNDT, A.C. (1949) Fauna and flora of the Greenly Islands, I: Introductory narrative and vertebrate fauna. *Rec. SA Mus.* 9 (2), 167–179.

MORGAN, A.M. (1916) An ornithological trip in St Vincent and Spencer Gulfs. *SA Orn.* 2 (6), 141–151.

MORGAN, A.M. (1916) Further observation on the cormorants and bird temperatures. *SA Orn.* 2 (7), 178–183.

MORGAN, A.M. (1922) Order *Passeriformes,* family *Sylividae,* genus *Megalurus. Megalurus gramineus*: the Little grassbird. *SA Orn.* 6 (8), 170–171.

MORGAN, A.M. (1923) Notes on a peculiar petrel skin. *SA Orn.* 7 (3), 78–79.

MORGAN, A.M. (1923) Some notes on *Puffinus tenuirostris. SA Orn.* 7 (2) 80–81.

MORGAN, F.G. (1935) The venom of *Notechis scutatus* variety *niger* (Reevesby Island). *Proc. Roy. Soc. Vic.* 50 (2), 303–413.

MORGAN, F.G. (1938) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research Part 1. 12: Reptilia, Part 2: The venom of *Notechis scutatus* variety niger (Reevesby Island) *Proc. Roy Soc. Vic.* 50, 394–398.

MOSSEL, R. (1972) *Where No Road Goes.* Enterprise Publications, Goodwood.

MUIR, R. and BRANSON, V.M. (1974) *Victor Harbor and District Sketchbook.* Rigby, Adelaide.

NEWLAND, S. (1921) Whaling at Encounter Bay and Report on Whaling in South Australia (parts of the President's Annual Address). *Proc. Royal Geog. Soc. Aust. SA Branch* 22, 15–40.

NISHIWAKI, M. (1972) General Biology. In: *Mammals of the Sea: Biology and Medicine.* ed. S.H. Ridgway. Thomas, Springfield, Massachusetts.

NIXON, L.G.B. (1964a) *Geological reconnaissance of the Sir Joseph Banks Group of Islands.* Adelaide, SA Dept. Mines (unpublished report).

NIXON, L.G.B. (1964b) The Sir Joseph Banks Islands: Spencer Gulf. Geological reconnaissance. *Min. Rev. Adelaide* 121, 60–69.

OSBORN, T.G.B. (1922) Flora and fauna of Nuyts Archipelago. 3: a sketch of the ecology of Franklin Islands *Trans. Roy. Soc. SA* 46, 194–206.

OSBORN, T.G.B. (1925) Flora and fauna of Nuyts Archipelago and the Investigator Group 18: notes on the vegetation of Flinders Island. *Trans. Roy. Soc. SA* **49**, 276–289.

OSBORN, T.G.B. and WOOD, J.G. (1923) Flora and fauna of Nuyts Archipelago and the Investigator Group 8: ecology of Pearson Islands. *Trans. Royal Soc. SA* **47**, 97–118.

OTTAWAY, J.R., CARRICK, R. and M.D. MURRAY (1984) Evaluation of leg bands for visual identification of free-living Silver Gulls. *J. Field Ornithol.* **55**, 287–308.

OTTAWAY, J.R., CARRICK, R. and M.D. MURRAY (1988) Reproductive Ecology of Silver Gulls, (*Larus novaehollandiae*) in South Australia. *Aust. Wildl. Ser.* **15**, 541–560.

PARKER, S.A. (1977) The distribution and occurrence in south Australia of owls of the genus *Tyto*. *SA Orn.* **27** (6), 207–215.

PARKER, S.A. and COX, J.B. (1978) Notes on the birds of Pearson, Dorothée and Greenly Islands, South Australia. *Trans. Roy. Soc. SA* **102** (7), 191–202.

PARKER, S.A, ECKERT, H.J., RAGLESS, G.B., COX, J.B. and N.C.H. REID (1979) *An Annotated Checklist of the Birds of South Australia, Part One: Emus to Spoonbills.* South Australian Ornithological Association, Adelaide.

PARKER, F.L. (1934) Flinders' place names in the Annual Address of the President. *Proc. Royal Geog. Soc. Aust. SA Branch* **35**, 27–29.

PARKER, F.L. and SOMMERVILLE, J.D. (1947) Notes on the exploration of Murat Bay. *Proc. Royal Geog. Soc. Aust. SA Branch* **48**, 42–48.

PARSONS, R. (1976) *Yorke Peninsula Shipping.* Self-published, Magill, SA.

PARSONS, R. (1978) *Ketches of South Australia.* Self-published, Magill, SA.

PARSONS, R. (1981) *Shipwrecks in South Australia 1836–1875.* Self-published, Magill, SA.

PARSONS, R. (1981) *Port Lincoln Shipping: Whalers, Disasters and the Sea Link with Adelaide.* Self-published, Adelaide.

PARSONS, R. (1985) *Lighthouses of South Australia.* Self-published, Magill SA.

PATON, D.C. (1973) Birds of the Goose Island group, Spencer Gulf. *SA Orn.* **26**, 77–84.

PATON, J.B. (1971) Pearson Island expedition, 1969, 6: Birds. *Trans. Roy. Soc. SA* **95** (3), 149–153.

PATON, J.B. and PATON, D.C. (1977a) West Island, South Australia (seabird islands No 51). *Corella* **1** (3), 65–67.

PATON, J.B. and PATON, D.C. (1977b) Wright Island, South Australia (seabird islands No 52) *Corella* 1 (3), 68–69.

PATON, J.B. and PATON, D.C. (1977c) Dangerous Reef, South Australia (seabird islands No 53) *Corella* **1** (3), 70–71.

PEARSE, R.J. (1975) Cape Barren Geese in Tasmania: biology and management to 1975. *Technical Report, Wildlife Division, National Parks and Wildlife Service, Tasmania.* 75/1.

PERON, M.F. (1809) *Voyage de Découvertes au Terra Australis.*

PERRYMAN, C.E. (1936) Birds seen at South Neptune Islands. *SA Orn.* 13 (8), 230–232.

PERRYMAN, C.E. (1937) Notes from Althorpe Islands. *SA Orn.* **14** (1), 14–19.

PERRYMAN, C.E. (1937) Notes on a sea-trip from 16th to 22nd December, 1936. *SA Orn.* 14 (2), 48.

PHILLIPS, V. (1977) *Romance of Australian Lighthouses.* Rigby, Adelaide.

PRAITE, R. and TOLLEY, J.C. (1970) *Place Names of South Australia.* Rigby, Adelaide.

PRICE, A. Grenfell (1934) Early South Australian Maps in London. *Proc. Royal Geog. Soc. Aust. SA Branch* 35, 82–92.

PROCTOR, J.B. (1923) Flora and fauna of Nuyts Archipelago and the Investigator Group 5: lizards. *Trans. Roy. Soc. SA* **47**, 79–81.

PUCKRIDGE, D. (1980) *They Came With the Buffalo: a Saga of Port Lincoln.* Pioneer Books, Warradale.

REID, N. and VINCENT, D.J. (1979) *Bird Surveys of South Australian Parks: Results of an Ornithological Survey of South Australia's National, Conservation and Recreation Parks and Game Reserves.* Unpublished Report, South Australian Ornithological Association, Adelaide.

RESCHKE, W. (1983) Strictly for the birds: island heritage. *Sunday Mail*, 27 February 1983, 51.

ROBINS, K. and LAMSHED, M., (1970) *South East Sketchbook*. Rigby, Adelaide.

ROBINSON, A.C. (1970) *Some aspects of the ecology and digestive physiology of the Franklin Island Sticknest Rat* Leporillus jonesi *(Thomas)*. BSc (Hons) thesis: Zoology, University of Adelaide.

ROBINSON, A.C. (1975) The stick-nest rat *Leporillus conditor* on Franklin Island, Nuyts Archipelago, South Australia. *Aust. Mammal.* **1**, 319–327.

ROBINSON, A.C. (1980) Notes on the mammals and reptiles of Pearson, Dorothée and Greenly Islands, South Australia. *Trans. Roy. Soc. SA* **104**, 93–99.

ROBINSON, A.Ç. (1989) Island Management in South Australia. In: A.A. Burbidge, ed. *Australian and New Zealand Islands: Nature Conservation Values and Management*. Department of Conservation and Land Management, Perth.

ROBINSON, A.C. and SMYTH, M.E.B. (1976) The vertebrate fauna of Nuyts Archipelago, South Australia. *Trans. Roy. Soc. SA* **100**, 171–176.

ROBINSON, A.C., HEWITT, M. and R.B. JENKINS, (1981) A new record of the Cape Leeuwin Wattle *Albizia lophantha* (Wild) Benth on Pearson Island, Investigator Group, South Australia. *SA Nat.* **55** (4), 52–55.

ROBINSON, A.C., DELROY, L.B. and R.B. JENKINS, (1982) The Conservation and Management of the Cape Barren Goose *Cereopsis novaehollandiae* Latham in South Australia. *DENR Special Publications* **1**, 1–50.

ROBINSON, A.C. and CANTY, P.D. (1984) Biological surveys of South Australia's offshore islands. In: K. Myers, C.R. Margulis and I. Musto, eds. *Survey Methods for Native Conservation: Proceedings of a Workshop held at Adelaide University, 31 August–2 September 1983.* CSIRO Division of Water and Land Resources, Canberra.

ƆBINSON, A.C. and DELROY, L.B. (1986) Monitoring of Cape Barren Goose populations in South Australia. *SA Orn.* **30**, 45–51.

ROBINSON, A.C. SPIERS, A. and S.A. PARKER (1986) First breeding record of the Fleshy–footed Shearwater in South Australia. *SA Orn.* **30**, 13–14.

ROBINSON, A.C. and DENNIS, T.E. (1988) The status and management of seal populations in South Australia. In: M.L. Augee, ed. *Marine Mammals of Australasia: Field Biology and Captive Management*. Surrey Beatty and Sons, Sydney.

ROBINSON, A.C., de GROOT, R. and T.S. FRASER (1995) Monitoring of Cape Barren Goose populations in South Australia III: the 1990 breeding season and the re-establishment on Reevesby Island. *SA Orn.* 32, 33-38.

ROWAN, I.S. (1969) Second report on induced polarisation survey on Spilsby island. Unpublished report 69/93, SA Dept. Mines, Adelaide.

SARRE, S. (1989) *Conservation genetics of island and mainland populations of the Sleepy Lizard (*Trachydosaurus rugosus *Gray)*. Master of Applied Science thesis, Canberra College of Advanced Education.

SARRE, S., SCHWANER, T.D. and A. GEORGES (1990) Genetic variation among insular populations of the Sleepy Lizard *Trachyologourus rugosus* Gray (Squamata: Scincidae). *Aust. J. Zool.* **38**, 603–616.

SARRE, S. and DEARN, J.M. (1991) Morphological variation and fluctuating asymmetry among insular populations of the Sleepy Lizard *Trachydosaurus rugosus* Gray (Squamata:Scincidae). *Aust. J. Zool.* **39**, 91–104.

SCHMITT, L.H. (1975) Genetic evidence for the existence of two separate populations of *Rattus fuscipes greyii* on Pearson Island, South Australia. *Trans. Roy. Soc. SA* **99** (1), 35–38.

SCHMITT, L.H. (1977a) *A Genetical Study of isolated populations of the Australian Bush Rat* Rattus fuscipes. PhD thesis: Genetics Department, University of Adelaide.

SCHMITT, L.H. (1977b) Mitochondrial isocitrate dehydrogenase variation in the Australian Bush Rat *Rattus fuscipes greyi*. *Animal Blood Groups Biochemistry and Genetics* **8**, 73–78.

SCHMITT, L.H. (1978) Genetic variation in isolated populations of the Australian Bush Rat *Rattus fuscipes*. *Evolution* **32**, 1–14.

SCHWANER, T.D. (1989) Population structure of Black Tiger Snakes *Notechis ater niger* on offshore islands of South Australia. In: G. Grigg, R. Shine and H. Ehmann, eds. *Biology of Australasian Frogs and Reptiles*. Royal Zoological Society of NSW, Sydney, 34–46.

SEED, W.F. (1973) Pearson Island expedition 1969. 11: Crustacea; Isopoda. *Trans. Roy. Soc. SA* **97** (3), 207–212.

SERVENTY, D.L. (1939) Observations on South Australian sea-birds: I. *SA Orn.* **15** (4), 51–54.

SERVENTY, D.L. (1941) Observations on South Australian sea-birds: II. *SA Orn.* **15** (8), 128–130.

SERVENTY, D.L. (1966) Aspects of the population ecology of the Short-tailed Shearwater *Puffinus tenuirostris.* Proceedings of the 54th International Ornithological Congress, Oxford, 165–190.

SERVENTY, D.L. (1974) The biology behind the muttonbird industry. *Proc. Roy. Soc. Tas.* 107, 1–9.

SERVENTY, D.L. and CURRY, P.J. (1984) Observations on colony size breeding success recruitment and inter-colony dispersal in a Tasmanian colony of Short-tailed Shearwaters. *Puffinus tenuirostris,* over a 30 year period. *Emu.* **84**, 71–79.

SEXTON, R. (1986) *The South Australian Coast 1853: Extracts from sailing directions compiled by Captain Thomas Lipson.* Sail Training Association of SA Inc, Adelaide.

SHACKELL, E.M. (1939) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research Part 2. 3: Lichens. *Proc. Roy. Soc. Vic.* **51**, 157–158.

SHAUGHNESSY, P.D. (1970) Serum protein variation in southern fur seals *Arctocephalus* spp. in relation to their taxonomy. *Aust. J. Zool.* **18**, 331–343.

SHAUGHNESSY, P.D. GALES, N.J., DENNIS, T.E. and S.D. GOLDSWORTHY (1994) Distribution and abundance of New Zealand Fur Seals *Arctocephalus forsteri* in South Australia and Western Australia. *Wildlife Research* **21**, 667–695.

SHEPHERD, S.A. (1969) Pearson Isles: beautiful and remote. *Wildlife in Australia* **6** (4), 117–119.

SHEPHERD, S.A. and THOMAS, I.M. (1971) Pearson Island expedition 1969. 1: Narrative. *Trans. Roy. Soc. SA* **95** (3), 121–122.

SHEPHERD, S.A. and WOMERSLEY, H.B.S. (1970) The sublittoral ecology of West Island, South Australia: 1. Environmental features and algal ecology. *Trans. Roy. Soc. SA* **94**, 105–138.

SHEPHERD, S.A. and WOMERSLEY, H.B.S. (1971) Pearson Island Expedition 1969. 7: sub-tidal ecology of benthic algae. *Trans. Roy. Soc. SA* **95** (3), 155–167.

SHEPHERD, S.A. and WOMERSLEY, H.B.S. (1976) Subtidal algal and seagrass ecology of St Francis Island, South Australia. *Trans. Roy. Soc. SA* **100** (4), 177–191.

SHEPHERD, S.A. and WATSON, J.E. (1970) Sublittoral ecology of West Island, South Australia. 2: association between hydroids and algal substrate. *Trans. Roy. Soc. SA* **94**, 139–146.

SLADE, P.G. (1962) *A Physical and Chemical Study of a Granite-Xenolith Contact from Granite Island.* BSc (Hons) thesis: geology, University of Adelaide.

SMYTH, M. (1971) Pearson Island Expedition, 1969. 5. Reptiles. *Trans. Roy. Soc. SA* **95** (3), 147–148.

SOCIAL and ECOLOGICAL ASSESSMENT Pty Ltd (1983) *Preliminary Draft Granite Island Management Plan.* Department of Environment and Planning, Adelaide.

SOMMERVILLE, J. (1937) *Centenary History of Early Days of Eyre Peninsula: Newspaper Clippings,* SAA 1381.

SOMMERVILLE, J. (undated) *Notes on the Port Lincoln District* SAA. 1041, 21 vols and index.

SOUTHCOTT, R.V. (1964) Plants of the South Neptunes. *SA Nat.* **38** (3), 56.

SORENSEN, J.H. (1969a) New Zealand seals with special reference to the fur seal. *Fisheries Technical Report 39, New Zealand Marine Department,* Wellington.

SORENSEN, J.H., ed. (1969b) New Zealand fur seals with special reference to the 1949 open season. *Fish. Tech. Rep. NZ. Mar. Dep.* **42**, 1–80.

SOUTER, T.G. (1942) Birds of mid-Yorke Peninsula. *SA Orn.* **16** (2), 15–17.

SPECHT, R.L. (1969) The vegetation of Pearson Islands: a re-examination, February 1960. *Trans. Roy. Soc. SA* **93**, 143–152.

SPECHT, R.L. (1970) Vegetation. In: G.W. Leeper, ed. *The Australian Environment* 4th Edn. CSIRO Australia/Melbourne University Press, Melbourne.

SPECHT, R.L. (1972) *The Vegetation of South Australia.* Government Printer, Adelaide.

STACH, L.W. (1944) Ecology of the sand flats at Moreton Bay, Reevesby Island, South Australia. *Trans. Roy. Soc. SA* **68** (2), 177–182.

STACH, L.W. (1938 The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research, Part 1. 4: Echinodermata, *Proc. Roy. Soc. Vic.* **50**, 329–337.

STAHEL, C. and GALES, R. (1987) *Little Penguin. Fairy Penguins in Australia.* University of New South Wales Press, Sydney.

STIRLING, I. (1970) Observations on the behaviour of the New Zealand fur seal (*Arctocephalus forsteri*) *J. Mammal.* **51**, 766–778.

STIRLING, I. (1971a) Studies on the behaviour of the South Australian fur seal, *Arctocephalus forsteri* (Lesson) I: annual cycle, pastures and calls, and adult males during the breeding season. *Aust. J. Zool.* **19**, 243–266.

STIRLING, I. (1971b) Studies on the behaviour of the South Australian fur seal *Arctocephalus forsteri* (Lesson) II: adult females and pups *Aust. J. Zool.* **19**, 267–273.

STIRLING, I. (1972a) Observations on the Australian sea-lion *Neophoca cinerea* (Peron) *Aust. J. Zool.* **20**, 271–279.

STIRLING, I. (1972b) The economic value and management of seals in South Australia. *SA Dept. Fisheries Pub. No. 2*, Adelaide.

STIRLING, I. and WARNEKE, R.M. (1971) Implications of a comparison of the airborne vocalisations and some aspects of the behaviour of the two Australian fur seals *Arctocephalus* spp. on the evaluation and present taxonomy of the genus. *Aust. J. Zool.* **19**, 227–241.

STIRLING, I., STIRLING, S.M. and G. SHAUGHNESSY (1970) The bird fauna of South Neptune Islands, South Australia. *Emu.* **70** (4), 189–192.

STREET, R.J. (1964) Feeding habits of the New Zealand fur seal *Arctocephalus forsteri. Fisheries Technical Report 9, New Zealand Marine Department.* Wellington.

STREMPEL, A.A. and TOLLEY, J.C. (1970) *The Story of Victor Harbor.* Ambrose Press, Victor Harbor.

SUTTON, J. (1933) *Puffinus tenuirostris*, Short-tailed shearwater or Petrel (Mutton-bird). *SA Orn.* **12** (4), 115–126.

SUTTON, J. (1935) *Gabianus pacificus*, Pacific gull. *SA Orn.* **13** (2), 54–56.

SWIFT, J. (1987) *Gulliver's Travels*, edited by Dixon, P and Chalker, O, with an introduction by Michael Foot. Penguin Books, U.K.

SYMON, D.E. (1971) Pearson Island Expedition 1969. 3: contributions to the land flora. *Trans. Roy. Soc. SA* **95** (3), 131–142.

TATE, R. (1883) Kangaroo Island: notes on its geology. In: Botany of Kangaroo Island. *Trans. Roy. Soc. SA* **6**, 116–171.

TAYLOR, B.J. (1964) *Induced polarisation survey on Spilsby Island.* Unpublished report 58/154, SA Dept. Mines, Adelaide.

TEDMAN, R.A. (1991) The female reproductive tract of the Australian Sea-lion, *Neophoca cinerea* (Peron 1816) (Carnivora: Otariidae). *Aust. J. Zool.* **39**, 351–372.

TEMPLE, A.K., 1966 Alteration of ilmenite. *Economic Geology* **61**, 695–714.

TEUFER, G. and TEMPLE, A.K. (1966) Pseudorutile: a new mineral intermediate between ilmenite and rutile in the natural alteration of ilmenite. *Nature* **211**, 180.

THOM, B.G. and CHAPPELL, J. (1975) Holocene sea levels relative to Australia. *Search* **6**, 90–93.

THOMAS, R.K. (1901) Thistle Island (part of President's address to a Special Meeting of the Society). *Proc. Royal Geog. Soc. Aust. SA Branch* **4**, 80–82.

THOMAS, I.M. and DELROY, L.B. (1971) Pearson Island Expedition 1969. 4: The Pearson Island wallaby. *Trans. Roy. Soc. SA* **95** (3), 143–145.

THOMPSON, N. (1983) *Cruising Gulfs Log.* Sprindrift Publications, Adelaide.

THOMSON, B.P., (1969) Precambrian basement cover, the Adelaide System. In: L.W. Parkin, ed. *Handbook of South Australian Geology,* 49–83. Geological Survey of South Australia, Adelaide.

TOLLEY, J.C. (1968) *South Coast Story.* District Council, Port Elliot.

THIELE, C. and McKELVEY, M. (1976) *The Bight.* Rigby, Adelaide.

TINDALE, N.B. (1923) Flora and fauna of Nuyts Archipelago and the Investigator Group 13: Orthoptera. *Trans. Roy. Soc. SA* **47**, 362.

TINDALE, N.B. (1924) Visit to the islands of the Sir Joseph Banks Group. *SA Nat.* **5** (3), 130–132.

TINDALE, N.B. (1941) Native songs of the southeast of South Australia. *Trans. Roy. Soc. SA* **65**, 233–243.

TINDALE, N.B. (1957) A dated Tartangan implement site from Cape Martin, Southeast of South Australia. *Trans. Roy. Soc. SA* **80**, 109–123.

TINDALE, N.B. (1974) *Aboriginal Tribes of Australia.* Australian National University Press, Canberra.

TWIDALE, C.R. (1971) Pearson Island Expedition 1969. 2: geomorphology. *Trans. Roy. Soc. SA* **95** (3), 123–130.

Van GESSEL, F.W.C. (1968) The masked gannet: a sight record from Granite Island, South Australia. *SA Orn.* **25** (2), 55.

VERCO, J.C. (1914) 31st Annual Report of the Committee: Field Naturalists' Section, Royal Society of SA September 15, 1914 Trip to St Francis Island. *Trans Roy. Soc. SA* **38**, 510–518.

VERCO, J.C. (1935) *Combing the South Seas.* Rigby, Adelaide.

VERCO, J.C. (1935) Notes on the avifauna on St Francis Island, from *Combing the South Seas. SA Orn.* **13** (2), 60–66.

WAITE, E.R. (1923) Flora and fauna of Nuyts Archipelago and the Investigator Group 7: fishes. *Trans. Roy. Soc. SA* **47**, 95–96.

WAITE, E.R. (1923) Flora and fauna of Nuyts Archipelago and the Investigator Group 10: snakes of St Francis Island. *Trans. Roy. Soc. SA* **47**, 127–128.

WALLACE, A.R. (1880) *Island Life: The Phenomena and Causes of Insular Faunas and Floras, Including a Revision and Attempted Solution to the Problem of Geological Climates.* MacMillan, London.

WANKLYN, N. and WANKLYN, M. (1971) *The Early History of the City of Port Lincoln 1802–1971.* Corporation, Port Lincoln.

WARNEKE, R.W. (1970) A visit to the fur seals of the South Neptunes. *Fur. Feathers and Fins* **124**, 5–11.

WARSON, J.E. (1973) Pearson Island Expedition 1969. 9: Hydroids. *Trans. Roy. Soc. SA* **97** (3), 153–200.

WATTS, C.H.S. (1974) The Nuyts Islands Bandicoot (*Isoodon obesulus nauticus*). *SA Nat.* **49** (1), 20–24.

WATTS, C.H.S, ed. (1990) *A List of the Vertebrates of South Australia.* Biological Survey Co-ordinating Committee/SA Department of Environment and Planning, Adelaide.

WEBB, A.E., THOMSON, B.P., BLISSETT, A.J., DAILY, S.J., FLINTS, R.B., and A.J. PARKER (1982) *Geochronology of the Gawler Craton, South Australia.* Unpublished report, SA Dept. Mines and Energy Rept Dk 82/86, Adelaide.

WHEELER, B.H. (1938) The Sir Joseph Banks Islands: reports of the expedition of the McCoy Society for Field Investigation and Research Part 1. 6: Sipunculoidea. *Proc. Roy. Soc. Vic.* **50**, 345–347.

WHITE, SA (1916) Ornithological cruise among the islands of St Vincent and Spencer Gulf, South Australia. *Emu* **16**, 1–15.

WHITWORTH, R. (1866) *Bailliere's South Australian Gazetteer and Road Guide.* P. Whiteworth and F.F. Bailliere, Adelaide.

WILLIS, J.H. (1947) Plants of Rodondo Island. *Victorian Naturalist* **64**, 21–24.

WILLIS, J.H. (1953) The Archipelago of the Recherche 3a: Land Flora. *Aust. Geog. Soc. Rep.* **1**, 3–39.

WOOD, J.G. (1923) Flora and fauna of Nuyts Archipelago and the Investigator Group: Analysis of soil samples from Pearson Islands. *Trans. Roy. Soc. SA* **47**, 111–118.

WOOD JONES, F. (1922) Flora and fauna of Nuyts Archipelago and the Investigator Group 2: Monodelphian mammals. *Trans. Roy. Soc. SA* **46**, 181–193.

WOOD JONES, F. (1923) Flora and fauna of Nuyts Archipelago and the Investigator Group 6: Didelphian mammals. *Trans. Roy. Soc. SA* **47**, 82–94.

WOOD JONES, F. (1923–1925) *The Mammals of South Australia* (1968 reprint). South Australian Museum, Adelaide.

WOOD JONES, F. (1924) Flora and fauna of Nuyts Archipelago and the Investigator Group 15: The Pearson Island rat and the Flinders Island wallaby. *Trans. Roy. Soc. SA* **47**, 10–14.

WOOD JONES, F. (1925) The eared seals of South Australia. *Rec. SA Mus.* **3**, 9–16.

WOOD JONES, F. (1936) Notes on the breeding of the Short-tailed Shearwater *Puffinus tenuirostris* in 1936. *SA Orn.* **13** (8), 223–228.

WOOD JONES, F. (1937) The breeding of the White-faced Storm Petrel (*Pelagodroma marina*) on South Australian islands. *SA Orn.* **14** (2), 35–41.

WOOD JONES, F. CONDON, H. MACK, G., RUTTER, J.F., and J.A. TUBBS (1938) The Sir Joseph Banks Islands: reports of the Expedition of the McCoy Society for Field Investigation and Research Part 1. 13: Aves. *Proc. Roy. Soc. Vic.* **50**, 399–413.

WORT, M.J. and JONES, M.P. (1980) X-ray diffraction and magnetic studies of altered ilmenite and pseudorutile. *Mineralogical Magazine* **43**, 659–663.

# Appendix A

# PLANTS

Taxonomy follows Jessop (1993), but with subsequent modifications incorporated in the Department of Environment and Planning FLORA 90 database. Introduced species are marked (*).

**ADIANTACEAE**
Rock Fern *Cheilanthes austrotenuifolia*

**CUPRESSACEAE**
Southern Cypress Pine *Callitris preissii*

**CASUARINACEAE**
Drooping She-oak *Allocasuarina verticillata*

**URTICACEAE**
Smooth Nettle *Parietaria debilis*
Scrub Nettle *Urtica incisa*
*Small Nettle *Urtica urens*

**PROTEACEAE**
Holly-leaved Grevillea *Grevillea ilicifolia* var. *ilicifolia*
Elm-seed Hakea *Hakea cycloptera*

**SANTALACEAE**
Leafless Ballart *Exocarpos aphyllus*
Broom Ballart *Exocarpos sparteus*
Coast Ballart *Exocarpos syrticola*
Quandong *Santalum acuminatum*

**POLYGONACEAE**
*Three-cornered Jack *Emex australis*
Climbing Lignum *Muehlenbeckia adpressa*
Coastal Lignum *Muehlenbeckia gunnii*
*Wireweed *Polygonum aviculare*

**GYROSTEMONACEAE**
Desert Poplar *Codonocarpus cotinifolius*

**AIZOACEAE**
Karkalla *Carpobrotus rossii*
Round-leaved Pigface *Disphyma crassifolium* ssp. *clavellatum*
*Coastal Galenia *Galenia pubescens* var. *pubescens*
*Common Iceplant *Mesembryanthemum crystallinum*
*Slender Iceplant *Mesembryanthemum nodiflorum*
Bower Spinach *Tetragonia implexicoma*
New Zealand Spinach *Tetragonia tetragonoides*

**PORTULACACEAE**
Pink Purslane *Calandrinia calyptrata*
Small Purslane *Calandrinia eremaea*
Pigmy Purslane *Calandrinia granulifera*

**CARYOPHYLLACEAE**
*Mouse-ear Chickweed *Cerastium glomeratum*
*Slender Sandwort *Minuartia hybrida*
*Allseed *Polycarpon tetraphyllum*
*Annual Pearlwort *Sagina apetala*
*Sea Pearlwort *Sagina maritima*
Prickly Knawel *Scleranthus pungens*
*French Catchfly *Silene gallica* var. *gallica*
*Mediterranean Catchfly *Silene nocturna* ssp. *nocturna*
*Corn Spurrey *Spergula arvensis, Spergularia bocconii*
*Salt Sand-spurrey *Spergularia marina*
*Coast Sand-spurrey *Spergularia media*
*Red-spurrey *Spergularia rubra*
*Chickweed *Stellaria media*

**CHENOPODIACEAE**
Grey Saltbush *Atriplex cinerea*
Mueller's Saltbush *Atriplex muelleri*

Old-man Saltbush *Atriplex nummularia* ssp. *spathulata*
Marsh Saltbush *Atriplex paludosa* ssp. *cordata*
*Atriplex pumilio*
Lagoon Saltbush *Atriplex suberecta*
*Fat Hen *Chenopodium album*
*Chenopodium desertorum* ssp. *microphyllum*
*Chenopodium desertorum* ssp. *rectum*
Black Crumbweed *Chenopodium melanocarpum* forma *melanocarpum*
*Nettle-leaved Goosefoot *Chenopodium murale*
Twin-horned Copperburr *Dissocarpus biflorus* var. *biflorus*
Climbing Saltbush *Einadia nutans* ssp. *eremaea*
Ruby Saltbush *Enchylaena tomentosa* var. *tomentosa*
Grey Samphire *Halosarcia halocnemoides* ssp. *halocnemoides*
Small-leaved Bluebush *Maireana brevifolia*
Rosy Bluebush *Maireana erioclada*
Heath Bluebush *Maireana oppositifolia*
Seaberry Saltbush *Rhagodia candolleana* ssp. *candolleana*
Fleshy Saltbush *Rhagodia crassifolia*
Mealy Saltbush *Rhagodia parabolica*
Buckbush *Salsola kali*
Thick-headed Samphire *Sarcocornia blackiana*
Bearded Samphire *Sarcocornia quinqueflora*
Bassia *Sclerolaena uniflora*
Salt Copperbush *Sclerolaena ventricosa*
Shrubby Glasswort *Sclerostegia arbuscula*
Austral Seablite *Suaeda australis*
Coast Bonefruit *Threlkeldia diffusa*

**AMARANTHACEAE**
Mallee Hemichroa *Hemichroa diandra*
Smokebush *Ptilotus obovatus* var. *obovatus*
Pussytail *Ptilotus spathulatus* forma *spathulatus*

**LAURACEAE**
Slender Dodder-laurel *Cassytha glabella* forma *dispar*
Large Dodder-laurel *Cassytha melantha*
Downy Dodder-laurel *Cassytha pubescens*

**RANUNCULACEAE**
Small-leaved Clematis *Clematis microphylla*

**DILLENIACEAE**
Twiggy Guinea-flower *Hibbertia virgata*

**PAPAVERACEAE**
*Bristle Poppy *Papaver aculeatum*
*Long-headed Poppy *Papaver dubium*

**FUMARIACEAE**
*White-flower Fumitory *Fumaria capreolata* ssp. *capreolata*

**CRUCIFERAE**
*Long-fruited Wild Turnip *Brassica tournefortii*
*Sea Rocket *Cakile maritima* ssp. *maritima*
*Ward's Weed *Carrichtera annua*
*Lesser Wart-cress *Coronopus didymus*
*Sand Rocket *Diplotaxis tenuifolia*
*Oval Purse *Hymenolobus procumbens*
Leafy Peppercress *Lepidium foliosum*
Common Peppercress *Lepidium hyssopifolium*
*Short-fruited Wild Turnip *Rapistrum rugosum*
*Smooth Mustard *Sisymbrium erysimoides*
*London Rocket *Sisymbrium irio*
*Hedge Mustard *Sisymbrium officinale*
*Wild Mustard *Sisymbrium orientale*

**CRASSULACEAE**
Dense Stonecrop *Crassula colorata* var. *colorata*
Australian Crassula *Crassula sieberana* ssp. *sieberana*
Australian Crassula *Crassula sieberana* ssp. *tetramera*

**PITTOSPORACEAE**
Sweet Bursaria *Bursaria spinosa* var. *spinosa*
Weeping Pittosporum *Pittosporum phylliraeoides* var. *microcarpa*

**LEGUMINOSAE**
Gold-dust Wattle *Acacia acinacea*

Port Lincoln Wattle *Acacia anceps*
Wallowa *Acacia calamifolia*
Sticky Wattle *Acacia dodonaeifolia*
Umbrella Bush *Acacia ligulata*
Sallow Wattle *Acacia longifolia* var. *longifolia*
Notable Wattle *Acacia notabilis*
Umbrella Wattle *Acacia oswaldii*
Spike wattle *Acacia oxycedrus*
Kangaroo Thorn *Acacia paradoxa*
Rock Wattle *Acacia rupicola*
*Cape Leeuwin Wattle *Albizia lophantha*
Eutaxia *Eutaxia microphylla* var. *microphylla*
Native Lilac *Hardenbergia violacea*
Australian Trefoil *Lotus australis*
*Spotted Medic *Medicago arabica*
*Woolly Burr Medic *Medicago minima* var. *minima*
*Toothed Medic *Medicago polymorpha* var. *polymorpha*
*Lucerne *Medicago sativa* ssp. *sativa*
*Barrel Medic *Medicago truncatula*
*King Island Melilot *Melilotus indica*
Large-leaved Bush-pea *Pultenaea daphnoides*
Island Bush-pea *Pultenaea rigida* var. *rigida*
Coast Swainson-pea *Swainsona lessertiifolia*
Cockies Tongue *Templetonia retusa*
*Hare's-foot Clover *Trifolium arvense* var. *arvense*
*Hop Clover *Trifolium campestre*

**OXALIDACEAE**
*Creeping Oxalis *Oxalis corniculata* ssp. *corniculata*
Native Oxalis *Oxalis perennans*
*Soursob *Oxalis pescaprae*

**GERANIACEAE**
*Long Stork's Bill *Erodium botrys*
*Common Stork's Bill *Erodium cicutarium*
Blue Stork's Bill *Erodium cygnorum* ssp. *glandulosum*
*Dove's Foot *Geranium molle* var. *molle*
Native Geranium *Geranium solanderi* var. *solanderi*
Austral Stork's Bill *Pelargonium australe*

**ZYGOPHYLLACEAE**
Nitre-bush *Nitraria billardierei*
Sand Twinleaf *Zygophyllum ammophilum*
Pointed Twinleaf *Zygophyllum apiculatum*
Coast Twinleaf *Zygophyllum billardierei*

**EUPHORBIACEAE**
Felted Wallaby-bush *Beyeria leschenaultii*
*Sea Spurge *Euphorbia paralias*
*Petty Spurge *Euphorbia peplus*
*False Caper *Euphorbia terracina*

**RUTACEAE**
Salmon Correa *Correa pulchella*
Common Correa *Correa reflexa* var. *reflexa*
Sheep Bush *Geijera linearifolia*

**POLYGALACEAE**
Love Creeper *Comesperma volubile*

**SAPINDACEAE**
Crinkled Hop-bush *Dodonaea baueri*
Dwarf Hop-bush *Dodonaea humilis*
Narrow-leaved Hop-bush *Dodonaea viscosa* ssp. *angustissima*
Sticky Hop-bush *Dodonaea viscosa* ssp. *spathulata*

**RHAMNACEAE**
Wedge-leaved Pomaderris *Pomaderris obcordata*
Coast Pomaderris *Pomaderris oraria*
*Blow-fly Bush *Rhamnus alaternus*
Forked Spyridium *Spyridium bifidum* var. *bifidum*
Narrow-leaved Spyridium *Spyridium phylicoides*

**MALVACEAE**
*Pyramid Tree *Lagunaria patersonii*
*Tree Mallow *Lavatera arborea*
Australian Hollyhock *Lavatera plebeia*
Clustered Lawrencia *Lawrencia glomerata*
Salt Lawrencia *Lawrencia spicata*
Thorny Lawrencia *Lawrencia squamata*
*Mallow of Nice *Malva nicaeensis*
*Marshmallow *Malva parviflora*
Malvastrum *Malvastrum americanum*

**STERCULIACEAE**
Coast Velvet-bush *Lasiopetalum discolor*

**THYMELAEACEAE**
Mallee Riceflower *Pimelea microcephala* ssp. *microcephala*
Thyme Riceflower *Pimelea serpyllifolia* ssp. *serpyllifolia*

**VIOLACEAE**
Shrub Violet *Hybanthus floribundus* ssp. *floribundus*

**FRANKENIACEAE**
*Frankenia cordata*
*Frankenia eremophila*
Common Sea-heath *Frankenia pauciflora* var. *fruticulosa*
Bristly Sea-heath *Frankenia serpyllifolia*
Small-leaved Sea-heath *Frankenia sessilis*

**CUCURBITACEAE**
*Bitter Melon *Citrullus lanatus*

**MYRTACEAE**
Common Fringe-myrtle *Calytrix tetragona*
Kangaroo Island White Mallee *Eucalyptus 'anceps'*
Coastal White Mallee *Eucalyptus diversifolia*
Yorrell *Eucalyptus gracilis*
Ridge-fruited Mallee *Eucalyptus incrassata*
South Australian Blue Gum *Eucalyptus leucoxylon* ssp. *leucoxylon*
Red Mallee *Eucalyptus oleosa*
Summer Red Mallee *Eucalyptus socialis*
*Coastal Tea-tree *Leptospermum laevigatum*
South Australian Swamp Paper-bark *Melaleuca halmaturorum*
Dryland Tea-tree *Melaleuca lanceolata*
Broombush *Melaleuca uncinata*

**UMBELLIFERAE**
Annual Celery *Apium annuum*
Sea Celery *Apium prostratum* ssp. *prostratum* var. *prostratum*
**Bupleurum semicompositum*
Native Carrot *Daucus glochidiatus*
*Hydrocotyle comocarpa*
*Hydrocotyle medicaginoides*
Dwarf Parsnip *Trachymene pilosa*

**EPACRIDACEAE**
Ridged Ground-berry *Acrotriche affinis*
Coast Ground-berry *Acrotriche cordata*
Shiny Ground-berry *Acrotriche patula*
Heart-leaved Beard-heath *Leucopogon cordifolius*
Coastal Beard-heath *Leucopogon parviflorus*
Prickly Broom-heath *Monotoca scoparia*

**PRIMULACEAE**
*Blue Pimpernel *Anagallis arvensis*
Creeping Brookweed *Samolus repens*

**LIMONIACEAE**
*Stattice/Sea Lavender *Limonium psilocladon*

**OLEACEAE**
*Olive *Olea europaea* ssp. *europaea*

**LOGANIACEAE**
Coast Logania *Logania crassifolia*
Oval-leaved Logania *Logania ovata*

**GENTIANACEAE**
*Common Centaury *Centaurium erythraea*
*Spike Centaury *Centaurium spicatum*
Yellow Sebaea *Sebaea ovata*

**APOCYNACEAE**
Dysentery Bush *Alyxia buxifolia*

**RUBIACEAE**
*Small Bedstraw *Galium murale*
*Bedstraw *Galium spurium* ssp. *ibicinum*
Variable Stinkweed *Opercularia varia*

**CONVOLVULACEAE**
Australian Bindweed *Convolvulus erubescens*
Kidney Weed *Dichondra repens*
Narrow-leaved Wilsonia *Wilsonia backhousei*
Silky Wilsonia *Wilsonia humilis* var. *humilis*

**BORAGINACEAE**
*Salvation Jane/Paterson's Curse *Echium plantagineum*

AVICENNIACEAE

Grey Mangrove *Avicennia marina* var. *resinifera*

LABIATAE

*Horehound *Marrubium vulgare*
Camel Bush *Teucrium sessiliflorum*
Shore Westringia *Westringia dampieri*
Stiff Western Rosemary *Westringia rigida*

SOLANACEAE

Spiny Ray-flower *Anthocercis anisantha* ssp. *anisantha*
*Common Thorn-apple *Datura stramonium*
Australian Boxthorn *Lycium australe*
*African Boxthorn *Lycium ferocissimum*
*Nicotiana excelsior*
*Tree Tobacco *Nicotiana glauca*
Coast Tobacco *Nicotiana maritima*
*Kangaroo Apple *Solanum aviculare*
*Black-berry Nightshade *Solanum nigrum*

SCROPHULARIACEAE

Purple Eyebright *Euphrasia collina* ssp. *collina*
*Spreading Night-phlox *Zaluzianskya divaricata*

OROBANCHACEAE

Australian Broomrape *Orobanche cernua* var. *australiana*

MYOPORACEAE

Turkey Bush *Eremophila deserti*
Tar-Bush *Eremophila glabra*
Native Myrtle *Myoporum acuminatum*
Native Juniper/Boobialla *Myoporum insulare*
Creeping Boobialla *Myoporum parvifolium*
Sticky Boobialla *Myoporum viscosum*

PLANTAGINACEAE

*Hairy Plantain *Plantago bellardii*
**Plantago coronopus* ssp. *commutata*
Sago Weed *Plantago drummondii*
*Plantago hispida*
*Variable Plantain *Plantago varia*

CAMPANULACEAE

Tall Bluebell *Wahlenbergia stricta* ssp. *stricta*

GOODENIACEAE

Hop Goodenia *Goodenia ovata*
Sticky Goodenia *Goodenia varia*
Cushion Fanflower *Scaevola crassifolia*
Spiny Fanflower *Scaevola spinescens*

COMPOSITAE

Salt Angianthus *Angianthus preissianus*
Hairy Cup-flower *Angianthus tomentosus*
False Tobacco *Apalochlamys spectabilis*
*Capeweed *Arctotheca calendula*
*White Arctotis *Arctotis stoechadifolia*
*Teneriffe Daisy *Argyranthemum frutescens* ssp. *foeniculaceum*
Variable Daisy *Brachycome ciliaris* var. *ciliaris*
Slender Daisy *Brachycome exilis*
Swan River Daisy *Brachycome iberidifolia*
Hard-headed Daisy *Brachycome lineariloba*
*Brachycome tesquorum*
Golden Everlasting *Bracteantha bracteatum*
Cushion-bush *Calocephalus brownii*
*Slender Thistle *Carduus tenuiflorus*
*Maltese Cockspur *Centaurea melitensis*
*Waterbuttons *Cotula coronopifolia*
Slender Cotula *Cotula vulgaris* var. *australasica*
Bluebush Daisy *Cratystylis conocephala*
Common Everlasting *Crysocephalum apiculatum*
Fringed Everlasting *Crysocephalum baxteri*
*Stinkwort *Dittrichia graveolens*
Tiny Cudweed *Gnaphalium indutum*
Common Cudweed *Gnaphalium involucratum*
Woolly Yellow-heads *Gnephosis skirrophora*
Coast Everlasting *Helichrysum leucopsideum*
Pigmy Sunray *Helipterum pygmaeum*
*Smooth Cat's-ear *Hypochoeris glabra*
Stalked Ixiolaena *Ixiolaena supina*
Woolly Ixiolaena *Ixiolaena tomentosa*
Ixodia *Ixodia achillaeoides* ssp. *achillaeoides*

Button Immortelle *Leptorhynchos waitzia*
*Ox-eye Daisy *Leucanthemum vulgare*
Coast Daisy-bush *Olearia axillaris*
Heath Daisy-bush *Olearia floribunda* var. *floribunda*
Twiggy Daisy-bush *Olearia ramulosa*
Pleated Podolepis *Podolepis rugata* var. *littoralis*
Pleated Podolepis *Podolepis rugata* var. *rugata*
Sticky Longheads *Podotheca angustifolia*
Stiff Cup-flower *Pogonolepis muelleriana*
Cudweed *Pseudognaphalium luteoalbum*
*False Sow-thistle *Reichardia tingitana*
Shrubby Groundsel *Senecio cunninghamii* var. *serratus*
Slender Groundsel *Senecio glossanthus*
Variable Groundsel *Senecio lautus*
Fireweed *Senecio minimus* var *picridioides*
*African Daisy *Senecio pterophorus* var. *pterophorus*
*Prickly Sow-thistle *Sonchus asper* ssp. *asper*
*Prickly Sow-thistle *Sonchus asper* ssp. *glaucescens*
Dune Thistle *Sonchus megalocarpus*
*Common Sow-thistle *Sonchus oleraceus*
Spoon Cudweed *Stuartina muelleri*
*False Hawkbit *Urospermum picroides*
Fuzzweed *Vittadinia cuneata* var. *cuneata* forma *cuneata*
Common New Holland Daisy *Vittadinia dissecta* var. *hirta*
Fuzzweed *Vittadinia megacephala*
Fuzzweed *Vittadinia pterochaeta*

**JUNCAGINACEAE**
Dwarf Arrowgrass *Triglochin centrocarpum*
Prickly Arrowgrass *Triglochin mucronatum*
*Triglochin muelleri*
Arrowgrass *Triglochin trichophorum*

**LILIACEAE**
Small Vanilla-lily *Arthropodium minus*
Leek Lily *Bulbine semibarbata*
Black-anther Flax Lily *Dianella revoluta*
Sandhill Mat-rush *Lomandra collina*
Scented Mat-rush *Lomandra effusa*
*Bridal Creeper *Myrsiphyllum asparagoides*
Mallee Fringe-lily *Thysanotus baueri*
Early Nancy *Wurmbea dioica* ssp. *dioica*

**HYPOXIDACEAE**
Tiny Star *Hypoxis hookeri*

**IRIDACEAE**
*Thread Iris *Gynandriris setifolia*
*Guildford Grass *Romulea rosea* var. *australis*

**JUNCACEAE**
*Sharp Rush *Juncus acutus*
Toad Rush *Juncus bufonius*
Sea Rush *Juncus kraussii*

**CENTROLEPIDACEAE**
Dwarf Centrolepis *Centrolepis cephaloformis* ssp. *murrayi*
Hairy Centrolepis *Centrolepis strigosa*

**GRAMINEAE**
Annual Bent-grass *Agrostis aequata*
Blown Grass *Agrostis avenacea* var. *avenacea*
*Marram Grass *Ammophila arenaria*
*Bearded Oat *Avena barbata*
*Wild Oat *Avena fatua*
*False Brome *Brachypodium distachyon*
Sand Brome *Bromus arenarius*
*Prairie Grass *Bromus catharticus*
*Great Brome *Bromus diandrus*
*Soft Brome *Bromus hordeaceus* ssp. *hordeaceus*
*Madrid Brome *Bromus madritensis*
*Red Brome *Bromus rubens*
*Couch-grass *Cynodon dactylon*
White-top *Danthonia caespitosa*
Slender Wallaby-grass *Danthonia racemosa* var. *racemosa*
Bristly Wallaby-grass *Danthonia setacea* var. *setacea*
Emu-grass *Distichlis distichophylla*
*Perennial Veldt Grass *Ehrharta calycina*
*Annual Veldt Grass *Ehrharta longiflora*
Native Wheat-grass *Elymus scabrus*
*Nit-grass *Gastridium phleoides*

*Common Barb-grass *Hainardia cylindrica*
*Northern Barley-grass *Hordeum glaucum*
*Barley-grass *Hordeum leporinum*
*Sea Barley *Hordeum marinum*
*Hare's-tail Grass *Lagurus ovatus*
*Golden-top *Lamarckia aurea*
*Italian Ryegrass *Lolium multiflorum*
*Perennial Ryegrass *Lolium perenne*
*Wimmera Ryegrass *Lolium rigidum*
**Lolium temulentum* forma *arvense*
*Annual Cat's-tail *Lophochloa cristata*
*Curly Ryegrass *Parapholis incurva*
*Winter Grass *Poa annua*
Coast Tussock Grass *Poa poiformis* var. *poiformis*
Slender Tussock Grass *Poa tenera*
*Coast Beard-grass *Polypogon maritimus*
*Annual Beard-grass *Polypogon monspeliensis*
*Arabian Grass *Schismus barbatus*
Rolling Spinifex *Spinifex sericeus*
Salt Couch *Sporobolus virginicus*
Cottony Spear-grass *Stipa drummondii*
Elegant Spear-grass *Stipa elegantissima*
Desert Spear-grass *Stipa eremophila*
Spear-grass *Stipa flavescens*
Corkscrew Grass *Stipa setacea*
Coast Spear-grass *Stipa stipoides*
Variable Spear-grass *Stipa variabilis*
Spinifex *Triodia irritans* var. *irritans*
*Squirrel-tail Fescue *Vulpia bromoides*
*Rat's-tail Fescue *Vulpia myuros*

**CYPERACEAE**

*Nut-grass *Cyperus rotundus* ssp. *rotundus*
Limestone Saw-sedge *Gahnia deusta*
Chaffy Saw-sedge *Gahnia filum*
*Isolepis congrua*
Coarse Club-rush *Isolepis marginata*
Knobby Club-rush *Isolepis nodosa*
Clustered Sword-sedge *Lepidosperma congestum*
Sword Rush *Lepidosperma gladiatum*

**ORCHIDACEAE**

Gnat Orchid *Cyrtostylis reniformis*
Common Onion-Orchid *Microtis unifolia*

# Appendix B

# MAMMALS

Taxonomy follows Watts (1990).
Introduced species marked (*)

**MACROPODIDAE**
Tammar/Dama Wallaby *Macropus eugenii*
Western Grey Kangaroo *Macropus fuliginosus*
Black-footed Rock-wallaby *Petrogale lateralis*

**PERAMELIDAE**
Short-nosed/Southern Brown Bandicoot *Isoodon obesulus*

**PHALANGERIDAE**
Brushtail Possum *Trichosurus vulpecula*

**POTOROIDAE**
Brush-tailed Bettong *Bettongia penicillata*

**VOMBATIDAE**
Hairy-nosed Wombat *Lasiorhinus latifrons*

**MURIDAE**
Greater Stick-nest Rat *Leporillus conditor*
*House Mouse *Mus domesticus*
Bush Rat *Rattus fuscipes*
*Black/Ship Rat *Rattus rattus*

**VESPERTILIONIDAE**
Lesser Long-eared Bat *Nyctophilus geoffroyi*

**OTARIIDAE**
New Zealand Fur-seal *Arctocephalus forsteri*
Australian Fur-seal *Arctocephalus pusillus doriferus*
Australian Sea-lion *Neophoca cinerea*

**LEPORIDAE**
*European Rabbit *Oryctolagus cuniculus*

**CANIDAE**
*Red Fox *Vulpes vulpes*

**FELIDAE**
*Domestic Cat *Felis catus*

**OVIDAE**
*Goat *Capra hircus*

**CERVIDAE**
*Fallow Deer *Cervus dama*

# Appendix C

# BIRDS

Taxonomy follows Watts (1990).
Introduced species marked (*)

**CASUARIIDAE**
Emu *Dromaius novaehollandiae*

**PHASIANIDAE**
Stubble Quail *Coturnix novaezelandiae*

**ANATIDAE**
Chestnut Teal *Anas castanea*
Australasian Grey Teal *Anas gracilis*
Pacific Black Duck *Anas superciliosa*
Musk Duck *Biziura lobata*
Cape Barren Goose *Cereopsis novaehollandiae*
Black Swan *Cygnus atratus*
Mountain Duck / Australasian Shelduck *Tadorna tadornoides*

**TURNICIDAE**
Painted Button-quail *Turnix varia*

**ALCEDINIDAE**
Sacred Kingfisher *Halcyon sancta*

**CUCULIDAE**
Fan-tailed Cuckoo *Cacomantis flabelliformis*
Horsfield's/Rufous-tailed Bronze Cuckoo *Chrysococcyx basalis*

**PSITTACIDAE**
Ring-necked Parrot *Barnardius zonarius*
Galah *Eolophus roseicapilla*
Budgerigah *Melopsittacus undulatus*
Elegant Parrot *Neophema elegans*
Rock Parrot *Neophema petrophila*
Red-rumped Parrot *Psephotus haematonotus*

**APODIDAE**
Fork-tailed Swift *Apus pacificus*

**TYTONIDAE**
Barn Owl *Tyto alba*

**STRIGIDAE**
Boobook Owl *Ninox novaeseelandiae*

**AEGOTHELIDAE**
Australian Owlet-nightjar *Aegotheles cristatus*

**EUROSTOPODIDAE**
Spotted Nightjar *Eurostopodus argus*

**COLUMBIDAE**
*Feral Pigeon / Rock Dove *Columba livia*
Crested Pigeon *Ocyphaps lophotes*
Common Bronzewing *Phaps chalcoptera*
Brush Bronzewing *Phaps elegans*

**RALLIDAE**
Black-tailed Native-hen *Gallinula ventralis*
Banded / Buff-banded Rail *Gallirallus philippensis*

**SCOLOPACIDAE**
Common Sandpiper *Actitis hypoleucos*
Ruddy Turnstone *Arenaria interpres*
Sharp-tailed Sandpiper *Calidris acuminata*
Sanderling *Calidris alba*
Red Knot *Calidris canutus*
Curlew Sandpiper *Calidris ferruginea*
Pectoral Sandpiper *Calidris melanotos*
Red-necked Stint *Calidris ruficollis*
Great Knot *Calidris tenuirostris*
Bar-tailed Godwit *Limosa lapponica*
Eastern Curlew *Numenius madagascariensis*
Whimbrel *Numenius phaeopus*
Greenshank *Tringa nebularia*

**BURHINIDAE**
Southern Stone-curlew / Bush Thick-knee *Burhinus grallarius*

**CHARADRIIDAE**
Double-banded Dotterel / Double-banded Plover *Charadrius bicinctus*
Mongolian Plover *Charadrius mongolus*
Hooded Dotterel / Plover *Charadrius rubricollis*
Red-capped Dotterel / Red-capped Plover *Charadrius ruficapillus*
Banded Stilt *Cladorhynchus leucocephalus*
Black-fronted Dotterel / Black-fronted Plover *Elseyornis melanops*
Red-kneed Dotterel *Erythogonys cinctus*
Sooty Oystercatcher *Haematopus fuliginosus*
Pied Oystercatcher *Haematopus ostralegus*
Masked / Spur-winged Plover *Hoplopterus miles*
Banded Plover / Lapwing *Hoplopterus tricolor*
Lesser Golden Plover *Pluvialis fulva*
Grey Plover *Pluvialis squatarola*

**LARIDAE**
Caspian Tern *Hydroprogne caspia*
Silver Gull *Larus novaehollandiae*
Pacific Gull *Larus pacificus*
Arctic Jaeger / Skua *Stercorarius parasiticus*
Bridled Tern *Sterna anaethetus*
Fairy Tern *Sterna nereis*
White-fronted Tern *Sterna striata*
Antarctic Tern *Sterna vittata*
Crested Tern *Thalasseus bergii*

**ACCIPITRIDAE**
Brown Goshawk *Accipiter fasciatus*
Wedge-tailed Eagle *Aquila audax*
Swamp / Marsh Harrier *Circus approximans*
Spotted Harrier *Circus assimilis*
Black-shouldered Kite *Elanus caeruleus*
Letter-winged Kite *Elanus scriptus*
White-bellied Sea-eagle *Haliaeetus leucogaster*
Whistling Eagle / Whistling Kite *Haliastur sphenurus*
Osprey *Pandion haliaetus*

**FALCONIDAE**
Brown Hawk / Falcon *Falco berigora*
Australian Kestrel *Falco cenchroides*
Little Falcon / Australian Hobby *Falco longipennis*
Peregrine Falcon *Falco peregrinus*
Black Falcon *Falco subniger*

**PODICIPEDIDAE**
Hoary-headed Grebe *Poliocephalus poliocephalus*

**PHAETHONTIDAE**
Red-tailed Tropicbird *Phaethon rubricauda*

**SULIDAE**
Australasian Gannet *Morus serrator*

**PHALACROCORACIDAE**
Black-faced Shag / Cormorant *Leucocarbo fuscescens*
Great / Black Cormorant *Phalacrocorax carbo*
Little Pied Cormorant *Phalacrocorax melanoleucos*
Little Black Cormorant *Phalacrocorax sulcirostris*
Pied Cormorant *Phalacrocorax varius*

**ARDEIDAE**
Great / White Egret *Ardea alba*
Little Egret *Ardea garzetta*
White-faced Heron *Ardea novaehollandiae*
Eastern Reef Egret / Reef Heron *Ardea sacra*

**THRESKIORNITHIDAE**
Yellow-billed Spoonbill *Platalea flavipes*
Glossy Ibis *Plegadis falcinellus*
Straw-necked Ibis *Threskiornis spinicollis*

**PELECANIDAE**
Australian Pelican *Pelecanus conspicillatus*

**SPHENISCIDAE**
Little / Fairy Penguin *Eudyptula minor*

**PROCELLARIIDAE**
White-faced Storm-petrel *Pelagodroma marina*

Fleshy-footed Shearwater *Puffinus carneipes*
Short-tailed Shearwater/Muttonbird *Puffinus tenuirostris*

**MALURIDAE**
Superb Blue Wren *Malurus cyaneus*

**MELIPHAGIDAE**
Red Wattlebird *Anthochaera carunculata*
Spiny-checked Honeyeater *Acanthogenys rufogularis*
White-fronted Chat *Ephthianura albifrons*
Crimson Chat *Ephthianura tricolor*
Tawny-crowned Honeyeater *Gliciphila melanops*
Noisy Miner *Manorina melanocephala*
Purple-gaped Honeyeater *Meliphaga cratitia*
Yellow-plumed Honeyeater *Meliphaga ornata*
Singing Honeyeater *Meliphaga virescens*
White-fronted Honeyeater *Phylidonyris albifrons*
New Holland Honeyeater *Phylidonyris novaehollandiae*
Crescent Honeyeater *Phylidonyris pyrrhoptera*

**PARDALOTIDAE**
Yellow-rumped Thornbill *Acanthiza chrysorrhoa*
Shy Heathwren *Hylacola cauta*
White-browed Scrubwren *Sericornis frontalis*

**EOPSALTRIIDAE**
Red-capped Robin *Petroica goodenovii*

**CORVIDAE**
Black-faced Wood-swallow *Artamus cinereus*
Dusky Wood-swallow *Artamus cyanopterus*
Masked Wood-swallow *Artamus personatus*
Grey Shrike-thrush *Colluricincla harmonica*
Black-faced Cuckoo-shrike *Coracina novaehollandiae*
Little Crow *Corvus bennetti*
Australian Raven *Corvus coronoides*
Little Raven *Corvus mellori*
Grey Butcherbird *Cracticus torquatus*
Magpie-lark *Grallina cyanoleuca*
Australian Magpie *Gymnorhina tibicen*
Golden Whistler *Pachycephala pectoralis*
Rufous Whistler *Pachycephala rufiventris*
Grey Fantail *Rhipidura fuliginosa*
Willie Wagtail *Rhipidura leucophrys*
Grey Currawong *Strepera versicolor*

**STURNIDAE**
*Common/European Starling *Sturnus vulgaris*

**HIRUNDINIDAE**
White-backed Swallow *Cheramoeca leucosternum*
Welcome Swallow *Hirundo neoxena*
Tree Martin *Hirundo nigricans*

**ZOSTEROPIDAE**
Silvereye *Zosterops lateralis*

**SYLVIIDAE**
Brown Songlark *Cinclorhamphus cruralis*
Little Grassbird *Megalurus gramineus*

**ALAUDIDAE**
*Skylark *Alauda arvensis*
Singing Bushlark *Mirafra javanica*

**PASSERIDAE**
Richard's Pipit *Anthus novaeseelandiae*
*House Sparrow *Passer domesticus*
Zebra Finch *Poephila guttata*

**FRINGILLIDAE**
*Goldfinch *Carduelis carduelis*

# *Appendix* D

# REPTILES

Taxonomy follows Watts (1990).
Introduced species marked (*)

**AGAMIDAE**
Peninsula Dragon *Ctenophorus fionni*
Painted Dragon *Ctenophorus pictus*
Central Bearded Dragon *Pogona vitticeps*

**GEKKONIDAE**
Western Stone Gecko *Diplodactylus granariensis*
Tree Dtella *Gehyra variegata*
Bynoe's Gecko *Heteronotia binoei*
Thick-tailed Gecko *Nephrurus milii*
Marbled Gecko *Phyllodactylus marmoratus*

**PYGOPODIDAE**
Red-tailed Worm-lizard *Aprasia inaurita*
Lined Worm-lizard *Aprasia striolata*
Burton's Legless Lizard *Lialis burtonis*
Common Scaly-foot *Pygopus lepidopodus*

**SCINCIDAE**
Striped Wall Skink *Cryptoblepharus virgatus*
Spotted Ctenotus *Ctenotus uber*
Spinifex Slender Bluetongue *Cyclodomorphus melanops*
Cunningham's Skink *Egernia cunninghami*
Bull Skink *Egernia multiscutata*
Western Tree Skink *Egernia richardi*
White's Skink *Egernia whitii*
Three-toed Earless Skink *Hemiergis decresiensis*
Four-toed Earless Skink *Hemiergis peronii*
Bight Coast Skink *Pseudemoia baudini*
Southern Grass Skink *Pseudemoia entrecasteauxii*
Bougainville's Skink *Lerista bougainvillii*
Southern Four-toed Slider *Lerista dorsalis*
Long-legged Slider *Lerista microtis*
Mallee Slider *Lerista edwardsae*
Southern Three-toed Slider *Lerista terdigitata*
Dwarf Skink *Menetia greyii*
Adelaide Snake-eye *Morethia adelaidensis*
Mallee Snake-eye *Morethia obscura*
Shingleback Skink/Sleepy Lizard *Tiliqua rugosa*

**VARANIDAE**
Gould's Goanna/Sand Monitor *Varanus gouldii*
Rosenberg's Goanna *Varanus rosenbergi*

**BOIDAE**
Carpet Python *Morelia spilota*

**ELAPIDAE**
Common Death Adder *Acanthophis antarcticus*
Master's Snake *Drysdalia mastersii*
Black Tiger Snake *Notechis scutatus*
Western Brown Snake *Pseudonaja nuchalis*
Eastern Brown Snake *Pseudonaja textilis*
Mitchell's Short-tailed Snake *Rhinoplocephalus nigriceps*

*Appendix*

# E

# ISLAND SPECIES LISTS

**Table 11.** Plant species from the Far West Coast islands.

| Common name | Scientific name | Lounds Island | Purdie Island | St Francis Island | Smooth Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Port Lincoln Wattle | *Acacia anceps* | | | | | | | | | | | | | | | | | | | | * | | * | | | | | * |
| Umbrella Bush | *Acacia ligulata* | | | * | | | | | | | | | | | * | | * | | | | * | | * | | | | * | |
| Umbrella Wattle | *Acacia notabilis* | | | | | | | | | | | | | | | | * | | | | | | | | | | | |
| Notable Wattle | *Acacia oswaldii* | | | * | | | | | | | | | * | | | | * | | | | | * | | | | | | |
| Ridged Ground-berry | *Acrotriche affinis* | | | | | | | | | | | | * | | | | * | | * | | * | | | | | | | |
| Shiny Ground-berry | *Acrotriche patula* | | | * | | | | | | | | | * | | | | * | | | | | | | | * | | | |
| Blown Grass | *Agrostis avenacea* var. *avenacea* | | | | | | | | | | | | | | * | * | | | | | | | | | | | | |
| Dysentery Bush | *Alyxia buxifolia* | | | | | | * | | | | | | * | | * | | * | | * | | | | | | | | | |
| *Blue Pimpernel | *Anagallis arvensis* | | | | | | | | | | | | | | * | | | | | | * | | * | | | | | |
| Salt Angianthus | *Angianthus preissianus* | | | | | | * | | | | | | | | | | | | | | | | | | | | | |
| Hairy Cup-flower | *Angianthus tomentosus* | | | | | | | | | | | | | | * | * | | | | | | | | | | | | |
| Annual Celery | *Apium annuum* | | | | | | | | | | | | | | * | | | | | | | | | | | | | |
| Sea Celery | *Apium prostratum* ssp. *prostratum* var. *prostratum* | | | * | * | * | * | * | * | * | * | | * | | | | | | | | | | | * | * | | | |
| *Capeweed | *Arctotheca calendula* | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| Grey Saltbush | *Atriplex cinerea* | | | * | | | | | | | | | | | * | * | * | | * | | | | | | | | | |
| Marsh Saltbush | *Atriplex paludosa* ssp. *cordata* | * | * | * | * | * | * | * | * | * | | | * | * | | | * | * | * | * | * | * | * | * | * | | | |
| | *Atriplex pumilio* | | | | | | | | | | | | | | * | | | | | | | | | | | | | |

**Table 11. (cont'd)** Plant species from the Far West Coast islands.

| Common name | Scientific name | Lounds Island | Purdie Island | St Francis Island | Smooth Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Bearded Oat | *Avena barbata* | | | * | | | | | | | | | | | | | | | | | * | * | * | * | * | * | * | |
| *Wild Oat | *Avena fatua* | | | * | | | | | | | | | | | * | * | | | | | | | | | | | | |
| Grey Mangrove | *Avicennia marina* var. *resinifera* | | | | | | | | | | * | | | | | | | * | * | | | | | | | | | |
| Felted Wallaby-bush | *Beyeria lechenaultii* | | | * | * | * | | | | | | | * | | | | * | | | | * | * | * | | * | * | * | |
| Variable Daisy | *Brachycome ciliaris* var. *ciliaris* | | | * | * | * | * | | | * | * | | | | * | | | | | | | | | | | | | |
| Hard-headed Daisy | *Brachycome lineariloba* | | | | | | | | | * | | | | | | | | | | | | | | | | | | |
| | *Brachycome* sp. | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| | *Brachycome tesquorum* | | | | | | | | | * | * | | | | | | | | | | | | | | | | | |
| *Large-fruited Wild Turnip | *Brassica tournefortii* | | | | | | | | | | | | | | * | | * | | | | | | | | * | | | |
| Sand Brome | *Bromus arenarius* | | | | * | * | * | | * | * | * | | | | * | * | | | | | | | | | | | | |
| *Great Brome | *Bromus diandrus* | | | * | | | | | | | | | | | * | | | | | | | | * | | * | | | |
| *Madrid Brome | *Bromus madritensis* | | | * | | | | | | | | | | | * | | | | | | | | * | | * | | | |
| *Red Brome | *Bromus rubens* | | | * | | | | | | | | | | | | | | | | | | * | | | | * | * | |
| Leek Lily | *Bulbine semibarbata* | | | * | | | | | | | | | | | | | | | | | | | | | * | | | |
| | **Bupleurum semicompositum* | | | * | * | | | * | | * | * | | | | * | | | | | | | | | | | | | |
| *Sea Rocket | *Cakile maritima* | | | * | | | | | | | | | | | * | | * | | * | | | | | | | | | * |
| | *Calandrinia* sp. | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Cushion-bush | *Calocephalus brownii* | | | * | | * | * | | | * | | | | | * | * | * | | | | | | | | | | | |

**Table 11. (cont'd)** Plant species from the Far West Coast islands.

| Common name | Scientific name | Lounds Island | Purdie Island | St Francis Island | Smooth Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Karkalla | *Carpobrotus rossii* | * | * | * | * | * | * | * | * | * | | | * | * | * | * | * | * | * | | * | | * | * | * | | * | * |
| *Ward's Weed | *Carrichtera annua* | | | | | | | | | | | | | | | | | | | | | * | | | | * | * | |
| Slender Dodder-laurel | *Cassytha glabella* forma *dispar* | | | | | | | | | | | | * | | | | * | | | | | | | | | | | |
| Large Dodder-laurel | *Cassytha melantha* | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| *Spike Centuary | *Centaurium spicatum* | | | | | | | | | | * | | | | * | * | | | | | | | | | | | | |
| *Fat Hen | *Chenopodium album* | | | | | | | | | | | | | | | | | | | | | * | | | | | | |
| *Nettle-leaved Goosefoot | *Chenopodium murale* | | | * | | | | | * | * | | | | | | | | | | * | | | | | | | | |
| Common Everlasting | *Chrysocephalum apiculatum* | | | | | | | | | | | | | | * | | | | | | * | | | | * | | | |
| Desert Poplar | *Codonocarpus cotinifolius* | | | | | | | | | | | | | | | | * | | | | | | | | | | | |
| Love Creeper | *Comesperma volubile* | | | | | | | | | | | | | | | | * | | | | * | | | | | | | |
| Common Correa | *Correa reflexa* var. *reflexa* | | | * | | * | | | | * | | | * | | | | | | | | | | | | | | | |
| Dense Stonecrop | *Crassula colorata* var. *colorata* | | | | | | | | | * | | | | | | | | | | | | | | | | | | |
| Australian Crassula | *Crassula sieberana* ssp. *sieberana* | | | | | | | | | | | | | | * | | | | | | | | * | | * | | | |
| Bluebush Daisy | *Cratystylis conocephalus* | | | | | | | | | | | | | | * | | | | | | | | | | | | | |
| White-top | *Danthonia caespitosa* | | | * | | | | | | * | * | | | | * | | | | | | * | | | | | | | |
| Slender Wallaby-grass | *Danthonia racemosa* var. *racemosa* | | | | | | | | | | | | | | * | * | | | | | | | | | | | | |
| Bristly Wallaby-grass | *Danthonia setacea* var. *setacea* | | | | | | | | | | | | | | * | * | | | | | | | * | | | | | |
| Native Carrot | *Daucus glochidiatus* | | | | | | | | | * | * | | | | * | * | | | | | | | | | | | | |
| Black-anther Flax Lily | *Dianella revoluta* | | | * | | | | | | | | | * | | * | | * | | * | | | | * | * | * | | * | |

**Table 11. (cont'd)** Plant species from the Far West Coast islands.

| Common name | Scientific name | Lounds Island | Purdie Island | St Francis Island | Smooth Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Round-leaved Pigface | *Disphyma crassifolium* | * | * | * | * | * | * | * | * | * | | * | * | * | * | * | * | | * | * | | | * | * | * | | * | |
| Twin-horned Copperburr | *Dissocarpus biflorus* var. *biflorus* | | | * | | | | | * | | | | | | * | | | | | | | | | | | | | |
| Emu-grass | *Distichlis distichophylla* | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Crinkled Hop-bush | *Dodonaea baueri* | | | | | | | | | | | | | | | | | | | | * | * | * | | | | | |
| Narrow-leaved Hop-bush | *Dodonaea viscosa* ssp. *angustissima* | | | | | | | | | | | | | | | | | | | | | | | | | * | | |
| Sticky Hop-bush | *Dodonaea viscosa* ssp. *spatulata* | | | * | | | | | | | | | | | | | | | | | | | | | * | | | |
| Climbing Saltbush | *Einadia nutans* ssp. *eremaea* | | | | | | | | | | | | * | | | | | | | | | | | | | | | |
| Native Wheat-grass | *Elymus scabrus* | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| Ruby Saltbush | *Enchylaena tomentosa* var. *tomentosa* | * | * | * | * | * | * | * | * | * | | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| Turkey Bush | *Eremophila deserti* | | | | | | | | | | | | | | | | * | | | | * | * | | | | | | |
| Tar Bush | *Eremophila glabra* | | | * | * | * | | | | * | | | * | | | | | | * | | * | | * | * | | | | |
| *Common Stork's Bill | *Erodium cicutarium* | | | | | | | | | * | | | | | * | | | | | | | * | | | | * | | |
| Blue Stork's Bill | *Erodium cygnorum* ssp. *glandulosum* | | | | | | | | | | | | | | | | | | | | | * | * | | | * | * | |
| Kangaroo Island White Mallee | *Eucalyptus anceps* | | | | | | | | | | | | | | | | * | | | | | | | | | | | |
| South Australian Blue Gum | *Eucalyptus leucoxylon* ssp. *leucoxylon* | | | | | | | | | | | | | | | | * | | | | | | | | | | | |
| | *Eucalyptus* sp. | | | | | | | | | | * | | | | | | | | | | | | | | | | | |
| *Sea Spurge | *Euphorbia paralias* | | | | | | | | | | | | | | * | | | | | | | | | | | | | |

**Table 11. (cont'd)** Plant species from the Far West Coast islands.

| Common name | Scientific name | Lounds Island | Purdie Island | St Francis Island | Smooth Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Leafless Ballart | *Exocarpos aphyllus* | | | * | | | | | | | * | | | | | | | | | | | * | * | | | | | |
| Coast Ballart | *Exocarpos syrticola* | | | * | | | | | | | | | * | | | | | | * | | | | | | | | | |
| | *Frankenia cordata* | * | * | * | | * | * | | | * | | | * | * | * | * | * | * | * | * | | | | * | | | | |
| | *Frankenia eremophila* | | | | * | * | | * | | | | | | | * | | | | | | | | | | | | | |
| Common Sea-heath | *Frankenia pauciflora* var. *fruticulosa* | | | * | | | * | | | | | | * | | * | * | | | | | | | | | | | | |
| Small-leaved Sea-heath | *Frankenia sessilis* | * | * | * | * | * | | * | * | * | | | * | * | * | * | | | * | * | | | | | | | | |
| *White-flower Fumitory | *Fumaria capreolata* ssp. *capreolata* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| *Bedstraw | *Galium spurium* ssp. *ibicinum* | | | | | | | | | | * | | | | | | | | | | | | | | | | | |
| *Nit Grass | *Gastridium phleoides* | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Sheep Bush | *Geijera linearifolia* | | | * | | | | | | | | | * | | * | | * | | * | | * | * | * | * | | | | |
| | *Geranium* sp. | | | | | | | | | | | | | | | | | | | | | | * | | * | | | |
| Woolly Yellow-heads | *Gnephosis skirrophora* | | | * | | | * | | | * | * | | | | | | | | | | | | | | | | | |
| Hop Goodenia | *Goodenia ovata* | | | | | | | | | | | | | | | | | | | | * | | | | | | | |
| Sticky Goodenia | *Goodenia varia* | | | | | | | | | | | | | | | | * | | | | | | | | | | | |
| *Thread Iris | *Gynandriris setifolia* | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| *Common Barb-grass | *Hainardia cylindrica* | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| Grey Samphire | *Halosarcia halocnemoides* ssp. *halocnemoides* | * | * | * | | * | * | * | * | * | | | * | * | | | * | | * | * | | | * | * | * | | | * |
| Coast Everlasting | *Helichrysum leucopsideum* | | | | | | * | | | | | | | | * | | | | | | | | | | | | | |

**Table 11. (cont'd)** Plant species from the Far West Coast islands.

| Common name | Scientific name | Lounds Island | Purdie Island | St Francis Island | Smooth Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mallee Hemichroa | *Hemichroa diandra* | | | * | * | * | * | | | * | * | | | | | | | | | | | | | | | | | |
| *Barley-grass | *Hordeum leporinum* | | | * | | | | | * | | * | | | | * | * | | | | | | | | | * | | | |
| *Oval Purse | *Hymenolobus procumbens* | | | * | | | | | | | * | | | | | | | | | | | | | | | | | |
| Knobby Club-rush | *Isolepis nodosa* | | | | | | | | | | | | | | | | * | | * | | | | | | | | | |
| Stalked Ixiolaena | *Ixiolaena supina* | | | | | | | | | | | | | | | | | | | | | | | * | | | | |
| Woolly Ixiolaena | *Ixiolaena tomentosa* | | | * | | * | | | | * | | | | | | | | | | | | | | * | | | | |
| Coast Velvet-bush | *Lasiopetalum discolor* | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| Australian Hollyhock | *Lavatera plebeia* | | | * | | | | | * | * | * | | | * | * | * | | | | * | | | * | * | * | * | * | |
| Clustered Lawrencia | *Lawrencia glomerata* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| Salt Lawrencia | *Lawrencia spicata* | | | * | | * | | | | | | | | | | | | | | | | | | | | | | |
| Thorny Lawrencia | *Lawrencia squamata* | | | * | * | * | * | * | * | * | | | * | | | | | | | | | | | | | | | |
| Leafy Peppercress | *Lepidium foliosum* | | | | | | | | | | | | | | * | * | | | | | | | | | | | | |
| Common Peppercress | *Lepidium hyssopifolium* | | | | | | * | | | * | | | | | | | | | | | | | | | | | | |
| Button Immortelle | *Leptorhynchus waitzia* | | | | | | | | | | | | | | * | | | | | | | | | | | | | |
| Coastal Beard-heath | *Leucopogon parviflorus* | | | | | | | | | | | | | | | | | | | | | | | | | | | * |
| *Italian Ryegrass | *Lolium multiflorum* | | | | | | | | | | | | | | | | | | | | | * | | | | | | |
| *Perennial Ryegrass | *Lolium perenne* | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| *Wimmera Ryegrass | *Lolium rigidum* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| Sandhill Mat-rush | *Lomandra collina* | | | | | | | | | | | | | | | | * | | | | * | | | | | | | |

Table 11. (cont'd) Plant species from the Far West Coast islands.

| Common name | Scientific name | Lounds Island | Purdie Island | St Francis Island | Smooth Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Annual Cat's-tail | *Lophochloa cristata* | | | * | | | | | | | | | | | | | | | | | | | * | | * | | | |
| Australian Boxthorn | *Lycium australe* | | | * | | | | | * | | | | * | | | | * | | | | | | * | * | | | | |
| *African Boxthorn | *Lycium ferocissimum* | * | | * | | * | * | * | * | * | | | * | * | * | | | | | | * | * | * | * | * | * | * | |
| Small-leaved Bluebush | *Maireana brevifolia* | | | | | | | | | | | | | | * | * | | | | | | | | | | | | |
| Rosy Bluebush | *Maireana erioclada* | | | | | | | | | | | | | | | | | | | | * | * | | | | | | |
| Heath Broombush | *Maireana oppositifolia* | | | * | * | * | | | * | * | | | | | * | * | * | | * | | | * | | * | * | | | * |
| *Marshmallow | *Malva parviflora* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| Malvastrum | *Malvastrum americanum* | | | | | | | | | | | | | | | | | | | | | * | | | | * | | |
| *Spotted Medic | *Medicago arabica* | | | | | | | | | | | | | | | | | | | | * | * | | | | * | * | |
| *Woolly Burr Medic | *Medicago polymorpha* var. *polymorpha* | | | * | | | | | | | | | | | | | | | | | | | * | | * | | | |
| *Barrel Medic | *Medicago truncatula* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| Dryland Tea-tree | *Melaleuca lanceolata* | | | * | | | | | | | | | * | | | | * | | | | * | | | | | | | |
| *King Island Melilot | *Melilotus indica* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| *Common Iceplant | *Mesembryanthemum crystallinum* | * | * | * | * | * | * | * | * | * | | | * | * | * | * | | | | * | | * | * | * | * | * | * | |
| *Slender Sandwort | *Minuartia hybrida* | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Climbing Lignum | *Muehlenbeckia adpressa* | | | * | | | | | | | | | | | | | | | | | | | * | | | | | |
| Coastal Lignum | *Muehlenbeckia gunnii* | | | | | | | | | | | | * | | | | | | | | | | | | | | | |
| Native Myrtle | *Myoporum acuminatum* | | | * | | | | | | | | | * | | * | * | | | | | | | | | | | | |

**Table 11. (cont'd)** Plant species from the Far West Coast islands.

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Native Juniper/Boobialla | *Myoporum insulare* | | | * | * | * | * | * | * | * | | | * | | * | * | * | | * | | | | | | | | | |
| Creeping Boobialla | *Myoporum parvifolium* | | | | | | | | | | | | | | | | | | | | * | | * | | | | | |
| Sticky Boobialla | *Myoporum viscosum* | | | | | | | | | | | | | | * | | | | | | | | | | | | | |
| Coast Tobacco | *Nicotiana maritima* | | | | | | | | | | | | | | * | * | | | | | | | | | | | | |
| Nitre-bush | *Nitraria billardierei* | * | * | * | * | * | * | * | * | * | | | * | * | * | * | | * | * | * | * | * | | * | * | | | |
| *Olive | *Olea europaea* ssp. *europaea* | | | | | | | | | | | | | | | | * | | | | | | | | | | | |
| Coast Daisy-bush | *Olearia axillaris* | | | * | | | * | | | * | | | * | | * | * | * | | * | | * | | * | * | | | | * |
| Twiggy Daisy-bush | *Olearia ramulosa* | | | | | * | * | | | * | | | * | | * | | | | | | | | | | | | | |
| *Creeping Oxalis | *Oxalis corniculata* ssp. *corniculata* | | | * | | | | | | | * | | * | | | | * | | | | | | * | * | * | | | |
| *Soursob | *Oxalis pes-caprae* | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| *Curly Ryegrass | *Parapholis incurva* | | | * | | * | * | | * | * | * | | | | * | | | | | | | | | | | | | |
| Smooth Nettle | *Parietaria debilis* | | | | | | | | | | | | | | * | | | | | | | * | | | | | | |
| Austral Stork's Bill | *Pelargonium australe* | | | * | * | * | * | * | * | * | | | * | | * | | | | | | | | | * | | | | |
| Mallee Riceflower | *Pimelea microcephala* ssp. *microcephala* | | | * | | | | | | | | | * | | | | | | | | | | | | | | | |
| Thyme Riceflower | *Pimelea serpyllifolia* ssp. *serpyllifolia* | | | * | | | * | | | | | | * | | | | | | | | | | | | | | | |
| Weeping Pittosporum | *Pittosporum phylliraeoides* var. *microcarpa* | | | | | | | | | | | | | | | | * | * | | | | | | | * | | | |
| *Hairy Plantain | *Plantago bellardii* | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| | *Plantago hispida* | | | | | | | | | | | | | | | | | | | | | | | * | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Variable Plantain | *Plantago varia* | | | | | | | | | * | | | | | | | | | | | | | | | | | | |
| *Winter Grass | *Poa annua* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| Coast Tussock Grass | *Poa poiformis* var. *poiformis* | | | * | | | | | | | | | * | | * | | * | * | * | | | | | * | | * | * | * |
| | *Pseudognaphalium luteoalbum* | | | | | | | | | | | | | | * | * | | | | | | | | | * | | | |
| Smokebush | *Ptilotus obovatus* var. *obovatus* | | | | | | | | | | | | | | | | * | | | | | | | | | | | |
| Seaberry Saltbush | *Rhagodia candolleana* ssp. *candolleana* | * | * | * | | * | * | * | * | * | | | * | * | | | * | * | * | | * | * | * | * | | * | * | * |
| Fleshy Saltbush | *Rhagodia crassifolia* | | | | * | * | * | * | | | | | | | * | * | | | | | | | | | * | | | |
| *Guildford Grass | *Romulea rosea* var. *australis* | | | | | | | | | | | | | | | | | | | | * | | | | | | | |
| Buckbush | *Salsola kali* | * | | * | | | * | | | | | | | | * | * | * | | * | * | * | * | * | | * | | | |
| Creeping Brookweed | *Samolus repens* | | | * | * | * | * | * | | * | | | * | | * | * | * | | * | | | | | | * | | | |
| Quondong | *Santalum acuminatum* | | | | | | | | | | | | | | | | * | | | | | * | | | | | | |
| Thick-headed Samphire | *Sarcocornia blackiana* | | | | * | | | | | | | | | | | | | | | | | | | | | | | |
| Beaded Samphire | *Sarcocornia quinqueflora* | | | | | | | | | | | | | | | | * | | * | | | | * | | | | | * |
| Cushion Fanflower | *Scaevola crassifolia* | | | * | | | * | | | | | | | | * | * | | | * | | * | | * | * | | | | * |
| Spiny Fanflower | *Scaevola spinescens* | | | | | | | | | | | | | | | | | | | | | * | | | | | | |
| Bassia | *Sclerolaena uniflora* | | | * | * | * | | * | * | * | | | * | * | * | * | * | * | | | | * | | | | | | |
| Slender Groundsel | *Senecio glossanthus* | | | | | | | | | | | | | | | | | | | | | | * | | * | | | |
| Variable Groundsel | *Senecio lautus* | | | * | * | * | * | | * | * | | | | | * | * | * | | * | | | | * | * | * | * | | |

**Table 11. (cont'd)** Plant species from the Far West Coast islands.

| Common name | Scientific name | Lounds Island | Purdie Island | St Francis Island | Smooth Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Mediterranean Catchfly | *Silene nocturna* ssp. *nocturna* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| *Smooth Mustard | *Sisymbrium erysimoides* | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| *London Rocket | *Sisymbrium irio* | | | | | | | | | | | | | | * | | | | | | | | * | | * | | | |
| *Hedge Mustard | *Sisymbrium orientale* | | | * | | | | | | | | | | | * | * | | | | | * | * | | | | * | * | |
| *Prickly Sow-thistle | *Sonchus asper* ssp. *asper* | | | | | | | | | | | | | | | * | | | | | * | * | | * | * | * | * | |
| Dune Thistle | *Sonchus megalocarpus* | | | | | | | | | | | | | | * | | | | | | | | | | | | | |
| Common Sow-thistle | *Sonchus oleraceus* | | | * | | * | * | | | * | * | | | | * | * | | | | | | | * | | * | | | |
| | *Spergularia bocconii* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| Salt Sand-spurrey | *Spergularia marina* | | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| *Coast Sand-spurrey | *Spergularia media* | | | * | * | * | | * | | | * | | | | | | | | | | | | | | | | | |
| *Red Spurrey | *Spergularia rubra* | | | | | | | | * | | * | | | | | | | | | | | | | | | | | |
| Rolling Spinifex | *Spinifex sericeus* | | | * | | | | | | | | | | | * | * | * | | * | | | | | | | | | |
| Salt Couch | *Sporobolus virginicus* | | | * | | * | | | * | | | | | | * | * | | | | | | | | | | | | |
| Cottony Spear-grass | *Stipa drummondii* | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| Elegant Spear-grass | *Stipa elegantissima* | | | * | | | | | | | | | * | | | | * | * | | | * | | * | * | | * | * | |
| Desert Spear-grass | *Stipa eremophila* | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Spear-grass | *Stipa flavescens* | | | * | | * | * | | | | * | | | | | | | | | | | | | | | | | |
| Corkscrew Grass | *Stipa setacea* | | | | | | | | | * | * | | | | | | | | | | | | | | | | | |
| Coast Spear-grass | *Stipa stipoides* | | | | | | | | | | | | | | * | * | | | | | | | | | | | | |

Table 11. (cont'd) Plant species from the Far West Coast islands.

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Austral Seablite | *Suaeda australis* | | | | | | | | | | | | | | | | * | | * | | | | * | | | | | |
| Cockie's Tongue | *Templetonia retusa* | | | * | | * | | | | | * | | * | | | | * | | | | | | * | | | | | |
| New Zealand Spinach | *Tetragonia implexicoma* | * | * | * | | * | * | * | * | * | * | | * | | * | * | * | | * | | * | * | * | * | * | | | * |
| Camel Bush | *Teucrium sessiliflorum* | | | | | | | | | | | | | | | | | | | | * | | | | | | | |
| Coast Bonefruit | *Threlkeldia diffusa* | * | * | * | * | * | * | * | * | * | | | * | | * | * | * | | * | | * | * | * | * | | | | * |
| Mallee Fringe-lily | *Thysanotus baueri* | | | | | | | | | | | | | | * | | | | | | | | | | | | | |
| *Hare's-foot Clover | *Trifolium arvense* | | | | | | | | | | | | | | | | | | | | * | * | | | | | | |
| Dwarf Arrowgrass | *Triglochin centrocarpum* | | | | | | | | | | * | | | | | | | | | | | | | | | | | |
| Prickly Arrowgrass | *Triglochin mucronatum* | | | * | | | | | * | | | | | | | | | | | | | | | | | | | |
| Spinifex | *Triodia irritans* var. *irritans* | | | * | | | | | | | | | * | | | | | | | | | | | | | | | |
| *False Hawkbit | *Urospermum picroides* | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| Common New Holland Daisy | *Vittadinia dissecta* var. *hirta* | | | | | | | | | | | | | | * | | * | | | | | | * | * | * | | | |
| *Rat's-tail Fescue | *Vulpia myuros* | | | | | | | | | | | | | | | | | | | | | | | | | * | * | |
| Shore Westringia | *Westringia dampieri* | | | * | * | * | | | | * | | | * | | | | * | | | | | | * | | * | | | |
| Stiff Western Rosemary | *Westringia rigida* | | | * | | | | | | | | | | | | | * | | | | | | | | | | | |
| Narrow-leaved Wilsonia | *Wilsonia backhousei* | | | | | * | | | | | | | | | | | | | | | | | | | * | | | |
| Silky Wilsonia | *Wilsonia humilis* var. *humilis* | | | | | | * | | | | * | | | | | | | | | | | | | | | | | |
| Early Nancy | *Wurmbea dioica* ssp. *dioica* | | | | | | | | | | | | | | * | | | | | | * | * | * | * | | | | |

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| Common name | Scientific name | Lounds Island | Purdie Island | St Francis Island | Smooth Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pointed Twinleaf | *Zygophyllum apiculatum* | | | | | | | | | | | | | | | | | | | | * | | * | | | | | |
| Coast Twinleaf | *Zygophyllum billardierei* | * | | * | | * | * | | | | | | * | | | | * | | * | | * | * | | * | | * | | |

Data in this table is from the following sources: **LOUNDS ISLAND**–Helicopter landing for 15 min on 25/4/82; **PURDIE ISLAND**–Helicopter landing for 1 hr 10 min on 25/4/82; **ST FRANCIS ISLAND**–Royal Society Expedition 5–13/1/71, Helicopter based expedition 18–22/4/82, The Brush–tailed Bettong reintroduction program 20/5/81, 28–30/1/82, 3–9/4/84, 27–29/3/85, 9–14/2/86, 8/9/87, 21/28/10/88, **SMOOTH ISLAND** (N. Wace pers. comm.); **EGG ISLAND**–Helicopter landing for 1 hr on 21/4/82; **DOG ISLAND**–Royal Society Expedition 7–8/1/71, Helicopter landing for 3 hr 30 min on 21/4/82; **FREELING ISLAND**–Helicopter landing for 1 hr on 21/4/82; **WEST ISLAND**–Helicopter landing for 3 hr 20 min on 20/4/82; **MASILLON ISLAND**–Royal Society Expedition 6–7/1/71, Helicopter landing for 3 hr 15 min on 20/4/82; **FENELON ISLAND**–Helicopter landing for 2 hr on 20/4/82; **HART ISLAND**–Helicopter landing for 1 hr on 4/9/80; **LACY ISLAND**–Helicopter landings for 4 hr on 21 & 22/4/82; **EVANS ISLAND**–Helicopter landing for 3 hr on 21/4/82; **THE FRANKLIN ISLANDS** (Osborn, 1922), Boat Expedition 3–11/3/70, (Robinson, 1970), Boat Expedition 10–12/4/71, Helicopter landing for 1 hr 15 min on 4/9/80, Helicopter based expedition 15–18/4/82, The Stick–nest Rat ecological studies 20–26/10/83, 6–19/12/83, 13–28/2/84, 1–12/5/84, 20–24/6/84,27/10–6/11/84, 14–20/1/85, 21–31/5/85, 4–14/11/85, 27/1–7/2/86, 4–16/6/86 (Copley 1988); **ST PETER ISLAND**–Helicopter landings for 11 hr 30 min on 23 & 24/4/82, The Brush–tailed Bettong re–introduction program 18–21/10/88, 17–20/1/90; **GOAT ISLAND**–Helicopter landings for 1day 3 hr on 23 & 24 /4/82; **EYRE ISLAND**–Boat landing for 4 hr on 10/3/70, Helicopter landing for 8 hr on 24/4/82; **OLIVE ISLAND**–Helicopter landing for 4 hr on 16/4/82; **EBA ISLAND**–Boat landing for 2 hr 45 min on 21/6/83; **PIGFACE ISLAND**–Boat landing for 1 hr 30 min on 21/6/82; **BAIRD ISLAND**–Boat landings 2–3/6/79, The Brush–tailed Bettong program 5/7/82, 16–17/3/83, 3–4/8/83, 11/11/83, 13/9/84, 15/1/85, 28/6/85, 6/10/85, 6/2/86, 3–4/3/88, 10–13/8/88, 15–16/8/89; **JONES ISLAND**–Boat landing for 1 hr 20 min on 22/6/83; **ISLAND A VENUS BAY**–Boat landings 2–3/6/79, The Brush–tailed Bettong program, 2/5/80, 7–8/8/80, 9/5/80, 20–21/10/80, 21/22/5/81, 4/6/82, 5/7/82, 15–16/3/83, 3–5/8/83, 8–10/11/83, 3–5/4/84, 11–15/9/84, 8–11/1/85, 21–22/1/85, 30/5/85, 27–30/8/85, 3–4/10/85, 7–9/2/86, 18–21/6/86, 4–9/10/86, 2–9/12/86, 1–9/3/87, 27/5–6/6/87, 25/8–1/9/87, 25–26/8/88, 12/16/9/89; **ISLAND B VENUS BAY**–Boat landings for 1 hr on 22/6/79, for 45 min on 22/6/83; **ISLAND C VENUS BAY**–Boat landings for 1 hr on 22/5/79, for 1 hr on 22/6/83, for 30 min on 13/9/89; **GERMEIN ISLAND**–Boat landing for 1 hr 30 min on 23/6/83.

**Table 12.** Mammal species from the Far West Coast islands.

| Common name | Scientific name | Nuyts Reef | Reef off Point Bell | Sinclair Island | Lounds Island | Purdie Island | St Francis Island | Dog Island | West Island | Freeling Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Baird Island | Jones Island | Island A–Venus Bay | Island B–Venus Bay | Island C–Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New Zealand Fur-seal | *Arctocephalus forsteri* | | | | | | | | | | | * | | | | | | | | | | | | | | | | |
| Brush-tailed Bettong | *Bettongia penicillata* | | | | | | 3 | | | | | | | | | | | 3 | | | | | * | | * | | | |
| Short-nosed/Southern Brown Bandicoot | *Isoodon obesulus* | | | | | | * | | | | | | | | | * | * | | | | | | | | | | | |
| Greater Stick-nest Rat | *Leporillus conditor* | | | | | | | | | | | | | | | * | * | | | | | | | | | | | |
| Tammar/Dama Wallaby | *Macropus eugenii* | | | | | | 1 | | | | | | | | | | | 1 | | | | | | | | | | |
| Western Grey Kangaroo | *Macropus fuliginosus* | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| *House Mouse | *Mus domesticus* | | | | | | | | | | | | | | | | | * | | | | | * | | * | | | |
| Australian Sea-lion | *Neophoca cinerea* | 4 | * | * | 4 | 4 | * | * | * | | * | 4 | * | | * | 4 | 4 | | | | 4 | | | * | | | | |
| Lesser Long-eared Bat | *Nyctophilus geoffroyi* | | | | | | | | | | | | | | | | | * | | | | | | | | | | |
| *European Rabbit | *Oryctolagus cuniculus* | | | | | | | | | | | | | | | | | | | | | | 1 | | | 1 | 1 | |
| Bush Rat | *Rattus fuscipes* | | | | | | | * | | * | | | | * | | | | | * | * | | | | | | | | |
| *Black/Ship Rat | *Rattus rattus* | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |

**Table 12.(cont'd)** Mammal species from the Far West Coast islands.

| Common name | Scientific name | Nuyts Reef | Reef off Point Bell | Sinclair Island | Lounds Island | Purdie Island | St Francis Island | Dog Island | West Island | Freeling Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Baird Island | Jones Island | Island A–Venus Bay | Island B–Venus Bay | Island C–Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brushtail Possum | *Trichosurus vulpecula* | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| *Red Fox | *Vulpes vulpes* | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | |

1. Skeletal remains only; 2. Tracks only; 3. Re-introduced population; 4. Breeding colony.

Data in this table is from the following sources: **NUYTS REEF**–Fixed wing overfly 1/77 and 12/77, Boat landing 3.3.90; **REEF OFF PT BELL**–Helicopter overfly on 25/4/82; **SINCLAIR ISLAND**–Helicopter overfly on 25/4/82; **LOUNDS ISLAND**–Helicopter Landing for 15 min on 25/4/82; **PURDIE ISLAND**–Helicopter landing for 1 hr 10 min on 25/4/82, Boat landing on 1/3/90; **ST FRANCIS ISLAND**–(Verco 1914) Royal Society Expedition 5–13/1/71 (Robinson & S myth 1976), Helicopter based Expedition 18–22/4/82, The Brush–tailed Bettong re–introduction program 20/5/81, 28–30/1/82, 3–9/4/84, 27–29/3/85, 9–14/2/86, 8/9/87, 21–28/10/88; **DOG ISLAND**–Royal Society Expedition 7–8/1/71 (Robinson & Smyth 1976), Helicopter landing for 3 hr on 21/4/82; **FREELING ISLAND**–Boat landing on 2/3/90; **WEST ISLAND**–Helicopter landing for 3 hr 20 min on 20/4/82, Boat landing on 2/3/90; **MASILLON ISLAND**–Royal Society Expedition 6–7/1/71 (Robinson & Smyth 1976), Helicopter landing for 3 hr 15 min on 20/4/82, Boat landing on 2/3/90; **FENELON ISLAND**–Helicopter landing for 2 hr on 20/4/82, Boat landings for 1 hr on 28/10/88 and on 2/3/90; **HART ISLAND**–Helicopter landing for 1 hr on 4/9/80, boat landing on 2/3/90; **LACY ISLAND**–Helicopter landings for 4 hr on 21 & 22 /4/82, Boat landing on 28/2/90; **EVANS ISLAND**–Helicopter landing for 3 hr on 21/4/82, Boat landing on 28/2/90; **THE FRANKLIN ISLANDS** (Wood–Jones 1922), Boat expedition 3–11/3/70 (Robinson 1975), Boat expedition 10–12/4/71, Helicopter landing for 1 hr 15 min on 4/9/80, Helicopter based expedition 15–18/6/84, The Stick–nest Rat ecological studies 20–26/10/83, 6–19/12/83, 13–28/2/84, 1–12/5/84, 20–24/6/84, 27/10–6/11/84, 14–20/1/85, 21–31/5/85, 4–14/11/85, 27/1–7/2/86, 4–16/6/86, (Copley 1988); **ST PETER ISLAND**–Helicopter landings for 11hr 30 min on 23 & 24/4/82, The Brush–tailed Bettong re–introduction program 18–21/10/88, 17–20/1/90; **GOAT ISLAND**–Helicopter landings for 1 day 3hr on 23 & 24/4/82; **EYRE ISLAND**–Boat landing for 4 hr on 10/3/70, Helicopter landing for 8hr on 24/4/82; **OLIVE ISLAND**–Helicopter for 4hr on 16/4/82; **EBA ISLAND**–Boat landings for 2 hr 45 min on 21/6/83; **BAIRD ISLAND**–Boat landings 2–3/6/79, The Brush–tailed Bettong program 5/7/82, 16–17/3/83, 3–4/8/83, 11/11/83, 13/9/84, 15/1/85, 26/6/85, 6/10/85, 6/2/86, 3–4/3/88, 10–13/8/88, 15–16/9/89; **JONES ISLAND**–Boat landing for 1 hr 30 min on 22/6/83; **ISLAND A VENUS BAY**–Boat landings 2–3/6/71, The Brush–tailed program 2/5/80, 7–8/8/80, 9/5/80, 20–21/10/80, 21–22/5/81, 4/6/82, 5/7/82, 15–15/3/83, 8–10/11/83, 3–5/4/84, 11–15/9/84, 8–11/1/85, 21–22/1/85, 30/5/85, 27–10/8/85, 3–4/10/85, 7–9/2/86, 18–21/6/86, 4–9/10/86, 2–9/12/86, 1–9/3/87, 27/5–6/6/87, 25/8–1/9/87, 25–26/8/88, 12–16/9/89; **ISLAND B VENUS** BAY–Boat landings for 1 hr on 22/6/79, for 45 hr on 22/6/83, **ISLAND C VENUS BAY**–Boat landings for 1 hr on 22/5/79, for 1 hr on 22/6/83, for 30 min on 13/9/89; **GERMEIN ISLAND**–Boat landing for 1 hr 30 min on 23/6/83.

**Table 13.** Bird species from the Far West Coast islands.

| Common name | Scientific name | Reef off Pt. Bell | Sinclair Island | Lounds Island | Purdie Island | St Francis Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Bird Rock | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common Sandpiper | *Actitis hypoleucos* | | | | | | | | | | | | | | | * | | | | | | | | | | | | | | |
| Australian Owlet-nightjar | *Aegotheles cristatus* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Chestnut Teal | *Anas castanea* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Australasian Grey Teal | *Anas gracilis* | | | | | | | | | | | | | | | * | | * | | | | | | | | | | | | |
| Pacific Black Duck | *Anas superciliosa* | | | | | | | | | | | | | | | * | | | | | | | | | | | | | | |
| Red Wattle Bird | *Anthochaera carunculata* | | | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Richard's Pipit | *Anthus novaeseelandiae* | | | * | | * | * | | * | * | * | * | | | * | | | * | * | | | | | | * | | * | * | * | |
| *Skylark | *Alauda atvensis* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Fork-tailed Swift | *Apus pacificus* | | | | | | | | | | | | | | | * | | | | | | | | | | | | | | |
| Great/White Egret | *Ardea alba* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Little Egret | *Ardea garzetta* | | | | | | | | | | | | | | | | | | | | | | | | * | | | | | |
| White-faced Heron | *Ardea novaehollandiae* | | | | | * | | * | * | * | | | | | * | * | * | * | * | | * | | * | | | * | | | | * |
| Eastern Reef Egret/ Reef Heron | *Ardea sacra* | | | | | * | | | | | | | | | | * | | * | | | | | | | | | | | | |
| Ruddy Turnstone | *Arenaria interpres* | | | * | * | | | * | * | | | | * | | | * | * | * | | | * | * | | | | | | | | |
| Black-faced Wood-swallow | *Artamus cinereus* | | | | | | | | | | | | | | | * | | | | | | | | | | | | | | |
| Dusky Wood-swallow | *Artamus cyanopterus* | | | | | | | | | | | | | | | * | | * | | | | | | | | | | | | |

**Table 13. (cont'd)** Bird species from the Far West Coast islands.

| Common name | Scientific name | Reef off Pt. Bell | Sinclair Island | Lounds Island | Purdie Island | St Francis Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Bird Rock | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sharp-tailed Sandpiper | *Calidris acuminata* | | | | | | | | | | | | | | | * | | * | | | | * | | | | | | | | |
| Sanderling | *Calidris alba* | | | | * | | | | * | | | | | | | * | | * | | | | | | | | | | | | |
| Red Knot | *Calidris canutus* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Curlew Sandpiper | *Calidris ferruginea* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Pectoral Sandpiper | *Calidris melanotos* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Red-necked Stint | *Calidris ruficollis* | | | * | * | | | | | | | | | | | * | | * | | | * | | | | | | | | | |
| Great Knot | *Calidris tenuirostris* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Cape Barren Goose | *Cereopsis novaehollandiae* | | | * | | * | | * | * | * | * | | | | | * | * | * | | | | * | | | | | | | | |
| Double-banded Dotterel/Plover | *Charadrius bicinctus* | | | | | | | | | | | | | | | * | | | | | | | | | * | | | | | |
| Hooded Dotterel/Plover | *Charadrius rubricollis* | | | | | * | | | | | | | | | | * | * | * | | | | | | | | | | | | |
| Red-capped Dotterel/Plover | *Charadrius ruficapillus* | | | | | | | | | | | | | | | * | * | * | | | * | | | | * | | | | | |
| Horsfield's/Rufous-tailed Bronze Cuckoo | *Chrysococcyx basalis* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Brown Songlark | *Cincloramphus cruralis* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Swamp/Marsh Harrier | *Circus approximans* | | | | | | | | | | | | | | | * | | * | | | * | | | | * | | | * | | |
| Spotted Harrier | *Circus assimilis* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Banded Stilt | *Cladorhynchus leucocephalus* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | * |
| *Feral Pigeon/Rock Dove | *Columba livia* | | | | | | | | | | | | | | | | | * | | | | | * | * | | | | | | |

Table 13. (cont'd) Bird species from the Far West Coast islands.

| Common name | Scientific name | Reef off Pt. Bell | Sinclair Island | Lounds Island | Purdie Island | St Francis Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Bird Rock | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black-faced Cuckoo-shrike | *Coracina novaehollandiae* | | | | | | | | | | | | | | | * | | * | | | * | | * | | * | | * | * | | |
| Little Crow | *Corvus bennetti* | | | | | | | | | | | | | | | * | * | | | | | | | | | | | | | |
| Australian Raven | *Corvus coronoides* | | | | | * | * | * | | | * | | | | | | * | * | * | | | | | | | | | | | |
| Little Raven | *Cornus mellori* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Stubble Quail | *Coturnix novaezelandiae* | | | | | | | | | | | | | | * | * | * | * | | | | | * | | * | | | | | |
| Grey Butcherbird | *Cracticus torquatus* | | | | | | | | | | | | | | | | | * | | | * | | * | | | | | | | |
| Black Swan | *Cygnus atratus* | | | | | | | | | | | | | | | | | * | | | * | | | | | | | | | |
| Galah | *Eolophus roseicapillus* | | | | | | | | | | | | | | | | | | * | | | | | | | | | | * | |
| White-fronted Chat | *Ephthianura albifrons* | | | | | | | | | | | | | | | * | * | * | | | | | | | | | * | | | |
| Crimson Chat | *Ephthianura tricolor* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Little/Fairy Penguin | *Eudyptula minor* | | | * | | 1 | * | * | * | | | * | | | * | * | * | 1 | * | | * | | | | | | | | | |
| Spotted Nightjar | *Eurostopodus argus* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Brown Hawk/Falcon | *Falco berigora* | | | | | | | | | | | | | | | | | * | * | | | | | | | | | | | |
| Australian Kestrel | *Falco cenchroides* | | | | | * | * | * | | | | | | * | * | * | * | * | * | | * | | | | | | | | | |
| Peregrine Falcon | *Falco peregrinus* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Black-tailed Native-hen | *Galinula ventralis* | | | | | | | | | | | | | | | * | | * | | | | | | | | | | | | |
| Banded/Buff-banded Rail | *Gallirallus philippensis* | | | | | * | | | | | | | | | * | | * | * | * | | * | | | | | | | | | 1 |
| Tawny-crowned Honeyeater | *Gliciphila melanops* | | | | | | | | | | | | | | | | | | | | * | | | | | | * | | | |

**Table 13. (cont'd)** Bird species from the Far West Coast islands.

| Common name | Scientific name | Reef off Pt. Bell | Sinclair Island | Lounds Island | Purdie Island | St Francis Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Bird Rock | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Magpie-lark | *Grallina cyanoleuca* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Sooty Oystercatcher | *Haematopus fuliginosus* | | | * | * | | * | * | * | * | * | * | * | | * | * | * | * | * | | * | | * | * | * | * | * | * | * | * |
| Pied Oystercatcher | *Haematopus ostralegus* | | | | | | | | | | | | | | | | | * | | | * | | * | | * | | * | * | * | * |
| White-bellied Sea-eagle | *Haliaeetus leucogaster* | | | | | * | * | * | | | | | | * | * | * | * | 2 | * | | | * | | | * | | * | | | |
| Welcome Swallow | *Hirundo neoxena* | | | | | * | * | * | * | | * | * | * | * | * | * | * | * | * | | | | | * | * | * | * | * | * | * |
| Tree Martin | *Hirundo nigricans* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Masked/Spur-winged Plover | *Hoplopterus miles* | | | * | * | * | * | * | * | * | * | | | * | * | * | * | * | * | | * | | | | | * | * | | | |
| Caspian Tern | *Hydroprogne caspia* | | | | | | | | | | | | | | | * | * | * | | | | | | | | | * | | | |
| Silver Gull | *Larus novaehollandiae* | | | | | * | | | | | | | * | | * | * | * | * | * | * | * | | 1 | * | * | * | * | * | * | * |
| Pacific Gull | *Larus pacificus* | | | | | * | * | * | * | | * | * | * | * | * | * | * | * | | | * | | | | | | * | * | * | * |
| Black-faced Shag/Cormorant | *Leucocarbo fuscescens* | * | | | | | | | | | | | | | * | * | * | * | | * | | | * | * | | * | | * | | * |
| Bar-tailed Godwit | *Limosa lapponica* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Noisy Miner | *Manorina melanocephala* | | | | | | | | | | | | | | | | | | | | | | * | | | | | | | |
| Little Grassbird | *Megalurus gramineus* | | | | | | | | | | | | | | | | | | | | | | | | | * | | | | |
| Singing Honeyeater | *Meliphaga virescens* | | | | * | * | * | | | * | * | * | | * | * | * | * | * | | | * | | * | * | * | | * | * | | * |
| Australasian Gannet | *Morus serrator* | | | | | | | | | | | | | | | * | | | | | | | | | | | | | | |
| Rock Parrot | *Neophema petrophila* | | | * | * | * | * | * | * | * | | * | | * | * | * | * | * | * | | * | * | | | | * | * | * | * | |

Table 13. (cont'd) Bird species from the Far West Coast islands.

| Common name | Scientific name | Reef off Pt. Bell | Sinclair Island | Lounds Island | Purdie Island | St Francis Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Bird Rock | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eastern Curlew | *Numenius madagascarensis* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Whimbrel | *Numenius phaeopus* | | | | | | | | | | | | | | | | | * | | | * | | | | | | | | | |
| Osprey | *Pandion haliaetus* | | | | | * | | | | | | | | | | * | * | 2 | | | | | | | * | | | | | |
| *House Sparrow | *Passer domesticus* | | | | | | | | | | | | | | | | | | | | | | | | | * | | | | |
| White-faced Storm-petrel | *Pelagodroma marina* | | | | | | | | | | | * | | | * | * | * | | | | | | | | | | | | | |
| Australian Pelican | *Pelecanus conspicillatus* | | | | | | | | | | | | | | | * | | * | | * | * | | | | * | 1 | * | * | 1 | |
| Great/Black Cormorant | *Phalacrocorax carbo* | | | | | | | | | | | | | | | * | | * | | | | | | | | * | | | | |
| Little Pied Cormorant | *Phalacrocorax melanoleucos* | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| Little Black Cormorant | *Phalacrocorax sulcirostris* | | | | | | | | | | | | | | | | | | | | | | | * | | | | * | | |
| Pied Cormorant | *Phalacrocorax varius* | | * | * | | * | | | | | | | | | | * | * | * | * | | * | | | | * | | | | | |
| Common Bronzewing | *Phaps chalcoptera* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Brush Bronzewing | *Phaps elegans* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Lesser Golden Plover | *Pluvialis squatarola* | | | | | | | | | | | | | | | | | * | | | * | | | | | | | | | |
| Short-tailed Shearwater | *Puffinus tenuirostris* | | | | | 1 | * | * | * | | * | | | * | * | * | * | 1 | * | | | | | | | | | | | |
| Willie Wagtail | *Rhipidura leucophrys* | | | | | | | | | | | | | | | * | | | | | | | | * | | * | | | | |
| Fairy Tern | *Sterna nereis* | | | * | | | | | | | | | * | | | * | * | * | | | | | | | * | | | | | |
| *Common/European Starling | *Sturnus vulgaris* | | | * | | * | | | | | | | | | | * | * | * | | | * | | * | | | * | | * | * | |
| Crested Tern | *Thalasseus bergii* | * | * | * | * | | | * | * | * | | | * | | | * | * | * | | * | * | | * | | | * | | | | * |

**Table 13. (cont'd)** Bird species from the Far West Coast islands.

| Common name | Scientific name | Reef off Pt. Bell | Sinclair Island | Lounds Island | Purdie Island | St Francis Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Hart Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Bird Rock | Eyre Island | Olive Island | Eba Island | Pigface Island | Baird Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay | Germein Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Greenshank | *Tringa nebularia* | | | | | | | | | | | | | | | * | | * | | | * | | | | | | | | | |
| Painted Button-quail | *Turnix varia* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | | |
| Barn Owl | *Tyto alba* | | | | | | | | | | | | | | | * | * | * | | | | | | | | | | | | |

1. Breeding colony; 2. Nesting recorded.

Data in this table is from the following sources: **REEF OFF PT BELL**–Helicopter overfly on 15/4/82; **SINCLAIR ISLAND**–Helicopter overfly on 25/4/82; **LOUNDS ISLAND**–Helicopter landing for 15 min on 25/4/82; **PURDIE ISLAND**–Helicopter landing for 1 hr 10 min on 25/4/82; **ST FRANCIS ISLAND**–(Verco 1935) Royal Society Expedition 5–13/1/71 (Robinson & Smyth 1976), Helicopter based Expedition 18–22/4/82, The Brush–tailed Bettong reintroduction program 20/5/81, 28–30/1/82, 3–9/4/84, 27–29/3/85, 9–14/2/86, 8/9/87, 21–28/10/88; **EGG ISLAND** — Helicopter landing for 1 hr on 21/4/82; **DOG ISLAND**–Royal Society Expedition 7–8/1/71 (Robinson & Smyth 1976), Helicopter landing for 3 hr on 21/4/82; **FREELING ISLAND**–Helicopter landing for 1 hr on 21/4/82, **WEST ISLAND**–Helicopter landing for 1 hr 20 min on 20/4/82; **MASILLON ISLAND**–Royal Society Expedition 6–7/1/71 (Robinson & Smyth 1976), Helicopter landing for 3 hr 15 min on 20/4/82, **FENELON ISLAND**–Helicopter landing for 2 hr on 20/4/82; **HART ISLAND**–Helicopter landing for 1 hr on 4/9/80; **LACY ISLAND**–Helicopter landing for 4 hr on 21 & 22/4/82; **EVANS ISLAND**–Helicopter landing for 3 hr on 21/4/82; **THE FRANKLIN ISLANDS**–Boat expedition 3–11/3/70 (Robinson 1970), (Eckert 1971), Boat expedition 10–12/4/71, Helicopter landing for 1 hr 15 min on 4/9//80, Helicopter landing for 1 hr 15 min on 4/9/80, Helicopter based expedition 15–18/4/82 , the Stick–nest Rat ecological studies 20–26/10/83, 6–19/12/83, 13–28/2/84, 1–12/5/84, 20–24/6/84, 27/10–6/11/84, 14–20/1/85, 21–31/5/85, 4–14/11/85, 27/1–7/2/86, 4–16/6/86; **ST PETER ISLAND**–Helicopter landings for 11 hr 30 min on 23 & 24/4/82, The Brush–tailed Bettong re–introduction program 18–21/10/88, 17–20/1/90, 15–20/2/91; **GOAT ISLAND**–Helicopter landings for 1 day 3 hr on 23 & 24/4/82; **BIRD ROCK**–Boat pass on 20/1/90; **EYRE ISLAND**–Boat landing for 4 hr on 10/3/70, (Eckert 1971) Helicopter landing for 8 hr on 24/4/82; **OLIVE ISLAND**–Helicopter landing for 4 hr on 16/4/82; **EBA ISLAND**–Boat landing for 2 hr 45 min on 21/6/83; **PIGFACE ISLAND**–Boat landing for 1 hr 30 min on 21/6/82; **BAIRD ISLAND**–Boat landings 2–3/6/79, The Brush–tailed Bettong program 5/7/82, 16–17/3/83, 3–4/8/83, 11/11/83, 13/9/84, 15/1/85, 28/6/85, 6/10/85, 6/2/86, 3–4/3/88, 10–13/8/88, 15–16/9/89; **JONES ISLAND**–Boat landing for 1 hr 30 min on 22/6/83; **ISLAND A VENUS BAY**–Boat landings 2–3/6/79, The Brush–tailed Bettong program 2/5/80, 7–8/8/80, 9/5/80, 20–21/10/80, 21–22/5/81, 4/6/82, 5/7/82, 15–16/3/83, 3–5/8/83, 8–10/11/83, 3–5/4/84, 11–15/9/84, 8–11/1/85, 21–22/1/85, 30/5/85, 27–30/8/85, 3–4/10/85, 7–9/2/86, 18–21/6/86, 4–9/10/86, 2–9/12/86, 1–9/3/87, 27/5–6/6/87, 25/8–1/9/87, 25–26/8/88,12–16/9/89, **ISLAND B VENUS BAY**–Boat landings for 1 hr on 22/6/79, for 45 min on 22/6/79; **ISLAND C VENUS BAY**–Boat landings for 1 hr on 22/5/79, for 1 hr on 22/6/83, for 30 min on 13/9/89; **GERMEIN ISLAND**–Boat landing for 1 hr 30 min on 23/6/83.

**Table 14.** Reptile species from the Far West Coast islands.

| Common name | Scientific name | Purdie Island | Lounds Island | St Francis Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common Death Adder | *Acanthophis antarcticus* | | | | | | | | | | | | | | * | | * | | | | | | |
| Red-tailed Worm-lizard | *Aprasia inaurita* | | | | | | | | | | * | | | | | | | | | | * | | |
| Striped Wall Skink | *Cryptoblepharus virgatus* | | | | | | | | | | | | * | * | * | * | | | | | | | |
| Peninsula Dragon | *Ctenophorus fionii* | | | * | | | | | | | | | | | | | | | | | | | |
| Painted Dragon | *Ctenophorus pictus* | | | | | | | | | | | | | | | | | | * | | | | |
| Spinifex Slender Bluetongue | *Cyclodomorphus melanops* | | | * | | | | | * | * | * | | | | | | | | | | | | |
| Western Stone Gecko | *Diplodactylus granariensis* | | | | | | | | | | | | | | * | | | | | | | | |
| Master's Snake | *Drysdalia mastersii* | | | * | | | | | * | * | | | | | | | | | | | | | |
| Western Tree Skink | *Egernia richardi* | | | * | | | | | | | | | | | | | | | | | | | |
| Bull Skink | *Egernia multiscutata* | * | | * | * | * | | | * | * | * | * | * | * | | * | * | | | * | | | |
| Tree Dtella | *Gehyra variegata* | | | | | | | | | | | | | | * | | | | | | | | |
| Three-toed Earless Skink | *Hemiergis decresiensis* | | | * | | | | | | | | | | | | | | | | | | | |
| Four-toed Earless Skink | *Hemiergis peronii* | * | * | * | | * | * | * | | * | * | * | * | * | * | * | * | * | * | | * | | * |
| Bynoe's Gecko | *Heteronotia binoei* | | | * | | | | * | | | * | | | | | | | | | | | | |
| Southern Four-toed Slider | *Lerista dorsalis* | | | * | | | | | * | | * | | | | * | | | | | | * | | |
| Long-legged Slider | *Lerista microtis* | | | | | | | | | | | | * | * | * | * | | | | | | | |

**Table 14. (cont'd)** Reptile species from the Far West Coast islands.

| Common name | Scientific name | Purdie Island | Lounds Island | St Francis Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mallee Slider | *Lerista edwardsae* | | | * | | | | * | | | * | | * | * | | * | | | | | | | |
| Southern Three-toed Slider | *Lerista terdigitata* | | | | | | | | | | | | | | * | | | | | | | | |
| Burton's Legless Lizard | *Lialis burtonis* | | | * | | | | | | | | | | | | | | | | | | | |
| Dwarf Skink | *Menetia greyii* | | | * | | * | | * | | | * | * | * | * | * | | | * | | | | | |
| Carpet Python | *Morelia spilota* | | | * | | | | | | | | | | | | | | | | | | | |
| Adelaide Snake-eye | *Morethia adelaidensis* | | | | | | | | | | | | * | * | | | | | | | | | |
| Mallee Snake-eye | *Morethia obscura* | | | * | | | | | | | * | * | * | * | * | * | | | | | | | |
| Thick-tailed Gecko | *Nephrurus milii* | | | * | * | * | | | * | * | * | * | * | * | | | | | | | | | |
| Black Tiger Snake | *Notechis scutatus* | | | * | | | | | | | | | * | * | * | * | | | | | | | |
| Marbled Gecko | *Phyllodactylus marmoratus* | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | * | * | * | * | * | |
| Bight Coast Skink | *Pseudemoia baudini* | | | | | | | | | | | | | | * | | | | | | | | |
| Southern Grass Skink | *Pseudemoia entrecasteauxii* | | | | | | | | | | | | | | * | | | | | | | | |
| Eastern Brown Snake | *Pseudonaja textilis* | | | | | | | | | | | | | | | | | | * | | * | | |
| Common Scaly-foot | *Pygopus lepidopodus* | | | * | | | | | | | | | | | | | | | | | | | |
| Mitchell's Short-tailed Snake | *Rhinoplocephalus nigriceps* | | | | | | | | | | | | | | * | | | | | | | | |

**Table 14. (cont'd)** Reptile species from the Far West Coast islands.

| Common name | Scientific name | Purdie Island | Lounds Island | St Francis Island | Egg Island | Dog Island | Freeling Island | West Island | Masillon Island | Fenelon Island | Lacy Island | Evans Island | West Franklin Island | East Franklin Island | St Peter Island | Goat Island | Eyre Island | Olive Island | Eba Island | Jones Island | Island A—Venus Bay | Island B—Venus Bay | Island C—Venus Bay |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shingleback Skink/ Sleepy Lizard | *Tiliqua rugosa* | | | | | | | | | | | | | | * | | | | | | | | |
| Gould's Goanna/Sand Monitor | *Varanus gouldii* | | | | | | | | | | | | | | 1 | | | | | | | | |

1. Introduced.

Data in this table is from the following sources: **LOUNDS ISLAND**–Helicopter landing for 15 min on 25/4/82; **PURDIE ISLAND**–Helicopter landing for 1hr 10m on 25/4/82; **ST FRANCIS ISLAND**–(Waite 1923), Royal Society Expedition 5–13/1/71 (Robinson & Smyth 1976), Helicopter based expedition 18–22/4/82, The Brush–tailed Bettong re–introduction program 20/5/81, 28–30/1/82, 3–9/4/84, 27–29/3/82, 9–14/2/86, 8/9/87, 21–28/10/88; **EGG ISLAND**–Helicopter landing for 1hr on 21/4/82; **DOG ISLAND**–Royal Society Expedition 7–8/1/71 (Robinson & Smyth 1976), Helicopter landing for 3hr 30 min on 21/4/82, Boat expedition on 17–18/2/91; **FREELING ISLAND**–Helicopter landing for 1hr on 21/4/82; **WEST ISLAND**–Helicopter landing for 3hr 20 min on 20/4/82, Boat landing for 2hr on 18/2/91; **MASILLON ISLAND**–Royal Society Expedition 6–7/1/71 (Robinson & Smyth 1976), Helicopter landing for 3hr 15 min on 20/4/82, Boat expedition on 17–18/2/91; **FENELON ISLAND**–Helicopter landing for 2hr on 20/4/82, Boat landings for 1hr on 28/10/88; **LACY ISLAND**–Helicopter landings for 4hr on 21–22/4/82, Boat expedition on 16–17/2/91; **EVANS ISLAND**–Helicopter landing for 3hr on 21/4/82; **THE FRANKLIN ISLANDS**–Boat expedition on 3–11/3/70 and on 10–12/4/71, Helicopter landing for 1hr 15 min on 4/9/80, Helicopter based expedition 15–18/4/82, The Stick–nest Rat ecological studies 20–26/10/83, 6–19/12/83, 13–28/2/84, 1–12/5/84, 20–24/6/84, 27/10–6/11/84, 14–20/1/85, 21–31/5/85, 4–14/11/85, 27/1–7/2/86, 4–16/6/86; **ST PETER ISLAND**–Helicopter landings for 11hr 30 min on 23 & 24/4/82, The Brush–tailed Bettong re–introduction program 18–21/10/88, 17–20/1/90; **GOAT ISLAND**–Helicopter landing for 8hr on 24/4/82; **EYRE ISLAND**–Boat landing for 4 hrs on 10/3/70, Helicopter landing for 8 hrs on 24/4/82; **OLIVE ISLAND**–Helicopter landing for 4hr on 16/4/82; **EBA ISLAND**–Boat landing for 2hr 45 min on 21/6/83; **JONES ISLAND**–Boat landing for 1hr 30 min on 22/6/83; **ISLAND A VENUS BAY** = Boat landings 2–3/6/79, The Brush–tailed Bettong Program 2/5/80, 7–8/8/80, 9/5/80, 20–21/10/80, 21–22/5/81, 4/6/83, 5/7/82, 15–16/3/83, 3–5/8/83, 8–10/11/83, 3–5/4/84, 11–15/9/84, 8–11/1/85, 21–22/1/85, 30/5/85, 27–30/8/85, 3–4/10/85, 7–9/2/86, 18–21/6/86, 4–9/10/86, 2–9/12/86, 1–9/3/97, 27/5–6/6/87, 25/8–1/9/87, 25–26/8/88, 12–16/9/89; **ISLAND B VENUS BAY**–Boat landings for 1hr on 22/6/79 for 45 min on 22/6/83; **ISLAND C VENUS BAY**–Boat landings for 1hr on 22/5/79, for 1hr on 22/6/83, for 30 min on 19/9/89.

**Table 15.** Plant species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | Dorothée Island | Cap Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blown Grass | *Agrostis avenacea* var. *avenacea* | | | | | | | * | | * | | * |
| *Cape Leeuwin Wattle | *Albizia lophantha* | | | | | | | * | | * | | |
| Drooping She-oak | *Allocasuarina verticillata* | | | | | | | * | | | | * |
| False Tobacco | *Apalochlamys spectabilis* | | | * | | | | * | | | | |
| Sea Celery | *Apium prostratum* ssp. *prostratum* var. *prostratum* | | * | * | | | | * | | * | * | |
| *Capeweed | *Arctotheca calendula* | * | | | | | | | | | | |
| Grey Saltbush | *Atriplex cinerea* | * | | * | | | | * | | * | | |
| Marsh Saltbush | *Atriplex paludosa* var. *cordata* | * | | | * | * | | * | * | * | * | * |
| *Wild Oat | *Avena fatua* | | | * | | | | | | | | |
| Swan River Daisy | *Brachycome iberidifolia* | | | | | | | | | * | | * |
| Golden Everlasting | *Bracteantha bracteatum* | | | | | | | | | | | * |
| Sand Brome | *Bromus arenarius* | | | * | | | | | | | | |
| *Madrid Brome | *Bromus madritensis* | | | * | | | | | | | | |
| Leek Lily | *Bulbine semibarbata* | | | | | | | * | | * | | * |
| *Sea Rocket | *Cakile maritima* | | | * | | | | | | | | |
| Pink Purslane | *Calandrinia calyptrata* | | | | | | | * | | * | | * |
| Southern Cypress Pine | *Callitris preissii* | | | * | | | | | | | | |
| Cushion-bush | *Calocephalus brownii* | | | | | | | * | * | * | | * |

**Table 15. (cont'd)** Plant species from western Eyre Peninsula islands.

| **Common name** | **Scientific name** | **Waldegrave Island** | **Little Waldegrave** | **Flinders Island** | **Topgallant Island** | **Ward Island** | **South Ward Island** | **Pearson Island** | **North Veteran Island** | **Dorothée Island** | **Cap Island** | **Greenly Island** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common Fringe-myrtle | *Calytrix tetragona* | | | | | | | * | | | | * |
| Karkalla | *Carpobrotus rossii* | * | | * | * | | | * | * | * | | * |
| *Maltese Cockspur | *Centaurea melitensis* | | | * | | | | | | | | |
| *Spike Centuary | *Centaurium spicatum* | | | | | | | | | | | * |
| Dwarf Centrolepis | *Centrolepis cephaloformis* ssp. *murrayi* | | | | | | | * | | | | |
| Hairy Centrolepis | *Centrolepis strigosa* | | | | | | | * | | | | |
| *Mouse-ear Chickweed | *Cerastium glomeratum* | | | * | | | | | | | | |
| Rock Fern | *Cheilanthes austrotenuifolia* | | | | | | | * | | | | * |
| | *Chenopodium desertorum* ssp. *microphyllum* | | | | | | | * | | | | |
| *Nettle-leaved Goosefoot | *Chenopodium murale* | | | * | | | | | | | | |
| Australian Bindweed | *Convolvulus erubescens* | | | * | | | | | | | | |
| Common Correa | *Correa reflexa* var. *reflexa* | | | | | | | * | * | * | | * |
| *Waterbuttons | *Cotula coronopifolia* | | | | | | | | | | | * |
| Slender Cotula | *Cotula vulgaris* var. *australasica* | | | | | | | * | | * | | |
| Australian Crassula | *Crassula sieberana* ssp. *sieberana* | | | * | | | | * | | | | |
| Gnat Orchid | *Cyrtostylis reniformis* | | | * | | | | | | | | |
| Slender Wallaby-grass | *Danthonia racemosa* var. *racemosa* | | | * | | | | * | | | | * |
| Bristly Wallaby-grass | *Danthonia setacea* var. *setacea* | | | * | | | | | | | | |
| Native Carrot | *Daucus glochidiatus* | | | | | | | | | * | | |

**Table 15. (cont'd)** Plant species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | Dorothée Island | Cap Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black-anther Flax Lily | *Dianella revoluta* | | | | | | | * | | * | | * |
| Round-leaved Pigface | *Disphyma crassifolium* | * | | | * | * | * | * | * | * | * | * |
| Emu-grass | *Distichlis distichophylla* | | | | | | | * | | * | | * |
| Crinkled Hop-bush | *Dodonaea baueri* | | | * | | | | | | | | |
| Sticky Hop-bush | *Dodonaea viscosa* ssp. *spatulata* | | | | | | | * | | * | | * |
| *Annual Veldt Grass | *Ehrharta longiflora* | | | * | | | | | | | | |
| Native Wheat-grass | *Elymus scabrus* | | | | | | | * | | * | | * |
| Ruby Saltbush | *Enchylaena tomentosa* var. *tomentosa* | * | * | | * | * | | * | * | * | | * |
| Turkey Bush | *Eremophila deserti* | | | * | | | | * | | | | |
| *Common Stork's Bill | *Erodium cicutarium* | | | * | | | | | | | | |
| Yorrell | *Eucalyptus gracilis* | | | * | | | | | | | | |
| Purple Eyebright | *Euphrasia collina* ssp. *collina* | | | | | | | | | | | * |
| Leafless Ballart | *Exocarpos aphyllus* | | | * | | | | | | | | |
| Coast Ballart | *Exocarpos syrticola* | | | * | | | | | | | | |
| Common Sea-heath | *Frankenia pauciflora* var. *fruticulosa* | * | * | * | * | | | * | * | * | * | * |
| Small-leaved Sea-heath | *Frankenia sessilis* | | | | | * | | | | | | |
| *Small Bedstraw | *Galium murale* | | | | | | | * | | | | * |
| Sheep Bush | *Geijera linearifolia* | | | * | | | | | | | | |
| Common Cudweed | *Gnaphalium involucratum* | | | | | | | * | | | | * |

**Table 15. (cont'd)** Plant species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | Dorothée Island | Cap Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sticky Goodenia | *Goodenia varia* | | | * | | | | | | | | |
| Grey Samphire | *Halosarcia halocnemoides* ssp. *halocnemoides* | * | | | * | * | * | * | | | * | * |
| Mallee Hemichroa | *Hemichroa diandra* | | | * | | | | | | | | |
| | *Hydrocotyle comocarpa* | | | | | | | * | | * | | |
| | *Hydrocotyle medicaginoides* | | | * | | | | | | | | |
| *Oval Purse | *Hymenolobus procumbens* | | | | | | | * | | * | | |
| | *Isolepis congrua* | | | | | | | * | | | | |
| Coarse Club-rush | *Isolepis marginata* | | | | | | | * | | | | |
| Knobby Club-rush | *Isolepis nodosa* | | | | | | | | * | * | | * |
| Stalked Ixiolaena | *Ixiolaena supina* | | | | | | | * | * | * | | * |
| Thorny Lawrencia | *Laurencia squamata* | | | | | | | | | | * | |
| Australian Hollyhock | *Lavatera plebeia* | | | | | | | | | * | | |
| Leafy Peppercress | *Lepidium foliosum* | | | | * | | | * | * | * | | * |
| Coastal Beard-heath | *Leucopogon parviflorus* | | | * | | | | | * | * | | * |
| *Annual Cat's-tail | *Lophochloa cristata* | | | * | | | | | | | | |
| Australian Boxthorn | *Lycium australe* | | | | * | * | | | | * | | |
| *African Boxthorn | *Lycium ferocissimum* | * | * | | * | | | | | | | |
| Heath Bluebush | *Maireana oppositifolia* | | * | * | * | | | * | | | | * |
| *Marshmallow | *Malva parviflora* | * | * | * | | * | | | | | | |

**Table 15. (cont'd)** Plant species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | Dorothée Island | Cap Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Woolly Burr Medic | *Medicago polymorpha* var. *polymorpha* | * | | * | | | | | | | | |
| *Lucerne | *Medicago sativa* ssp. *sativa* | | | * | | | | | | | | |
| South Australian Swamp Paper-bark | *Melaleuca halmaturorum* | | | | | | | * | | | | |
| Dryland Tea-tree | *Melaleuca lanceolata* | | | | | | | * | | | | * |
| *King Island Melilot | *Melilotus indica* | | | * | | | | | | | | |
| *Common Iceplant | *Mesembryanthemum crystallinum* | * | * | | * | | | | | | * | |
| Prickly Broom-heath | *Monotoca scoparia* var. *scoparia* | | | | | | | * | | | | |
| Climbing Lignum | *Muehlenbeckia adpressa* | | | | | | | | | | | * |
| Native Juniper/Boobialla | *Myoporum insulare* | | | | | | | * | * | | | * |
| Creeping Boobialla | *Myoporum parvifolium* | | | * | | | | | | | | |
| Coast Tobacco | *Nicotiana maritima* | | | | | | | | | * | | * |
| Nitre-bush | *Nitraria billardierei* | * | * | * | * | * | * | * | * | * | * | |
| Coast Daisy-bush | *Olearia axillaris* | * | | | | | | | * | * | | * |
| Twiggy Daisy-bush | *Olearia ramulosa* | | | | | | | * | | * | | * |
| *Creeping Oxalis | *Oxalis corniculata* ssp. *corniculata* | * | | | | | | | | | | * |
| *Long-headed Poppy | *Papaver dubium* | | | * | | | | | | | | |
| Curly Ryegrass | *Parapholis incurva* | | | * | | | | | | | | |
| Smooth Nettle | *Parietaria debilis* | * | | * | * | * | | | * | | | |
| Austral Stork's Bill | *Pelargonium australe* | * | | | | | | | * | * | | * |

**Table 15. (cont'd)** Plant species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | Dorothée Island | Cap Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Thyme Riceflower | *Pimelea serpyllifolia* ssp. *serpyllifolia* | | | | | | | | | | | * |
| Weeping Pittosporum | *Pittosporum phylliraeoides* var. *microcarpa* | | | * | | | | | | | | |
| *Variable Plantain | *Plantago varia* | | | | | | | | | * | | |
| Coast Tussock Grass | *Poa poiformis* var. *poiformis* | | | | | | | | * | | | * |
| Pleated Podolepis | *Podolepis rugata* var. *rugata* | | | | | | | | | | | * |
| Sticky Longheads | *Podotheca angustifolia* | | | * | | | | | | | | |
| Stiff Cup-flower | *Pogonolepis muelleriana* | | | * | | | | | | | | |
| Coast Pomaderris | *Pomaderris oraria* | | | * | | | | | | | | |
| Pussytail | *Ptilotus spathulatus* forma *spathulatus* | | | * | | | | | | | | |
| Seaberry Saltbush | *Rhagodia candolleana* ssp. *candolleana* | * | * | | * | | | | * | * | | * |
| Fleshy Saltbush | *Rhagodia crassifolia* | | | * | | | | | | * | | * |
| *Annual Pearlwort | *Sagina apetala* | | | | | | | * | | | | |
| *Sea Pearlwort | *Sagina maritima* | | | | | | | * | | * | | |
| Buckbush | *Salsola kali* | * | | * | | | | | | | | |
| Creeping Brookweed | *Samolus repens* | | | * | | | | | | | | * |
| Beaded Samphire | *Sarcocornia quinqueflora* | | | * | | | | | | | | * |
| Prickly Knawel | *Scleranthus pungens* | | | * | | | | | * | * | | * |
| Bassia | *Sclerolaena uniflora* | | | * | * | | | | | | | |
| Yellow Sebaea | *Sebaea ovata* | | | * | | | | | | | | |

Table 15. (cont'd) Plant species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | Dorothée Island | Cap Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable Groundsel | *Senecio lautus* | * | | | | | | * | | * | | * |
| | *Senecio minimus* var. *picridioides* | | | | | | | * | | | | |
| *French Catchfly | *Silene gallica* var. *gallica* | | | * | | | | | | | | |
| *Hedge Mustard | *Sisymbrium orientale* | | | * | | | | | | | | |
| *Black-berry Nightshade | *Solanum nigrum* | | | * | | | | | | | | |
| *Prickly-Sow-thistle | *Sonchus asper* ssp. *asper* | | | * | | | | * | | * | | * |
| *Common Sow-thistle | *Sonchus oleraceus* | | | | * | | | | | | | * |
| *Coast Sand-spurrey | *Spergularia media* | | | * | | | | | | | | |
| Rolling Spinifex | *Spinifex sericeus* | | | * | | | | | | | | |
| *Chickweed | *Stellaria media* | | | * | | | | | | | | |
| Elegant Spear-grass | *Stipa elegantissima* | | | | | | | | | | | * |
| Desert Spear-grass | *Stipa eremophila* | | | * | | | | | | | | |
| Austral Seablite | *Suaeda australis* | | | * | | | | * | | | * | |
| New Zealand Spinach | *Tetragonia implexicoma* | * | * | | * | | | * | * | * | | * |
| Coast Bonefruit | *Threlkeldia diffusa* | * | * | | * | * | | | * | * | * | * |
| | *Triglochin muelleri* | | | | | | | * | | | | * |
| *Small Nettle | *Urtica urens* | * | | * | | | | | | | | |
| Common New Holland Daisy | *Vittadinia dissecta* var. *hirta* | * | | | | | | | | | | |
| Fuzzweed | *Vittadinia megacephala* | | | * | | | | | | | | |

**Table 15. (cont'd)** Plant species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | Dorothée Island | Cap Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Squirrel-tail Fescue | *Vulpia bromoides* | | | * | | | | | | | | |
| *Rat's-tail Fescue | *Vulpia myuros* | | | * | | | | | | | | |
| Shore Westringia | *Westringia dampieri* | * | | | * | | | | | | | |
| Sand Twinleaf | *Zygophyllum ammophilum* | | | * | | | | | | | | |
| Pointed Twinleaf | *Zygophyllum apiculatum* | | | | * | * | | | | | * | |
| Coast Twinleaf | *Zygophyllum billardierii* | | | * | | * | | * | | | | |

Data in this table is from the following sources: **WALDEGRAVE ISLAND**–Boat landings for 7 hr on 27/7/79, for 6 hr on 4/10/79, Helicopter landing for 1 hr 30 min on 30/5/80; **LITTLE WALDEGRAVE**–Helicopter landing for 15 min on 30/5/80; **FLINDERS ISLAND**–(Osborn 1925), 10hr on 8/9/83; **TOPGALLANT ISLAND**–Helicopter landings for 18 hr on 28 & 29/5/80, **WARD ISLAND**–Helicopter landings for 18 hr 30 min on 29 & 30/5/80; **PEARSON ISLAND**–(Osborn & Wood 1923), (Specht 1969), (Symon 1971), boat landing for 23 hr on 1–2/11/75, Boat expedition for 3 days on 23–25/11/76 (Fatchen 1982), Helicopter landing for 2 hr on 29/5/80 (Robinson et al 1981); **THE VETERAN ISLES**–Helicopter landing for 1 hr on 29/5/80; **DOROTHÉE ISLAND** (Specht 1969), (Symon 1971), Boat expedition for 21 hr on 26–27/11/76 (Fatchen 1982), Helicopter landing for 30 min on 29/5/80; **CAP ISLAND**–Helicopter landing for 30 min on 28/5/80, **GREENLY ISLAND**–(Finlayson 1949a,b) (Cleland 1949) (Lindsay 1949), Boat expedition for 3 days on 28–30/11/76 (Fatchen 1982), Helicopter landing for 1 hr on 28/5/80.

**Table 16.** Mammal species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave Island | Flinders Island | Ward Island | Pearson Island | South Veteran Island | Dorothée Island | Cap Island | North Rocky Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|
| New Zealand Fur-seal | *Arctocephalus forsteri* | | | | 3 | | * | * | | | 3 |
| Tammar/Dama Wallaby | *Macropus eugenii* | | | 2 | | | | | | | 1 |
| Australian Sea-lion | *Neophoca cinerea* | | * | | * | * | * | * | * | * | * |
| Black-footed Rock-wallaby | *Petrogale lateralis* | | | | | * | | | | | |
| Bush Rat | *Rattus fuscipes* | * | | | | * | | | | | * |
| *Black/Ship Rat | *Rattus rattus* | | | * | | | | | | | |

1. Introduced population; 2. Extinct; 3. Breeding colony.

Data in this table is from the following sources: **WALDEGRAVE ISLAND**–(Schmitt 1977a, b, 1978), Boat landings for 7 hr on 27/7/79, for 6 hr on 4/10/79, Helicopter landing for 1 hr 30 min on 30/5/80; **LITTLE WALDEGRAVE ISLAND**–Helicopter landings for 15 min on 30/5/80; **FLINDERS ISLAND**–(Wood Jones 1924) (Aitken 1968) (Hudson et al 1981), 10 hr on 8/9/83; **WARD ISLAND**–Helicopter landings for 18 hr 30 min on 29 & 30/5/80, Boat landing 23/1/90; **PEARSON ISLAND**–(Wood Jones 1922, 1923, 1924), (Delroy 1974), Boat landing for 23 hr on 1–2/11/75, Boat expedition for 3 days on 23–25/11/76 (Robinson 1980), Helicopter landing for 2 hr on 19/5/80, Boat landing 22/1/90; **SOUTH VETERAN ISLAND**–Helicopter overfly on 29/5/80, Boat pass 22/1/90: **DOROTHÉE ISLAND**–Boat landing for 21 hr on 26–27/11/76 (Robinson 1980), Helicopter landing for 30 min on 29/5/80, Boat landing 22/1/90; **CAP ISLAND**–Helicopter landing for 30 min on 28/5/80; **NORTH ROCKY ISLAND**–Helicopter overfly on 28/5/80; **GREENLY ISLAND**–(Finlayson 1948a, b) (Lindsay 1949) (Mitchell & Behrndt 1949), Boat expedition for 3 days 28–30/11/76 (Robinson 1980), Helicopter landing for 1 hr on 28/5/80.

**Table 17.** Bird species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave Island | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | South Veteran Island | Dorothée Island | Cap Island | North Rocky Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chestnut Teal | *Anas castanea* | | | * | | | | | | | | | | |
| Australasian Grey Teal | *Anas gracilis* | | | * | | | | | | | | | | |
| Richard's Pipit | *Anthus novaeseelandiae* | | | * | * | * | | * | | | | | | |
| Fork-tailed Swift | *Apus pacificus* | | | * | | | | | | | * | | | |
| Wedge-tailed Eagle | *Aquila audax* | | | * | | | | | | | | | | |
| White-faced Heron | *Ardea novaehollandiae* | | | * | * | | | * | | | * | | | * |
| Eastern Reef Egret/Reef Heron | *Ardea sacra* | | | * | | | | * | | | | | | |
| Ruddy Turnstone | *Arenaria interpres* | | | * | | | | * | | | * | | | * |
| Masked Wood-swallow | *Artamus personatus* | | | | | | | * | | | | | | |
| Fan-tailed Cuckoo | *Cacomantis flabelliformis* | | | * | | | | | | | | | | |
| Red-necked Stint | *Calidris ruficollis* | | | * | | | | * | | | | | | |
| Cape Barren Goose | *Cereopsis novaehollandiae* | 1 | 1 | * | | | | * | * | | * | | | * |
| Double-banded Dotterel/Plover | *Charadrius bicinctus* | | | * | | | | | | | | | | |
| Hooded Dotterel/Plover | *Charadrius rubricollis* | | | * | | | | * | | | | | | |
| Red-capped Dotterel/Plover | *Charadrius ruficapillus* | | | * | | | | | | | | | | |

Table 17. (cont'd) Bird species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave Island | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | South Veteran Island | Dorothée Island | Cap Island | North Rocky Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horsfield's/Rufous-tailed Bronze Cuckoo | *Chrysococcyx basalis* | | | * | | | | * | | | | | | |
| Brown Songlark | *Cinclorhamphus cruralis* | | | * | | | | | | | | | | |
| *Feral Pigeon/Rock Dove | *Columba livia* | | | * | | | | | | | | | | |
| Australian Raven | *Corvus coronoides* | | | * | | | | * | | | * | | | * |
| Stubble Quail | *Coturnix novaezelandiae* | | | * | | | | | | | | | | |
| Galah | *Eolophus roseicapillus* | | * | | | | | * | * | * | | | | |
| White-fronted Chat | *Ephthianura albifrons* | * | | * | | | | * | | | | | | |
| Crimson Chat | *Ephthianura tricolor* | | | * | | | | * | | | | | | |
| Little/Fairy Penguin | *Eudyptula minor* | 1 | 1 | 1 | | | | 1 | 1 | | 1 | | | 1 |
| Australian Kestrel | *Falco cenchroides* | * | | * | * | | | 2 | | | 2 | | | 2 |
| Peregrine Falcon | *Falco peregrinus* | | | * | | | | | | | | | | |
| Tawny-crowned Honeyeater | *Gliciphila melanops* | | | * | | | | | | | | | | |
| Australian Magpie | *Gymnorhina tibicen* | | | * | | | | | | | | | | |
| Sooty Oystercatcher | *Haematopus fuliginosus* | * | | * | | * | | 1 | * | * | * | * | | * |
| Pied Oystercatcher | *Haematopus ostralegus* | | | * | | | | | | | | | | |
| Sacred Kingfisher | *Halcyon sancta* | | | * | | | | | | | | | | |

**Table 17. (cont'd)** Bird species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave Island | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | South Veteran Island | Dorothée Island | Cap Island | North Rocky Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| White-bellied Sea-eagle | *Haliaeetus leucogaster* | * | | 2 | * | * | | * | | | 2 | | | 2 |
| Welcome Swallow | *Hirundo neoxena* | | | * | * | | | * | * | | * | * | | * |
| Masked/Spur-winged Plover | *Hoplopterus miles* | * | | * | | | | * | | | * | | | |
| Banded Plover/Lapwing | *Hoplopterus tricolor* | | | * | | | | | | | | | | |
| Caspian Tern | *Hydroprogne caspia* | | | * | | | | | | | | | | |
| Silver Gull | *Larus novaehollandiae* | * | | * | * | * | | * | | | * | * | * | * |
| Pacific Gull | *Larus pacificus* | * | * | * | | * | | * | * | * | 2 | | | * |
| Black-faced Shag/Cormorant | *Leucocarbo fuscescens* | * | | * | | | | | | | | | | |
| Little Grassbird | *Megalurus gramineus* | * | | * | | | | | | | | | | * |
| Yellow-plumed Honeyeater | *Meliphaga ornata* | | | * | | | | | | | | | | |
| Singing Honeyeater | *Meliphaga virescens* | | | * | | | | * | | | | | | |
| Budgerigah | *Melopsittacus undulatus* | | | * | | | | * | | | | | | |
| Rock Parrot | *Neophema petrophila* | * | * | * | * | * | | * | * | | * | * | | * |
| Eastern Curlew | *Numenius madagascariensis* | | | * | | | | | | | | | | |
| Golden Whistler | *Pachycephala pectoralis* | | | * | | | | * | | | | | | |
| Osprey | *Pandion haliaetus* | 2 | | 2 | | * | | * | | | | | | |

**Table 17. (cont'd)** Bird species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave Island | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | South Veteran Island | Dorothée Island | Cap Island | North Rocky Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *House Sparrow | *Passer domesticus* | | | * | | | | * | | | * | | | |
| White-faced Storm-petrel | *Pelagodroma marina* | | | | 1 | 1 | | | | | 1 | 1 | | |
| Red-capped Robin | *Petroica goodenovii* | | | * | | | | * | | | | | | * |
| Red-tailed Tropicbird | *Phaethon rubricauda* | | | * | | | | * | | | | | | |
| Great/Black Cormorant | *Phalacrocorax carbo* | | | * | | | | * | | | * | | | * |
| Little Black Cormorant | *Phalacrocorax sulcirostris* | | | * | | | | | | | | | | |
| Pied Cormorant | *Phalacrocorax varius* | | | * | | | | | | | | | | |
| Brush Bronzewing | *Phaps elegans* | | | * | | | | | | | | | | |
| White-fronted Honeyeater | *Phylidonyris albifrons* | | | * | | | | | | | | | | |
| Yellow-billed Spoonbill | *Platalea flavipes* | | | * | | | | | | | | | | |
| Short-tailed Shearwater | *Puffinus tenuirostris* | | | | 1 | 1 | 1 | | * | | 1 | | | 1 |
| Willie Wagtail | *Rhipidura leucophrys* | | | * | | | | | | | | | | |
| White-browed Scrubwren | *Sericornis frontalis* | | | * | | | | * | | | | | | |
| Fairy Tern | *Sterna nereis* | | | * | | | | 1 | | | | | | 1 |
| White-fronted Tern | *Sterna striata* | | | | | | | | | | | 3 | | |
| *Common/European Starling | *Sturnus vulgaris* | | | * | * | | | * | | | * | * | | |

**Table 17. (cont'd)** Bird species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Little Waldegrave Island | Flinders Island | Topgallant Island | Ward Island | South Ward Island | Pearson Island | North Veteran Island | South Veteran Island | Dorothée Island | Cap Island | North Rocky Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crested Tern | *Thalasseus bergii* | * | * | * | | | | * | | | * | * | * | * |
| Barn Owl | *Tyto alba* | * | | | | | | * | | | * | | | |
| Silvereye | *Zosterops lateralis* | | | * | | | | * | | | * | | | * |

1. Breeding colony; 2. Nesting recorded; 3. Dead bird collected.

Data in this table from the following sources: **WALDEGRAVE ISLAND**–(Parker 1977), Boat landings for 7hr, for 6 hr on 4/10/79, Helicopter landway for 1 hr on 30/5/80; **LITTLE WALDEGRAVE ISLAND**–Helicopter landing for 15 min on 30/5/80; **FLINDERS ISLAND**–(Finlayson 1948), (Eckert 1970) (Delroy)1974 (Hudson et al 1981); **TOPGALLANT ISLAND**–Helicopter landings for 18 hr on 28/5/80; **WARD ISLAND**–Helicopter landings for 18 hr 30 min on 29 and 30/5/80, **PEARSON ISLAND**–(Cleland 1923) (Paton 1971) (Hornsby 1978), Boat landing for 23 hr on 1–2/11/75, Boat expedition for 3 days on 23–25/11/76 (Parker and Cox 1978), Helicopter landing for 2 hr on 29/5/80; **THE VETERAN ISLES**–Helicopter landing for 1 hr on 29/5/80; **DOROTHÉE ISLAND**–Boat expedition for 21 hr on 26–27/11/76 (Parker and Cox 1978), **CAP ISLAND**–Helicopter landing for 30 min on 28/5/80; **NORTH ROCKY ISLAND**–Helicopter overfly on 28/5/80; Helicopter landing for 30 min on 29/5/80; **GREENLY ISLAND**–(Finlayson 1948a,b) (Cleland 1949) (Lindsay 1949) (Mitchell and Behrndt 1949), Boat expedition for 3 days on 28–30/11/76 (Parker and Cox 1978), Helicopter landing for 1 hr on 28/5/80.

**Table 18.** Reptile species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Flinders Island | Topgallant Island | Pearson Island | North Veteran Island | Dorothée Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|
| Lined Worm-lizard | *Aprasia striolata* | * | | | * | | | |
| Striped Wall Skink | *Cryptoblepharus virgatus* | * | | | | | | |
| Paninsula Dragon | *Ctenophorus fionii* | | * | | * | * | * | |
| Spinifex Slender Bluetongue | *Cyclodomorphus melanops* | | * | | | | | |
| Western Tree Skink | *Egernia richardi* | | * | | | | | |
| Bull Skink | *Egernia multiscutata* | | * | | * | | | * |
| Four-toed Earless Skink | *Hemiergis peronii* | * | * | | * | * | * | * |
| Southern Four-toed Slider | *Lerista dorsalis* | * | * | | * | | * | * |
| Mallee Slider | *Lerista edwardsae* | | * | | * | | | |
| Dwarf Skink | *Menetia greyii* | | * | | * | | | * |
| Mallee Snake-eye | *Morethia obscura* | | * | | * | | | * |
| Thick-tailed Gecko | *Nephrurus milii* | | * | | * | | | |
| Black Tiger Snake | *Notechis scutatus* | | * | | | | | |
| Marbled Gecko | *Phyllodactylus marmoratus* | * | * | * | * | * | * | * |
| Southern Grass Skink | *Pseudemoia entrecasteauxii* | | * | | * | | | |

Table 18. (cont'd) Reptile species from western Eyre Peninsula islands.

| Common name | Scientific name | Waldegrave Island | Flinders Island | Topgallant Island | Pearson Island | North Veteran Island | Dorothée Island | Greenly Island |
|---|---|---|---|---|---|---|---|---|
| Eastern Brown Snake | *Pseudonaja textilis* | * | | | | | | |
| Mitchell's Short-tailed Snake | *Rhinoplocephalus nigriceps* | | * | | | | | |
| Shingleback Skink/Sleepy Lizard | *Tiliqua rugosa* | | * | | | | | |
| Rosenbergs Goanna | *Varanus rosenbergi* | | * | | | | | |

Data in this table is from the following sources: **WALDEGRAVE ISLAND**–Boat landings for 7 hr on 27/7/79, for 6 hr on 4/10/79, Helicopter landing for 1 hr 30 min on 30/5/80; **FLINDERS ISLAND**–(Hudson et al. 1981), 10 hr on 8/9/83; **TOPGALLANT ISLAND**–Helicopter landings for 18 hr on 28 and 29/5/80; **PEARSON ISLAND**–(Proctor 1923), Boat landing for 23 hr on 1–2/11/75, Boat expedition for 4 days on 23–25/11/76 (Robinson 1980), Helicopter landing for 2 hr on 29/5/80; **THE VETERAN ISLES**– Helicopter landing for 1 hr on 29/5/80; **DOROTHÉE ISLAND**–Boat landing for 21 hr on 26–27/11/76 (Parker and Cox 1978), Helicopter landing for 30 min on 29/5/80; **GREENLY ISLAND**–(Mitchell and Behrndt 1949), Boat expedition for 3 days in 28–30/11/76 (Robinson 1980), Helicopter landing for 1 hr on 28/5/80.

**Table 19a.** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Port Lincoln Wattle | *Acacia anceps* | | | | | * | | | | | | | | | | | | | |
| Drooping She-oak | *Allocasuarina verticillata* | | | | | * | | | | | | | | | | | | | |
| *Blue Pimpernel | *Anagallis arvensis* | | | * | | * | | | | | | | | | | | | | |
| Sea Celery | *Apium prostratum* ssp. *prostratum* var. *prostratum* | | | * | | | | | | | * | * | | * | | * | * | * | |
| *Capeweed | *Arctotheca calendula* | * | | * | | | | | | | | | | | | | | | |
| Grey Saltbush | *Atriplex cinerea* | | | * | | | | | | | | | | * | | | * | * | * |
| Mueller's Saltbush | *Atriplex muelleri* | | | | | | | | | | | | | * | | | | | |
| Marsh Saltbush | *Atriplex paludosa* ssp. *cordata* | * | | | * | * | * | * | * | * | * | * | * | | * | * | * | * | * |
| Lagoon Saltbush | *Atriplex suberecta* | | * | | | | | | | | | | | | | | | | |
| *Red Brome | *Bromus rubens* | * | | | | | | | | | | | | | | | | | * |
| *Sea Rocket | *Cakile maritima* ssp. *maritima* | | | | | | | | | | | | | | | | | | * |
| Cushion-bush | *Calocephalus brownii* | | | | | | * | | * | * | | | * | | * | | | * | |
| Karkalla | *Carpobrotus rossii* | | | * | * | * | | * | * | * | * | * | * | * | * | * | * | * | * |
| Ward's Weed | *Carrichtera annua* | | | * | | | | | | | | | | | | | | | |
| Slender Dodder-laurel | *Cassytha glabella* forma *dispar* | | | | | | | | | | | | * | | | | | | |
| *Fat Hen | *Chenopodium album* | * | | | * | | | | | | | | | | | | | | |
| *Nettle-leaved Goosefoot | *Chenopodium murale* | | * | | | | | | | | | | | | | | | | |

Table 19a. (cont'd) Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common Everlasting | *Chrysocephalum apiculatum* | | | | | | | | | | | | * | | | | | | |
| Small-leaved Clematis | *Clematis microphylla* | | | | | * | | | | | | | | | | | | | |
| Salmon Correa | *Correa pulchella* | | | | | * | | | | | | | * | | | | | | |
| Common Correa | *Correa reflexa* var. *reflexa* | | | | | | | | | | * | | | | | | | | |
| Black-anther Flax Lily | *Dianella revoluta* | | | * | | * | | * | | * | * | | * | | * | | | | * |
| Kidney Weed | *Dichondra repens* | | | | | | | | | | | * | | | | | | | |
| *Sand Rocket | *Diplotaxis tenuifolia* | | | | | | | | | | | | | | | | | | |
| Round-leaved Pigface | *Disphyma crassifolium* ssp *clavellatum* | | | | | | * | * | * | * | * | * | * | | * | * | * | * | * |
| Emu-grass | *Distichlis distichophylla* | | | | | | | | | | | | | * | | | | | |
| Ruby Saltbush | *Enchylaena tomentosa* var. *tomentosa* | * | | * | * | * | * | * | * | * | * | * | | * | * | * | * | | * |
| Coastal White Mallee | *Eucalyptus diversifolia* | | | * | | | | | | | | | | | | | | | |
| Leafless Ballart | *Exocarpos aphyllus* | | | | | | | | | * | | | * | | | | | | |
| Broom Ballart | *Exocarpos sparteus* | | | | | | | | | | | | | | | | | | |
| Coast Ballart | *Exocarpos syrticola* | | | | | | | | | | | | | | | | | | |
| | *Frankenia cordata* | | | | * | | | | | | | | | | | | | | |
| Common Sea-heath | *Frankenia pauciflora* var. *fruticulosa* | | | | | | * | * | * | * | | * | * | | * | * | | * | |
| Limestone Saw-sedge | *Gahnia deusta* | | | | | | | | | | | | | | | | | | |
| Chaffy Saw-sedge | *Gahnia filum* | | | | | * | | | | | | | | | | | | | |
| Sticky Goodenia | *Goodenia varia* | | | | | | | | | * | | | * | | | | | | |

**Table 19a. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grey Samphire | *Halosarcia halocnemoides* ssp. *halocnemoides* | | | | | | | | * | * | | | | | | * | | * | * |
| Native Lilac | *Hardenbergia violacea* | | | * | | | | | | | | | | | | | | | |
| Coast Everlasting | *Helichrysum leucopsideum* | | | | | | | | | | | | * | | | | | | |
| *Northern Barley-grass | *Hordeum glaucum* | * | | * | | | | | | | | | | | | | | | |
| Tiny Star | *Hypoxis hookeri* | | | | | * | | | | | | | | | | | | | |
| Knobby Club-rush | *Isolepis nodosa* | | | | | | | | | | | | | | | | | | |
| Stalked Ixiolaena | *Ixiolaena supina* | | | | | | | | | * | * | * | * | * | * | * | | * | * |
| Ixodia | *Ixodia achillaeoides* ssp. *achillaeoides* | | | | | | | | | | | | * | | | | | | |
| Coast Velvet-bush | *Lasiopetalum discolor* | | | | | * | | | | | | | * | | | | | | |
| *Tree Mallow | *Lavatera arborea* | * | | * | | | | | | | | | | | | | | | |
| Australian Hollyhock | *Lavatera plebeia* | | * | * | | | | | * | | * | * | | * | | * | * | | * |
| Thorny Lawrencia | *Lawrencia squamata* | | | | | | | | | | | | * | | | | | | |
| Leafy Peppercress | *Lepidium foliosum* | * | * | | | | | | * | * | * | * | | * | * | * | * | | * |
| Clustered Sword-sedge | *Lepidosperma congestum* | | | | | | | | | | | | * | | | | | | |
| Coastal Beard-heath | *Leucopogon parviflorus* | | | * | | * | | | | | | | * | | | | | * | |
| Coast Logania | *Logania crassifolia* var. *crassifolia* | | | | | | | | | * | | | | | | | | | |
| Oval-leaved Logania | *Logania ovata* | | | | | | | | | | | | * | | | | | | |
| *Perennial Ryegrass | *Lolium perenne* | | | | | | | | | | | | | | | * | | | |

**Table 19a. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Annual Cat's-tail | *Lophochloa cristata* | | | | | | | | | | | | * | | | | | | |
| Australian Trefoil | *Lotus australis* | | | | | | | | | | | | * | | | | | | |
| *African Boxthorn | *Lycium ferocissimum* | * | | * | * | | | | | | | | | | | | | * | * |
| Heath Bluebush | *Maireana oppositifolia* | | | | | | | * | * | * | * | | * | | * | * | * | * | * |
| Malvastrum | *Malvastrum americanum* | * | | | * | | | | | | | | | | | | | | |
| *Spotted Medic | *Medicago arabica* | | | * | | | | | | | | | | | | | | | |
| Dryland Tea-tree | *Melaleuca lanceolata* | | | | | * | | | | | | | * | | | | | | |
| Broombush | *Melaleuca uncinata* | | | | | | | | | | | | | | | | | | |
| *King Island Melilot | *Melilotus indica* | | | | | | | | | | | | | | | | | | |
| *Common Iceplant | *Mesembryanthemum crystallinum* | | | * | | | | * | | | | * | | | | * | * | * | * |
| Climbing Lignum | *Muehlenbeckia adpressa* | | | | | | | | | | * | | | | | | | | |
| Coastal Lignum | *Muehlenbeckia gunnii* | | | * | | | | | | | | | | | * | * | | | * |
| Native Juniper/Boobialla | *Myoporum insulare* | | | | | | | | | * | | | * | | | * | | * | |
| *Bridal Creeper | *Myrsiphyllum asparagoides* | | | | | * | | | | | | | * | | | | | | |
| Nitre-bush | *Nitraria billardierei* | * | | * | * | * | * | * | * | * | * | * | * | | * | * | * | * | * |
| Coast Daisy-bush | *Olearia axillaris* | | | | | * | | * | * | * | * | * | * | | * | | | | |
| Twiggy Daisy-bush | *Olearia ramulosa* | | | | | | | * | * | | | | | | | * | | * | * |
| Smooth Nettle | *Parietaria debilis* | * | | | * | * | | | | | * | * | | | * | | | | |

Table 19a. **(cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Austral Stork's Bill | *Pelargonium australe* | | | | | * | | | | | * | * | * | | * | * | | | * |
| Thyme Riceflower | *Pimelea serpyllifolia* ssp. *serpyllifolia* | | | | | | | | | * | | | * | | * | | | * | |
| Coast Tussock Grass | *Poa poiformis* var. *poiformis* | | | * | * | * | | * | | * | * | | | | * | | | * | * |
| Pleated Podolepis | *Podolepis rugata* var. *rugata* | | | | | | | | | | | | * | | | | | | |
| *Annual Beard-grass | *Polypogon monspeliensis* | | * | | | | | | | | | | | | | | | | |
| Coast Pomaderris | *Pomaderris oraria* | | | | | | | | | | | | * | | | | | | |
| Seaberry Saltbush | *Rhagodia candolleana* ssp. *candolleana* | | | * | * | * | | * | * | * | * | * | * | | * | * | * | * | * |
| Fleshy Saltbush | *Rhagodia crassifolia* | | | | | | | * | * | | | | | | | | * | | |
| Buckbush | *Salsola kali* | | | * | | | | | | | | | | | | | | | |
| Creeping Brookweed | *Samolus repens* | | | | | | | | * | * | | | * | | * | * | | * | |
| Thick-headed Samphire | *Sarcocornia blackiana* | | | | | | | | | * | | | | | | | | | |
| Beaded Samphire | *Sarcocornia quinqueflora* | | | | | * | | | | | | | | | | | | | |
| Cushion Fanflower | *Scaevola crassifolia* | | | | | | | | | | | | * | | | | | * | |
| Prickly Knawel | *Scleranthus pungens* | | | | | | | | | | * | | | | | | | | |
| Bassia | *Sclerolaena uniflora* | | | | * | | | | | | | | * | | | * | | * | |
| Salt Copperburr | *Sclerolaena ventricosa* | | | | | | | | | | | | | | | | | | |
| Variable Groundsel | *Senecio lautus* | | | | | | | | | | | | * | * | | * | * | * | * |
| *Hedge Mustard | *Sisymbrium orientale* | | | * | * | | | | | | | | | | | | | | |

**Table 19a. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Black-berry Nightshade | *Solanum nigrum* | * | | | | | | | | | | | | | | | | | |
| *Prickly Sow-thistle | *Sonchus asper* ssp. *asper* | * | | * | * | | | | | | | | | | | | | * | |
| Dune Thistle | *Sonchus megalocarpus* | | | | | | | | | * | | | | | | | | | |
| *Common Sow-thistle | *Sonchus oleraceus* | | | | | | | | | | | | | | | * | | | |
| *Corn Spurrey | *Spergula arvensis* | | | | | | | | | | | | * | | | | | | |
| *Salt Sand Spurrey | *Spergularia marina* | | | | | | * | | | | | | | | | | | | |
| | *Spergularia* sp. | * | | | | | | | | | | | | | | | | | |
| Rolling Spinifex | *Spinifex sericeus* | | | | | | | | | | | | | | | | | | * |
| Salt Couch | *Sporobolus virginicus* | | | | | | | | | | | | | | * | | | | |
| Narrow-leaved Spyridium | *Spyridium phylicoides* | | | | | | | | | * | | | | | | | | | |
| Elegant Spear-grass | *Stipa elegantissima* | | | * | * | | | | * | * | | | * | | | * | | | |
| Desert Spear-grass | *Stipa eremophila* | | | | | * | | | | | | | | | | | | | * |
| Austral Seablite | *Suaeda australis* | * | * | | | * | | | | | | | | | * | | | | |
| Cockie's Tongue | *Templetonia retusa* | | | | | | | | | * | | | * | | | | | | |
| Bower Spinach | *Tetragonia implexicoma* | | | * | | * | | | * | * | * | * | * | | * | | * | | * |
| Coast Bonefruit | *Threlkeldia diffusa* | | | | | * | * | * | * | * | | | * | | | * | * | * | * |
| *Hare's-foot Clover | *Trifolium arvense* | | | * | * | | | | | | | | | | | | | | |
| Scrub Nettle | *Urtica incisa* | * | | | * | | | | | | | | | | | | | | |

**Table 19a. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common New Holland Daisy | *Vittadinia dissecta* | | | * | | | | | | | | | | | | | | | |
| *Rat's-tail Fescue | *Vulpia myuros* | | | * | | | | | | | | | | | | | | | |
| Shore Westringia | *Westringia dampieri* | | | | | | | | | * | * | | | | | | | | |
| Stiff Western Rosemary | *Westringia rigida* | | | | | | | | | * | | | | | | | | | |
| Silky Wilsonia | *Wilsonia humilis* var. *humilis* | | | | | | | | | | | | * | | | * | | | |
| Early Nancy | *Wurmbea dioica* ssp. *dioica* | | | * | | * | | | | | | | | | | | | | |
| Pointed Twinleaf | *Zygophyllum apiculatum* | | | | | | | * | * | * | * | | * | | * | * | * | * | * |
| Coast Twinleaf | *Zygophyllum billardierii* | | | * | * | * | | | | | | | * | | | | | | |

Data in this table is from the following sources: **MT DUTTON (N) ISLAND**–Boat landing for 1 hr on 25/6/83; **THE BROTHERS**–Boat landings for 1 hr on 1/12/76, for 1 hr 30 min on 24/6/83; **RABBIT ISLAND**–Boat landings for 1 hr on 1/12/76, for 1 hr on 24/6/83; **GOAT ISLAND**–Boat landing for 30 min on 24/6/83; **YANGIE BAY ISLAND**–Boat landing for 45 min on 25/6/83; **AVOID ISLAND**–Boat landing for 3 hr on 22/12/81; **GOLDEN ISLAND**–Helicopter landing for 1 hr 30 min on 26/5/80; **PRICE ISLAND**–Helicopter landing for 1hr 30 min on 26/5/80; **PERFORATED ISLAND**–Helicopter landings for 21 hr 30 min on 27 and 28/5/80; **NORTH FOUR HUMMOCKS**–Helicopter landing for 1hr 15 min on 26/5/80; **CENTRAL FOUR HUMMOCKS**–Helicopter landing for 1 hr 30 min on 27/5/80; **SOUTH FOUR HUMMOCKS**–Helicopter landing for 3hr on 1/6/80; **SOUTH ROCKY ISLAND**–Helicopter landing for 1hr 15 min on 27/5/80; **LIGUANEA ISLAND**–Helicopter landings for 19 hr 30 min on 26 and 27/5/80; **CURTA ROCKS**–Helicopter landing for 2 hr on 28/11/82; **WANNA STACK**–Helicopter landing for 45 min on 28/11/82; **WILLIAMS ISLAND**–Helicopter landing for 17 hr on 27 and 28/11/82.

**Table 19b.** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gold-dust Wattle | *Acacia acinacea* | | | | | | | | | | | | | | | | * | | | | |
| Wallowa | *Acacia calamifolia* | | | | | | * | | | | | | | | | | * | | | | |
| Sticky Wattle | *Acacia dodonaeifolia* | | | | | | | | | | | | | | | | | * | | | |
| Umbrella Bush | *Acacia ligulata* | | | | * | | | | | | | | | | | | * | | | * | |
| Kangaroo Thorn | *Acacia paradoxa* | | | | | | * | | | | | * | | * | | | | | | | |
| Rock Wattle | *Acacia rupicola* | | | | | | | | | | | | | | | | | | | | |
| Shiny Ground-berry | *Acrotriche patula* | | | | | | * | | | | | * | | | | | | | | | |
| Annual Bent-grass | *Agrostis aequata* | | | | | | | | | | | | | | | | | | | | |
| Drooping She-oak | *Allocasuarina verticillata* | | | | * | | * | | | | | | | * | | | * | * | | * | |
| Dysentery Bush | *Alyxia buxifolia* | | | | | | | | | | | * | | | | | * | | | | |
| *Blue Pimpernel | *Anagallis arvensis* | | | | | | | | | | | | | | | | | | | | |
| Spiny Ray-flower | *Anthocercis anisantha* ssp. *anisantha* | | | | | | | | | | | | | | | | | * | | | |
| False Tobacco | *Apalochlamys spectabilis* | | | | | | | | | | | | | | | | | | | | |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sea Celery | *Apium prostratum* ssp. *prostratum* var. *prostratum* | * | * | * | | | | * | | * | * | | * | | * | | | | * | | |
| Small Vanilla-lily | *Arthropodium minus* | | | | | | | | | | | | | | | | | | | | |
| Grey Saltbush | *Atriplex cinerea* | * | * | * | | | | | | * | | | * | | | | | | * | | |
| Mueller's Saltbush | *Atriplex muelleri* | | * | | | | | * | | | | | | | | | | | | | * |
| Marsh Saltbush | *Atriplex paludosa* ssp. *cordata* | | | * | | * | | | | * | * | | * | | | | | | * | * | * |
| *Bearded Oat | *Avena barbata* | | | | * | | | | | | | * | * | * | * | | * | * | | | |
| Felted Wallaby-bush | *Beyeria lechenaultii* | | | | | | * | | | | | * | | | | | | | | * | |
| Golden Everlasting | *Bracteantha bracteatum* | * | | | | | | | | | | | | | | | | | | | |
| *Red Brome | *Bromus rubens* | | | | | | | | * | | * | * | * | * | * | * | | | | | |
| Leek Lily | *Bulbine semibarbata* | * | * | | | | | | | | | | | | | | | | | | |
| | **Bupleurum semicompositum* | | | | | * | | | | | | | | | | | | | | | |
| *Sea Rocket | *Cakile maritima* ssp. *maritima* | | | | | | | | | | | | * | | * | | | | | | |
| Pink Purslane | *Calandrinia calyptrata* | * | | | | | | | | | | | | | | | | | | | |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cushion-bush | *Calocephalus brownii* | * | * | | | * | * | | | * | | | | | | | | | | * | |
| Common Fringe-myrtle | *Calytrix tetragona* | | | | | | | | | | | | | | | | | | | * | |
| Karkalla | *Carpobrotus rossii* | * | * | * | | | | | * | * | * | | * | * | * | * | * | | | * | |
| Ward's Weed | *Carrichtera annua* | | | | | | | | | | | | | | | | | | | | |
| Slender Dodder-laurel | *Cassytha glabella* forma *dispar* | | | | | | | | | | | | | | | | * | | | * | |
| Large Dodder-laurel | *Cassytha melantha* | | | | | | | | | | | | | | | | * | | | | |
| Common Centuary | *Centaurium erythraea* | | | | | * | | | | | | | | | * | * | | | | | |
| Spike Centuary | *Centaurium spicatum* | | | | | | | | | | | | | | | | | | | | |
| Rock Fern | *Cheilanthes austrotenuifolia* | | | | | | | | | | | | | | | | | * | | | |
| Common Everlasting | *Chrysocephalum apiculatum* | | | | | | * | | | | | | | | | | | | | | |
| Small-leaved Clematis | *Clematis microphylla* | | | | | | | | * | | | * | | * | | | * | | | | |
| Australian Bindweed | *Convolvulus erubescens* | | | | | | | | | | | | | | | | | | | | |
| Salmon Correa | *Correa pulchella* | | | | | | * | | | | | | | | | | | | | | |
| Common Correa | *Correa reflexa* var. *reflexa* | * | * | | | | * | | | | | | | | | | | | | | |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Waterbuttons | *Cotula coronopifolia* | * | | * | | | | | | | | | | | | | | | | | |
| Black-anther Flax Lily | *Dianella revoluta* | * | * | | | | | | * | | | * | * | * | * | * | * | | | * | |
| Kidney Weed | *Dichondra repens* | | | | | | | | | | | | | | | | | | | | |
| *Sand Rocket | *Diplotaxis tenuifolia* | | | | | | | | * | | | | | * | | | | | | | |
| Round-leaved Pigface | *Disphyma crassifolium* ssp *clavellatum* | * | * | | | * | * | * | | * | * | | | | * | * | * | | | * | |
| Twin-horned Copperburr | *Dissocarpus biflorus* var. *biflorus* | | | | | | | | | | | | | | | | | | | | |
| Emu-grass | *Distichlis distichophylla* | | * | | | | | * | | | | | | | | | | | | | |
| *Stinkwort | *Dittrichia graveolens* | | | | | | | | | | | | | | | | | | | | |
| Dwarf Hop-bush | *Dodonaea humilis* | | | | | | * | | | | | | | | | | | | | | |
| | *Dodonaea viscosa* ssp. *spatulata* | * | | | * | | | | | | | | | * | | | * | | | | |
| Climbing Saltbush | *Einadia nutans* | | | | | | | | | | | | | | | | | | | | |
| Native Wheat-grass | *Elymus scabrus* | | | | | | | | | | | | | | | | * | | * | | |
| *Three-cornered Jack | *Emex australis* | | | | | | | | | | | | | | | | | | | | |

Table 19b. (cont'd) Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ruby Saltbush | *Enchylaena tomentosa* var. *tomentosa* | * | * | * | * | * | | * | * | * | * | * | * | * | * | | * | | * | * | * |
| Kangaroo Island White Mallee | *Eucalyptus anceps* | | | | | | | | | | | * | | | | | | | | | |
| Coastal White Mallee | *Eucalyptus diversifolia* | | | | | | * | | | | | * | | | | | * | | | | |
| Yorrell | *Eucalyptus gracilis* | | | | | | | | | | | * | | | | | | * | | | |
| Ridge-fruited Mallee | *Eucalyptus incrassata* | | | | | | | | | | | | | | | | | | | * | |
| Red Mallee | *Eucalyptus oleosa* | | | | | | | | | | | | | | | | * | | | | |
| *Sea Spurge | *Euphorbia paralias* | | | | | | | | | | | | * | | | | | | | | |
| *Petty Spurge | *Euphorbia peplus* | | | | * | | | | | | | | | | | | | | | | |
| *False Caper | *Euphorbia terracina* | | | | | | | | | | | | | * | | | | | | | |
| Eutaxia | *Eutaxia microphylla* var. *microphylla* | | | | | | | | | | | | | | | | | | | * | |
| Broom Ballart | *Exocarpos sparteus* | | | | | | | | | | | | | | | | * | | | * | |
| Common Sea-heath | *Frankenia pauciflora* var. *fruticulosa* | | * | | | | * | * | | | * | | | | | | | | | | |
| Limestone Saw-sedge | *Gahnia deusta* | | | | | | * | | | | | | | | | | | | | | |
| Chaffy Saw-sedge | *Gahnia filum* | | | | | | * | | | | | | | | | | | | | | |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Coastal Galenia | *Galenia pubescens* var. *pubescens* | | | | | | | | | | | | | | | | | | | | |
| Sheep Bush | *Geijera linearifolia* | | | | | | | | | | | | | | * | | * | | | | |
| *Dove's Foot | *Geranium molle* ssp. *molle* | | | | | | | | | | | | | | | | | * | | | |
| Native Geranium | *Geranium solanderi* var. *solanderi* | | | | | | | | | | | | | | | | | | | | |
| Sticky Goodenia | *Goodenia varia* | | | | * | | * | | | | | | | | | | * | | | | |
| Holly-leaved Grevillea | *Grevillea ilicifolia* var. *ilicifolia* | | | | | | | | | | | | | | | | | | | * | |
| Elm-seed Hakea | *Hakea cycloptera* | | | | | | | | | | | | | | | | | | | * | |
| Grey Samphire | *Halosarcia halocnemoides* ssp. *halocnemoides* | * | | * | * | | | | | | * | | | | | * | * | | | * | |
| Native Lilac | *Hardenbergia violacea* | | | | | | | | | | | * | | | | | * | | | | |
| Coast Everlasting | *Helichrysum leucopsideum* | * | | | | | * | | | | | | | | | | | | | | |
| Twiggy Guinea-flower | *Hibbertia virgata* | | | | | | | | | | | | | | | | | | | * | |
| *Northern Barley-grass | *Hordeum glaucum* | | | | | | * | | | | | | | | | | | | | | |
| *Barley-grass | *Hordeum leporinum* | * | * | | * | | | | | | | | | * | | | | | * | | |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shrub Violet | *Hybanthus floribundus* ssp. *floribundus* | | | | | | | | | | | | | | | | | | | * | |
| Knobby Club-rush | *Isolepis nodosa* | | | | | | * | | | | | | | | | | | | | | |
| Stalked Ixiolaena | *Ixiolaena supina* | | | | | | | | | * | | | | | | | | | | | |
| Ixodia | *Ixodia achillaeoides* ssp. *achillaeoides* | | | | * | | * | | | | | | | | | | | | | | |
| Toad Rush | *Juncus bufonius* | | | | | | | | | | | | | | | | | | | | |
| *Hare's-tail Grass | *Lagurus ovatus* | | | | | | * | | | | | | | | | | | | | | |
| *Golden-top | *Lamarckia aurea* | | | | | | | | | | | | | | | | | | | | |
| Coast Velvet-bush | *Lasiopetalum discolor* | | | | | | * | | | | | | | | | | * | | | | |
| Australian Hollyhock | *Lavatera plebeia* | | * | * | | | | * | * | * | * | | * | | * | * | * | | * | | * |
| Leafy Peppercress | *Lepidium foliosum* | * | * | | | | | * | | * | * | | | | | | | | | | * |
| Clustered Sword-sedge | *Lepidosperma congestum* | | | | | | | | | | | | | | | | | | | * | |
| Sword Rush | *Lepidosperma gladiatum* | | | | | | * | | | | | | | | | | | | | | |
| *Coastal Tea-tree | *Leptospermum laevigatum* | | | | | | | | | | | | | | | | | | | * | |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Ox-eye Daisy | *Leucanthemum vulgare* | | | | | | | | | | | | | | | | | | | | |
| Heart-leaved Beard-heath | *Leucopogon cordifolius* | | | | | | | | | | | | | | | | | | | * | |
| Coastal Beard-heath | *Leucopogon parviflorus* | | | | | | * | | | | | * | | | | | * | | | | |
| Coast Logania | *Logania crassifolia* var. *crassifolia* | | | | | | | | | | | | | | | | | | | | |
| Oval-leaved Logania | *Logania ovata* | | | | * | | * | | | | | | | | | | | | | | |
| *Perennial Ryegrass | *Lolium perenne* | | | | | | | | | | | | | * | | | | | | | |
| *Wimmera Ryegrass | *Lolium rigidum* ssp. *rigidum* | | | | | | | | | | | | | | | | | | | | |
| | **Lolium temulaetum* | | | | | | | | | | | | | | | | | | | | |
| Scented Mat-rush | *Lomandra effusa* | | | | | | | | | | | | | | | | | | | * | |
| *Annual Cat's-tail | *Lophochloa cristata* | | | | * | | * | | | | | | | * | | | * | | | | |
| Australian Boxthorn | *Lycium australe* | | | | | | | | | | | | | | | | | | | * | |
| *African Boxthorn | *Lycium ferocissimum* | * | | | * | * | | | * | | * | | * | * | * | * | * | * | * | * | * |
| Small-leaved Bluebush | *Maireana brevifolia* | | | | | | | | | | | | | | | | | | | | |
| Heath Bluebush | *Maireana oppositifolia* | | | | | * | | | * | * | | | | | | | | | | | |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

| Common name | Scientific name | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Malvastrum | *Malvastrum americanum* | | | | | | | | | | | | | | | | | | * | | |
| *Horehound | *Marrubium vulgare* | | | | | | | | | | | | | * | | | | | | | |
| *Toothed Medic | *Medicago polymorpha* var. *polymorpha* | | | | | | | | | | | | | * | | | * | | | | |
| Dryland Tea-tree | *Melaleuca lanceolata* | | | | * | | * | | | | | * | | | | | | * | | * | |
| Broombush | *Melaleuca uncinata* | | | | | | | | | | | | | | | | | | | * | |
| *King Island Melilot | *Melilotus indica* | | * | | | * | | | * | | | | | | * | * | | | | | |
| *Common Iceplant | *Mesembryanthemum crystallinum* | | | * | | * | | | * | * | * | | * | | * | * | | | * | * | * |
| Climbing Lignum | *Muehlenbeckia adpressa* | | | | | | | | | | | | | | | | * | | | | |
| Coastal Lignum | *Muehlenbeckia gunnii* | * | * | | | | * | | | * | * | | * | * | * | * | | | * | * | |
| Native Juniper/Boobialla | *Myoporum insulare* | | | | * | * | * | | * | * | * | * | * | * | * | * | * | | | | |
| *Bridal Creeper | *Myrsiphyllum asparagoides* | | | | | | | | | | | | | | * | | * | | | | |
| Coast Tobacco | *Nicotiana maritima* | | | | | | | | | | | | | | | | | | | | |
| Nitre-bush | *Nitraria billardierei* | * | | * | | * | | * | * | * | * | | * | * | | | * | | * | * | * |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coast Daisy-bush | *Olearia axillaris* | | | | * | * | * | | * | | | | | | | | * | | | * | |
| Heath Daisy-bush | *Olearia floribunda* var. *floribunda* | | | | | | | | | | | * | | | | | | | | | |
| Twiggy Daisy-bush | *Olearia ramulosa* | * | * | | | | * | | | * | * | | | | | | | | | | |
| Variable Stinkweed | *Opercularia varia* | | | | * | | | | | | | | | | | | | | | | |
| *Creeping Oxalis | *Oxalis corniculata* ssp. *corniculata* | | | | | | | | | | | | | | | | | | | | |
| *Curly Ryegrass | *Parapholis incurva* | | | | | | | | | | | | | | | | | | | | |
| Smooth Nettle | *Parietaria debilis* | * | | | | | | | | | | | | | | | | | | | |
| Austral Stork's Bill | *Pelargonium australe* | * | * | | | | | | | * | * | | | | | | | | | | |
| Thyme Riceflower | *Pimelea serpyllifolia* ssp. *serpyllifolia* | | | | | | * | | | | | | | | | | | | | * | |
| Weeping Pittosporum | *Pittosporum phylliraeoides* var. *microcarpa* | | | | | | * | | | | | * | | | | * | * | | | * | |
| *Winter Grass | *Poa annua* | | | | | | | | | | | | | | | | | | | | |
| Coast Tussock Grass | *Poa poiformis* var. *poiformis* | * | * | | | | * | | * | | | | | | | | * | | | | |
| Slender Tussock Grass | *Poa tenera* | | | | | | | | | | | | | | | | | | | | |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

| **Common name** | **Scientific name** | **North Neptune Island** | **South Neptune Island** | **South Neptune (Lighthouse) Island** | **Wedge Island** | **North Islet** | **Thistle Island** | **Albatross Island** | **Hopkins Island** | **Smith Island** | **Lewis Island** | **Taylor Island** | **Owen Island** | **Grindal Island** | **North Bickers Island** | **South Bickers Island** | **Grantham Island** | **Boston Island** | **Rabbit Island** | **Tumby Island** | **Lipson Island** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pleated Podolepis | *Podolepis rugata* var. *rugata* | | | | * | * | | | | | | | | | | | | | | | |
| *Coast Beard-grass | *Polypogon maritimus* | | | | | * | | | | | | | | | | | | | | | |
| *Annual Beard-grass | *Polypogon monspeliensis* | | | | | | | | | | | | | | | | | | | | |
| Wedge-leaved Pomaderris | *Pomaderris obcordata* | | | | | | | | | | | | | | | | * | | | | |
| Coast Pomaderris | *Pomaderris oraria* | | | | | | * | | | | | | | | | | * | | | | |
| | *Pseudognaphalium luteoalbum* | * | | | | | | | | | | | | | | | | | | | |
| Island Bush-pea | *Pultenaea rigida* var. *rigida* | | | | * | | * | | | | | | | | | | | | | | |
| Seaberry Saltbush | *Rhagodia candolleana* ssp. *candolleana* | * | * | * | * | * | | | * | * | * | * | * | * | * | * | * | | * | * | |
| Fleshy Saltbush | *Rhagodia crassifolia* | | | | | * | | | * | | | | | * | | | | | | | |
| Mealy Saltbush | *Rhagodia parabolica* | | | | | | | | | | | | | | | | | | | | |
| Buckbush | *Salsola kali* | | | | | | | | | | | | | | | | | | * | | |
| Creeping Brookweed | *Samolus repens* | * | | | | | * | | | | | | | | | * | * | | | | |
| Thick-headed Samphire | *Sarcocornia blackiana* | | * | | | | | | | | | | | | | | | | | | |

**Table 19b. (cont'd)** Plant species from southern Eyre Peninsula islands.

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Beaded Samphire | *Sarcocornia quinqueflora* | | | | | | | | | | | | | | | | * | | | | |
| Cushion Fanflower | *Scaevola crassifolia* | | | | | | * | | | | | | | | | | * | | | | |
| Prickly Knawel | *Scleranthus pungens* | * | * | | | | | | | | | | | | | | | | | | |
| Salt Copperburr | *Sclerolaena ventricosa* | | | | | | | | | | | | | | | | | | | | |
| Variable Groundsel | *Senecio lautus* | * | * | * | | * | | | * | * | | | * | | | | * | | | | |
| *African Daisy | *Senecio pterophorus* var. *pterophorus* | | | | | | | | | | | | | | | | * | | | * | |
| *Black-berry Nightshade | *Solanum nigrum* | | | | | | | | | | | | | | | | | | | | |
| Dune Thistle | *Sonchus megalocarpus* | | | | | | | | * | | | | | | | | | | | | |
| *Common Sow-thistle | *Sonchus oleraceus* | | | | | | | | | | | | | | * | * | | | | | |
| | *Spergularia bocconii* | | | | | | | | | | | | | | | | | | | | |
| *Coast Sand Spurrey | *Spergularia media* | | * | | | | | | | | | | | | | | | | | | |
| *Red Spurrey | *Spergularia rubra* | | | | | | | | | | | | | | | | | | | | |
| Rolling Spinifex | *Spinifex sericeus* | | | | | | * | | | | | | | | | | | | | | |
| Salt Couch | *Sporobolus virginicus* | * | * | * | | | * | | | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Forked Spyridium | *Spyridium bifidum* var. *bifidum* | | | | | | | | | | | | | | | | | | | * | |
| Narrow-leaved Spyridium | *Spyridium phylicoides* | | | | * | | | | | | | | | | | | | | | | |
| Cottony Spear-grass | *Stipa drummondii* | | | | | | | | | | | | | | | | | | | | |
| Elegant Spear-grass | *Stipa elegantissima* | | | | | | | | * | | | | | | | | | | | | |
| Desert Spear-grass | *Stipa eremophila* | | | | | | | | | | | | | | * | * | | | | | |
| Spear-grass | *Stipa flavescens* | | | | | | | | | | | | | | | | | | | | |
| Coast Spear-grass | *Stipa stipoides* | | | | | | | | | | | | | | | | | | | | |
| Austral Seablite | *Suaeda australis* | | * | | | | | | | | | | | | | * | * | | | | |
| Cockie's Tongue | *Templetonia retusa* | | | | | | * | | | | | * | | * | | | * | | | * | |
| Bower Spinach | *Tetragonia implexicoma* | * | * | | | | | | * | * | | | * | * | * | | * | | * | * | |
| Coast Bonefruit | *Threlkeldia diffusa* | * | | * | * | * | | * | * | * | * | | * | * | * | * | * | | | * | |
| *Squirrel-tail Fescue | *Vulpia bromoides* | | | | | | | | | | | | | | | | | | | | |
| *Rat's-tail Fescue | *Vulpia myuros* | * | | | | * | | | * | | | | | | * | * | | | | | |
| Tall bluebell | *Wahlenbergia stricta* ssp. *stricta* | | | | | | | | | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shore Westringia | *Westringia dampieri* | | | | | | | | | | | | | | | | | | | * | |
| Early Nancy | *Wurmbea dioica* ssp. *dioica* | | | | | | | | | | | | | | | | | | | | |
| *Spreading Night-phlox | *Zaluzianskya divaricata* | | | | | | | | | | | | | | | | | | | | |
| Pointed Twinleaf | *Zygophyllum apiculatum* | | | | * | | * | | * | * | * | * | | * | * | * | * | | | | |
| Coast Twinleaf | *Zygophyllum billardierii* | | | | | | | | | * | | | | | * | | * | | | | |

Data in this table is from the following sources: **NORTH NEPTUNE ISLAND**–(Stirling et al 1970) Helicopter landing for 2 hr on 3/9/80, Helicopter landings for 15 hr 30 min 26 and 27/11/82; **SOUTH NEPTUNE ISLAND**–Helicopter landing for 2 hr on 26/11/82; **SOUTH NEPTUNE (LIGHTHOUSE) ISLAND**–(Southeo H 1964) Helicopter landing for 1 hr 30 min on 26/11/82; **WEDGE ISLAND**–3 hr visit on 2/11/75, Helicopter landing for 1 hr 45 min on 26/11/75, 2 day visit on 8/5/83; **NORTH ISLET**–Helicopter landings for 18 hr 30 min on 25 and 26/11/82; **THISTLE ISLAND**–Visit for 4 hr on 2/11/75, Helicopter landing for 2 hr 15 min on 27/11/82; **ALBATROSS ISLAND**–Helicopter landing for 1 hr on 27/11/82; **HOPKINS ISLAND**–Helicopter landing for 3 hr 15 min on 28/1//82; **SMITH ISLAND**–Helicopter landing for 1 hr 15 min on 27/11/82; **LEWIS ISLAND**–Helicopter landing for 1 hr 15 min on 28/11/82; **TAYLOR ISLAND**–Helicopter landing for 1 hr on 28/11/82; **OWEN ISLAND**–Helicopter landing for 45 min on 29/11/82; **GRINDAL ISLAND**–Helicopter landings for 17hr 30 min on 28 and 29/11/82; **BICKERS ISLANDS**–Helicopter landings for 2 hr 30 min on 29/11/82; **GRANTHAM ISLAND**–Helicopter landing for 1 hr 30 min on 29/11/82; **BOSTON ISLAND**–Helicopter landing for 30 min on 29/11/82; **RABBIT ISLAND**–Helicopter landings for 17 hr on 29 and 30/11/82; **TUMBY ISLAND**–Helicopter landings for 24 hr on 30/11/ and 1/12/82; **LIPSON ISLAND**–Helicopter landing for 1 hr on 30/11/82.

**Table 20.** Mammal species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (SW) Island | Yangie Bay Island | Perforated Island | Central Four Hummocks | South Four Hummocks | South Rocky Island | Ligaunea Island | South Curta Rocks | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | West Peaked Rocks | East Peaked Rocks | South-west Rock | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Little Island | Taylor Island | North Bickers Island | Boston Island | Rabbit Island | Tumby Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New Zealand Fur-seal | *Arctocephalus forsteri* | | | | * | * | * | | * | * | * | * | * | | | | | | | | | | | | | | | | |
| Brush-tailed Bettong | *Bettongia penicillata* | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| Fallow Deer | *Cervus dama* | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| Hairy-nosed Wombat | *Lasiorhinus latifrons* | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |
| Tammar/Dama Wallaby | *Macropus eugenii* | | | | | | | | | | | | | | | | | | 2 | | | | | | | | 1 | | |
| Western Grey Kangaroo | *Macropus fuliginosus* | | * | | | | | | | | | | | | | | | | | | | | | | * | | | | |
| *House Mouse | *Mus domesticus* | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Australian Sea-lion | *Neophoca cinerea* | | | * | * | * | * | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | | | | | |
| *European Rabbit | *Oryctolagus cuniculus* | * | * | | | | | | | | | | | | | | | * | | | | | | | | * | | * | * |
| Black-footed Rock-wallaby | *Petrogale lateralis* | | | | | | | | | | | | | 1 | | | | | 1 | | | | | | | | | | |
| Bush Rat | *Rattus fuscipes* | | | * | | | | * | | * | * | | | | | | | * | | | * | | | | | | | | |

**Table 20. (cont'd)** Mammal species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (SW) Island | Yangie Bay Island | Perforated Island | Central Four Hummocks | South Four Hummocks | South Rocky Island | Ligaunea Island | South Curta Rocks | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | West Peaked Rocks | East Peaked Rocks | South-west Rock | North Islet | Thistle Island | Albatross Island | Hopkins Island | Smith Island | Lewis Island | Little Island | Taylor Island | North Bickers Island | Boston Island | Rabbit Island | Tumby Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brushtail Possum | *Trichosurus vulpecula* | | | | | | | | | | | | | | | | | | * | | | | | | * | | | | |

1. Introduced population; 2. Skeletal remains only.

Data in this table is from the following sources: **MT DUTTON (SW) ISLAND**–Boat landing for 30 min on 25/6/83; **YANGIE BAY ISLAND**–Boat landing for 1 hr on 24/6/83; **PERFORATED ISLAND**–Helicopter landings for 21 hr 30 min on 27 and 28/5/80; **CENTRAL FOUR HUMMOCKS**–Helicopter landing for 1 hr 30 min on 27/5/80, Boat landing on 29/1/90; **SOUTH FOUR HUMMOCKS**–Helicopter landing for 3 hr on 1/6/80, Boat landing on 29/1/90; **SOUTH ROCKY ISLAND**–Helicopter landing for 1 hr 15 min on 27/5/80, Boat landing on 29/1/90; **LIGAUNEA ISLAND**–Helicopter landings for 19 hr 30 min on 26 and 27/5/80, Boat landing on 30/1/90; **CURTA ROCKS**–Helicopter landing for 2 hr on 28/11/82, Boat pass 30/1/90; **WILLIAMS ISLAND**–Helicopter landings for 17 hr on 27 and 28/11/82; **NORTH NEPTUNE ISLAND**–(Stirling 1970, 1971a, b), Helicopter landing for 2 hr on 3/9/90, Helicopter landings for 15 hr 30 min on 26 and 27/11/82; **SOUTH NEPTUNE ISLAND**–Helicopter landing for 2 hr on 26/11/82; **PEAKED ROCKS**– Helicopter overfly on 26/11/82; **SOUTH-WEST ROCK**– Helicopter overfly on 26/11/82; **SOUTH NEPTUNE (LIGHTHOUSE) ISLAND**–Helicopter landing for 1 hr 30 min on 26/11/82; **WEDGE ISLAND**–3 hr visit on 2/1//75, Helicopter landing for 1 hr 45 min on 26/11/75, 2 day visit on 8/5/83; **NORTH ISLET**–Helicopter landings for 18 hr 30 min on 25 and 26/11/82; **THISTLE ISLAND**–Visit for 4 on 2/11/75–Helicopter landing for 2 hr 15 min on 27/11/82; **ALBATROSS ISLAND**–Helicopter landing for 1 hr on 27/11/82–Boat pass on 31/1/90; **HOPKINS ISLAND**–Helicopter landing for 3 hr 15 min on 27/11/82–Boat landing on 31/1/90; **SMITH ISLAND**–Helicopter landing for 1 hr 15 min on 27/11/82;–Boat pass on 30/1/90; **LEWIS**–Helicopter landing for 1 hr on 28/11/82, Boat landing on 31/1/90; **LITTLE ISLAND**–Helicopter overfly on 28/11/82; **TAYLOR ISLAND**–Helicopter landing for 1 hr on 28/11/82; **BICKERS ISLANDS**–Helicopter landing for 2 hr 30 min on 29/11/82; **BOSTON ISLAND**–Helicopter landing for 30 min on 29/11/82; **RABBIT ISLAND**–Helicopter landings for 17hr on 29 and 30/11/82; **TUMBY ISLAND**–Helicopter landings for 24 hr on 30/11 and 11/2/82.

**Table 21a.** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | Mt Dutton (SW) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Yellow-rumped Thornbill | *Acanthiza chrysorrhoa* | | | | | | * | | | | | | | | | | | | | | | | | | | | |
| Red Wattlebird | *Anthochaera carunculata* | | | | | | * | | | | | | | | | | | | | | | | | | | | |
| Richard's Pipit | *Anthus novaeseelandiae* | | | | | | | | | | | | | | | | * | * | | | | | | * | | | |
| Wedge-tailed Eagle | *Aquila audax* | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| White-faced Heron | *Ardea novaehollandiae* | | | | | | | | * | | * | | | | | * | | * | | | | | | | * | * | |
| Ruddy Turnstone | *Arenaria interpres* | | | | | | | | | | | | | | | | | | | | * | | | | | | |
| Southern Stone-curlew/ Bush Thicknee | *Burhinus grallarius* | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Red-necked Stint | *Calidris ruficollis* | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| Cape Barren Goose | *Cereopsis novaehollandiae* | | | | | | | | | | * | * | 2 | 2 | | 2 | | | | 2 | 2 | 2 | | | | | |
| Hooded Dotterel/ Plover | *Charadrius rubricollis* | | | | | | | | | | | | | | | | | | | * | | | | * | | * | |

**Table 21a. (cont'd)** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | Mt Dutton (SW) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Red-capped Dotterel/ Plover | *Charadrius ruficapillus* | | * | | | | | | | | | | | | | | | | | | | | | | | * | * |
| Swamp/Marsh Harrier | *Circus approximans* | | | | | | | | | | | | | | | | | | | | | * | | | | * | |
| Black-faced Cuckoo-shrike | *Coracina novaehollandiae* | | | | | | | | | | | | | | | | | | | | * | * | | * | | | |
| Australian Raven | *Corvus coronoides* | | | | | | | | | | | | | | | | | | | | | | | * | * | * | |
| Little Raven | *Corvus mellori* | | | | | | | | | | * | | | | | | | | | | | | | | | | |
| Emu | *Dromaius novaehollandiae* | | | | | | 4 | | | | | | | | | | | | | | | | | * | | | |
| Galah | *Eolophus roseicapillus* | | | | | | | | * | * | * | | | | | | | | | | | | | | | | |
| White-fronted Chat | *Ephthianura albifrons* | | | | | | | | | | | | | | | | | | | | * | * | * | | | | * |
| Little/Fairy Penguin | *Eudyptula minor* | | | | 1 | | | | | | | | | * | | 1 | 1 | 1 | | | 3 | | | 1 | | | 1 |
| Brown Hawk/Falcon | *Falco berigora* | | | | | | | | * | | | | | | | | | | | | | | | | | | |
| Australian Kestrel | *Falco cenchroides* | | | | | | | | | * | * | | * | * | | * | | * | | | | * | | * | | | |
| Peregrine Falcon | *Falco peregrinus* | | | | | | | | | | | | | | | | | | | | | * | | | * | | |

**Table 21a. (cont'd)** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | Mt Dutton (SW) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Banded/Buff-banded Rail | *Gallirallus philippensis* | * | | * | | | | | | | | | | | | | | | | | | | | | | | |
| Sooty Oystercatcher | *Haematopus fuliginosus* | | * | * | | | | * | * | * | | * | * | * | | * | | | * | * | * | 2 | | * | | * | * |
| Pied Oystercatcher | *Haematopus ostralegus* | | * | * | | | | | | | | | | | | | | | | | | | | | | | |
| Sacred Kingfisher | *Halcyon sancta* | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| White-bellied Sea-eagle | *Haliaeetus leucogaster* | | | | | | * | | | | 3 | | * | * | | * | | | | * | * | * | | 2 | * | | |
| Welcome Swallow | *Hirundo neoxena* | | | | | | | | * | * | * | * | * | | | | * | * | * | * | * | * | | * | * | * | |
| Masked/Spur-winged Plover | *Hoplopterus miles* | | | | | | | | | | | | | | | * | | | | | | * | * | * | * | * | |
| BandedPlover/ Lapwing | *Hoplopterus tricolor* | | | | | | | | | | * | | | | | | | | | | | | | | | | |
| Caspian Tern | *Hydroprogne caspia* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Silver Gull | *Larus novaehollandiae* | * | * | * | * | * | * | 1 | | | | | * | * | * | * | | | * | * | * | 1 | * | * | * | * | * |
| Pacific Gull | *Larus pacificus* | | | * | * | | | 2 | * | | * | * | * | | * | | | * | | * | * | * | * | * | * | | 1 |

**Table 21a. (cont'd)** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | Mt Dutton (SW) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black-faced Shag/Cormorant | *Leucocarbo fuscescens* | | | | | | | | | | | | | | | | | | * | | | | | | | | |
| Superb Blue Wren | *Malurus cyaneus* | | | | | | * | | | | | | | | | | | | | | | | | | | | |
| Little Grassbird | *Megalurus gramineus* | | | * | * | | | | * | * | * | * | * | | | * | * | * | | * | | | * | | | | |
| Singing Honeyeater | *Meliphaga virescens* | * | | | * | | | | | | | | | | | | | | | | | | | | | * | |
| Rock Parrot | *Neophema petrophila* | | | * | * | | | 2 | * | * | * | * | * | * | | * | 2 | * | * | * | * | * | * | * | | | * |
| Golden Whistler | *Pachycephala pectoralis* | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Rufous Whistler | *Pachycephala rufiventris* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Osprey | *Pandion haliaetus* | | | | | | | * | * | | 2 | | | | | | | | 2 | | | | | * | | * | |
| *House Sparrow | *Passer domesticus* | | | | | | | | | | | | | | | | | | | | | | * | * | | | |
| White-faced Storm-petrel | *Pelagodroma marina* | | | | | | | | | 1 | | | | 1 | | | 2 | 1 | | | | | | | | | |
| Australian Pelican | *Pelecanus conspicillatus* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Red-capped Robin | *Petroica goodenovii* | | | | | | | | | | | | | | | | | | | | | | | * | | | |

**Table 21a. (cont'd)** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | Mt Dutton (SW) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Red-tailed Tropicbird | *Phaethon rubricauda* | | | | | | | | | | | | | | | | | | | | | | 2 | | | | |
| Little Pied Cormorant | *Phalacrocorax melanoleucos* | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Little Black Cormorant | *Phalacrocorax sulcirostris* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pied Cormorant | *Phalacrocorax varius* | | * | | | | | | * | | | | | | | * | | | | | | | | * | * | | |
| Common Bronzewing | *Phaps chalcoptera* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brush Bronzewing | *Phaps elegans* | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Grey Plover | *Pluvialis squatarola* | | * | | | | | | | | | | | | | | | | | | | | | | | | |
| Short-tailed Shearwater | *Puffinus tenuirostris* | | | | | | | | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | | 1 | | |
| Grey Fantail | *Rhipidura fuliginosa* | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| White-browed Scrubwren | *Sericornis frontalis* | | | | | | * | | | | | | | | | | | | | | | | | * | | * | |
| Fairy Tern | *Sterna nereis* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Grey Currawong | *Strepera versicolor* | | | | | | * | | | | | | | | | | | | | | | | | | | | |

**Table 21a. (cont'd)** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (N) Island | Mt Dutton (SW) Island | The Brothers | Rabbit Island | Goat Island | Yangie Bay Island | Avoid Island | Golden Island | Price Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Four Hummocks | South Rocky Island | Liguanea Island | North Curta Rocks | South Curta Rocks | Wanna Stack | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Albatross Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Common/European Starling | *Sturnus vulgaris* | | | | | | | | | * | * | * | * | | | * | | | | * | | | | * | | | |
| Crested Tern | *Thalasseus bergii* | | | * | | | * | 1 | | * | | | | 1 | * | * | | | | | | | 1 | * | * | | |
| Greenshank | *Tringa nebularia* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Barn Owl | *Tyto alba* | | | * | | | | | | | | | | | | * | | | | | | | | | | | |
| Silvereye | *Zosterops lateralis* | | | | | | * | | | | * | | * | * | | | | * | | * | | * | * | * | * | * | |

1. Breeding colony; 2. Nesting recorded; 3. Dead bird found; 4. Droppings only.

Data in this table is from the following sources: **MT DUTTON BAY ISLANDS**–Boat landing for 1 hr on 25/6/83; **THE BROTHERS**–Boat landings for 1 hr on 1/12/76, for 1hr 30 min on 24/6/83; **RABBIT ISLAND**–Boat landings for 1 hr on 1/12/76, for 1 hr on 24/6/83; **GOAT ISLAND**–Boat landing for 30 min on 24/6/83; **YANGIE BAY ISLAND**–Boat landing for 45 min on 25/6/83; **AVOID ISLAND**–Boat landing for 3 hr on 22/12/81; **GOLDEN ISLAND**–Helicopter landing for 1 hr 30 min on 26/5/80; **PRICE ISLAND**–Helicopter landing for 1 hr 30 min on 26/5/80; **PERFORATED ISLAND**–Helicopter landings for 21 hr 30 min on 27 and 28/5/80, **NORTH FOUR HUMMOCKS**–Helicopter landing for 1 hr 15 min on 26/5/80; **CENTRAL FOUR HUMMOCKS**– Helicopter landing for 1 hr 30 min on 27/5/80; **SOUTH FOUR HUMMOCKS**–Helicopter landing for 3 hr on 1/6/80; **SOUTH ROCKY ISLAND**–Helicopter landing for 1 hr 15 min on 27/5/80; **LIGUANEA ISLAND**–Helicopter landings for 19 hr 30 min on 26 and 27/5/80; **CURTA ROCKS**–Helicopter landing for 2 hr on 28/11/82; **WANNA STACK**–Helicopter landing for 45 min on 28/11/82; **WILLIAMS ISLAND**–Helicopter landing for 17 hr on 27 and 28/11/82; **NORTH NEPTUNE ISLAND**–(Stirling et al 1970) Helicopter landing for 2 hr on 3/9/80, Helicopter landing for 15 hr 30 min on 26 and 27/11/82. **SOUTH NEPTUNE ISLAND**–Helicopter landing for 2 hr on 26/11/82; **SOUTH NEPTUNE (LIGHTHOUSE) ISLAND** (Perryman 1936) Helicopter landing for 1 hr 30 min on 26/11/82; **WEDGE ISLAND**–(Finlayson 1951) 3 hr visit on 2/11/75, (Bonnin and Angove 1980) Helicopter landing for 1 hr 45 min on 26/11/75, 2 day visit on 8/5/83; **NORTH ISLET** (Finlayson 1951)–Helicopter landing for 18 hr 30 min on 25 and 26/11/82; **THISTLE ISLAND**–(Lindsay 1950) Visit for 4 hrs on 2/11/75–Helicopter landing for 2 hr 15 min on 27/11/82; **ALBATROSS ISLAND**–helicopter landing for 1 hr on 27/11/82.

**Table 21b.** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Hopkins Island | Smith Island | Lewis Island | Little Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brown Goshawk | *Accipiter fasciatus* | | | | | | | | | | | * | | | |
| Chestnut Teal | *Anas castanea* | | | | | | | | | | | * | | | |
| Australasian Grey Teal | *Anas gracilis* | | | | | | | | | | | * | | * | |
| Richard's Pipit | *Anthus novaeseelandiae* | | | | | * | | | | | | * | | | |
| Wedge-tailed Eagle | *Aquila audax* | | | | | | | | | | | * | | | |
| White-faced Heron | *Ardea novaehollandiae* | | | | | * | | * | | | | * | | * | |
| Eastern Reef Egret/Reef Heron | *Ardea sacra* | | | | | | | | | | | * | | | |
| Black-faced Wood-swallow | *Artamus cinereus* | | | | | | | | | | | | | * | |
| Dusky Wood-swallow | *Artamus cyanopterus* | | | | | | | | | | | | | | |
| Ring-necked Parrot | *Barnardius zonarius* | | | | | | | | | | | * | | | |
| Southern Stone-curlew/Bush Thicknee | *Burhinus grallarius* | | | | | | | | | | | * | | | |
| Cape Barren Goose | *Cereopsis novaehollandiae* | | * | * | | | * | 2 | | | | * | * | | |
| Hooded Dotterel/Plover | *Charadrius rubricollis* | | | | | | * | | | | | * | | | |
| Red-capped Dotterel/Plover | *Charadrius ruficapillus* | | | | | | | | | | | * | | | |
| White-backed Swallow | *Cheramoeca leucosternum* | | | | | | | | | | | * | | | |
| Brown Songlark | *Cinclorampkus cruralis* | | | | | | | | | | | * | | | |
| Grey Shrike-thrush | *Colluricincla harmonica* | | | | | | | | | | * | | | | |
| *Feral Pigeon/Rock Dove | *Columba livia* | | | | | | | | | | | | | 2 | * |
| Black-faced Cuckoo-shrike | *Coracina novaehollandiae* | | | | | * | | | * | | * | * | | | |

**Table 21b. (cont'd)** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Hopkins Island | Smith Island | Lewis Island | Little Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australian Raven | *Corvus coronoides* | * | | | | * | | * | | | * | * | | | |
| Stubble Quail | *Coturnix novaezelandiae* | | | | | | | | | | | * | | | |
| Black Swan | *Cygnus atratus* | | | | | | | | | | | * | | * | |
| Black-shouldered Kite | *Elanus caeruleus* | | | | | | | | | | | * | | | |
| White-fronted Chat | *Ephthianura albifrons* | | | | | | | | | | | * | | | |
| Little/Fairy penguin | *Eudyptula minor* | | | 1 | | | 1 | | | | | * | 1 | | 1 |
| Galah | *Eolophus roseicapillus* | | | | | | | | | | | * | | * | |
| Brown Hawk/Falcon | *Falco berigora* | | | | | * | | | | | | | | | |
| Australian Kestrel | *Falco cenchroides* | | | | | | | * | | | | * | * | * | |
| Magpie-lark | *Grallina cyanoleuca* | | | | | | | | | | | * | | | |
| Australian Magpie | *Gymnorhina tibicen* | | | | | | | | | | | * | | | |
| Sooty oystercatcher | *Haematopus fuliginosus* | | * | * | * | | * | * | * | * | * | * | * | | * |
| Pied Oystercatcher | *Haematopus ostralegus* | | | | | | | | | | * | * | | | |
| White-bellied Sea-eagle | *Haliaeetus leucogaster* | | | | | | | | | | | 2 | 2 | | |
| Welcome Swallow | *Hirundo neoxena* | * | | * | | * | | | | | | * | | | |
| Masked/Spur-winged Plover | *Hoplopterus miles* | | | | | * | | | | | | * | | | |
| Banded Plover/Lapwing | *Hoplopterus tricolor* | | | | | | | | | | | * | | | |
| Caspian Tern | *Hydroprogne caspia* | | | | | | | | | | | * | | | |
| Silver Gull | *Larus novaehollandiae* | | | * | | | | * | | * | * | * | 1 | | 1 |
| Pacific Gull | *Larus pacificus* | | * | * | * | * | 2 | * | * | * | | | * | * | |

**Table 21b. (cont'd)** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Hopkins Island | Smith Island | Lewis Island | Little Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black-faced Shag/Cormorant | *Leucocarbo fuscescens* | | | * | | | * | * | | | * | * | * | | * |
| Little Grassbird | *Megalurus gramineus* | | | | | | * | | * | | | | | | * |
| Singing Honeyeater | *Meliphaga virescens* | | | | | | | | | | | * | | * | |
| Budgerigah | *Melopsittacus undulatus* | | | | | | | | | | | * | | | |
| Elegant Parrot | *Neophema elegans* | | | | | | | | | | | * | | | |
| Rock Parrot | *Neophema petrophila* | | * | * | | | * | | * | | * | * | * | * | |
| Boobook Owl | *Ninox novaeseelandiae* | | | | | | | | | | | * | | | |
| Golden Whistler | *Pachycephala pectoralis* | | | | | * | | | | | * | | | | |
| Osprey | *Pandion haliaetus* | | | | | | | | | | | * | | | |
| *House Sparrow | *Passer domesticus* | | | | | | | | | | | * | | | |
| White-faced Storm-petrel | *Pelagodroma marina* | | 3 | 1 | | | 1 | | | | | | 3 | | |
| Little Pied Cormorant | *Phalacrocorax melanoleucos* | | | | | | | | | | | * | | | |
| Little Black Cormorant | *Phalacrocorax sulcirostris* | | | | | | | | | | | * | | | |
| Pied Cormorant | *Phalacrocorax varius* | | | | | | | | | | | | | | |
| Common Bronzewing | *Phaps chalcoptera* | | | | | | | | | | | * | | | |
| Zebra Finch | *Poephila guttata* | | | | | | | | | | | * | | | |
| Fleshy-footed Shearwater | *Puffinus carneipes* | | 1 | | | | | | | | | | | | |
| Short-tailed Shearwater | *Puffinus tenuirostris* | 1 | 1 | | | | | | | | | | | | |
| Grey Fantail | *Rhipidura fuliginosa* | | | | | * | | | | | | | | | |
| Willie Wagtail | *Rhipidura leucophrys* | | | | | | | | | | | * | | * | |

**Table 21b. (cont'd)** Bird species from southern Eyre Peninsula islands.

| Common name | Scientific name | Hopkins Island | Smith Island | Lewis Island | Little Island | Taylor Island | Owen Island | Grindal Island | North Bickers Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island | Lipson Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fairy Tern | *Sterna nereis* | | | | | | * | | | | | * | | | |
| Grey Currawong | *Strepera versicolor* | | | | | | | | | | | * | | | |
| *Common/European Starling | *Sturnus vulgaris* | | | | | | | | | | * | * | * | * | * |
| Mountain Duck/Australasian Shelduck | *Tadorna tadornoides* | | | | | | | | | | | * | | | |
| Crested Tern | *Thalasseus bergii* | | | | | | | * | | | | * | * | | 1 |
| Greenshank | *Tringa nebularia* | | | | | | | | | | | | | | |
| Barn Owl | *Tyto alba* | | | | | | | | * | | | * | * | | |
| Silvereye | *Zosterops lateralis* | | | | | * | * | | | | * | * | | | |

1. Breeding colony; 2. Nesting recorded; 3. Dead bird found.

Data in this table is from the following sources: **HOPKINS ISLAND**–Helicopter landing for 3 hr 15 min on 27/11/82; **SMITH ISLAND**–Helicopter landing for 1 hr 15 min on 27/11/82; **LEWIS ISLAND**–Helicopter landing for 1 hr 15 min on 28/11/82; **LITTLE ISLAND**–Helicopter overfly 28/11/82; **TAYLOR ISLAND**–Helicopter landing for 1 hr on 28/11/82; **OWEN ISLAND**–Helicopter landing for 45 min on 29/11/82; **GRINDAL ISLAND**–Helicoper landing for 17 hr 30 min on 28 and 29/11/82; **BICKERS ISLANDS**–Helicopter landing for 2 hr 30 min on 19/11/82; **GRANTHAM ISLAND**–Helicopter landing for 1 hr 30 min on 29/11/82; **BOSTON ISLAND**–Helicopter landing for 30 min on 29/11/82; **RABBIT ISLAND**–Helicopter landing for 17 hr on 29 and 30/11/82; **TUMBY ISLAND**–Helicopter landing for 24 hr on 30/11 and 1/12/82; **LIPSON ISLAND**–Helicopter landing for 1 hr on 30/11/82

Table 22. Reptile species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (SW) Island | The Brothers | Rabbit Island | Goat Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Curta Rocks | Wanna Stack | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Hopkins Island | Smith Island | Lewis Island | Little Island | Taylor Island | Owen Island | Grindal Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Striped Wall Skink | *Cryptoblepharus virgatus* | | | | | | | | | | | | | | | | * | * | | | | * | | | | | | | |
| Peninsula Dragon | *Ctenophorus fionii* | | | | | | | | | | | | | | * | * | | | | | | | | | | | | | |
| Spotted Ctenotus | *Ctenotus uber* | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bull Skink | *Egernia multiscutata* | | | | | * | | | * | | * | * | | | * | * | * | * | | * | | * | * | | | | | | |
| White's Skink | *Egernia whitii* | | | | | | | | | | | | | | * | | * | | | | | | | | | | | | |
| Four-toed Earless Skink | *Hemiergis peronii* | * | * | * | * | | | * | * | | * | * | | | * | | * | * | | * | * | * | * | * | * | | | * | |
| Bougainville's Skink | *Lerista bougainvillii* | | | * | | | | | | | | | | | | | | | | | | * | | * | | | | | |
| Southern Four-toed Slider | *Lerista dorsalis* | | * | | | | | | | | | | | | | | * | * | | * | | | * | | | | | | |
| Mallee Slider | *Lerista edwardsae* | | | | | | | | | | | | | | | | | * | | | | | | | | | | | |
| Dwarf Skink | *Menetia greyii* | | | | | | | | | | * | | | | | | * | * | | | | | | | | | | | |

**Table 22. (cont'd)** Reptile species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (SW) Island | The Brothers | Rabbit Island | Goat Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Curta Rocks | Wanna Stack | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Hopkins Island | Smith Island | Lewis Island | Little Island | Taylor Island | Owen Island | Grindal Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adelaide Snake-eye | *Morethia adelaidensis* | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mallee Snake-eye | *Morethia obscura* | | | | | | | | | * | | | | | | | * | * | | | | | | | | | | | |
| Thick-tailed Gecko | *Nephrurus milii* | | | | | | | | | | | | | | * | * | * | | | | | * | | | | | | | |
| Black Tiger Snake | *Notechis scutatus* | | | | | | | | | | * | | | | | | | * | | | | | | * | | | | | |
| Marbled Gecko | *Phyllodactylus marmoratus* | * | * | * | * | * | * | * | | | * | * | * | * | * | | * | * | * | * | * | * | * | * | | | * | * | |
| Central Bearded Dragon | *Pogona vitticeps* | | | | | | | | | | | | | | | | | | | | | | | | | | | | * |
| Southern Grass Skink | *Pseudemoia entrecasteauxii* | | | | | | | | | | | * | | | | | | * | | | | * | * | | | | | | |
| Western Brown Snake | *Pseudonaja nuchalis* | | | | | | | | | | | * | | | | | | | | | | | | | | | | | |
| Eastern Brown Snake | *Pseudonaja textilis* | | | | | | | | | | | | | | | | | | | | | | | | | * | | | |
| Common Scaly-foot | *Pygopus lepidopodus* | | | | | | | | | | | | | | | | | | | | | * | | | | | | | |

**Table 22. (cont'd)** Reptile species from southern Eyre Peninsula islands.

| Common name | Scientific name | Mt Dutton (SW) Island | The Brothers | Rabbit Island | Goat Island | Perforated Island | North Four Hummocks | Central Four Hummocks | South Curta Rocks | Wanna Stack | Williams Island | North Neptune Island | South Neptune Island | South Neptune (Lighthouse) Island | Wedge Island | North Islet | Thistle Island | Hopkins Island | Smith Island | Lewis Island | Little Island | Taylor Island | Owen Island | Grindal Island | South Bickers Island | Grantham Island | Boston Island | Rabbit Island | Tumby Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shingleback Skink/ Sleepy Lizard | *Tiligna rugosa* | | * | | | | | | | | | | | | | | | * | | * | | | * | | | | | | |
| Rosenberg's Goanna | *Varanus rosenbergi* | | | | | | | | | | | | | | | | * | | | | | * | | | | | | | |

Data in this table is from the following sources: MT DUTTON (SW) ISLAND–Boat landing for 30m on 25/6/83; THE BROTHERS–Boat landings for 1hr on 1/12/76, for 1 hr 30m on 24/6/83; RABBIT ISLAND–Boat landings for 1 hr on 1/12/76, for 1 hour on 24/6/83; GOAT ISLAND–Boat landing for 30m on 24/6/83; PERFORATED ISLAND–Helicopter landings for 21hr 30m on 27 and 28/5/80; NORTH FOUR HUMMOCKS–Helicopter landing for 1 hr 15m on 26/5/80; CENTRAL FOUR HUMMOCKS–Helicopter landing for 1hr 30m on 27/5/80; CURTA ROCKS–Helicopter landings for 2hr on 28/11/82; WANNA STACK–Helicopter landing for 45m on 28/11/82; WILLIAMS ISLAND–Helicopter landings for 17hr on 27 and 28/11/82; NORTH NEPTUNE ISLAND–Helicopter landing for 2 hr on 3/9/80, helicopter landings for 15hr 30m 26 and 27/11/82; SOUTH NEPTUNE ISLAND–Helicopter landing for 2hr on 26/11/82; SOUTH NEPTUNE (LIGHTHOUSE) ISLAND–(Southeo, H 1964) Helicopter landing for 1hr 30m on 26/11/82; WEDGE ISLAND–3hr visit on 2/11/75, helicopter landing for 1hr 45m on 26/11/75, 2 day visit on 8/5/83; NORTH ISLET Helicopter landings for 18hr 30m on 25 and 26/11/82; THISTLE ISLAND–Visit for 4hrs on 2/11/75, helicopter landing for 2hr 15m on 27/11/82; HOPKINS ISLAND–Helicopter landing for 3hr 15m on 27/11/82; SMITH ISLAND–Helicopter landing for 1hr 15m on 27/11/82; LEWIS ISLAND–Helicopter landing for 1hr 15m on 28/11/82; LITTLE ISLAND–Museum records; TAYLOR ISLAND–Helicopter landing for 1 hr on 28/11/82; OWEN ISLAND–Helicopter landing for 45m on 29/11/82; GRINDAL ISLAND–Helicopter landings for 17hr 30m on 28 and 29/11/82; BICKERS ISLANDS–Helicopter landings for 2hr 30m on 29/11/82; GRANTHAM ISLAND–Helicopter landing for 1hr 30m o 29/11/82; BOSTON ISLAND–Helicopter landing for 30m on 29/11/82; RABBIT ISLAND–Helicopter landings for 17hr on 29 and 30/11/82; TUMBY ISLAND–Helicopter landings for 24hr on 30/11 and 1/12/82.

**Table 23.** Plant species from the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wallowa | *Acacia calamifolia* | | | | | * | | | | | | | | | | | | | |
| Umbrella Bush | *Acacia ligulata* | | | | | | | | | * | | | | | | | | | |
| Umbrella Wattle | *Acacia oswaldii* | | | | | * | | | | * | | | | | | | | | |
| Spike Wattle | *Acacia oxycedrus* | | | | | | | | | * | | | | | | | | | |
| Rock Wattle | *Acacia rupicola* | | | | | * | | | | * | | | | * | | | | | |
| Annual Bent-grass | *Agrostis aequata* | * | | | | | | | | | | | | | | | | | |
| Drooping She-oak | *Allocasuarina verticillata* | | | | | * | | | | | | | | * | | | | | |
| Dysentery Bush | *Alyxia buxifolia* | | | | | | | | | * | | | | | | | | | |
| *Marram Grass | *Ammophila arenaria* | | | | | | | | | | | | | * | | | | | |
| *Blue Pimpernel | *Anagallis arvensis* | * | * | | | | | | | | | | | | | * | | | |
| False Tobacco | *Apalochlamys spectabilis* | | | | | | | | | | * | * | | | | | | | |
| Sea Celery | *Apium prostratum* ssp. *prostratum* var. *prostratum* | | * | | * | | * | | | * | | | * | | | | * | | |
| *Capeweed | *Arctotheca calendula* | | | | | | | | | | | | | * | | | * | | |
| Small Vanilla-lily | *Arthropodium minus* | * | | | | | | | | | | | | | | | | * | |
| Grey Saltbush | *Atriplex cinerea* | * | * | | * | * | * | * | * | | * | * | * | * | | | * | * | |
| Mueller's Saltbush | *Atriplex muelleri* | * | * | * | | | * | | | | * | | | | | | | * | * |
| Marsh Saltbush | *Atriplex paludosa* ssp. *cordata* | * | * | * | * | | * | * | | | * | * | * | | * | * | * | * | |

**Table 23. (cont'd)** Plant species from the Sir Joseph Banks group.

| **Common name** | **Scientific name** | **Kirkby Island** | **Sibsey Island** | **English Island** | **Stickney Island** | **Spilsby Island** | **Boucaut Island** | **Duffield Island** | **Hareby Island** | **Roxby Island** | **Langton Island** | **Blythe Island** | **Dalby Island** | **Reevesby Island** | **Lusby Island** | **Marum Island** | **Partney Island** | **Winceby Island** | **Dangerous Reef** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Bearded Oat | *Avena barbata* | | | | | * | | | * | | | | | * | | | * | | |
| Felted Wallaby-bush | *Beyeria lechenaultii* | | | | | | | | | * | | | | | | | | | |
| Slender Daisy | *Brachycome exilis* | | | | | | | | | | | | | * | | | | | |
| Hard-headed Daisy | *Brachycome lineariloba* | | | | | | | | | | | | | * | | * | * | | |
| *False Brome | *Brachypodium distachyon* | | | | | | | * | | | | | | * | | | | | |
| *Long-fruited Wild Turnip | *Brassica tournefortii* | | | | | | | | | | | | | * | | | | | |
| Sand Brome | *Bromus arenarius* | | * | | | * | * | | | * | * | | | | * | | * | | |
| *Prairie Grass | *Bromus catharticus* | | | | | | | | | | | | | * | | | | | |
| *Great Brome | *Bromus diandrus* | | * | | | | | | | | | | | | | | * | | |
| *Soft Brome | *Bromus hordeaceus* | | | | | | | | | | | | | * | | | | | |
| *Madrid Brome | *Bromus madritensis* | | | | | | | | | | | | | * | | | | | |
| *Red Brome | *Bromus rubens* | | | | | * | | | | * | | | | * | | | | | |
| Leek Lily | *Bulbine semibarbata* | * | * | | * | | * | * | * | * | * | | | * | | * | * | * | |
| | **Bupleurum semicompositum* | * | * | | * | | * | | | * | * | | * | * | | | | | |
| *Sweet Bursaria | *Bursaria spinosa* var. *spinosa* | | | | | * | | | | | | | | | | | | | |
| *Sea Rocket | *Cakile maritima* ssp. *maritima* | | | | | * | | | | | | | | * | | | | | |
| Pink Purslane | *Calandrinia calyptrata* | * | * | | * | * | | | * | | | | | * | | | * | | |
| Small Purslane | *Calandrinia eremaea* | | | | | | | | | * | | | | | * | | | | |

**Table 23. (cont'd)** Plant species from the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pigmy Purslane | *Calandrinia granulifera* | | | | | | | | | | | | | * | | | | | |
| Cushion-bush | *Calocephalus brownii* | | * | | * | * | * | * | * | * | | * | | * | | | | | |
| Common Fringe-myrtle | *Calytrix tetragona* | | | | | | | | | | | | | | | | | | |
| Karkalla | *Carpobrotus rossii* | * | * | | | * | * | * | * | * | * | * | * | * | | * | | | |
| Maltese Cockspur | *Centaurea melitensis* | | | | * | | | | | | | | | * | | | | | |
| Spike Centuary | *Centaurium spicatum* | * | | | | | | | | | | | | | | | | | |
| Rock Fern | *Cheilanthes austrotenuifolia* | | | | | | | | | * | * | | | | | | | | |
| *Black Crumbweed | *Chenopodium melanocarpum* | | | | | | | | | | | | | * | | | | | |
| *Nettle-leaved Goosefoot | *Chenopodium murale* | | | | | | | | | | | * | | * | | | | | |
| Small-leaved Clematis | *Clematis microphylla* | | | | | * | | | | | | | | | | | | | |
| Australian Bindweed | *Convolvulus erubescens* | * | | | | * | | | * | * | * | | | | | | * | | |
| *Lesser Wart-cress | *Coronopus didymus* | | | | | | | | | | | | | * | | | | | |
| Waterbuttons | *Cotula coronopifolia* | | * | | | * | | | | | | | | * | | | | | |
| Dense Stonecrop | *Crassula colorata* var. *colorata* | | | | | | | | | | | | | * | | * | | | |
| Australian Crassula | *Crassula sieberana* ssp. *sieberana* | | * | | | * | | | * | * | * | | | * | | * | * | * | |
| *Couch-grass | *Cynodon dactylon* | | | | | | * | | | | | | | | | | | | |
| *Nut-grass | *Cyperus rotundus* ssp. *rotundus* | | | | | | | | | | | | | | | | | * | |
| White-top | *Danthonia caespitosa* | | * | * | * | * | * | * | | * | * | | * | * | * | * | * | * | |

**Table 23. (cont'd)** Plant spe[illegible] m the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bristly Wallaby-grass | *Danthonia setacea* var. *setacea* | | * | | | | | | | * | * | | | | | | | | |
| *Common Thorn-apple | *Datura stramonium* | | | | | * | | | | | | | | * | | | | | |
| Native Carrot | *Daucus glochidiatus* | | | | | | | | | | | * | | * | | | | | |
| Black-anther Flax Lily | *Dianella revoluta* | * | | | | * | | | | * | * | | | * | | | | | |
| Kidney Weed | *Dichondra repens* | | * | | * | * | | | | * | | | | * | | | | * | |
| Round-leaved Pigface | *Disphyma crassifolium* ssp. *clavellatum* | * | * | | * | * | * | * | * | * | * | | * | * | * | * | * | * | |
| Twin-horned Copperburr | *Dissocarpus biflorus* var. *biflorus* | * | * | | * | | | * | * | * | * | | * | * | * | * | * | * | |
| Emu-grass | *Distichlis distichophylla* | | | | | | | | | | | * | | * | | | | | |
| *Stinkwort | *Dittrichia graveolens* | * | | | | * | | | | * | | | | | | | | | |
| Narrow-leaved Hop-bush | *Dodonaea viscosa* ssp. *angustissima* | | | | | * | | | | * | | | | * | | | | | |
| Dwarf Hop-bush | *Dodonaea humilis* | | | | | | | | | | | | | | | | | | |
| Sticky Hop-bush | *Dodonaea viscosa* ssp. *spatulata* | * | | | | * | | | | * | | | | * | | | | | |
| *Perennial Veldt Grass | *Ehrharta calycina* | | | | | | | | | | | | | * | | | | | |
| *Annual Veldt grass | *Ehrharta longiflora* | | * | | | | | | | | | | | * | | | | | |
| Climbing Saltbush | *Einadia nutans* | * | * | | | * | * | | | * | | | * | * | | | | * | |
| Native Wheat-grass | *Elymus scabrus* | | * | | | | * | | | | | | | | * | | | * | |
| *Three-cornered Jack | *Emex australis* | * | | | | | | | | | | | | | | | | | |
| Ruby Saltbush | *Enchylaena tomentosa* var. *tomentosa* | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |

**Table 23. (cont'd)** Plant species from the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Long Stork's Bill | *Erodium botrys* | | * | | * | * | | | | * | | | | * | | | | | |
| *Common Stork's Bill | *Erodium cicutarium* | | | | | | * | | | * | | | | * | | | | | |
| Ridge-fruited Mallee | *Eucalyptus incrassata* | | | | | * | | | | | | | | | | | | | |
| Leafless Ballart | *Exocarpos aphyllus* | | | | | | | | | | | | * | | | | | | |
| Broom Ballart | *Exocarpos sparteus* | | | | | | | | | | | | | | | | | | |
| Coast Ballart | *Exocarpos syrticola* | | | | | | | | | | | * | * | | | | | | |
| Common Sea-heath | *Frankenia pauciflora* var. *fruticulosa* | * | * | | * | * | * | * | * | * | * | | * | * | * | * | * | * | |
| *Coastal Galenia | *Galenia pubescens* var. *pubescens* | * | | | | | | | | | | | | | | | | | |
| Native Geranium | *Geranium solanderi* var. *solanderi* | * | | | | | * | | | | | | | | | | | | |
| *Common Barb-grass | *Hainardia cylindrica* | | | | | * | | | | | | | | * | | | | | |
| Grey Samphire | *Halosarcia halocnemoides* ssp. *halocnemoides* | | | | | * | | | | | | | | * | | | * | | |
| Coast Everlasting | *Helichrysum leucopsideum* | * | | | | | | | | * | | | | | | | | | |
| *Northern Barley-grass | *Hordeum glaucum* | * | * | | * | * | | | * | * | | | | * | | | * | * | |
| *Barley-grass | *Hordeum leporinum* | * | * | * | * | * | | * | | * | * | | * | * | | * | | * | |
| *Sea Barley | *Hordeum marinum* | | | | | * | | | | | | | | * | | | | | |
| *Smooth Cat's-ear | *Hypochoeris glabra* | | | | * | | | | | * | | | | * | | | | | |
| Knobby Club-rush | *Isolepis nodosa* | | * | | | * | | | | | | | | | | | | | |
| Toad Rush | *Juncus bufonius* | * | * | | | | * | | | * | * | | | * | | * | * | * | |

**Table 23. (cont'd)** Plant species from the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sea Rush | *Juncus kraussii* | | | | | | | | | | * | | * | | | | | | |
| *Golden-top | *Lamarckia aurea* | | | | | * | | | | | | | | | | | | | |
| Coast Velvet-bush | *Lasiopetalum discolor* | | | | | | | | | | | | | | | | | | |
| *Tree Mallow | *Lavatera arborea* | | * | | | * | | | | | | | | | | | | | |
| Australian Hollyhock | *Lavatera plebeia* | * | * | * | * | * | * | | * | | * | * | * | * | * | * | * | * | |
| Leafy Peppercress | *Lepidium foliosum* | * | * | * | * | * | * | | * | * | | | * | | | | | * | * |
| *Ox-eye Daisy | *Leucanthemum vulgare* | | | | | | | | | | | | | * | | | | | |
| *Perennial Ryegrass | *Lolium perenne* | | | | * | | * | | | | | | | | | | | | |
| *Wimmera Ryegrass | *Lolium rigidum* ssp. *rigidum* | * | * | | * | * | * | | | | | | | * | | | * | | |
| | **Lolium temulaetum* | * | | | | | | | | | | | | * | | | | | |
| Scented Mat-rush | *Lomandra effusa* | | | | | | | | | | | | | | | | | | |
| *Annual Cat's-tail | *Lophochloa cristata* | * | * | | | * | | | | | | | | * | | * | * | * | |
| Australian Trefoil | *Lotus australis* | | | | | | | | | | | | | | | | | | |
| Australian Boxthorn | *Lycium australe* | * | | | * | | | | * | * | * | | * | * | | * | * | * | |
| *African Boxthorn | *Lycium ferocissimum* | * | * | | | * | * | * | | | | | * | * | * | * | * | * | |
| Small-leaved Bluebush | *Maireana brevifolia* | | * | | * | | | | | * | | | | * | | | | * | |
| Heath Bluebush | *Maireana oppositifolia* | | | * | | * | | | * | * | * | | | * | * | | * | | |
| *Marshmallow | *Malva parviflora* | | | | | * | | | | | | | | | | | | | |

**Table 23. (cont'd)** Plant species from the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Horehound | *Marrubium vulgare* | | | | | * | | | | | | | | | | | | | |
| *Woolly Burr Medic | *Medicago minima* var. *minima* | | | | | | | | | | | | | * | | | | | |
| *Toothed Medic | *Medicago polymorpha* var. *polymorpha* | | * | | * | * | * | * | | | * | | | * | * | * | * | * | |
| South Australian Swamp Paper-bark | *Melaleuca halmaturorum* | | | | | * | | | | | | | | | | | | | |
| *King Island Melilot | *Melilotus indica* | | | | * | | | | | | | | | * | | | | | |
| *Common Iceplant | *Mesembryanthemum crystallinum* | * | * | * | * | * | * | * | * | | | | | * | * | * | * | * | |
| Climbing Lignum | *Muehlenbeckia adpressa* | | | | | | | | | * | * | | | * | * | * | | * | |
| Coastal Lignum | *Muehlenbeckia gunnii* | * | * | | * | * | * | * | * | * | | * | * | * | | | * | * | |
| Native Juniper/Boobialla | *Myoporum insulare* | | | | * | * | * | | * | * | * | * | * | * | * | | * | * | |
| | *Nicotiana excelsior* | | | | | * | | | | | | | | | * | | | | |
| Coast Tobacco | *Nicotiana maritima* | * | | | * | | * | | | * | | | * | * | | * | * | * | |
| Nitre-bush | *Nitraria billardierei* | * | * | * | * | * | * | | * | * | * | * | * | * | * | * | * | * | |
| Coast Daisy-bush | *Olearia axillaris* | | | | * | * | | | * | * | | * | * | * | * | | * | | |
| Heath Daisy-bush | *Olearia floribunda* var. *floribunda* | | | | | | | | | | | | | * | | | | | |
| Twiggy Daisy-bush | *Olearia ramulosa* | | | | | * | | | | | | | | * | | | | | |
| *Creeping Oxalis | *Oxalis corniculata* ssp. *corniculata* | * | * | | * | * | | | | | | | | * | | | | | |
| *Bristle Poppy | *Papaver aculeatum* | | | | | | | | | | | | | * | | | | | |

Table 23. (cont'd) Plant species from the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Curly Ryegrass | *Parapholis incurva* | * | * | | * | * | | | | | * | | | * | | | * | * | |
| Austral Stork's Bill | *Pelargonium australe* | * | * | | | | * | * | | * | | | * | | | | | | |
| Thyme Riceflower | *Pimelea serpyllifolia* ssp. *serpyllifolia* | | | | | * | | | | | | | | | | | | | |
| Weeping Pittosporum | *Pittosporum phylliraeoides* var. *microcarpa* | | | | * | | | | | * | | | | | | | | | |
| *Winter Grass | *Poa annua* | * | | | | | | | | | | | | | | | | | |
| Coast Tussock Grass | *Poa poiformis* var. *poiformis* | | * | | | * | | | | * | | | | | | | | | |
| Slender Tussock Grass | *Poa tenera* | * | * | | | * | | | | | | | | * | | | | | |
| Sticky Longheads | *Podotheca angustifolia* | | | | | | | | | | | | | * | | | | | |
| *Allseed | *Polycarpon tetraphyllum* | | * | | * | | | | * | | | | * | * | | * | * | | |
| | *Pseudognaphalium luteoalbum* | * | * | | | | * | | * | * | | | * | | | | | | |
| Large-leaved Bush-pea | *Pultenaea daphnoides* | | | | | * | | | | * | | | | | | | | | |
| Seaberry Saltbush | *Rhagodia candolleana* ssp. *candolleana* | | | | | * | * | | | * | | | * | | | | * | | |
| Fleshy Saltbush | *Rhagodia crassifolia* | * | * | | * | * | | | * | * | * | * | * | * | * | * | * | * | |
| Mealy Saltbush | *Rhagodia parabolica* | * | * | | * | | * | | | | | | * | * | | | | * | |
| Pigmy Sunray | *Rhodanthe pygmaeum* | | | | | | | | | * | | | | | | | | | |
| Annual Pearlwort | *Sagina apetala* | | | | * | | | | | | | | | | | | | | |
| *Sea Pearlwort | *Sagina maritima* | | | | | | | | | | | | | * | | | | | |
| Buckbush | *Salsola kali* | * | * | | * | * | * | * | * | * | * | | * | * | * | * | * | * | |

Table 23. (cont'd) Plant species from the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Beaded Samphire | *Sarcocornia quinqueflora* | | | | | | | | | | | | | * | | | | | |
| Arabian Grass | *Schismus barbatus* | | | | | | | | | | | | | * | | | | | |
| Prickly Knawel | *Scleranthus pungens* | * | * | | | * | | | | | | | | * | | * | | | |
| Bassia | *Sclerolaena uniflora* | | | | | | | | | | | | | | * | | * | | |
| Salt Copperburr | *Sclerolaena ventricosa* | * | * | | | | * | | | * | * | | * | | * | * | * | * | |
| Variable Groundsel | *Senecio lautus* | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| *African Daisy | *Senecio pterophorus* var. *pterophorus* | * | | | | | | | | * | | | | * | | | | | |
| *French Catchfly | *Silene gallica* var. *gallica* | | | | | * | | | | | | | | * | | | | | |
| *Mediterranean Catchfly | *Silene nocturna* ssp. *nocturna* | | | | | | | | | | | | | * | | | | | |
| *Hedge Mustard | *Sisymbrium orientale* | | | | | | | | | | | | | * | | | | | |
| *Black-berry Nightshade | *Solanum nigrum* | * | * | | * | * | | | | * | | | | | | | | * | |
| *Prickly Sow-thistle | *Sonchus asper* ssp. *asper* | | * | | | | * | | | | | | | * | | | | * | |
| Dune Thistle | *Sonchus megalocarpus* | | | | | | | | | | | | | | | | | | |
| *Common Sow-thistle | *Sonchus oleraceus* | * | | | | * | | | | * | | * | * | * | | * | * | | |
| | *Spergularia bocconii* | * | | | | | | | | | | | | | | | | | |
| *Salt Sand Spurrey | *Spergularia marina* | | | | * | | | | | | | | | | | | | | |
| *Red Spurrey | *Spergularia rubra* | * | * | | | * | | | | | | | | * | | * | | | |
| | *Spergularia* sp. | | | | | | | | | | | | | | | | | | |

**Table 23. (cont'd)** Plant species from the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rolling Spinifex | *Spinifex sericeus* | * | * | | | * | * | | | * | * | * | * | * | * | | * | | |
| Salt Couch | *Sporobolus virginicus* | | | | | * | | | | | | | | * | | | | | |
| Cottony Spear-grass | *Stipa drummondii* | * | | | | | | | | | | | | * | | | | | |
| Elegant Spear-grass | *Stipa elegantissima* | | | | | | | | | | | | | * | | | * | | |
| Desert Spear-grass | *Stipa eremophila* | * | * | | * | * | * | * | * | * | * | | * | * | * | * | * | * | |
| Spear-grass | *Stipa flavescens* | * | * | * | | | * | | | * | * | | * | * | * | * | | | |
| Coast Spear-grass | *Stipa stipoides* | * | | | | | * | | | | | | | | | | | | |
| Variable Spear-grass | *Stipa variabilis* | | | | | | | | | | | | | | | | * | | |
| Austral Seablite | *Suaeda australis* | * | * | | * | | | | | * | * | | * | * | * | * | * | * | |
| Coakie's Tongue | *Templetonia retusa* | | | | | | | | | * | | | | | | | | | |
| Bower Spinach | *Tetragonia implexicoma* | * | * | | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| Coast Bonefruit | *Threlkeldia diffusa* | * | * | | * | | * | * | | * | | * | * | * | * | * | * | * | |
| *False Hawkbit | *Urospermum picroides* | | | | | | | | | | | | | * | | | | | |
| Fuzzweed | *Vittadinia cuneata* var. *cuneata* forma *cuneata* | | | | | | | | | * | | | | | | | | | |
| Fuzzweed | *Vittadinia pterochaeta* | | | | | | | | * | * | | | | | | | | | |
| *Squirrel-tail Fescue | *Vulpia bromoides* | * | * | | | | * | | * | * | * | | | * | | * | * | * | |
| *Rat's-tail Fescue | *Vulpia myuros* | * | * | | * | * | | | | | | | | * | | | * | | |
| Tall Bluebell | *Wahlenbergia stricta* ssp. *stricta* | | | | | * | | | | | | | | * | | | | | |

**Table 23. (cont'd)** Plant species from the Sir Joseph Banks group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shore Westringia | *Westringia dampieri* | | | | * | | | | | | | | | | | | | | |
| Early Nancy | *Wurmbea dioica* ssp. *dioica* | * | | | | | | | | | | | | | | | | | |
| *Spreading Night-phlox | *Zaluzianskya divaricata* | | | | | | | | | | | | | * | | | | | |
| Pointed Twinleaf | *Zygophyllum apiculatum* | | | | | | | | | | | | | * | | | | | |
| Coast Twinleaf | *Zygophyllum billardierii* | | | | | | | | | | | | | * | | | | | |

Data in this table is from the following sources: **KIRKBY ISLAND**–Boat landings for 30 min on 27/6/79 for 3hr on 20/9/79, for 3 hr on 20/9/80; **SIBSEY ISLAND**–Boat landings for 30m on 26/6/79, for 4 hr on 19/9/79 for 2 hr on 22/9/80; **ENGLISH ISLAND**–Boat landings for 30 min on 26/6/79, for 3 min on 22/9/80; **STICKNEY ISLAND**–Boat landings for 1 hr 45 min on 26/6/79, for 4 hr on 19/9/79, for 2hr 45m on 22/9/80; **SPILSBY ISLAND** –Boat landing for 1hr 45m on 22/9/80; **BOUCAUT ISLAND**–Boat landings for 1 hr on 26/6/79, for 1hr on 22/9/80; **DUFFIELD ISLAND**–Boat landings for 1 hr on 26/6/79, for 2 hr on 18/9/79, for 1 hr on 22/9/90; **HAREBY ISLAND**–Boat landings for 2 hr 30 min on 28/6/79, for 3 hr on 20/9/79, for 8 hr on 17 and 18/9/80; **ROXBY ISLAND**–Boat landings for 1hr 15 min on 27/6/79, for 6 hr on 18/9/79, for 11 hr 45 min on 17 and 18/9/80; **LANGTON ISLAND**–Boat landings for 2 hr on 28/6/79, for 3 hr on 20/9/79, for 1 hr 30 min on 18/9/80; **BLYTHE ISLAND**–Boat landings for 15 min on 28/6/79, for 1 hr on 17/9/80; **DALBY ISLAND**–(Hayman and Henty 1939), Boat landings for 15 min on 27/6/79, for 1 hr on 21/9/80; **REEVESBY ISLAND**–(Fawcett and Wace 1938), Boat expeditions for 4 days from 26–29/6/79, for 4 days from 17–20/8/79, for 7 days from 15–22/9/80; **LUSBY ISLAND**–Boat landings for 30 min on 27/6/79, for 2 hr on 18/9/79, for 3 hr on 15/9/80; **MARUM ISLAND**–Boat landings for 30 min on 27/6/79, for 2 hr on 20/9/79, for 1 hr 15 min on 16/9/80; **PARTNEY ISLAND**–Boat lands for 45 min on 27/6/79, for 45 min on 17/9/79, for 4 hr on 16/9/80; **WINCEBY ISLAND**–Boat landings for 45 min on 27/6/79, for 45 min on 17/9/79, and 4 hr on 18/9/80; **DANGEROUS REEF**–Helicopter landing for 1 hr on 29/11/82.

**Table 24.** Mammal species from the Sir Joseph Banks Group.

| Common name | Scientific name | English Island | Stickney Island | Spilsby Island | Hareby Island | Langton Island | Reevesby Island | Partney Island | Buffalo Reef | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|
| Greater Stick-nest Rat | *Leporillus conditor* | | | | | | 1 | | | |
| Tammar/Dama Wallaby | *Macropus eugenii* | | | | | | 2 | | | |
| *House Mouse | *Mus domesticus* | | | | | | * | | | |
| Australian Sea-lion | *Neophoca cinerea* | * | | | * | * | * | | | * |
| *European Rabbit | *Oryctolagus cuniculus* | | * | * | | | | 2 | | |

1. Introduced population; 2. Skeletal remains only.

Data in this table is from the following sources: **STICKNEY ISLAND**–Boat landings for 1 hr 45 min on on 26/6/79, for 4 hr on 19/9/79, for 2 hr 45 min on 12/9/80; **ENGLISH ISLAND**–Boat landings for 30 min on 26/6/79, for 30 min on 22/9/80; **HAREBY ISLAND**–Boat landings for 2 hr 30 min on 28/6/79, for 3 hr on 20/9/79, for 8 hr on 17–18/9/80; **LANGTON ISLAND**–Boat landings for 2 hr on 28/6/79, for 3 hr on 20/9/79, for 1 hr 30 min on 18/9/80; **REEVESBY ISLAND**–Boat expeditions for 4 days from 26–29/6/79, for 4 days from 17–20/8/79, for 7 days from 15–22/9/80; **PARTNEY ISLAND**–Boat landings for 1 hr on 27/6/79, for 3 hr on 20/9/79, for 4 hr on 21/9/79; **BUFFALO REEF**–Helicopter overfly on 29/11/82; **DANGEROUS REEF**–Helicopter landing for 1hr on 29/11/82.

**Table 25.** Bird species from the Sir Joseph Banks Group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chestnut Teal | *Anas castanea* | | | | * | | | | | | | * | | | | | | | |
| Australasian Grey Teal | *Anas gracilis* | | | | | | | | | | | | | | | | | | |
| Pacific Black Duck | *Anas superciliosa* | | | | * | | | | | * | | | | | | | | | |
| Richard's Pipit | *Anthus novaeseelandiae* | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | | |
| Wedge-tailed Eagle | *Aquila audax* | | | | | | | | | | | | | | | | | | |
| White-faced Heron | *Ardea novaehollandiae* | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| Eastern Reef Egret/Reef Heron | *Ardea sacra* | | * | | * | | * | | * | * | | | | * | | * | | | |
| Ruddy Turnstone | *Arenaria interpres* | | * | * | * | * | * | * | * | * | * | | * | * | | * | * | * | * |
| Black-faced Wood-swallow | *Artamus cinereus* | | | | | | | | | | | | | | | | | | |
| Dusky Wood-swallow | *Artamus cyanopterus* | | | | * | | | | | | | | | | | | | | |
| Southern Stone-curlew/Bush Thicknee | *Burhinus grallarius* | | | | | | | | | | | | | * | | | | | |
| Fan-tailed Cuckoo | *Cacomantis flabelliformis* | | | | | | | | | | | | | * | | | | | |
| Sharp-tailed Sandpiper | *Calidris acuminata* | | | | | | | | * | * | | | | | | | | | |
| Red-necked Stint | *Calidris ruficollis* | * | * | * | * | * | * | * | * | * | | * | * | * | | * | * | * | * |
| Cape Barren Goose | *Cereopsis novaehollandiae* | 2 | 2 | * | 2 | * | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| Hooded Dotterel/Plover | *Charadrius rubricollis* | | | | | | | | | | | | | * | * | | | | |
| Red-capped Dotterel/Plover | *Charadrius ruficapillus* | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| White-backed Swallow | *Cheramoeca leucosternum* | | | | | | | | | | | | | | | | | | |

Table 25. (cont'd) Bird species from the Sir Joseph Banks Group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Horsfield's/Rufous-tailed Bronze Cuckoo | *Chrysococcyx basalis* | | | | | | | | | | | | | * | | | | | |
| Little Raven | *Corvus mellori* | | | | | | | | | * | * | | | * | | | | * | |
| Stubble Quail | *Coturnix novaezelandiae* | | * | | * | * | | * | * | * | * | | | * | | | * | * | |
| Black Swan | *Cygnus atratus* | | | | | | | | | | | | | * | | | | | |
| Letter-winged Kite | *Elanus scriptus* | | | | | | | | | | | | | * | | | | | |
| Black-fronted Dotterel/Plover | *Elseyornis melanops* | | | * | * | | | | 2 | | | | | * | | | | | |
| Galah | *Eolophus roseicapillus* | | | | | | | | | | | | | * | | | | * | |
| White-fronted Chat | *Ephthianura albifrons* | * | * | * | 2 | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| Red-kneed Dotterel | *Erythogonys cinctus* | | * | | | * | | | * | | | | | | | | | | |
| Little/Fairy Penguin | *Eudyptula minor* | 1 | 1 | 1 | * | * | * | 1 | 1 | 1 | 1 | 1 | * | 1 | * | * | 1 | 1 | |
| Brown Hawk/Falcon | *Falco berigora* | | | | | | | | | * | | | | | | | | | |
| Australian Kestrel | *Falco cenchroides* | | * | | | * | | | | * | | * | | * | | * | * | * | |
| Banded/Buff-banded Rail | *Gallirallus philippensis* | | | | | | | | * | | | | | 2 | | | | 2 | |
| Magpie-lark | *Grallina cyanoleuca* | | | | | | | | | * | | | | | | | | | |
| Sooty Oystercatcher | *Haematopus fuliginosus* | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Pied Oystercatcher | *Haematopus ostralegus* | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| White-bellied Sea-eagle | *Haliaeetus leucogaster* | | * | * | 2 | * | | | | | * | | | | | | | * | |
| Welcome Swallow | *Hirundo neoxena* | * | * | * | * | * | * | * | 2 | * | * | * | * | 2 | * | * | * | 2 | |
| Masked/Spur-winged Plover | *Hoplopterus miles* | * | 2 | | * | * | * | | * | * | * | | | * | | | | * | |

**Table 25. (cont'd)** Bird species from the Sir Joseph Banks Group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Banded Plover/Lapwing | *Hoplopterus tricolor* | | | | | | | | | | | | | * | | | | | |
| Caspian Tern | *Hydroprogne caspia* | * | * | | | | | | | * | | * | | * | * | | * | * | |
| Silver Gull | *Larus novaehollandiae* | * | 1 | * | 1 | * | 1 | * | * | * | * | * | * | * | * | 1 | * | * | 1 |
| Pacific Gull | *Larus pacificus* | 2 | * | 2 | 2 | * | 1 | 2 | * | 1 | 2 | * | * | * | * | 1 | * | * | 1 |
| Black-faced Shag/Cormorant | *Leucocarbo fuscescens* | * | 1 | 1 | * | * | | * | * | * | * | * | * | * | 2 | * | * | 1 | 1 |
| Little Grassbird | *Megalurus gramineus* | | * | | * | | | | 2 | | 2 | * | | * | * | | | * | |
| Singing Bushlark | *Mirafra javanica* | | | | | | | | * | | | | | | | | | | |
| Rock Parrot | *Neophema petrophila* | * | * | | * | * | 2 | * | * | * | * | * | * | * | * | * | * | * | |
| Eastern Curlew | *Numenius madagascariensis* | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| Rufous Whistler | *Pachycephala rufiventris* | | | | | | | | | | | | | * | | | | | |
| *House Sparrow | *Passer domesticus* | | | | | | | | | | | | | * | | | * | * | |
| White-faced Storm-petrel | *Pelagodroma marina* | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Australian Pelican | *Pelecanus conspicillatus* | | | | * | | | * | | | | | | * | * | | | * | |
| Little Pied Cormorant | *Phalacrocorax melanoleucos* | | | | | | | | * | * | * | | * | * | | | | * | |
| Little Black Cormorant | *Phalacrocorax sulcirostris* | | | | | | | | | | | | | | | * | | | |
| Pied Cormorant | *Phalacrocorax varius* | * | * | * | * | * | | | | * | * | * | * | * | * | | | * | |
| Glossy Ibis | *Plegadis falcinellus* | | | | | * | * | | | | | | | | | | | | |
| Lesser Golden Plover | *Pluvialis fulva* | | | | | | | | | | | | | | | | * | | |
| Grey Plover | *Pluvialis squatarola* | | | | | * | | | | | | | | | | | | | |

**Table 25. (cont'd)** Bird species from the Sir Joseph Banks Group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Hareby Island | Roxby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Lusby Island | Marum Island | Partney Island | Winceby Island | Dangerous Reef |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grey Fantail | *Rhipidura fuliginosa* | | | | | | | | | | | | | * | | | | * | |
| Willie Wagtail | *Rhipidura leucophrys* | | | | | | | | | | | | | | | | | | |
| White-browed Scrubwren | *Sericornis frontalis* | | | | | | | | | | | | | | | | | | |
| Fairy Tern | *Sterna nereis* | * | | | * | | | | | | * | * | | * | | | * | * | |
| *Common/European Starling | *Sturnus vulgaris* | | | | * | 2 | | 2 | * | 2 | 2 | | | * | * | | | * | |
| Crested Tern | *Thalasseus bergii* | * | | * | | | | | * | * | | | | 1 | | | * | * | |
| Greenshank | *Tringa nebularia* | * | * | * | * | * | * | * | * | * | * | * | | * | * | * | * | * | |
| Barn Owl | *Tyto alba* | | | | | * | | | | | | | | * | | | | | |
| Silvereye | *Zosterops lateralis* | 2 | | * | * | 2 | * | | 2 | * | 2 | * | | 2 | * | | * | * | |

1. Breeding colony; 2. Nesting recorded; 3. Dead bird found.

Data in this table is from the following sources: **KIRKBY ISLAND**–Boat landings for 30m on 27/6/79, for 3hr on 20/9/79, for 3 hr on 20/9/80; **SIBSEY ISLAND**–Boat landings for 30 min on 26/6/79, for 4 hr on 22/9/80, **ENGLISH ISLAND**–Boat landings for 30 min on 26/6/79, for 30 min on 22/9/80; **STICKNEY ISLAND**–Boat landings for 1 hr 45 min on 26/6/79, for 4 hr on 19/9/79, for 2hr 45min on 22/9/80; **SPILSBY ISLAND**–Boat landing for 1 hr 15 min on 22/9/80; **BOUCAUT ISLAND**–Boat landings for 1 hr on 26/6/79, for 1 hr on 22/9/80; **DUFFIELD ISLAND**–Boat landings for 1 hr on 26/6/79, for 2 hr on 18/9/79, for 1 hr on 22/9/90; **HAREBY ISLAND**–Boat landings for 2 hr 30 min on 28/6/79, for 3 hr on 20/9/79, for 8 hr on 17–18/9/80; **ROXBY ISLAND**–Boat landings for 1 hr 15 min on 27/6/79, for 6 hr on 18/9/79, for 11 hr 45 min on 17–18/9/80; **LANGTON ISLAND**–Boat landings for 2 hr on 28/6/79, for 3 hr on 20/9/79, for 1 hr 30 min on 18/9/80; **BLYTHE ISLAND**–Boat landings for 15 min on 28/6/79, for 1 hr on 17/9/80, **DALBY ISLAND**–Boat landings for 15 min on 27/6/79 for 1 hr on 21/9/80; **REEVESBY ISLAND** (Condon 1938)–Boat expeditions for 4 days from 26–29/6/79, for 4 days from 17–20/8/79, for 7 days from 15–22/9/80, **LUSBY ISLAND**–boat landings for 30 min on 27/6/79, for 2 hr on 18/9/79, for 3 hr on 15/9/80; **MARUM ISLAND**–Boat landings for 30 min on 27/6/79, for 2 hr on 20/9/79, for 1 hr 15 min on 16/9/80; **PARTNEY ISLAND**–Boat landings for 1 hr on 27/9/79, for 3 hr on 20/9.79, for 4 hr on 21/9/79; **WINCEBY ISLAND**–Boat landings for 45 min on 27/6/79, for 45 min on 17/9/79, for 4 hr on 16/9/80; **DANGEROUS REEF**–(Paton and Paton 1977cd) Helicopter landing for 1 hr on 29/11/82.

**Table 26.** Reptile species from the Sir Joseph Banks Group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Roxby Island | Hareby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Marum Island | Partney Island | Winceby Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Common Death Adder | *Acanthophis antarcticus* | | | | | | | | | | | | | * | | | |
| Red-tailed Worm-lizard | *Aprasia inaurita* | | | | | | | | | | | | | * | | | |
| Striped Wall Skink | *Cryptoblepharus virgatus* | * | | | * | | | | * | | | | * | | * | * | |
| Peninsula Dragon | *Ctenophorus fionii* | | | | | | | | | | | | | | | | |
| Spotted Ctenotus | *Ctenotus uber* | | | | | | | | * | | | | | * | | | |
| Bull Skink | *Egernia multiscutata* | | | | | | | | | | | | | | | | |
| White's Skink | *Egernia whitii* | | | | | | | | | | | | | | | | |
| Four-toed Earless Skink | *Hemiergis peronii* | * | * | * | * | * | * | * | * | * | * | * | | * | * | * | * |
| Bougainville's Skink | *Lerista bougainvillii* | | * | | * | | | | | | | | | | | * | |
| Southern Four-toed Slider | *Lerista dorsalis* | * | | | * | * | * | * | * | * | * | | | * | * | * | * |
| Mallee Slider | *Lerista edwardsae* | * | | | * | | | | | | | | | * | | * | |
| Dwarf Skink | *Menetia greyii* | * | | | | * | * | | * | * | * | | | | | | |
| Adelaide Snake-eye | *Morethia adelaidensis* | | | | | | | | | | | | | * | * | | |
| Mallee Snake-eye | *Morethia obscura* | * | | | | * | | | * | | | | | * | | | * |
| Thick-tailed Gecko | *Nephrurus milii* | | | | | | | | | | | | | | | | |
| Black Tiger Snake | *Notechis scutatus* | | | | | | | | * | * | | * | | * | | * | |
| Marbled Gecko | *Phyllodactylus marmoratus* | * | * | * | * | * | * | * | | * | * | * | * | * | | | * |
| Central Bearded Dragon | *Pogona vitticeps* | | | | | | | | | | | | | * | * | * | |
| Southern Grass Skink | *Pseudemoia entrecasteauxii* | | | | | | | | | * | | * | | * | | | |
| Western Brown Snake | *Pseudonaja nuchalis* | | | | | | | | | | | | | | | | |

**Table 26. (cont'd)** Reptile species from the Sir Joseph Banks Group.

| Common name | Scientific name | Kirkby Island | Sibsey Island | English Island | Stickney Island | Spilsby Island | Boucaut Island | Duffield Island | Roxby Island | Hareby Island | Langton Island | Blythe Island | Dalby Island | Reevesby Island | Marum Island | Partney Island | Winceby Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eastern Brown Snake | *Pseudonaja textilis* | | | | | | | | | | | | | | | | |
| Common Scaly-foot | *Pygopus lepidopodus* | | | | | | | | | | | | | | | | |
| Shingleback Skink/Sleepy Lizard | *Tiligna rugosa* | | | | | | * | | | | | * | | | | | |
| Rosenberg's Goanna | *Varanus rosenbergi* | | | | | 1 | | | | | | | | 1 | | | |

1. Introduced population

Data in this table is from the following sources: **KIRKBY ISLAND**–Boat landings for 30 min on 27/6/79, for 3hr on 20/9/79, for 3 hr on 20/9/80; **SIBSEY ISLAND**–Boat landings for 30 min on 26/6/79, for 4 hr on 19/9/79, for 2 h r on 22/9/80; **ENGLISH ISLAND**–Boat landings for 30 min on 26/6/79, for 30 min on 22/9/80; **STICKNEY ISLAND**–Boat landings for 1 hr 45 min on 26/6/79, for 4 hr on 19/9/79, for 2 hr 45 min on 22/9/80; **SPILSBY ISLAND**–Boat landing for 1 hr 15 min on 22/9/80; **BOUCAUT ISLAND**–Boat landings for 1 hr on 26/6/79, for 1 hr on 22/9/80; **DUFFIELD ISLAND**–Boat landings for 1 hr on 26/6/79, for 2 hrs on 18/9/79, for 1 hr on 22/9/90; **HAREBY ISLAND**–Boat landings for 2 hr 30 min on 28/6/79, for 3 hr on 20/9/79, for 8 hr on 17–18/9/80; **ROXBY ISLAND**–Boat landings for 1 hr 15 min on 27/6/79, for 6 hr on 18/9/79, for 11 hr 45 min on 17–18/9/80; **LANGTON ISLAND**–Boat landings for 2 hr on 28/6/79, for 3 hr on 20/9/79, for hr 30 min on 18/9/80; **BLYTHE ISLAND**–Boat landings for 15 min on 28/6/79, for 1 hr on 17/9/80; **DALBY ISLAND**– Boat landings for 15 min on 27/6/79, for 1 hr on 21/9/80; **REEVESBY ISLAND**–(Morgan 1938), (Johnson and Ellins 1979)–Boat expeditions for 4 days from 26–29/6/79, for 4 days from 17–20/8/79, for 7 days from 15–22/9/80; **LUSBY ISLAND**–Boat landings for 30 min on 27/6/79, for 2 hr on 18/9/79, for 3 hr on 15/9/80; **MARUM ISLAND**–Boat landings for 30 min on 27/6/79, for 3 hr on 20/9/79, for 4 hr on 21/9/79; **PARTNEY ISLAND**–Boat landings for 1 hr on 27/6/79, for 3 hr on 20/9/79, for 4 hr on 21/9/79; **WINCEBY ISLAND**–Boat landings for 45 min on 27/6/79, for 45 minmin on 17/9/79, for 4 hr on 18/9/80.

**Table 27.** Plant species from Yorke Peninsula islands.

| Common name | Scientific name | West Bird Island | East Bird Island | Goose Island | Little Goose Island | White Rocks | Green Island | Island Point | Rocky Island | Wardang Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Port Lincoln Wattle | *Acacia anceps* | | | | | | | | | | | * | * | | | | | | |
| Umbrella Bush | *Acacia ligulata* | | | | | | | | | | | * | | | | | | | |
| Umbrella Wattle | *Acacia oswaldii* | | | | | | | * | | | | | | | | | | | |
| Dysentery Bush | *Alyxia buxifolia* | * | | | | | | | | | | | | | | | | | |
| *Marram Grass | *Ammophila arenaria* | | | | | | | | | | | | | | | | | | * |
| Sea Celery | *Apium prostratum* ssp. *prostratum* var. *prostratum* | | | | | * | | * | | | * | | | * | * | | * | | |
| *Capeweed | *Arctotheca calendula* | | | * | | | | | | | | | | | | | | | |
| *White Arctotis | *Arctotis stoechadifolia* | | | | | | | | | | | | | | | | | | * |
| *Teneriffe Daisy | *Argyranthemum frutescens* ssp. *foeniculaceum* | | | | | | | | | | | | | | | | | | * |
| Grey Saltbush | *Atriplex cinerea* | * | | * | * | | * | * | | | | | | | | | | | * |
| Mueller's Saltbush | *Atriplex muelleri* | | | | | | | | * | | | | | | | | | | |
| Old-man Saltbush | *Atriplex numularia* ssp. *spathulata* | | | | | | | | | * | | | | | | | | | |
| Marsh Saltbush | *Atriplex paludosa* var. *cordata* | * | * | * | | | | * | | * | * | * | * | * | * | * | * | | |
| Lagoon Saltbush | *Atriplex suberecta* | | | * | * | | | | | | | | | | | | | | |
| *Bearded Oat | *Avena barbata* | | | | | | | * | | | | | | | | | * | | |
| Grey Mangrove | *Avicennia marina* var. *resinifera* | * | * | | | | | | | | | | | | | | | | |
| *Long-fruited Wild Turnip | *Brassica tournefortii* | | | | | | | | | * | | | | | | | | | |
| Sand Brome | *Bromus arenarius* | | | | * | | | | | | | | | | | | | | |

Table 27. (cont'd) Plant species from Yorke Peninsula islands.

| Common name | Scientific name | West Bird Island | East Bird Island | Goose Island | Little Goose Island | White Rocks | Green Island | Island Point | Rocky Island | Wardang Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Great Brome | *Bromus diandrus* | | | * | | | | | | | | | | | | | * | | |
| Red Brome | *Bromus rubens* | | | | | | | | | | | | | | | | | | * |
| Leek Lily | *Bulbine semibarbata* | | | * | | | | | | | | | | | | | | | |
| *Sea Rocket | *Cakile maritima* ssp. *maritima* | * | | * | | * | | * | | | | | | | | | | | * |
| Cushion Bush | *Calocephalus brownii* | | | | | | | * | | | | * | * | | | * | | | |
| *Slender Thistle | *Carduus tenuiflorus* | | | * | | | | * | | * | | | | | | | | | |
| Karkalla | *Carpobrotus rossii* | * | | * | | | | | | | * | * | * | | | | * | | * |
| *Ward's Weed | *Carrichterra annua* | | | | | | | | | * | | | | | | | | | |
| Slender Dodder-laurel | *Cassytha glabella* forma *dispar* | | | | | | | | | | | | * | | | | | | |
| *Spike Century | *Centaurium spicatum* | | | | | | | | | * | | | | | | | | | |
| *Nettle-leaved Goosefoot | *Chenopodium murale* | | | * | | | | * | | | | | | | | | | | * |
| Common Everlasting | *Chrysocephalum apiculatum* | | | | | | | | | | | | * | | | | | | |
| Salmon Correa | *Correa pulchella* | | | | | | | | | | | | * | | | | | | |
| Black-anther Flax-lily | *Dianella revoluta* | * | * | | | | | * | | | | * | * | | | | | | * |
| *Sand Rocket | *Diplotaxis tenuifolia* | | | * | | | | | | | | | | | | | | | |
| Round-leaved Pigface | *Disphyma crassifolium* ssp. *clavellatum* | * | | | | | | * | | | * | * | * | * | * | * | * | | |
| *Stinkwort | *Dittrichia graveolens* | | | | | | * | * | | * | | | | | | | | | |
| Ruby Saltbush | *Enchylaena tomentosa* var. *tomentosa* | * | * | * | | | | * | | * | * | * | | * | * | * | * | | * |
| *Sea Spurge | *Euphorbia paralias* | | | | | | | * | | * | | | | | | | | | |

**Table 27. (cont'd)** Plant species from Yorke Peninsula islands.

| Common name | Scientific name | West Bird Island | East Bird Island | Goose Island | Little Goose Island | White Rocks | Green Island | Island Point | Rocky Island | Wardang Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *False Caper | *Euphorbia terracina* | | | * | | | * | | | | | | | | | | | | |
| Leafless Ballart | *Exocarpos aphyllus* | * | | | | | | | | | | * | * | | | | | | |
| Coast Ballart | *Exocarpos syrticola* | | | | | | | | | | | | | | | | | | * |
| | *Frankenia cordata* | | | | | | | | | | | | | | | * | | | |
| | *Frankenia eremophila* | * | * | | | | | | | | | | | | | | | | |
| Common Sea-heath | *Frankenia pauciflora* var. *fruticulosa* | | | | | | | * | | | * | * | * | | | | | | |
| Small-leaved Sea-heath | *Frankenia sessilis* | | | | | | | | | * | | | | * | | | | | |
| Sticky Goodenia | *Goodenia varia* | | | | | | | | | | * | | * | | | | | | |
| Grey Samphire | *Halosarcia halocnemoides* ssp. *halocnemoides* | * | * | | | | | | | | | * | | * | * | * | * | | |
| Coast Everlasting | *Helichrysum leucopsideum* | | | | | | | | | | | | * | | | | | | |
| *Barley-grass | *Hordeum leporinum* | | | | | | | | | | | | | | | | | | * |
| Knobby Club-rush | *Isolepis nodosa* | * | * | | | | | | | | | * | | | | | | | |
| Stalked Ixiolaena | *Ixiolaena supina* | | | | | | | | | | | | * | | | * | * | | |
| Ixodia | *Ixodia achillaeoides* ssp. *achillaeoides* | | | | | | | | | | | | * | | | | | | |
| Coast Velvet-bush | *Lasiopetalum discolor* | | | | | | | | | | | | * | | | | | | |
| *Tree Mallow | *Lavatera arborea* | | | | | | | | | | | | | | | | * | | * |
| Australian Hollyhock | *Lavatera plebeia* | | | * | | | | * | | | | | | | * | | | | |
| Thorny Lawrencia | *Lawrencia squamata* | | | | | | | | | | * | * | * | | | | | | |
| Leafy Peppercress | *Lepidium foliosum* | | | * | * | | | | | | | | | | | | | | |

**Table 27. (cont'd)** Plant species from Yorke Peninsula islands.

| Common name | Scientific name | West Bird Island | East Bird Island | Goose Island | Little Goose Island | White Rocks | Green Island | Island Point | Rocky Island | Wardang Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clustered Sword-sedge | *Lepidosperma congestum* | | | | | | | | | | | | * | | | | | | |
| Coastal Deard-heath | *Leucopogon parviflorus* | | | | | | | | | | | * | * | | | | | | |
| *Stattice/Sea Lavender | *Limonium psilocladon* | * | | | | | | | | | | | | | | | | | |
| Oval-leaved Logania | *Logania ovata* | | | | | | | | | | | * | * | | | | | | |
| *Perennial Ryegrass | *Lolium perenne* | | | | | | | | | | | * | | | | | * | | * |
| *Annual Cat's-tail | *Lophochloa cristata* | | | * | | | | | | | | | * | | | | | | |
| Australian Trefoil | *Lotus australis* | * | | | | | | * | | | | * | * | | | | | | |
| Australian Boxthorn | *Lycium australe* | | | * | | | | | | * | | | | | | | | | |
| *African Boxthorn | *Lycium ferocissimum* | * | * | * | * | * | * | * | * | | * | * | | | | | * | | * |
| Heath Bluebush | *Maireana oppositifolia* | * | * | | | | | * | | | | * | * | | | | * | | |
| *Mallow of Nice | *Malva nicaeensis* | | | * | | | | | | | | | | | | | | | |
| *Marshmallow | *Malva parviflora* | | | | | | | | | | | | | | | | | | * |
| Dryland Tea-tree | *Melaleuca lanceolata* | | | | | | | | | | | | * | | | | | | |
| *Common Iceplant | *Mesembryanthemum crystallinum* | * | | * | | | * | * | | | * | | | * | * | * | * | | * |
| *Slender Iceplant | *Mesembryanthemum nodiflorum* | * | | | | | | | | | | | | | | | | | |
| Climbing Lignum | *Muehlenbeckia adpressa* | | | | | | | * | | | | | | | | | | | |
| Coastal Lignum | *Muehlenbeckia gunnii* | * | * | * | | | * | | | | * | | | | | | | | |
| Native Juniper/Boobialla | *Myoporum insulare* | * | * | | | | | * | | * | * | * | * | | | | | | |
| *Tree Tobacco | *Nicotiana glauca* | | | | | | | | | | | | | | | | | | * |

**Table 27. (cont'd)** Plant species from Yorke Peninsula islands.

| Common name | Scientific name | West Bird Island | East Bird Island | Goose Island | Little Goose Island | White Rocks | Green Island | Island Point | Rocky Island | Wardang Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitre-bush | *Nitraria billardierei* | * | * | * | * | | * | * | | | * | | * | * | * | * | * | * | * |
| Coast Daisy-bush | *Olearia axillaris* | * | * | | | | * | | | * | | * | * | | | | | | * |
| Australian Broomrape | *Orobanche cernua* var. *australiana* | | | | | | | * | | | | | | | | | | | |
| *Soursob | *Oxalis pes-caprae* | | | | | | | | | | | | | | | | | | * |
| Austral Stork's Bill | *Pelargonium australe* | | | | | | | | | | * | | * | | | | | | |
| Thyme Riceflower | *Pimelea serpyllifolia* ssp. *serphllifola* | | | | | | | * | | | | * | * | | | | | | |
| Weeping Pittosporum | *Pittosporum phylliraeoides* var. *microcarpa* | * | * | | | | * | * | | | | | | | | | | | |
| *Winter Grass | *Poa annua* | | | | | | | | | | | | | | | | | | * |
| Coast Tussock Grass | *Poa poiformis* var. *poiformis* | * | * | | | | | | | | | | | | | | | | |
| Pleated Podolepis | *Podolepis rugata* var. *rugata* | | | | | | | | | | | | * | | | | * | | |
| *Wireweed | *Polygonum aviculare* | | | | * | | | | | | | | | | | | | | |
| Coast Pomaderris | *Pomaderris ovaria* | | | | | | | | | | | | * | | | | | | |
| Seaberry Saltbush | *Rhagodia candolleana* ssp. *candollcana* | | | * | | | | * | | * | * | * | * | | * | | * | | |
| Fleshy Saltbush | *Rhagodia crassifolia* | | | * | | | * | * | | | | | | | | | | | * |
| Buckbush | *Salsola kali* | | | * | | | * | | | | | | | | | | | | |
| Climbing Bookweed | *Samolus repens* | | | | | | | * | | | | * | * | | | | | | |
| Beaded Samphire | *Sarcocornia quinqueflora* | * | * | | | | * | * | * | | | | | | | | | | |
| Cushion Fanflower | *Scaevola crassifolia* | | | | | | | | | | | * | * | | | | | | |
| Bassia | *Sclerolaena uniflora* | | | | | | | | | | | | * | | | | * | | |

Table 27. (cont'd) Plant species from Yorke Peninsula islands.

| Common name | Scientific name | West Bird Island | East Bird Island | Goose Island | Little Goose Island | White Rocks | Green Island | Island Point | Rocky Island | Wardang Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shrubby Glasswort | *Sclerostegia arbuscula* | | | | | | | | | * | | | | | | | | | |
| Variable Groundsel | *Senecio lautus* | * | * | * | | | | * | | | | * | * | | | * | * | | |
| *London Rocket | *Sisymbrium irio* | | | * | | | | | | | | | | | | | | | |
| *Hedge Mustard | *Sisymbrium officinale* | | | * | | | | | | | | | | | | | | | |
| *Wild Mustard | *Sisymbrium orientale* | | | | * | | | | | | | | | | | | | | * |
| *Black-berry Nightshade | *Solanum nigrum* | | | | | | | * | | | | | | | | | | | |
| *Prickly Sow-thistle | *Sonchus asper* ssp. *asper* | * | * | | | | | | | | | | | | | | | | |
| *Common Sow-thistle | *Sonchus oleraceus* | * | | * | | | | | | | | | | | | | * | | * |
| *Corn Spurrey | *Spergula arvensis* | | | | | | | | | | | | * | | | | * | | |
| *Coast Sand Spurrey | *Spergularia media* | | | | | | | * | | | | | | | | | | | |
| Rolling Spinifex | *Spinifex sericeus* | | | | | | | | | * | | | | | | | | | * |
| *Chickweed | *Stellaria media* | | | | | | | | | | | | | | | | | | * |
| Elegant Spear-grass | *Stipa elegantissima* | | | | | | | * | | | | | * | | | | | | |
| Austral Seablite | *Suaeda australis* | * | | * | * | | | | * | | | | | | | | | | |
| Cockie's Tongue | *Templetonia retusa* | | | | | | | | | | * | | * | | | | | | |
| Bower Spinach | *Tetragonia implexicoma* | * | | * | | | * | * | | | * | | * | * | | | | | * |
| New Zealand Spinach | *Tetragonia tetragonoides* | | | | | | | | | * | | | | | | | | | |
| Coast Bonefruit | *Threlkeldia diffusa* | * | | * | | | * | * | | * | * | * | * | * | * | * | * | | * |
| *False Hawkbit | *Urospermum picroides* | | | | | | * | | | | | | | | | | | | |

**Table 27. (cont'd)** Plant species from Yorke Peninsula islands.

| Common name | Scientific name | West Bird Island | East Bird Island | Goose Island | Little Goose Island | White Rocks | Green Island | Island Point | Rocky Island | Wardang Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Small Nettle | *Urtica urens* | | | | | | | | | | | | | | | | | | * |
| Silky Wilsonia | *Wilsonia humilis* | * | * | | | | | | | | | | * | * | | | | | |
| Pointed Twinleaf | *Zygophyllum apiculatum* | | | | | | | | | | * | * | * | | | | * | | |
| Coast Twinleaf | *Zygophyllum billardierii* | | | | | | | * | | | | | * | | | | | | |

Data in this table is from the following sources: **BIRD ISLANDS**–Boat landing for 4 hr on 19/1/79; **GOOSE ISLAND**–Boat landing for 3 hr on 24/11/81; **LITTLE GOOSE**–boat landing for 15 min on 24/11/81; **WHITE ROCKS**–Boat landing for 15 min on 24/11/81; **GREEN ISLAND**–Boat landing for 1 hr on 24/11/81; **ISLAND POINT** (Paton 1973) Boatlanding for 1 hr 30 min on 24/11/81; **ROCKY ISLAND**–Boat landing for 15 min on 24/11/81; **WARDANG ISLAND**–(unpublished species list 1985); **ROYSTON ISLAND**–Helicopter landing for 1 hr 30 min on 25/11/82; **MIDDLE ISLET**–Helicopter landing for 2 hr on 25/11/82; **SOUTH ISLET**–Helicopter landing for 1 hr 15 min on 24/11/82; **CHINAMAN'S HAT ISLAND**–Helicopter landing for 1 hr 15 min on 24/11/82; **SEAL ISLAND**–Helicopter landing for 1 hr 30 min on 24/11/82; **HAYSTACK ISLAND**– Helicopter landing for 1 hr on 24/11/82; **ALTHORPE ISLAND**–Helicopter landings for 23 hr on 24–25/11/82; **TROUBRIDGE ISLAND**–Boat landing for 4 hr on 25/8/81.

**Table 28.** Mammal species from Yorke Peninsula islands.

| Common name | Scientific name | East Bird Island | White Rocks | Green Island | Wardang Island | Daly Head Island | South Islet | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Goat | *Capra hircus* | | | | | | | | | * | | |
| *Domestic Cat | *Felis catus* | | | | * | | | | | | | * |
| Tammar/Dama Wallaby | *Macropus eugenii* | | | | * | | | | | | | |
| Western Grey Kangaroo | *Macropus fuliginosus* | | | | | | * | | | | | |
| *House Mouse | *Mus domesticus* | | | | * | | | | | * | | |
| Australian Sea-lion | *Neophoca cinerea* | | * | | | * | | * | * | * | * | 2 |
| *European Rabbit | *Oryctolagus cuniculus* | | | * | * | | | | | | | |
| *Red Fox | *Vulpes vulpes* | 1 | | | | | | | | | | |

1. Tracks only; 2. Historical record and occasional visiting animals at present; 3. Introduced population.

Data in this table is from the following sources: **BIRD ISLANDS**–Boat landing for 4 hr on 19/1/79; **WHITE ROCKS**–Boat landing for 15 min on 24/11/81; **GREEN ISLAND**–Boat landing for 1 hr on 24/11/81; **WARDANG ISLAND**–Museum Records, B. Cooke (pers. comm.); **DALY HEAD ISLET**–Helicopter overfly on 25/11/82; **SOUTH ISLET**–Helicopter landing for 1 hr on 25/11/82; **SEAL ISLAND**–Helicopter landing for 1 hr 30 min on 24/11/82; **HAYSTACK ISLAND**–Helicopter landing for 1 hr on 24/11/82; **ALTHORPE ISLANDS**–Helicopter landings for 23 hr on 24–25/11/82; **TROUBRIDGE ISLAND**–Boat landing for 4 hr on 25/8/81.

**Table 29.** Bird species from Yorke Peninsula islands.

| Common name | Scientific name | East Bird Island | Goose Island | Little Goose | White Rocks | Seal Rocks | Green Island | Rocky Island | Wardang Island | Daly Head Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spiny-cheeked Honeyeater | *Acanthogenys rufogularis* | | | | | | | | | | | | | | | | | | * |
| *Skylark | *Alauda arvensis* | | | | | | | | | | | | | | | | * | | |
| Richard's Pipit | *Anthus novaeseelandiae* | | * | | | | | | * | | | | | | | | | | * |
| Great/White Egret | *Ardea alba* | * | | | | | | | | | | | | | | | | | |
| White-faced Heron | *Ardea novaehollandiae* | * | * | | | | | | | | * | | | | | | * | | * |
| Ruddy Turnstone | *Arenaria interpres* | | * | | | | | | * | | | | | | | | * | | * |
| Masked Wood-swallow | *Artamus personatus* | | * | | | | | | | | | | | | | | | | |
| Musk Duck | *Biziura lobata* | * | | | | | | | | | | | | | | | | | |
| Sharp-tailed Sandpiper | *Calidris acuminata* | | * | | | | | | * | | | | | | | | | | * |
| Sanderling | *Calidris alba* | | | | | | | | | | | | | | | | | | * |
| Red Knot | *Calidris canutus* | | | | | | | | | | | | | | | | | | * |
| Curlew Sandpiper | *Calidris ferruginea* | | | | | | | | | | | | | | | | | | * |
| Red-necked Stint | *Calidris ruficollis* | | * | | | | | | * | | | | | | | | | | * |
| Great Knot | *Calidris tenuirostris* | | * | | | | | | * | | | | | | | | | | * |
| *Goldfinch | *Carduelis carduelis* | | | | | | | | | | | | | | | | | | * |
| Cape Barren Goose | *Cereopsis novaehollandiae* | | | | | | | | | | | | | | | | | | * |
| Double-banded Dotterel/Plover | *Charadrius bicinctus* | | | | | | | | | | | | | | | | | | * |
| Mongolian Plover | *Charadrius mongolus* | | | | | | | | | | | | | | | | | | * |
| Hooded Dotterel/Plover | *Charadrius rubricollis* | | * | | | | | | | | | | | | | | | | * |

**Table 29. (cont'd)** Bird species from Yorke Peninsula islands.

| Common name | Scientific name | East Bird Island | Goose Island | Little Goose | White Rocks | Seal Rocks | Green Island | Rocky Island | Wardang Island | Daly Head Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Red Capped Dotterel/Plover | *Charadrius ruficapillus* | | | | | | | | * | * | | | | | | | | | * |
| White-backed Swallow | *Cheramoeca leucosternum* | | | | | | | | * | | | | | | | | | | |
| Swamp/Marsh Harrier | *Circus approximans* | | * | | | | | | | | | | | | | | | | |
| *Feral Pigeon/Rock Dove | *Columba livia* | | * | | | * | * | | * | | | * | | * | | * | | | * |
| Black-faced Cuckoo-shrike | *Coracina novaehollandiae* | | * | | | | | | | | | | | | | | | | |
| Australian Raven | *Corvus coronoides* | | | | | | | | | | | * | | | | | | | |
| Little Raven | *Corvus mellori* | | * | | | | | | * | | | | | | | | | | |
| Black Swan | *Cygnus atratus* | | * | | | | | | | | | | | | | | | | * |
| Black-fronted Dotterel/Plover | *Elseyornis melanops* | * | | | | | | | | | | | | | | | | | * |
| Galah | *Eolophus roseicapillus* | | | | | | | | * | | | | | | * | | 2 | | * |
| White-fronted Chat | *Ephthianura albifrons* | | | | | | | | * | | | | | | | | | | * |
| Little/Fairy Penguin | *Eudyptula minor* | | 1 | | | | | | | | 1 | 1 | | 1 | 1 | | 1 | | 1 |
| Brown Hawk/Falcon | *Falco berigora* | | * | | | | | | | | | | | | | | | | |
| Australian Kestrel | *Falco cenchroides* | | * | | | | | | | | | | | | | | | | |
| Peregrine Falcon | *Falco peregrinus* | | | | | | | | | | | | | | | | | | * |
| Black-tailed Native Hen | *Galinula ventralis* | | | | | | | | | | | | | | | | | | * |
| Banded/Buff-banded Rail | *Gallirallus philippensis* | | | | | | | | | | | | | | | | | | * |
| Australian Magpie | *Gymnorhina tibicen* | | * | | | | | | * | | | | | | | | | | |
| Sooty Oystercatcher | *Haematopus fuliginosus* | | * | | | | | | | | * | * | | * | * | | * | * | * |

Table 29. (cont'd) Bird species from Yorke Peninsula islands.

| Common name | Scientific name | East Bird Island | Goose Island | Little Goose | White Rocks | Seal Rocks | Green Island | Rocky Island | Wardang Island | Daly Head Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pied Oystercatcher | *Haematopus ostralegus* | | * | | | | * | | | | | | | | | | | | * |
| Sacred Kingfisher | *Halcyon sancta* | * | | | | | | | | | | | | | | | | | * |
| White-bellied Sea-eagle | *Haliaeetus leucogaster* | | | | | | | | | | | | | | | 2 | * | | |
| Whistling Eagle/Kite | *Haliastur sphenurus* | | | | | | | | * | | | | | | | | | | |
| Welcome Swallow | *Hirundo neoxena* | | * | | | | * | | * | | | * | * | | * | * | * | | * |
| Masked/Spur-winged Plover | *Hoplopterus miles* | | | | | | | | * | | | | | | | | * | | * |
| Caspian Tern | *Hydroprogne caspia* | | | | | | 2 | * | | | | * | | | | | | | 1 |
| Shy Heathwren | *Hylacola cauta* | | * | | | | | | | | | | | | | | | | |
| Silver Gull | *Larus novaehollandiae* | * | * | * | * | | * | | 1 | 1 | * | * | * | * | * | 1 | | | * |
| Pacific Gull | *Larus pacificus* | * | * | 2 | * | | | | * | | | * | * | | * | * | * | | * |
| Black-faced Shag/Cormorant | *Leucocarbo fuscescens* | * | * | * | * | | | 1 | | | | * | | | * | | | | 1 |
| Bar-tailed Godwit | *Limosa laponica* | | | | | | | | | | | | | | | | | | * |
| Little Grassbird | *Megalurus gramineus* | | | | | | | | | | | | | | | | | | * |
| Purple-gaped Honeyeater | *Meliphaga cratitia* | * | | | | | | | | | | | | | | | | | |
| Singing Honeyeater | *Meliphaga virescens* | * | * | | | | | | | | * | * | | | | | | | |
| Singing Bushlark | *Mirafra javanica* | | | | | | | | * | | | | | | | | | | |
| Australasian Gannet | *Morus serrator* | | | | | | | | | | | | | | | | | | * |
| Elegant Parrot | *Neophema elegans* | | | | | | | | | | | | | | | | | | * |
| Rock Parrot | *Neophema petrophila* | * | * | | | | | | | | 2 | * | | | * | * | * | * | * |

Table 29. (cont'd) Bird species from Yorke Peninsula islands.

| Common name | Scientific name | East Bird Island | Goose Island | Little Goose | White Rocks | Seal Rocks | Green Island | Rocky Island | Wardang Island | Daly Head Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boobook Owl | *Ninox novaeseelandiae* | | * | | | | | | | | | | | | | | | | |
| Crested Pigeon | *Ocyphaps lophotes* | * | | | | | | | | | | | | | | | | | |
| Golden Whistler | *Pachycephala pectoralis* | | * | | | | | | | | | | | | | | | | |
| Osprey | *Pandion haliaetus* | | | | | | | | | | | | 2 | | | | | | |
| *House Sparrow | *Passer domesticus* | | * | | | | | | * | | | | | | | | * | | * |
| White-faced Storm-petrel | *Pelagodroma marina* | | | | | | | | | | | | | | | 1 | | | |
| Australian Pelican | *Pelecanus conspicillatus* | * | * | | | | | | * | | | | | | | | | | * |
| Red-capped Robin | *Petroica goodenovii* | | * | | | | | | | | | | | | | | | | |
| Great/Black Cormorant | *Phalacrocorax carbo* | * | * | | | | | | * | | | | | | | | | | * |
| Little Pied Cormorant | *Phalacrocorax melanoleucos* | * | | | | | | | * | | | | | | | | | | * |
| Little Black Cormorant | *Phalacrocorax sulcirostris* | | * | | | | | | * | | | | | | | | | | * |
| Pied Cormorant | *Phalacrocorax varius* | * | * | * | | * | * | | | | | | | | * | | | | 1 |
| White-fronted Honeyeater | *Phylidonyris albifrons* | | * | | | | | | | | | | | | | | | | |
| Crescent Honeyeater | *Phylidonyris pyrrhoptera* | | | | | | | | | | | | | | | | 3 | | |
| Lesser Golden Plover | *Pluvialis squatarola* | | | | | | | | | | | | | | | | | | * |
| Zebra Finch | *Poephila guttata* | | * | | | | | | | | | | | | | | | | |
| Red-rumped Parrot | *Psephotus haematonotus* | | | | | | | | | | | | | | | | | | * |
| Short-tailed Shearwater | *Puffinus tenuirostris* | | | | | | | | | | | | | | | | 1 | | * |
| Willie Wagtail | *Rhipidura leucophrys* | | | | | | | | | | | | | | | | | | * |

Table 29. (cont'd) Bird species from Yorke Peninsula islands.

| Common name | Scientific name | East Bird Island | Goose Island | Little Goose | White Rocks | Seal Rocks | Green Island | Rocky Island | Wardang Island | Daly Head Island | Royston Island | Middle Islet | South Islet | Chinamans Hat Island | Seal Island | Haystack Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Antarctic Jaegar/Skua | *Stercorarius parasiticus* | | | | | | | | | | | | | | | | | | * |
| Bridled Tern | *Sterna anaethetus* | | | | | | | | | | | | | | | | | | * |
| Fairy Tern | *Sterna nereis* | | * | | | | | | | | | | | | 1 | | | | * |
| *Common/European Starling | *Sturnus vulgaris* | | * | | | | | | * | | | * | | | * | | * | | * |
| Crested Tern | *Thalasseus bergii* | 1 | 1 | * | | | * | 1 | * | | | | | | | | 1 | * | * |
| Greenshank | *Tringa nebularia* | | | | | | | | | | | | | | | | | | * |
| Barn Owl | *Tyto alba* | | * | | | | | | * | | | | | | | | | | * |
| Silvereye | *Zosterops lateralis* | | * | | | | * | | * | | | * | | | | | * | | * |

1. Breeding colony; 2. Nesting recorded; 3. Dead bird collected.

Data in this table is from the following sources: **BIRD ISLANDS**–Boat landing for 4hrs on 19/1/79; **GOOSE ISLAND**–(Paton 1973) (Joseph & Reid 1977) Boat landing for 3hr on 24/11/81; **LITTLE GOOSE**–Boat landing for 15m on 24/11/81; **SEAL ROCKS**–Boat pass 24/11/81; **WHITE ROCKS**–Boat landing for 15m on 24/11/81; **ROCKY ISLAND**–Boat landing for 15m on 24/11/81; **WARDANG ISLAND** (Paton 1973) Museum records; **GREEN ISLAND**–Boat landing for 1hr on 24/11/81; **ISLAND POINT**–Boat landing for 1hr 30m on 24/11/81; **ROYSTON ISLAND**–Helicopter landing for 1hr 30m 25/11/82; **MIDDLE ISLET**–Helicopter landing for 2hr on 25/11/82; **SOUTH ISLET**–Helicopter landing for 1hr on 25/11/82; **DALY HEAD ISLET**–Helicopter overfly 25/11/82; **CHINAMANS HAT ISLAND**–Helicopter landing for 1hr 15m on 24/11/82; **SEAL ISLAND**–Helicopter landing for 1hr 30m on 24/11/82; **HAYSTACK ISLAND**–Helicopter landing for 1hr on 24/11/82; **ALTHORPE ISLAND**–(Perryman 1937) Helicopter landings for 23hr on 24–25/11/82; **TROUBRIDGE ISLAND** (Ellis 1958) (Close 1982)–Boat landing for 4hr on 25/8/81.

Table 30. Reptile species from Yorke Peninsula islands.

| Common name | Scientific name | Goose Island | Green Island | Wardang Island | Royston Island | Middle Islet | South Islet | Seal Island | Althorpe Island | Western Islets | Troubridge Island |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lined Worm-lizard | *Aprasia striolata* | | | * | | | | | | | |
| Striped Wall Skink | *Cryptoblepharus virgatus* | * | | * | | | | | | | |
| Spotted Ctenotus | *Ctenotus uber* | | | * | | | | | | | |
| Bull Skink | *Egernia multiscutata* | | | | | | * | | | | |
| Four-toed Earless Skink | *Hemiergis peronii* | * | | * | | | | * | * | | |
| Southern Four-toed Slider | *Lerista dorsalis* | | | * | | | | | * | | |
| Mallee Slider | *Lerista picturata* | | | * | | | | | | | |
| Dwarf Skink | *Menetia greyii* | | | * | | | | | | | |
| Mallee Snake-eye | *Morethia obscura* | | | * | | | | | | | |
| Marbled Gecko | *Phyllodactylus marmoratus* | * | * | * | * | * | | * | * | * | * |
| Eastern Brown Snake | *Pseudonaja textilis* | | | * | | | | | | | |
| Shingleback Skink/Sleepy Lizard | *Tiliqua rugosa* | | | * | | | | | | | 1 |
| Gould's Goanna/Sand Monitor | *Varanus gouldii* | | | * | | | | | | | |

1. Possibly introduced by former lighthouse keeper.

Data in this table is from the following sources: **GOOSE ISLAND**–Boat landing for 3 hr on 24/11/81; **WARDANG ISLAND**–Museum records; **ROYSTON ISLAND**–Helicopter landing for 1 hr 30 min on 25/11/82; **MIDDLE ISLET**– Helicopter landing for 2 hr on 25/11/82; **SOUTH ISLET**– Helicopter landing for 1 hr on 25/11/82; **SEAL ISLAND**–Helicopter landing for 1 hr 30 min on 24/11/82; **ALTHORPE ISLANDS**–Helicopter landings for 24 hr on 24–25/11/82; **TROUBRIDGE ISLAND**–Boat landing for 4 hr on 25/8/81.

**Table 31.** Plant species from Kangaroo Island coast islands.

| Common names | Scientific name | West Bay Islet | North Casuarina Island | South Casuarina Island | Nobby Islet | Busby Islet |
|---|---|---|---|---|---|---|
| Coast ground-berry | *Acrotriche cordata* | | | | * | |
| Sea Celery | *Apium prostratum* ssp. *prostratum* var. *prostratum* | * | * | * | | |
| Marsh Saltbush | *Atriplex paludosa* ssp.*cordata* | * | | | | |
| Cushion-bush | *Calocephalus brownii* | | | | * | |
| Karkalla | *Carpobrotus rossii* | | | | * | |
| Downy Dodder-laurel | *Cassytha pubescens* | | | | * | |
| Common Correa | *Correa reflexa* var. *reflexa* | | | | * | |
| White-top | *Danthonia caespitosa* | | | | * | |
| Black-anther Flax lily | *Dianella revoluta* | | | | * | |
| Round-leaved Pigface | *Disphyma crassifolium* ssp. *clavellatum* | * | * | * | | |
| Ruby Saltbush | *Enchylaena tomentosa* var. *tomentosa* | * | * | * | * | |
| Small leaved Sea-heath | *Frankenia sessilis* | * | | | | |
| Grey Samphire | *Halosarcia halocnemoides* ssp. *halocnemoides* | | | | | * |
| Stalked Ixiolaena | *Ixiolaena supina* | | | | * | |
| Leafy peppercress | *Lepidium foliosum* | * | | | * | |
| Coastal Beard-heath | *Leucopogon parviflorus* | | | | * | |
| Oval-leaved Logania | *Logania ovata* | | | | * | |
| *Annual Cat's-tail | *Lophochloa cristata* | | | | * | |

**Table 31. (cont'd)** Plant species from Kangaroo Island coast islands.

| Common names | Scientific name | West Bay Islet | North Casuarina Island | South Casuarina Island | Nobby Islet | Busby Islet |
|---|---|---|---|---|---|---|
| *African Boxthorn | *Lycium ferocissimum* | | | | | * |
| Dryland Tea-tree | *Melaleuca lanceolata* | | | | * | |
| Native Juniper/Boobialla | *Myoporum insulare* | | | | * | |
| Nitre-bush | *Nitraria billardierei* | * | * | | | * |
| Coast Daisy-bush | *Olearia axillaris* | | | | * | |
| Twiggy Daisy-bush | *Olearia ramulosa* | | | | * | |
| Thyme Riceflower | *Pimelea serpyllifolia* ssp. *serpyllifolia* | | | | * | |
| Coast Tussock Grass | *Poa poiformis* var. *poiformis* | | | | * | |
| *False Sow-thistle | *Reichardia tingitana* | | | | * | |
| Fleshy Saltbush | *Rhagodia crassifolia* | | | | * | |
| Creeping Brookweed | *Samolus repens* | | | | * | |
| Thick-headed Samphire | *Sarcocornia blackiana* | | | | | * |
| Beaded Samphire | *Sarcocornia quinqueflora* | | * | | | * |
| Variable Groundsel | *Senecio lautus* | * | * | | * | |
| *Corn Spurrey | *Spergula arvensis* | * | | | | |
| Elegant Spear-grass | *Stipa elegantissima* | * | * | | * | |
| Austral Seablite | *Suaeda australis* | * | * | * | | * |
| Bower Spinach | *Tetragonia implexicoma* | | * | | * | |

**Table 31. (cont'd)** Plant species from Kangaroo Island coast islands.

| Common names | Scientific name | West Bay Islet | North Casuarina Island | South Casuarina Island | Nobby Islet | Busby Islet |
|---|---|---|---|---|---|---|
| Coast Bonefruit | *Threlkeldia diffusa* | | | | * | |
| Silky Wilsonia | *Wilsonia humilis* var. *humilis* | * | | | | |
| Pointed Twinleaf | *Zygophyllum apiculatum* | | | | * | |

Data in this table is from the following sources: **WEST BAY ISLET**–Helicopter landing for 45m on 23/11/82; **NORTH CASUARINA ISLET**–Helicopter landing for 1hr on 22/11/82; **SOUTH CASUARINA ISLET**–Helicopter landings for 17hr 30m on 22-23/11/82; **NOBBY ISLET**–Helicopter landing for 1hr 15m on 22/11/82; **BUSBY ISLET**–Helicopter landing for 1hr on 23/11/82.

**Table 32.** Mammal species from Kangaroo Island coast islands.

| Common names | Scientific name | West Bay Islet | North Casuarina Islet | South Casuarina Islet | Pelorus Islet |
|---|---|---|---|---|---|
| New Zealand Fur-seal | *Arctocephalus forsteri* | | 1 | * | * |
| Australian Sea-lion | *Neophoca cinerea* | * | * | * | |

1. Breeding colony.

Data in this table is from the following sources: **WEST BAY ISLET**–Helicopter landing for 45m on 23/11/82; **NORTH CASUARINA ISLET**–Helicopter landing for 1hr on 22/11/82; **SOUTH CASUARINA ISLET**–Helicopter landings for 17hr 30m on 22-23/11/82; **PELORUS ISLET**–Helicopter overfly on 22/11/82.

**Table 33.** Bird species from Kangaroo Island coast islands.

| Common names | Scientific names | West Bay Islet | North Casuarina Islet | South Casuarina Islet | Nobby Islet | Busby Islet | Pelorus Islet |
|---|---|---|---|---|---|---|---|
| Red Wattlebird | *Anthochaera carunculata* | | | | | | * |
| Richard's Pipit | *Anthus novaeseelandiae* | * | * | | | | |
| White-faced Heron | *Ardea novaehollandiae* | | | | | | * |
| Eastern Reef Egret/Reef Heron | *Ardea sacra* | | | | | | * |
| Ruddy Turnstone | *Arenaria interpres* | | | * | | | |
| Red-capped Dotterel/Plover | *Charadrius ruficapillus* | * | | * | | | |
| Black Swan | *Cygnus atratus* | | | | | | * |
| Little/Fairy Penguin | *Eudyptula minor* | | | | * | | 1 |
| Sooty Oystercatcher | *Haematopus fuliginosus* | 2 | * | * | | | 2 |
| Pied Oystercatcher | *Haematopus ostralegus* | | | | | | 2 |
| White-bellied Sea-eagle | *Haliaeetus leucogaster* | | | | * | | |
| Welcome Swallow | *Hirundo neoxena* | * | * | * | * | | * |
| Caspian Tern | *Hydroprogne caspia* | | | | | | * |
| Silver Gull | *Larus novaehollandiae* | | 1 | * | | | 1 |
| Pacific Gull | *Larus pacificus* | 1 | 1 | 1 | | | 1 |
| Black-faced Shag/Cormorant | *Leucocarbo fuscescens* | | | | | | 1 |
| Little Grassbird | *Megalurus gramineus* | | | | | | * |
| Rock Parrot | *Neophema petrophila* | * | * | | | | * |
| Eastern Curlew | *Numenius madagascarensis* | | | | | | * |
| Osprey | *Pandion haliaetus* | | | | 2 | | |

**Table 33. (cont'd)** Bird species from Kangaroo Island coast islands.

| **Common names** | **Scientific names** | **West Bay Islet** | **North Casuarina Islet** | **South Casuarina Islet** | **Nobby Islet** | **Busby Islet** | **Pelorus Islet** |
|---|---|---|---|---|---|---|---|
| White-faced Storm-petrel | *Pelagodroma marina* | | | | 2 | | |
| Australian Pelican | *Pelecanus conspicillatus* | | | | | | 1 |
| Little Pied Cormorant | *Phalacrocorax melanoleucos* | | | | | | 1 |
| Pied Cormorant | *Phalacrocorax varius* | | | | | | 1 |
| Hoary-headed Grebe | *Poliocephalus poliocephalus* | | | | | | * |
| Fairy Tern | *Sterna nereis* | 1 | | * | | | * |
| Antarctic Tern | *Sterna vittata* | | | 3 | | | |
| Mountain Duck/Australasian Shelduck | *Tadorna tadornoides* | | | | | | * |
| Crested Tern | *Thalasseus bergii* | 1 | 1 | * | | * | |
| Straw-necked Ibis | *Threskiornis spinicollis* | | | | | | * |

1. Breeding colony; 2. Nesting recorded; 3. Dead bird collected.

Data in this table is from the following sources: **WEST BAY ISLET**–Helicopter landing for 45 min on 23/11/82, Copley (in press): **NORTH CASUARINA ISLET**–Helicopter landing for 1 hr on 22/11/82; **SOUTH CARUARINA ISLET**–Helicopter landings for 17 hr 30 min on 22-23/11/82; **NOBBY ISLET**–Helicopter landing for 1 hr 15 min on 22/11/82; **BUSBY ISLET**–Helicopter landing for 1 hr on 23/11/82, Boat landings on 7/10/82 and 5/10/89; **PELORUS ISLET**–Helicopter overfly on 22/11/82.

**Table 34.** Reptile species from Kangaroo Island coast islands.

| Common name | Scientific name | West Bay Islet | North Casuarina Islet | South Casuarina Islet | Nobby Islet |
|---|---|---|---|---|---|
| Bull Skink | *Egernia multiscutata* | | * | | * |
| Four-toed Earless Skink | *Hemiergis peronii* | * | * | * | * |
| Marbled Gecko | *Phyllodactylus marmoratus* | | * | | * |

Data in this table is from the following sources: **WEST BAY ISLET**– Helicopter landing for 45 min on 23/11/82; **NORTH CASUARINA ISLET**–Helicopter landing for 1 hr on 22/11/82; **SOUTH CASUARINA ISLET**–Helicopter landings for 17 hr 30 min on 22–23/11/82; **NOBBY ISLET**–Helicopter landing for 1 hr 15 min on 22/11/82.

**Table 35.** Plant species from Fleurieu Peninsula islands.

| Common name | Scientific name | North Page Island | South Page Island | West Island | Pullen Island | Wright Island |
|---|---|---|---|---|---|---|
| Sallow Wattle | *Acacia longifolia* var. *longifolia* | | | * | | |
| Drooping She-oak | *Allocasuarina verticillata* | | | * | | |
| Annual Celery | *Apium annuum* | | | * | | |
| Sea Celery | *Apium prostratum* ssp. *prostratum* var. *prostratum* | * | | | | |
| *Capeweed | *Arctotheca calendula* | | | * | | |
| *Great Brome | *Bromus diandrus* | | | * | | |
| Leek Lily | *Bulbine semibarbata* | | * | | | |
| *Fat hen | *Chenopodium album* | | | * | | |
| *Nettle-leaved Goosefoot | *Chenopodium murale* | * | * | | | |
| *Bitter Melon | *Citrullus lanatus* | | | * | | |
| Round-leaved Pigface | *Disphyma crassifolium* ssp *clavellatum* | * | * | * | | |
| *Salvation Jane/Patterson's Curse | *Echium plantagineum* | | | * | | |
| *Annual Veldt Grass | *Ehrharta longiflora* | | | * | | |
| Ruby Saltbush | *Enchylaena tomentosa* var. *tomentosa* | | * | * | | |
| | *Frankenia cordata* | * | | | | |
| *Coastal Galenia | *Galenia pubescens* var. *pubescens* | | | * | | |
| *Barley Grass | *Hordeum leporinum* | | | * | | |
| *Sharp Rush | *Juncus acutus* | | | * | | |
| *Pyramid Tree | *Lagunaria patersonii* | | | * | | |
| *Tree Mallow | *Lavatera arborea* | | | | * | |
| Australian Hollyhock | *Lavatera plebeia* | | | * | | |

Table 35. (cont'd) Plant species from Fleurieu Peninsula islands.

| Common name | Scientific name | North Page Island | South Page Island | West Island | Pullen Island | Wright Island |
|---|---|---|---|---|---|---|
| *Perennial Ryegrass | *Lolium perenne* | | | * | | |
| *African Boxthorn | *Lycium ferocissimum* | | | * | * | |
| South Australian Swamp Paper-bark | *Melaleuca halmaturorum* | | | * | | |
| *Common Iceplant | *Mesembryanthemum crystallinum* | | | * | | |
| Native Juniper/Boobialla | *Myoporum insulare* | | | | * | |
| Coast Tobacco | *Nicotiana maritima* | | | * | | |
| *Curly Ryegrass | *Parapholis incurva* | | | * | | |
| | *Plantago coronopus* ssp. *comutata* | | | * | | |
| *Short-fruited Wild Turnip | *Rapistrum rugosum* | | | * | | |
| *Blow-fly Bush | *Rhamnus alaternus* | | | * | * | |
| Variable Groundsel | *Senecio lautus* | * | * | * | | |
| Black-berry Nightshade | *Solanum nigrum* | | | * | | |

Data in this table is from the following sources: **NORTH PAGE ISLAND**–Helicopter landing for 1 hr on 22/11/82; **SOUTH PAGE ISLAND**–Helicopter landing for 2 hr on 20/9/78, for 30 min on 22/11/82; **WEST ISLAND**–Boat landings for 2 hr on 22/12/75, for 4 hr on 1/12/78 **WRIGHT ISLAND** (Lothian 1959, 1961); **PULLEN ISLAND**–Boat landing for 3 hr on 23/11/78.

**Table 36.** Mammal species from Fleurieu Peninsula islands.

| Common name | Scientific name | North Page Island | South Page Island | West Island |
|---|---|---|---|---|
| New Zealand Fur-seal | *Arctocephalus forsteri* | | | * |
| Australian Sea-lion | *Neophoca cinerea* | * | * | |
| Black-footed Rock-wallaby | *Petrogale lateralis* | | | 1 |

1 Introduced population now extinct.

Data in this table is from the following sources: **NORTH PAGE ISLAND**–Helicopter landing for 1 hr on 22/11/82; **SOUTH PAGE ISLAND**–Helicopter landing for 2 hr on 20/9/78, for 30 min on 22/11/82; **WEST ISLAND**–Boat landings for 2 hr on 22/12/75, for 4 hr on 1/12/78.

**Table 37.** Bird species from Fleurieu Peninsula islands.

| Common name | Scientific name | North Page Island | South PageIsland | West Island | Wright Island | Granite Island | Pullen Island |
|---|---|---|---|---|---|---|---|
| *Skylark | *Alauda arvensis* | | | * | | | |
| Richard's Pipit | *Anthus novaeseelandiae* | | | * | | | |
| Fork-tailed Swift | *Apus pacificus* | | | * | | | |
| White-faced Heron | *Ardea novaehollandiae* | | | * | * | | |
| Eastern Reef Egret/Reef Heron | *Ardea sacra* | | | * | | | |
| *Feral Pigeon/Rock Dove | *Columba livia* | | | 2 | | * | * |
| Little/Fairy Penguin | *Eudyptula minor* | 1 | 1 | 1 | 1 | 1 | 1 |
| Little Falcon/Australian Hobby | *Falco longipennis* | | | * | | | |
| Black Falcon | *Falco subniger* | | | * | | | |
| Sooty Oystercatcher | *Haematopus fuliginosus* | | | 2 | * | | |
| Masked/Spur-winged Plover | *Hoplopterus miles* | | | * | | | |
| White-bellied Sea-eagle | *Haliaeetus leucogaster* | | | * | | | |
| Caspian Tern | *Hydroprogne caspia* | | | 1 | * | | |
| Silver Gull | *Larus novaehollandiae* | 2 | 2 | 1 | 1 | | |
| Pacific Gull | *Larus pacificus* | | | * | * | | |
| Black-faced Shag/Cormorant | *Leucocarbo fuscescens* | | | * | * | | |
| Rock Parrot | *Neophema petrophila* | | | * | | | |
| Great/Black Cormorant | *Phalacrocorax carbo* | | | * | * | | * |

Table 37. (cont'd) Bird species from Fleurieu Peninsula islands.

| Common name | Scientific name | North Page Island | South PageIsland | West Island | Wright Island | Granite Island | Pullen Island |
|---|---|---|---|---|---|---|---|
| Little Pied Cormorant | *Phalacrocorax melanoleucos* | | | * | | | * |
| Little Black Cormorant | *Phalacrocorax sulcirostris* | | | | * | | |
| Pied Cormorant | *Phalacrocorax varius* | | | | * | | |
| Fairy Tern | *Sterna nereis* | | | 1 | 1 | | |
| White-fronted Tern | *Sterna striata* | | | 3 | | | |
| *Common/European Starling | *Sturnus vulgaris* | | | 2 | | | 2 |
| Crested Tern | *Thalasseus bergii* | 1 | 1 | 1 | * | | * |

1. Breeding colony; 2. Nesting recorded; 3. Dead bird collected.

Data in this table is from the following sources: **NORTH PAGE ISLAND**–Helicopter landing for 1 hr on 22/11/82; **SOUTH PAGE ISLAND**–Boat landing by Mrs Joan Paton, 26/3/67, Helicopter landing for 2 hr on 20/9/78, for 30 min on 22/11/82; **WEST ISLAND**–(Paton and Paton 1977a), Boat landings for 2 hr on 22/12/75, for 4 hr on 1/12/78; **WRIGHT ISLAND**–(Paton and Paton 1977b): **GRANITE ISLAND**–R. Storr (pers comm): **PULLEN ISLAND**–(Anon 1983).

**Table 38.** Reptile species from Fleurieu Peninsula Islands.

| Common name | Scientific name | West Island |
| --- | --- | --- |
| Cunningham's Skink | *Egernia cunninghamii* | * |
| White's Skink | *Egernia whitii* | * |
| Four-toed Earless Skink | *Hemiergis peronii* | * |

Data in this table is from the following sources: **WEST ISLAND**–Boat landings for 2 hr on 22/12/75, for 4 hr on 1/12/78.

*Appendix*

# F

# ISLAND STRUCTURAL VEGETATION MAPS

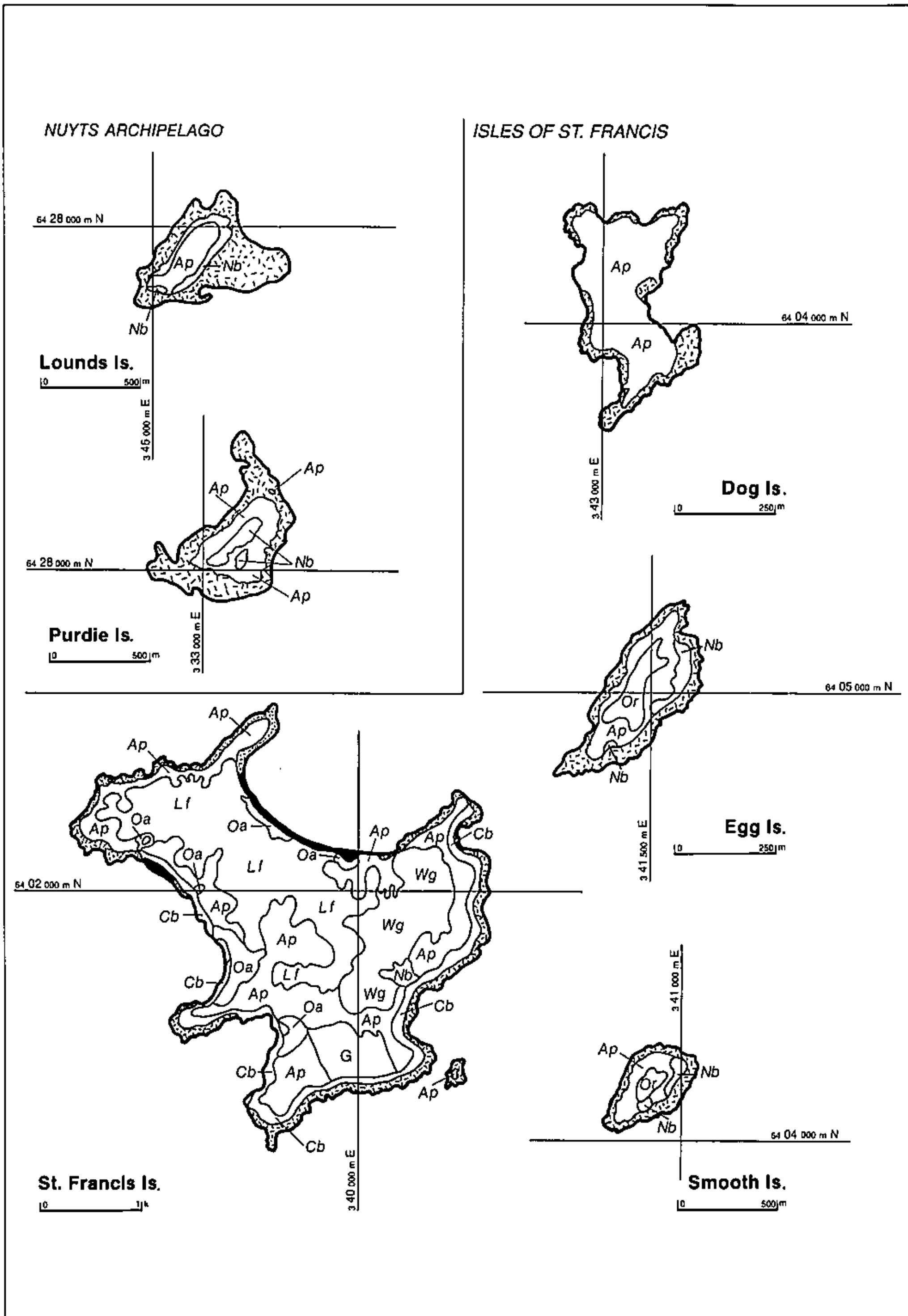



Figure 75. Nuyts Archipelago—Lounds, Dog, Purdie, Egg, St Francis and Smooth Islands.

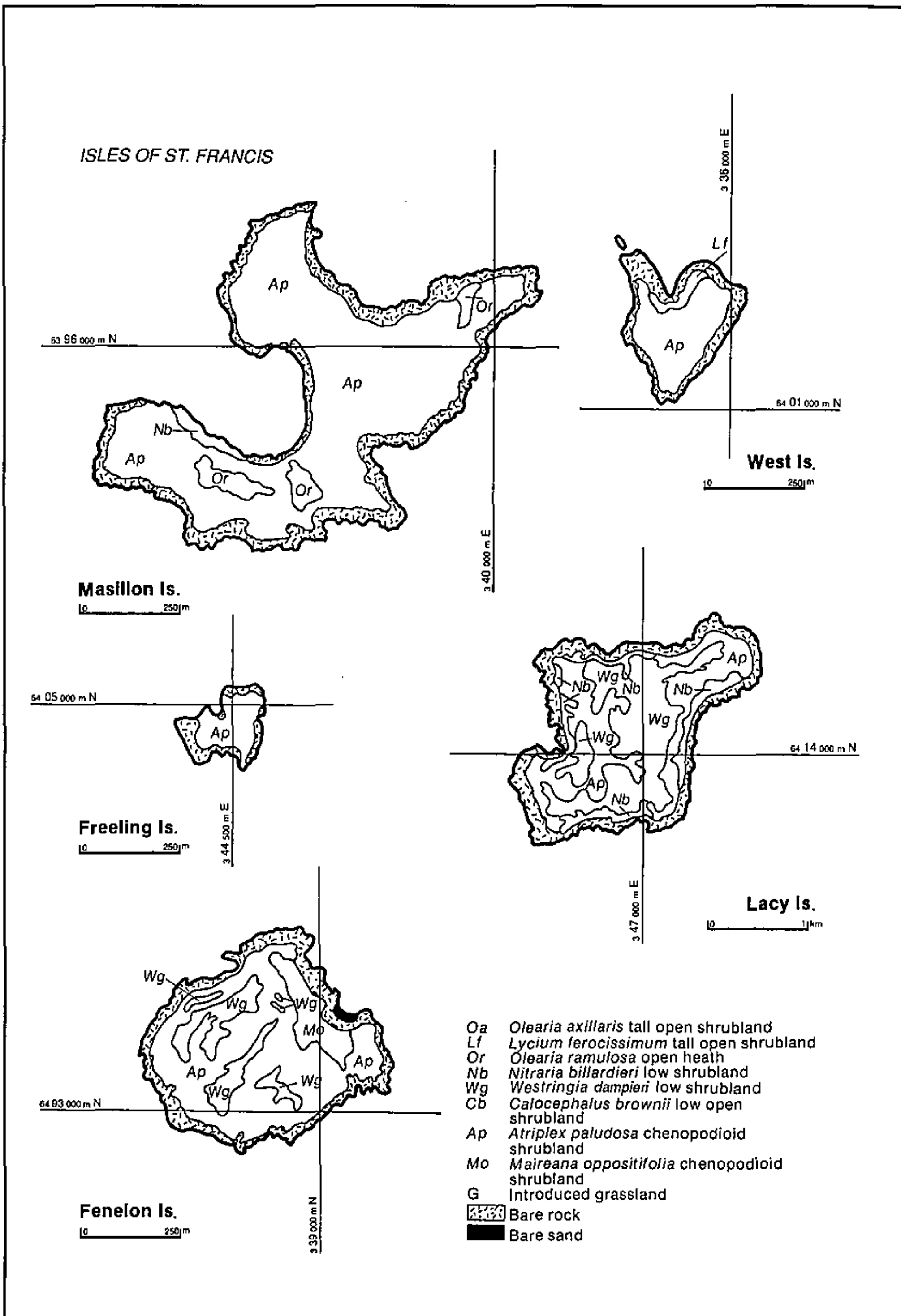



Figure 76. Nuyts Archipelago—Masillon, West, Freeling, Lacy and Fenelon Islands.

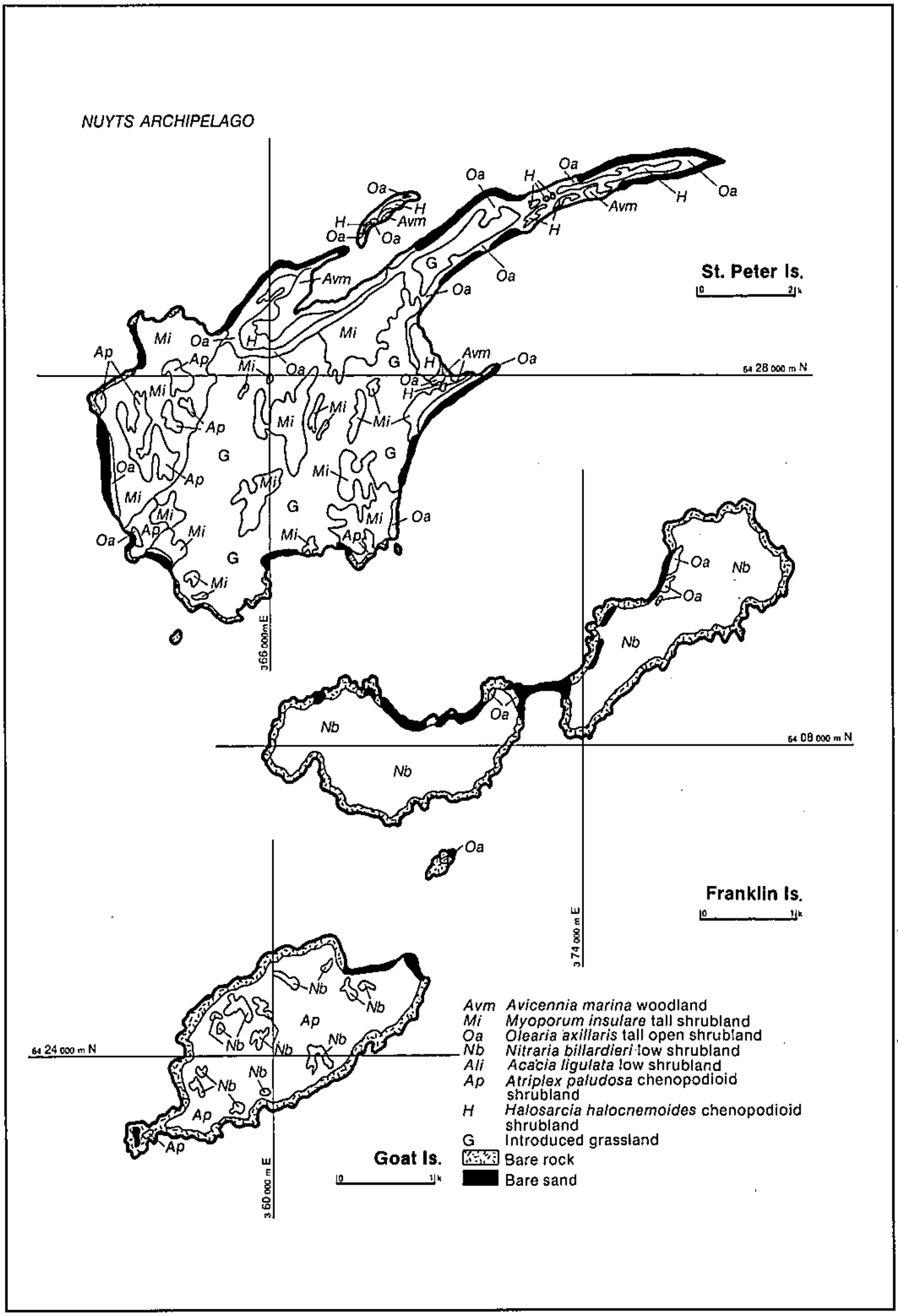



**Figure 77.** Nuyts Archipelago—St Peter, Franklin and Goat Islands.

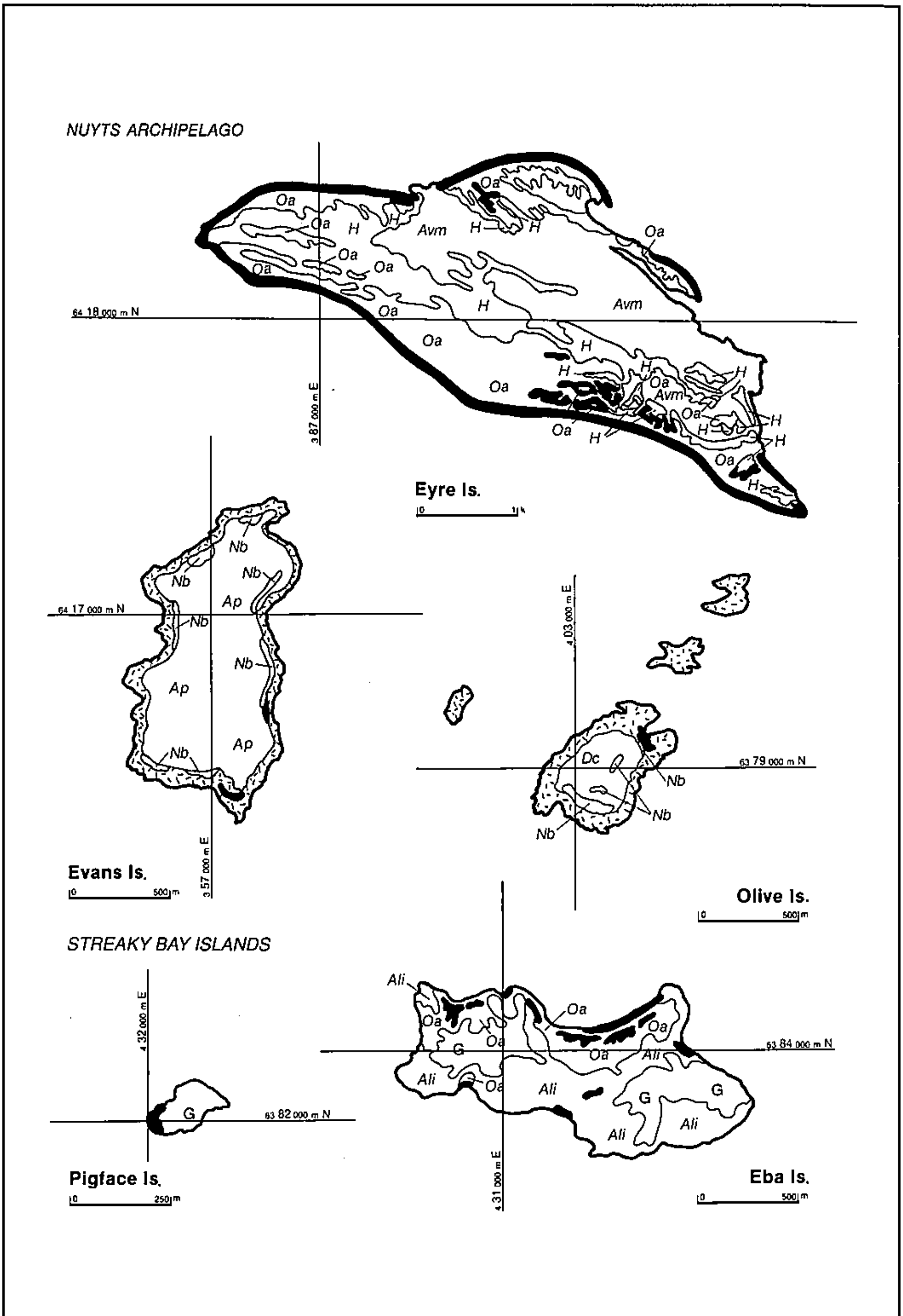



Figure 78. Nuyts Archipelago—Eyre, Evans and Pigface, Olive and Eba Islands.

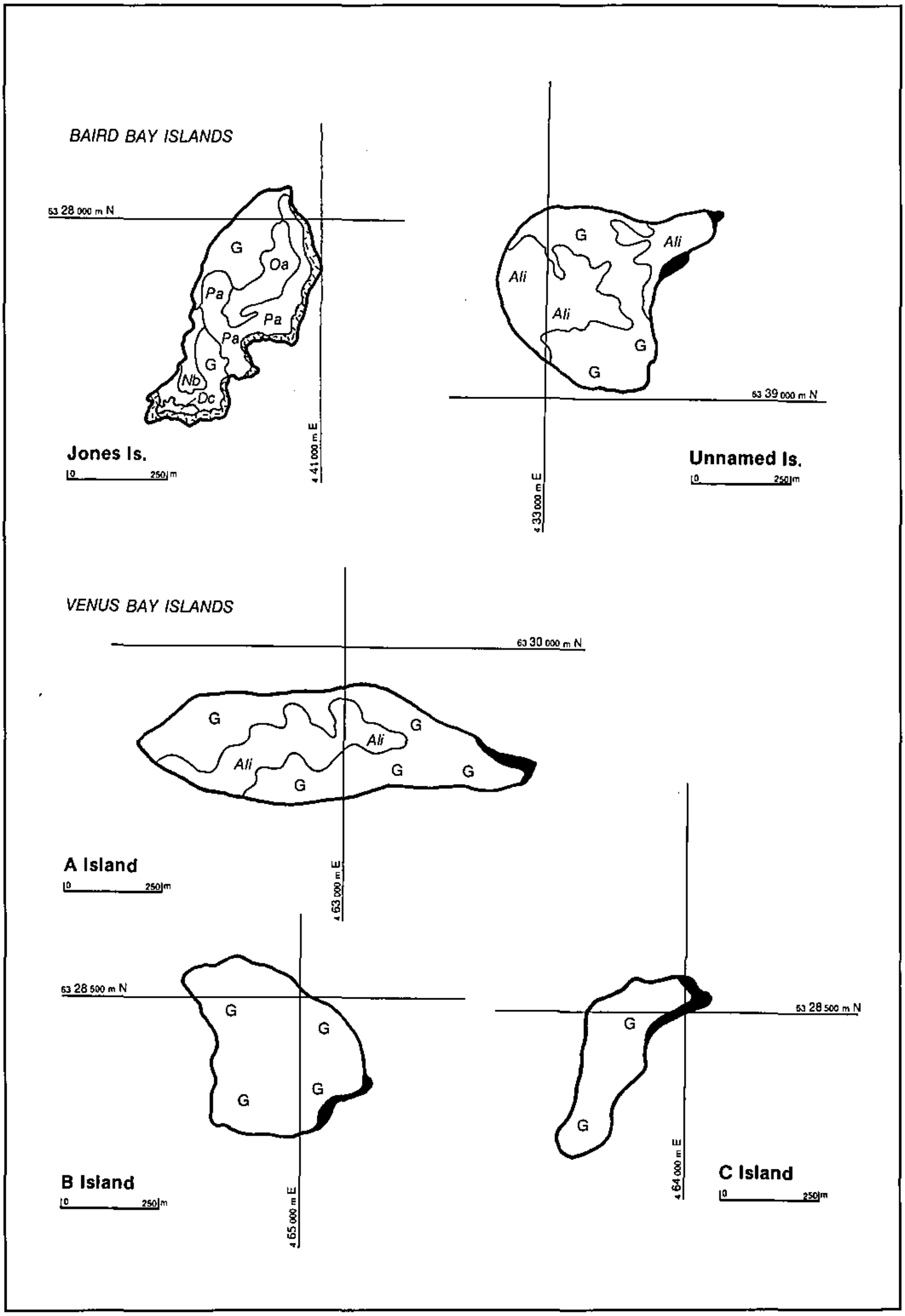



**Figure 79.** Baird Bay Islands—Jones and Unnamed, and Venus Bay Islands—A, B and C.

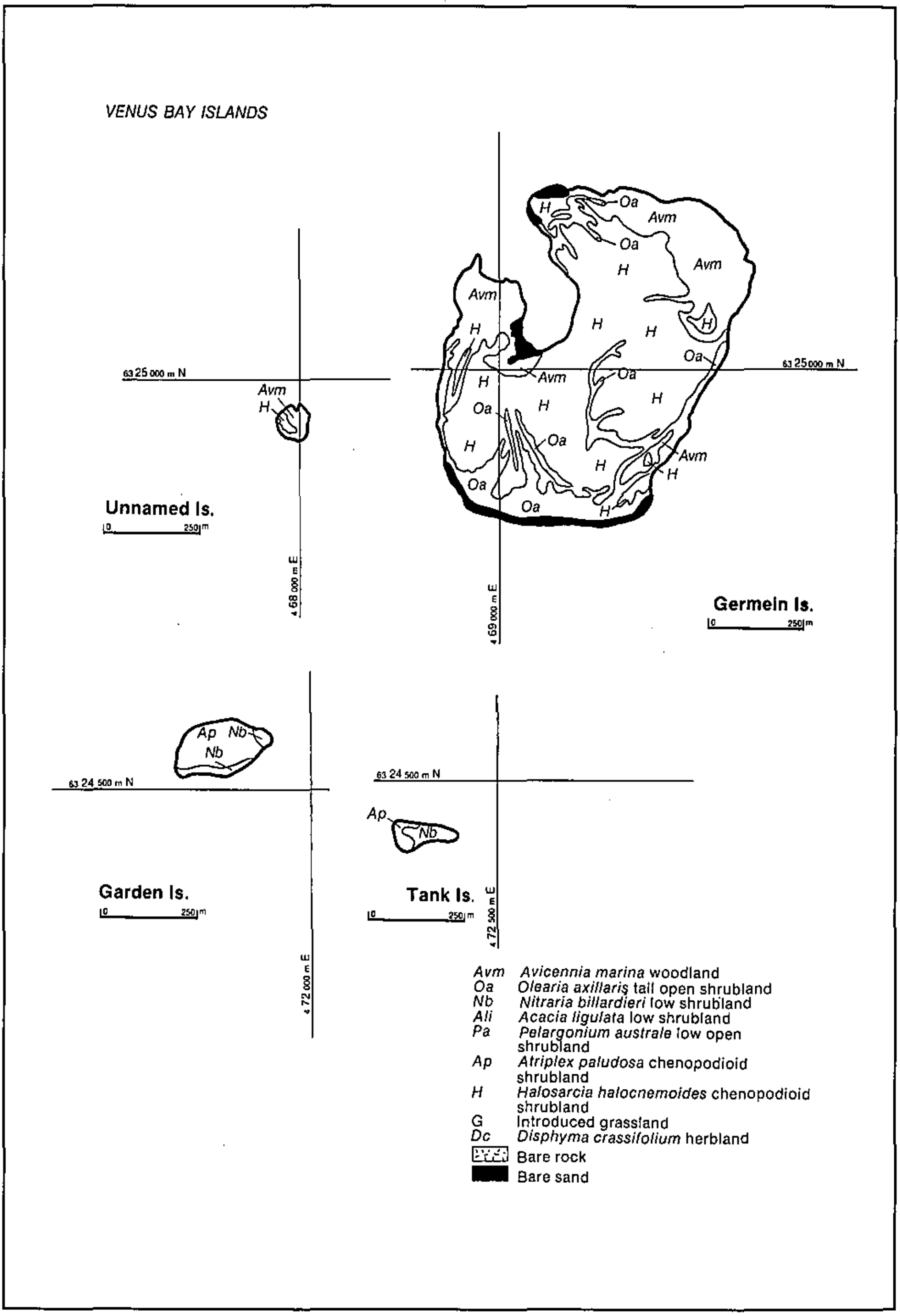



**Figure 80.** Venus Bay Islands—Unnamed, Germein, Garden and Tank Islands.

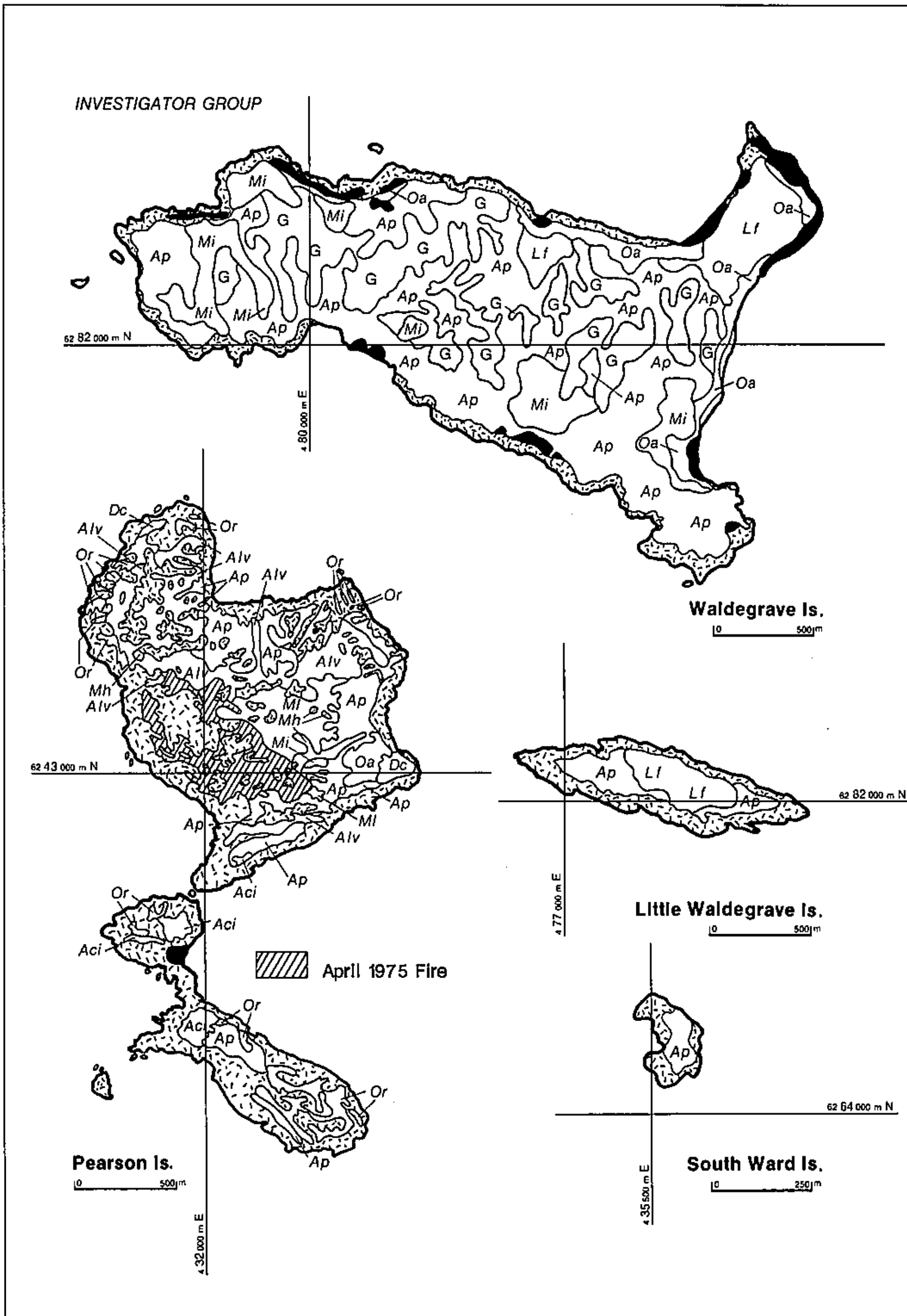



Figure 81. Investigator Group—Waldegrave, Little Waldegrave, Pearson and Sth Ward Islands.

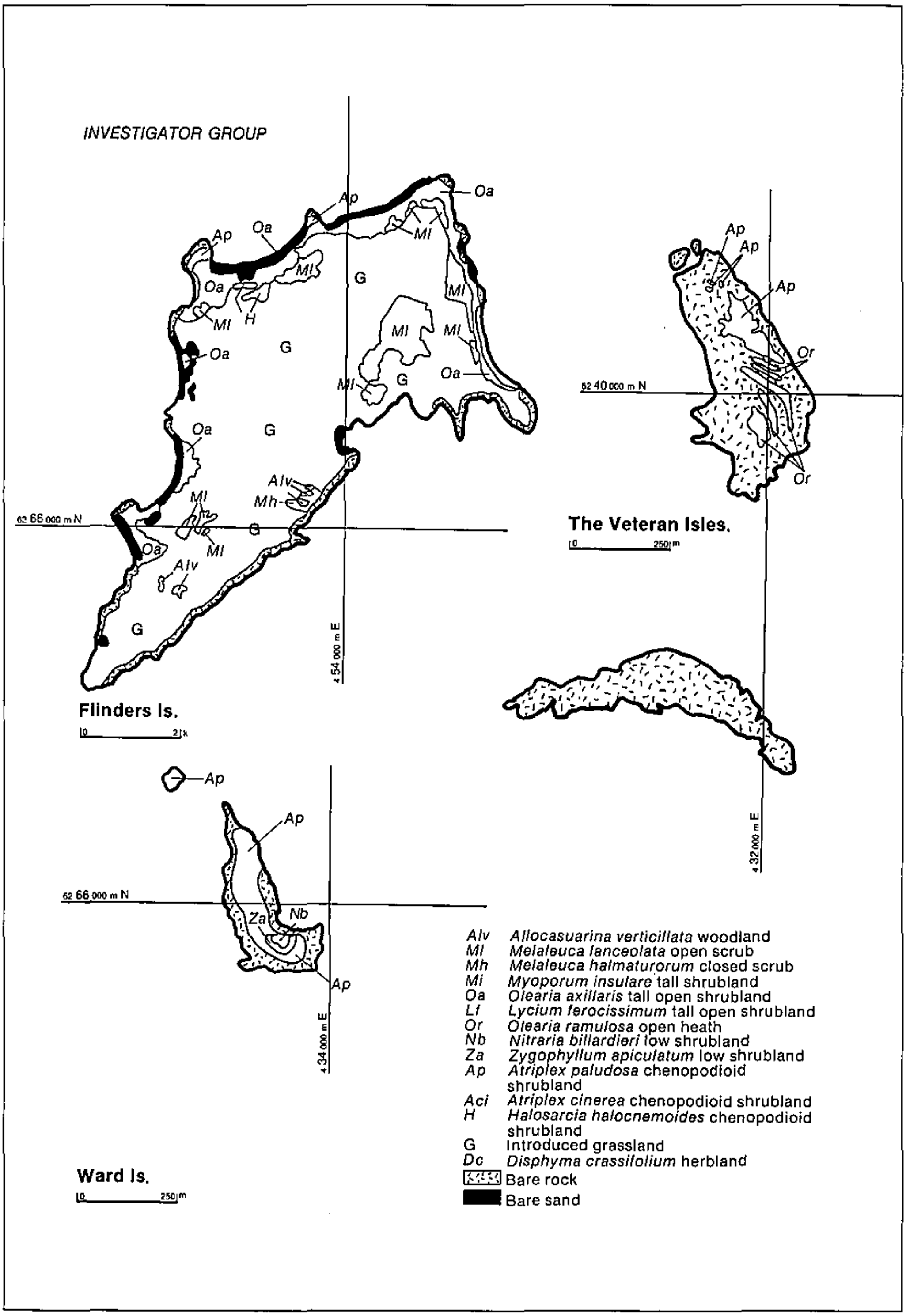



**Figure 82.** Investigator Group—Flinders, Veteran and Ward Islands.

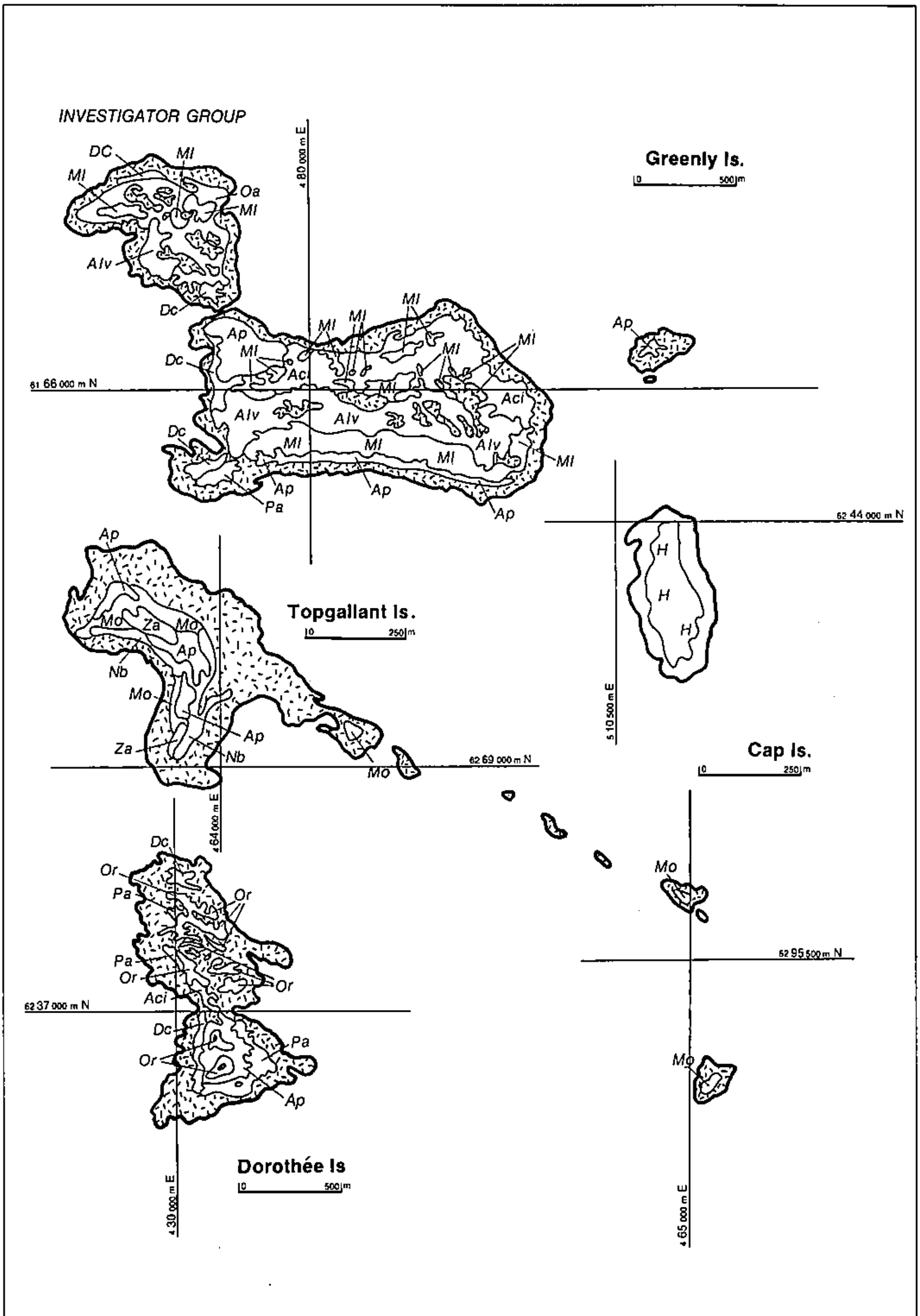



Figure 83. Investigator Group—Topgallant, Dorothée, Cap and Greenly Islands.

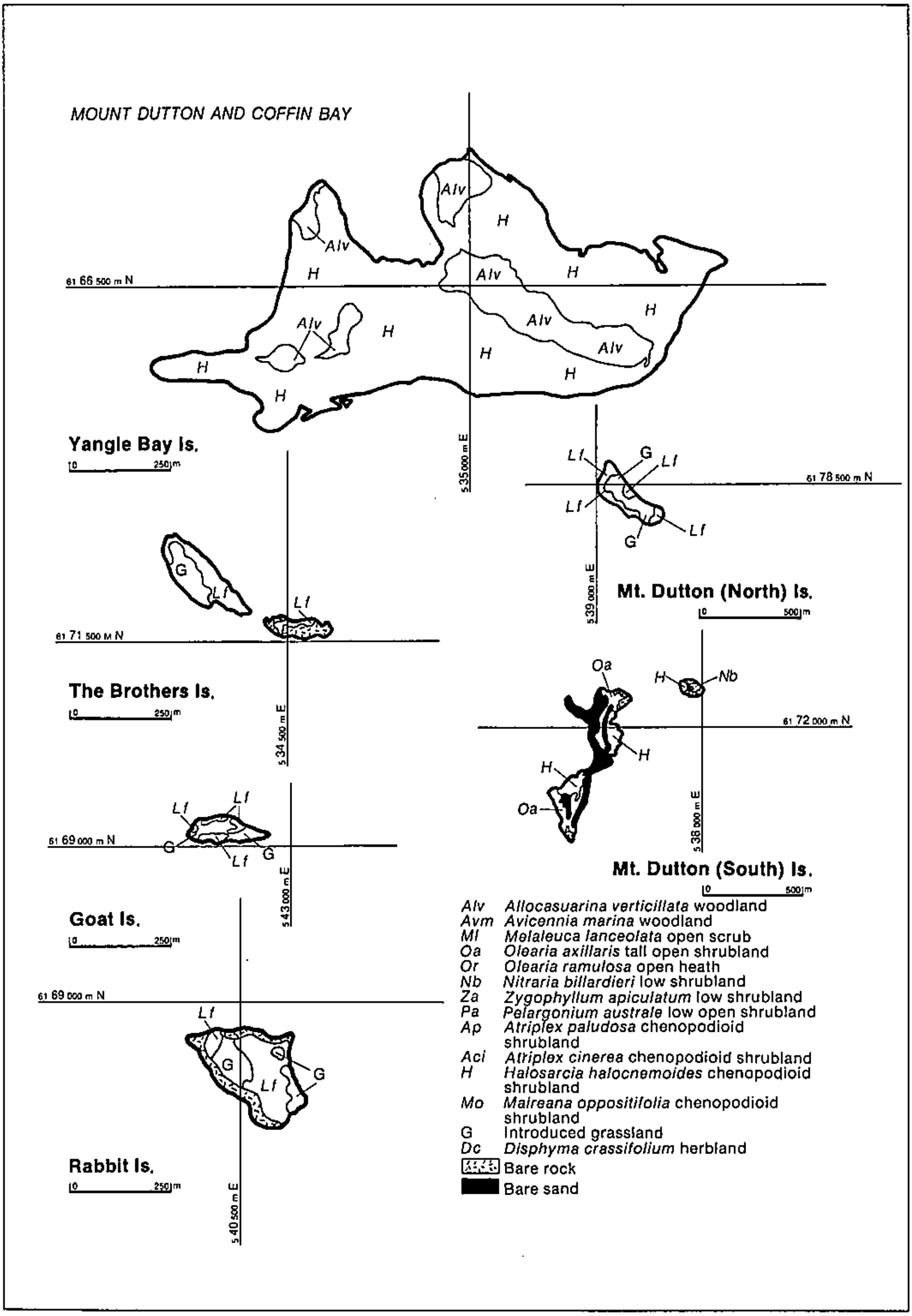



Figure 84. Mt Dutton and Coffin Bay—Yangie Bay, The Brothers, North Mt Dutton, South Mt Dutton, Goat and Rabbit Islands.

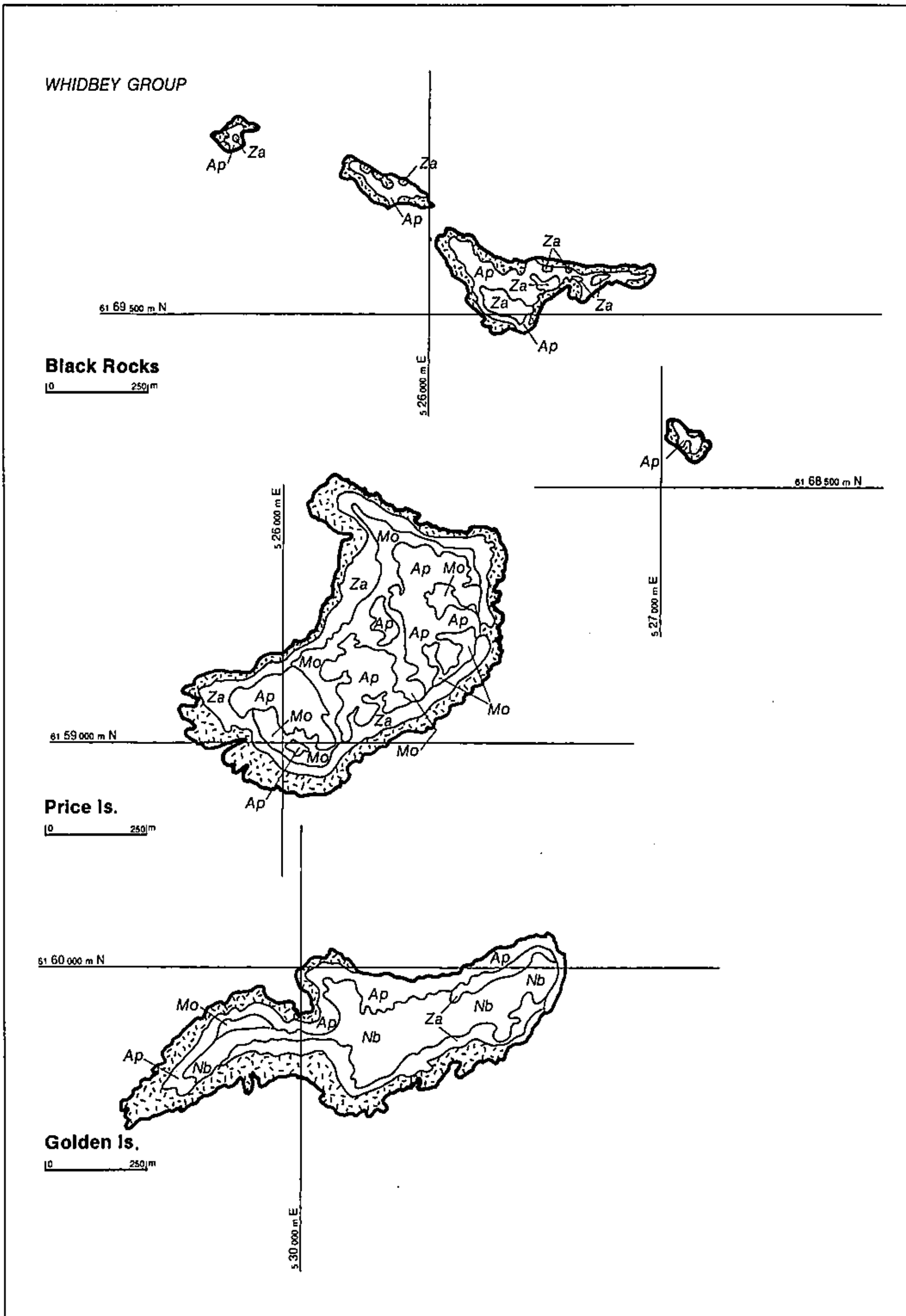



Figure 85. Whidbey Group—Black Rocks, Price and Golden Islands.

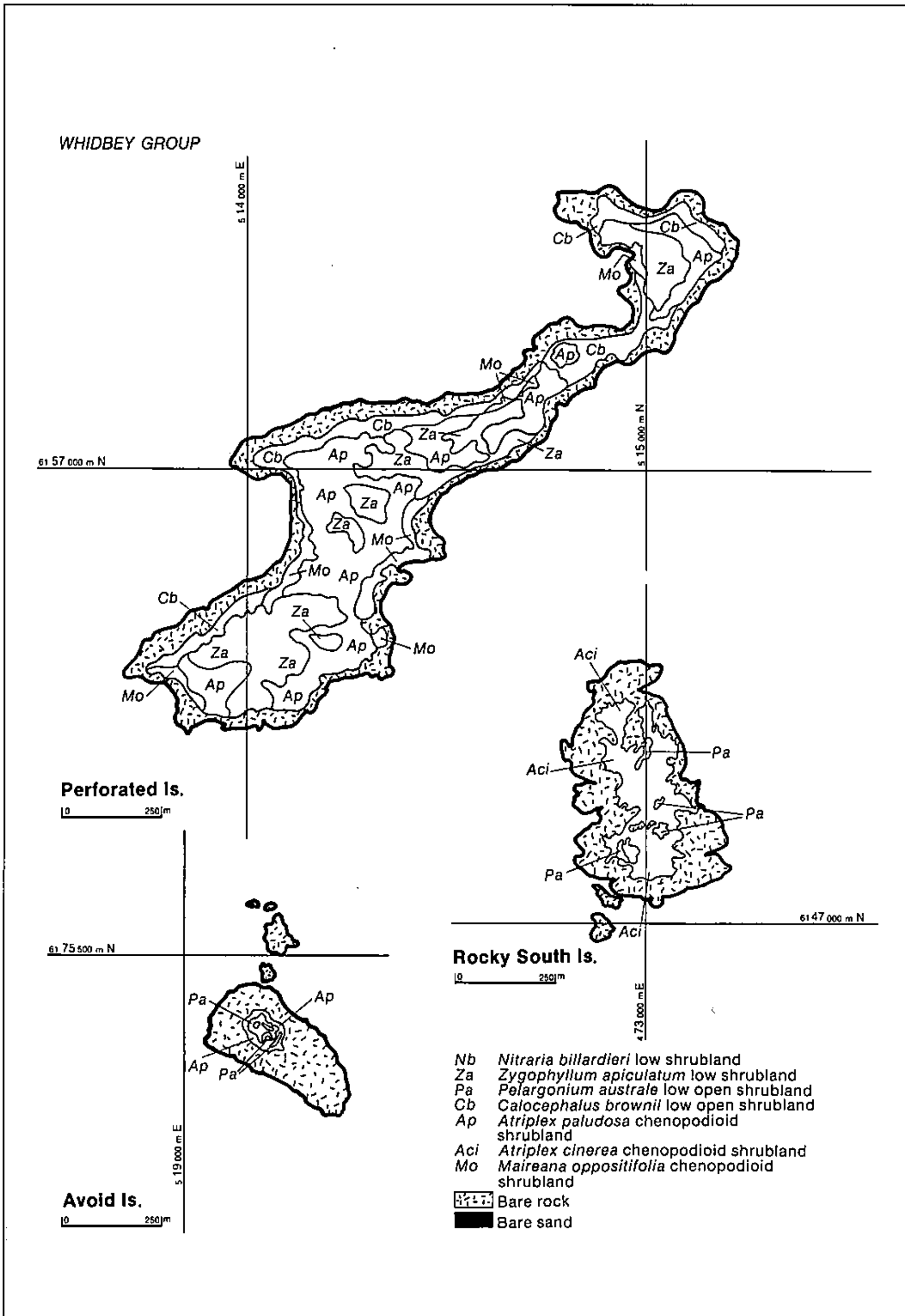



Figure 86. Whidbey Group—Perforated, Sth Rocky and Avoid Islands.

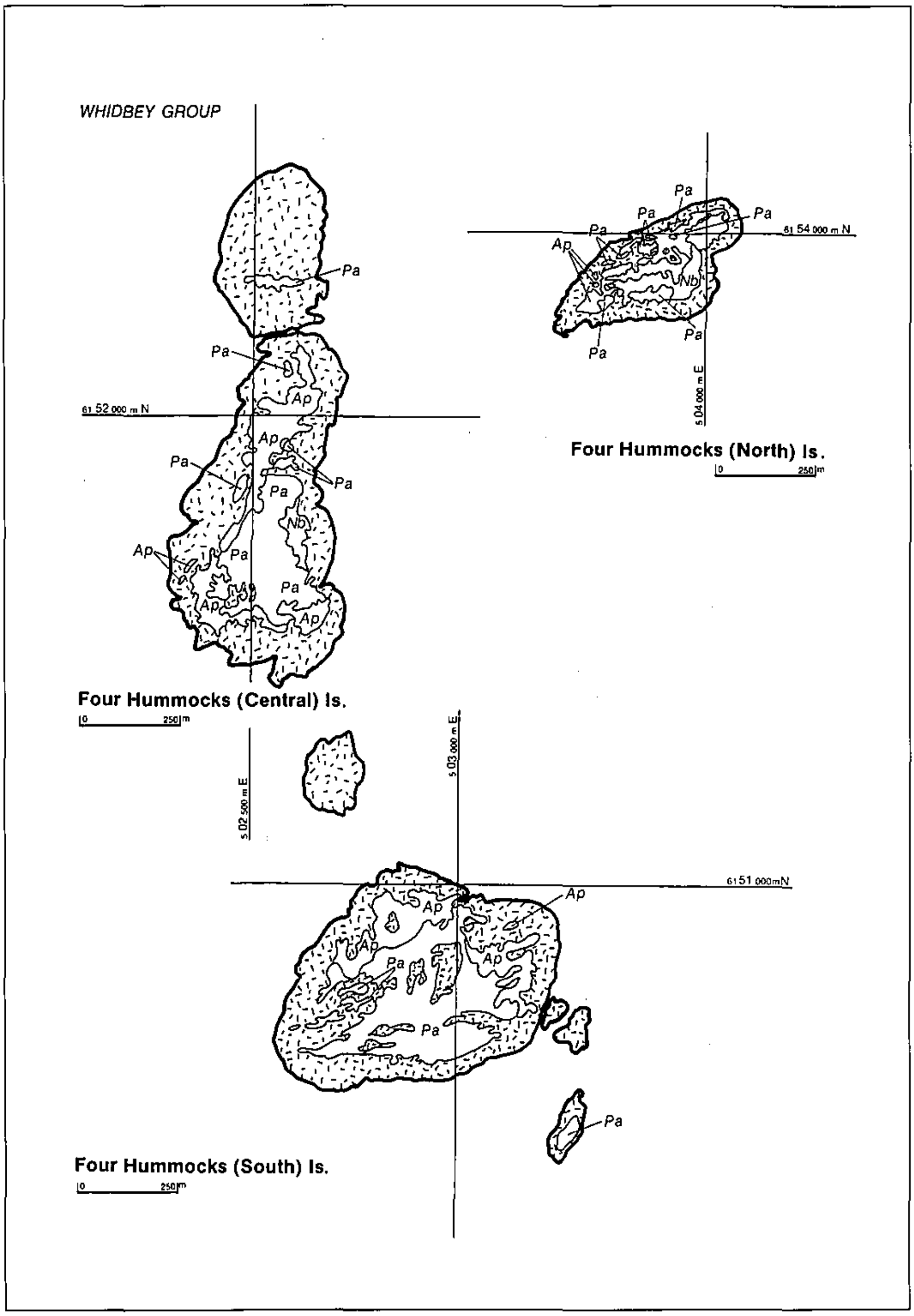



Figure 87. Whidbey Group—North Four Hummocks, Central Four Hummocks and South Four Hummocks Islands.

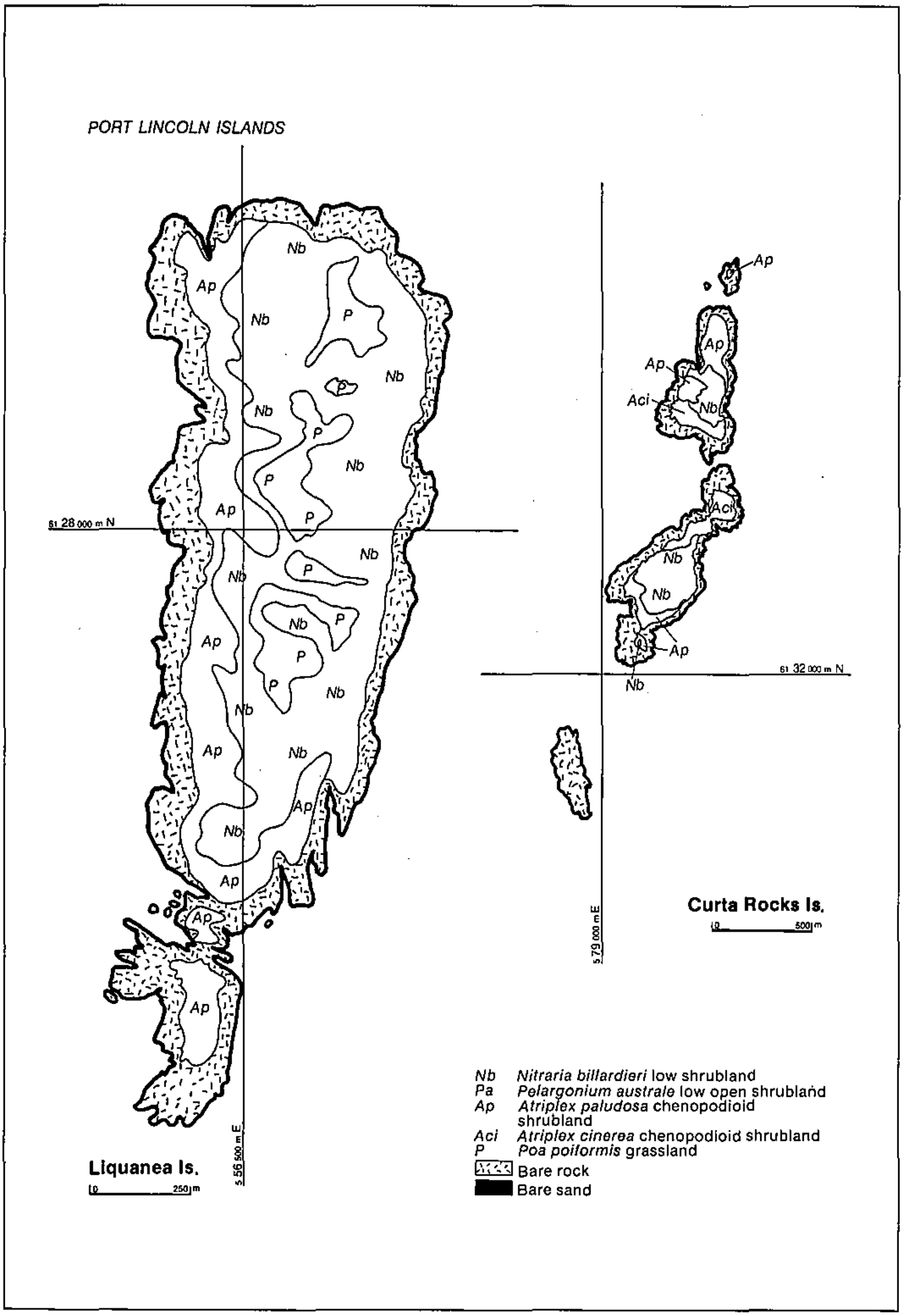



Figure 88. Port Lincoln—Liguanea and Curta Rocks Islands.

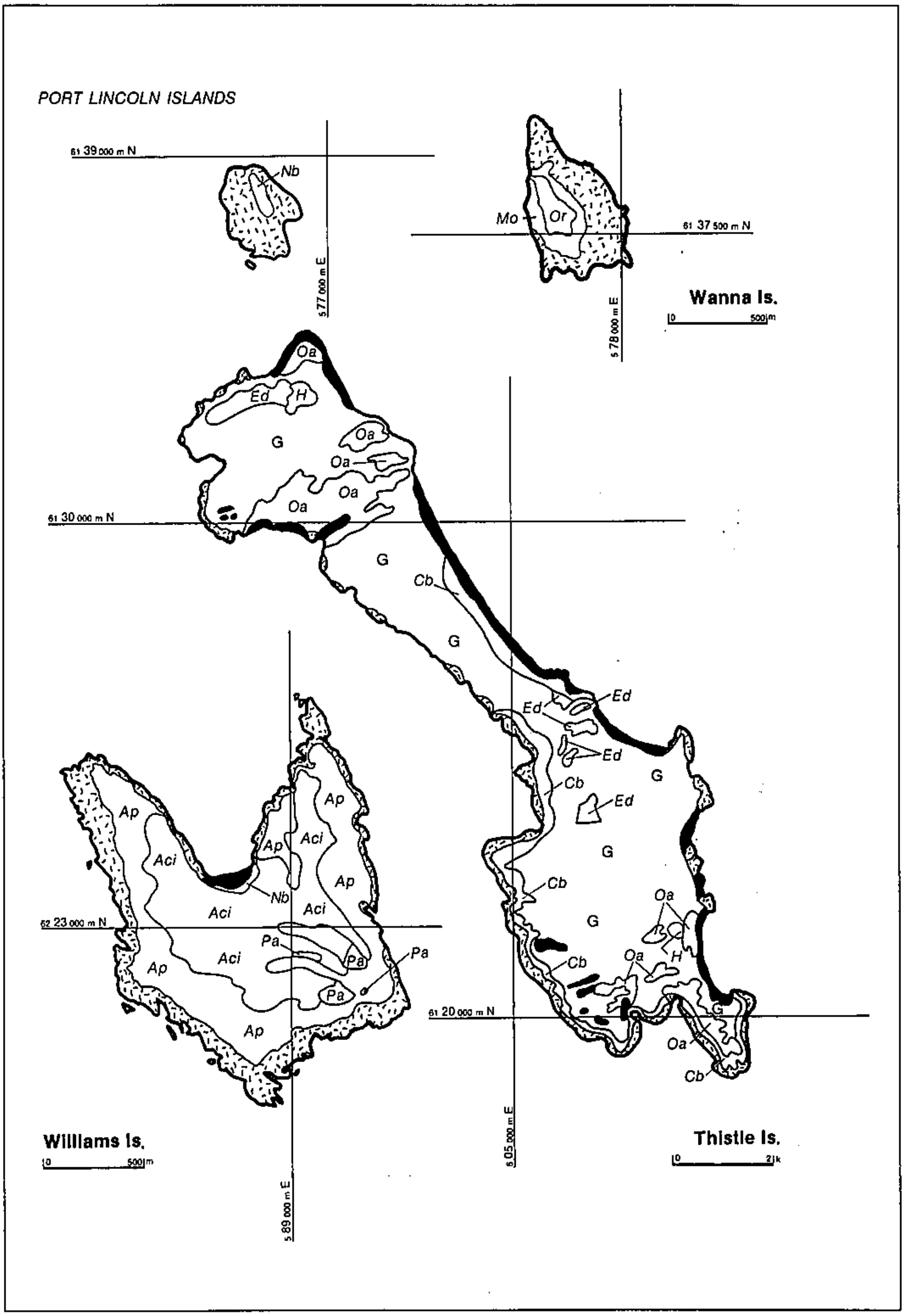



Figure 89. Port Lincoln—Wanna, Williams and Thistle Islands.

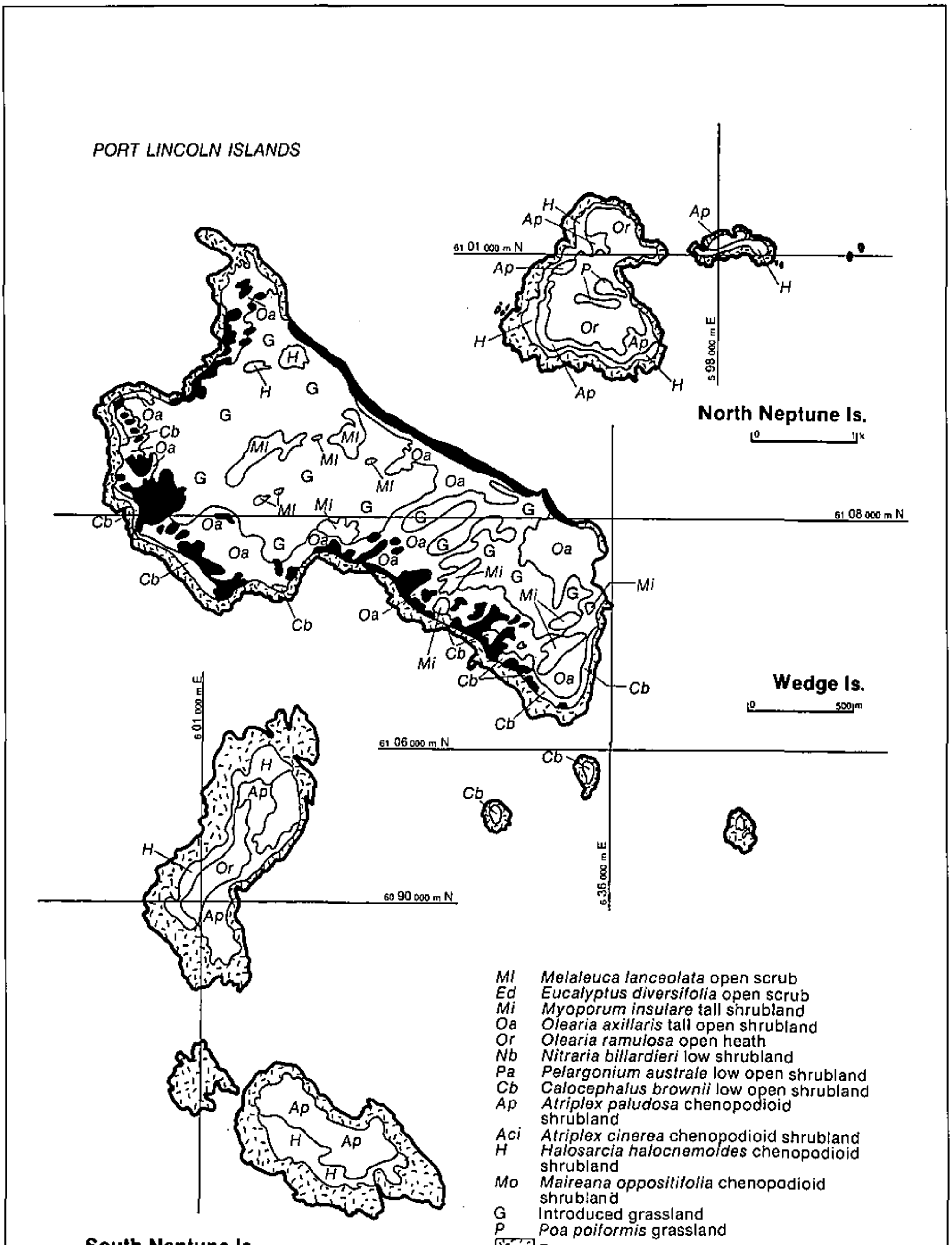



**Figure 90.** Port Lincoln—Wedge, North Neptune and South Neptune Islands.

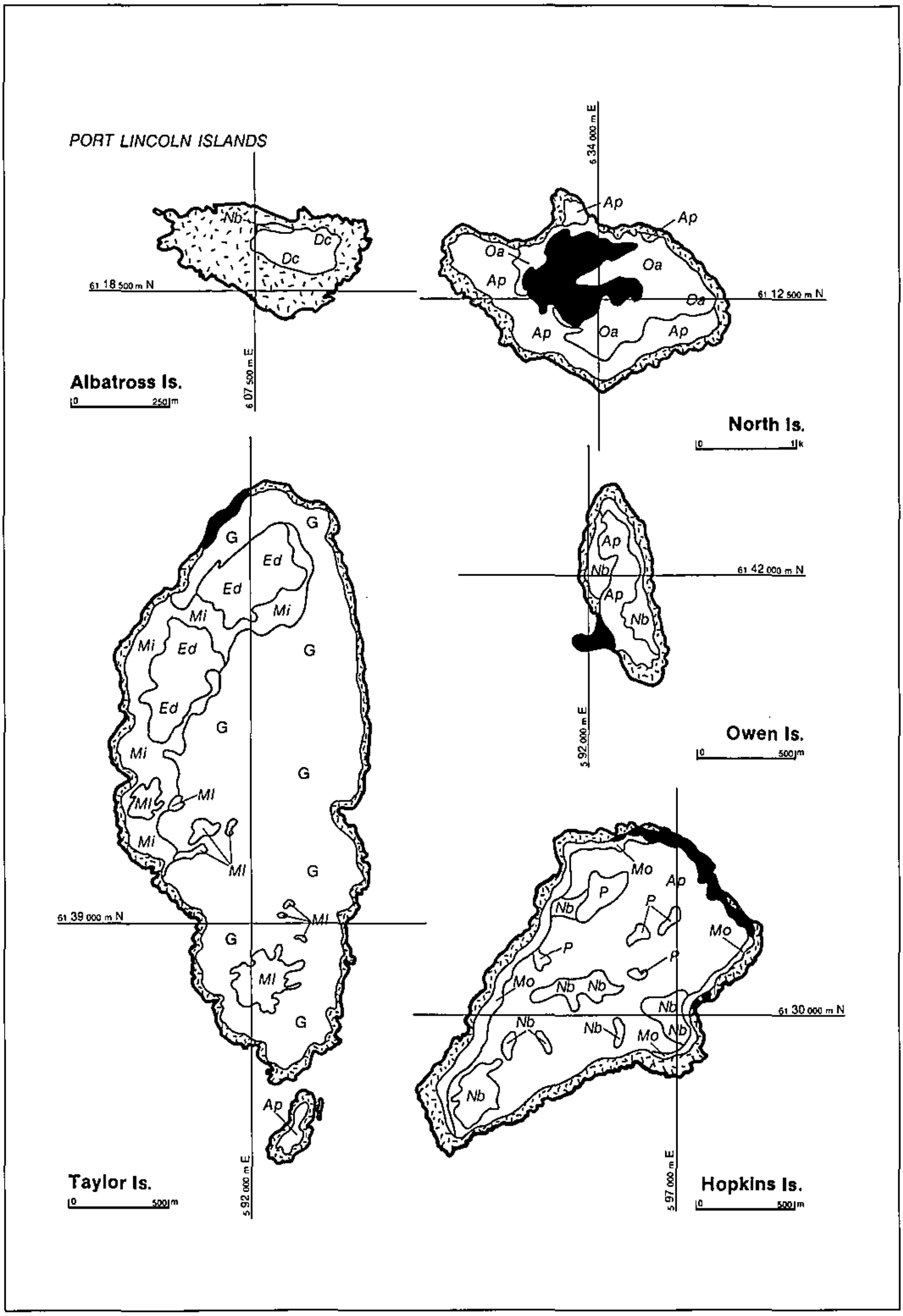



Figure 91. Port Lincoln—Albatross, North, Taylor, Owen and Hopkins Islands.

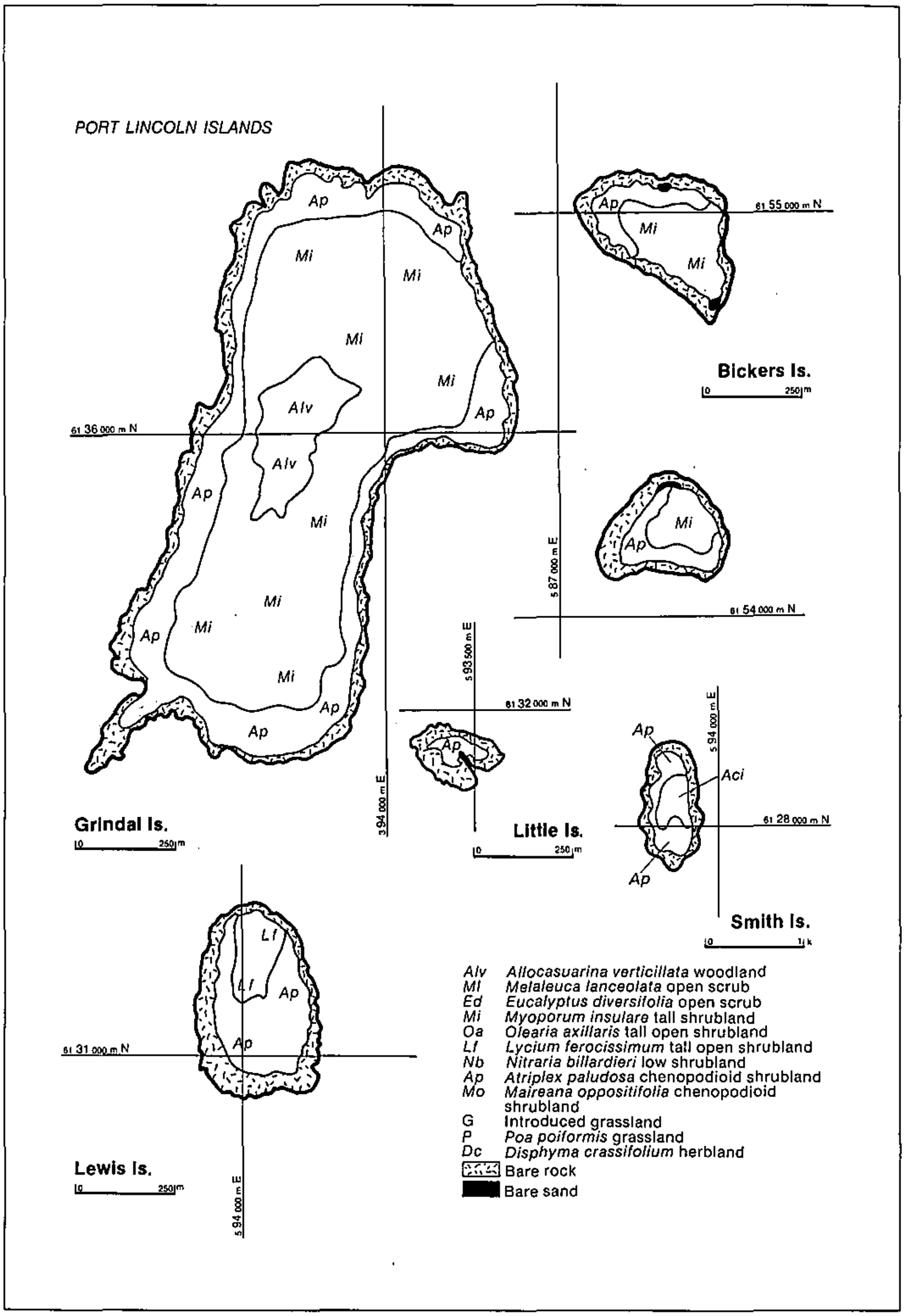



**Figure 92.** Port Lincoln—Grindal, Bickers, Little, Smith and Lewis Islands.

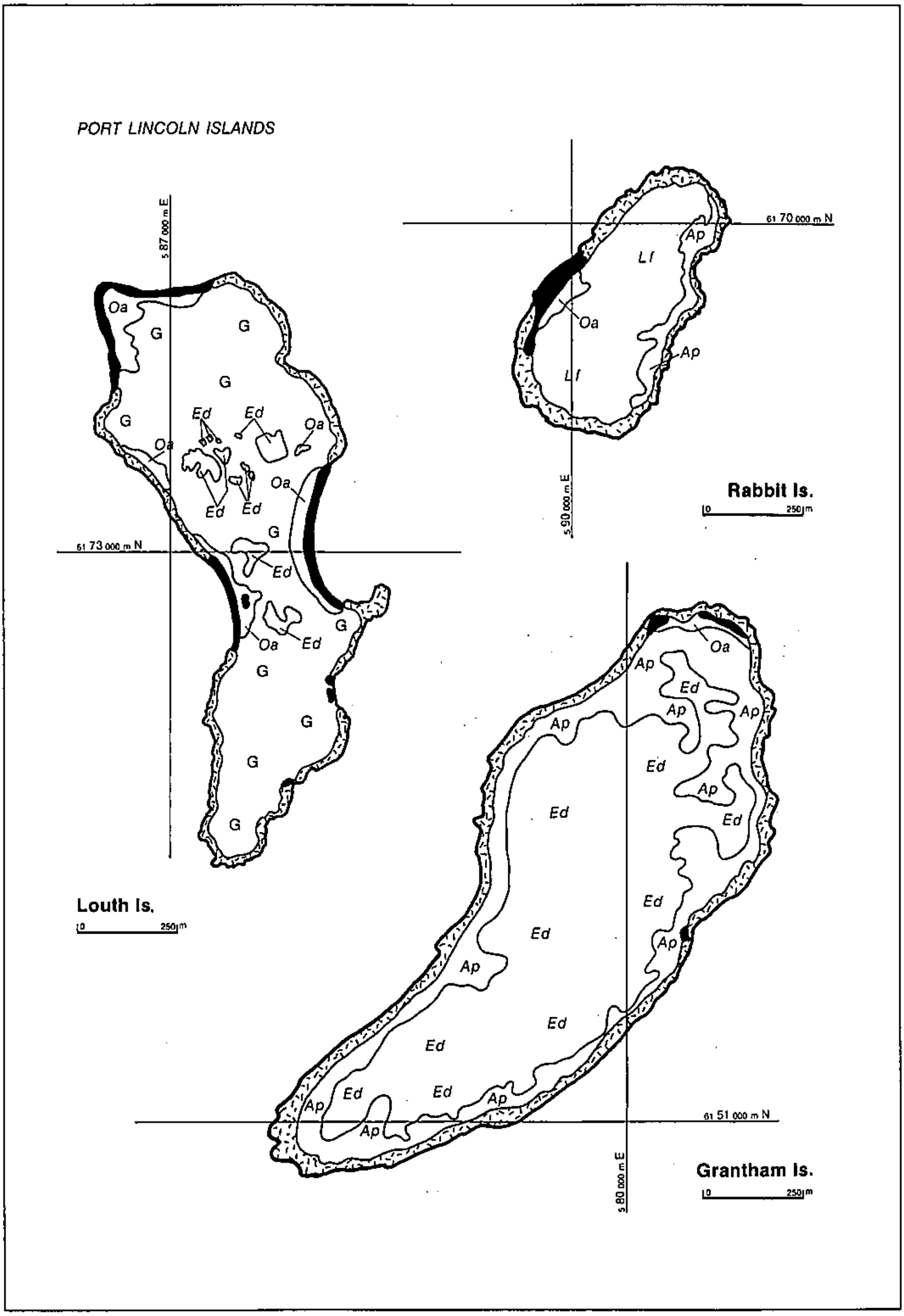



Figure 93. Port Lincoln—Rabbit, Louth and Grantham Islands.

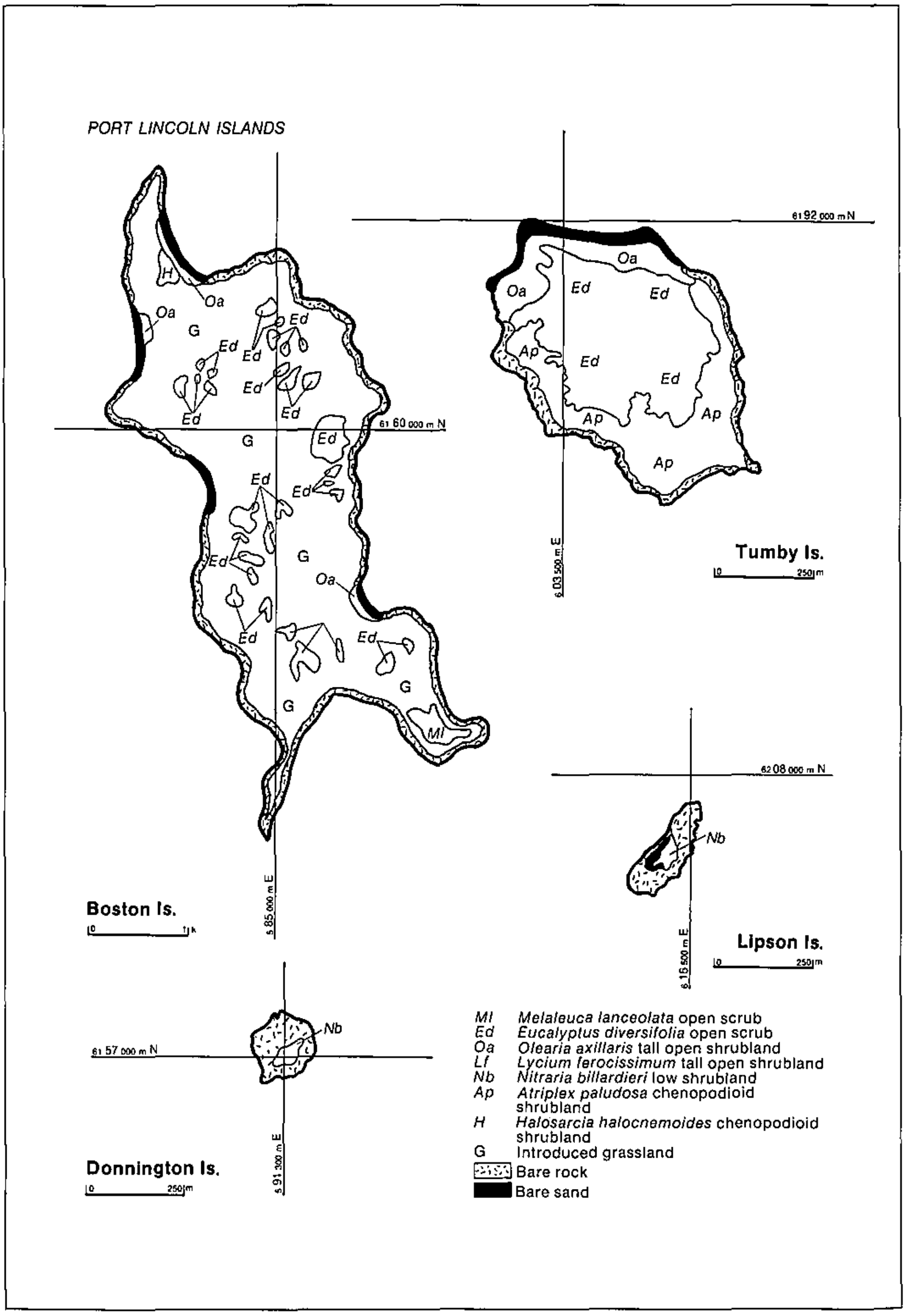



Figure 94. Port Lincoln—Boston, Donnington, Tumby and Lipson Islands.

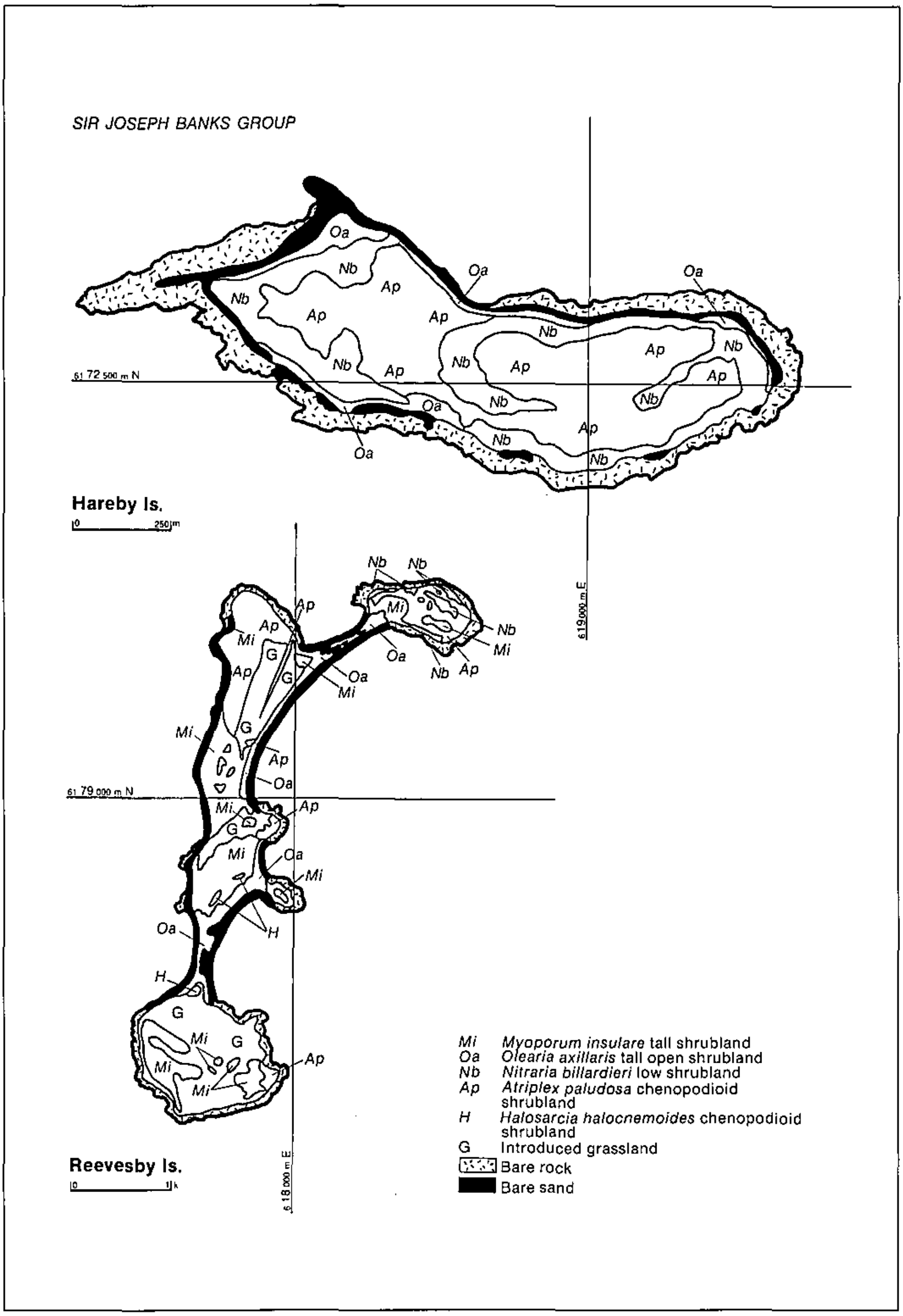



**Figure 95.** The Sir Joseph Banks Group—Hareby and Reevesby Islands.

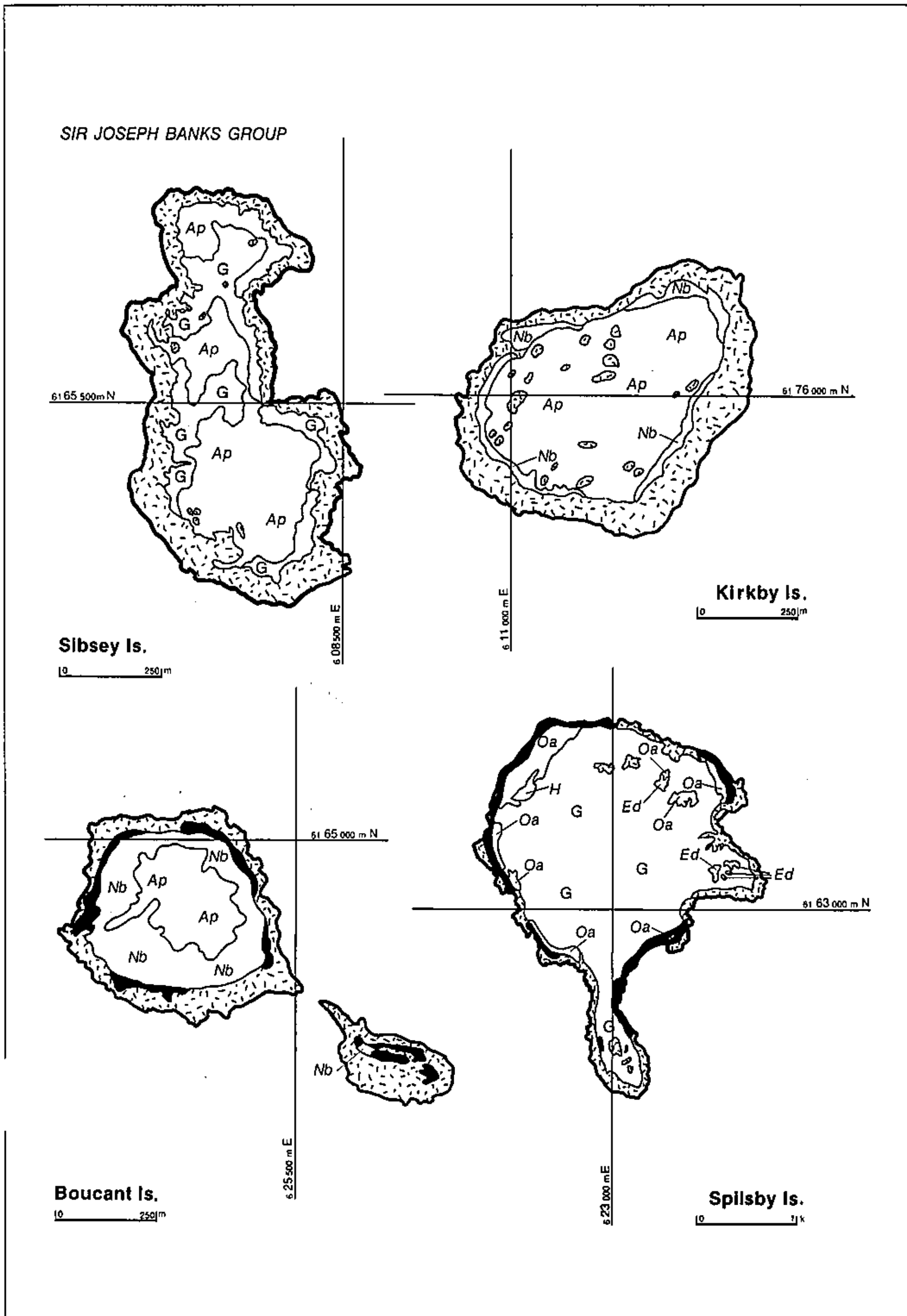



Figure 96. The Sir Joseph Banks Group—Sibsey, Kirkby, Boucault and Spilsby Islands.

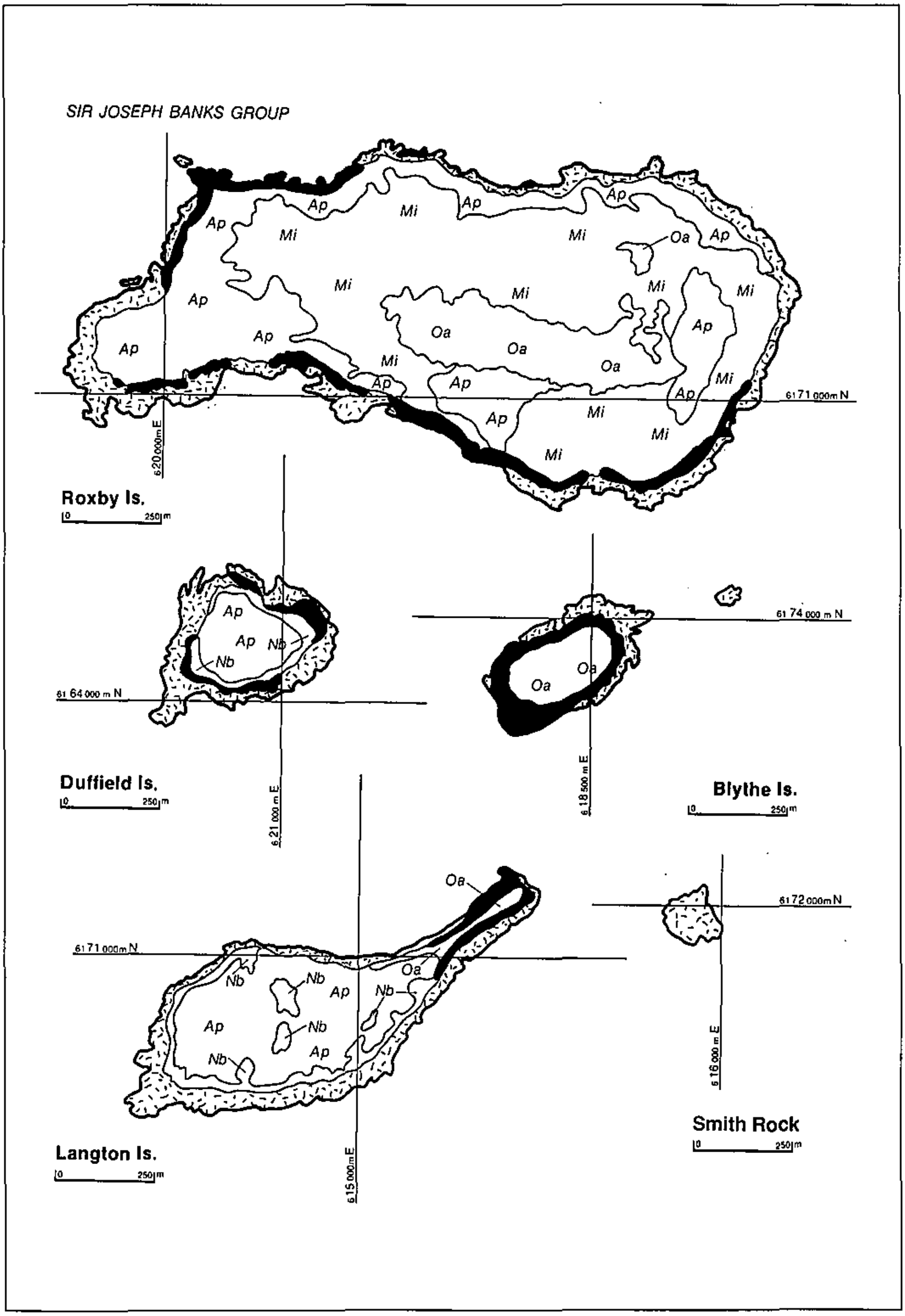



Figure 97. The Sir Joseph Banks Group—Roxby, Duffield, Blythe and Langton Islands.

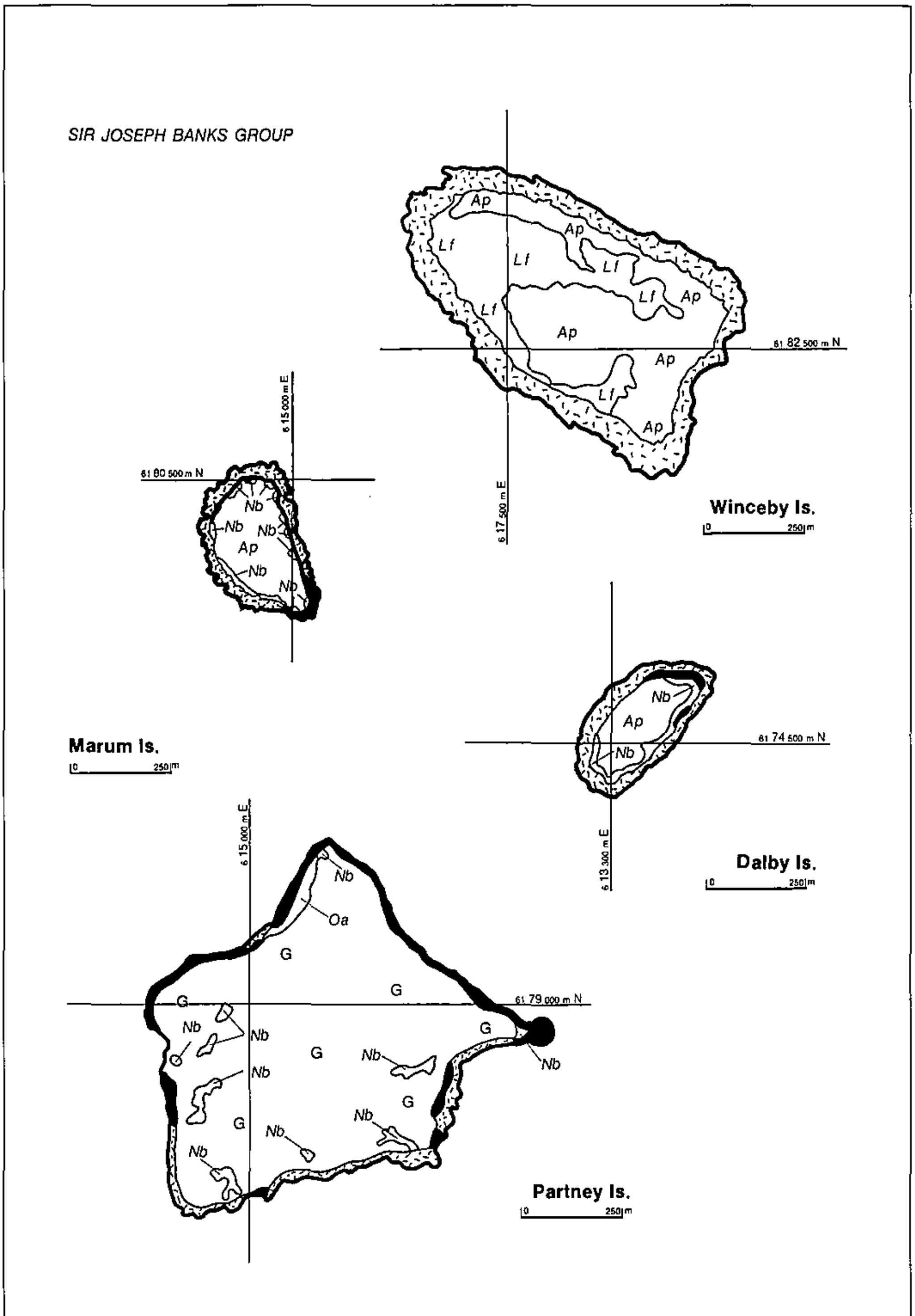



Figure 98. The Sir Joseph Banks Group—Winceby, Marum, Dalby and Partney Islands.

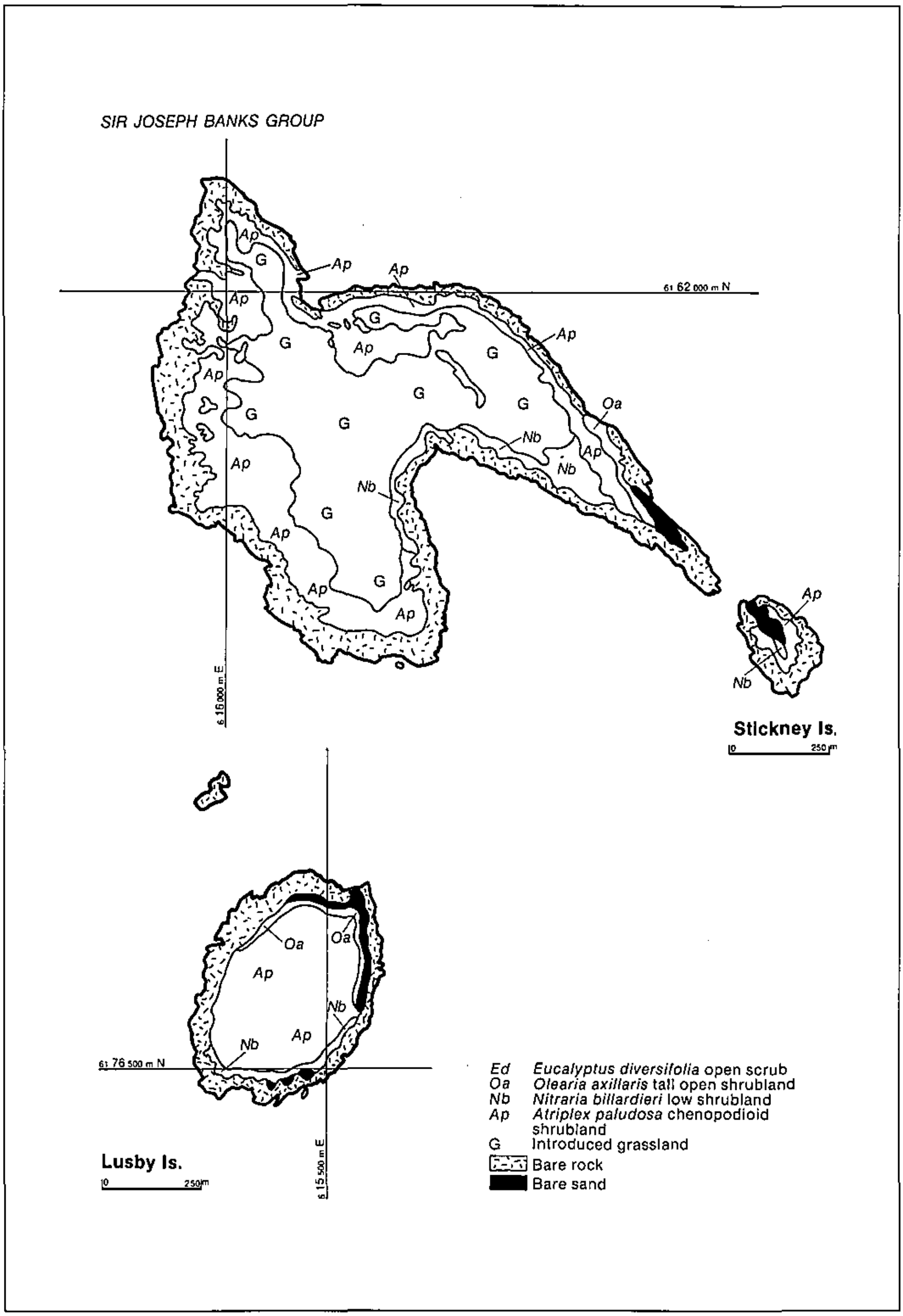



**Figure 99.** The Sir Joseph Banks Group—Stickney and Lusby Islands.

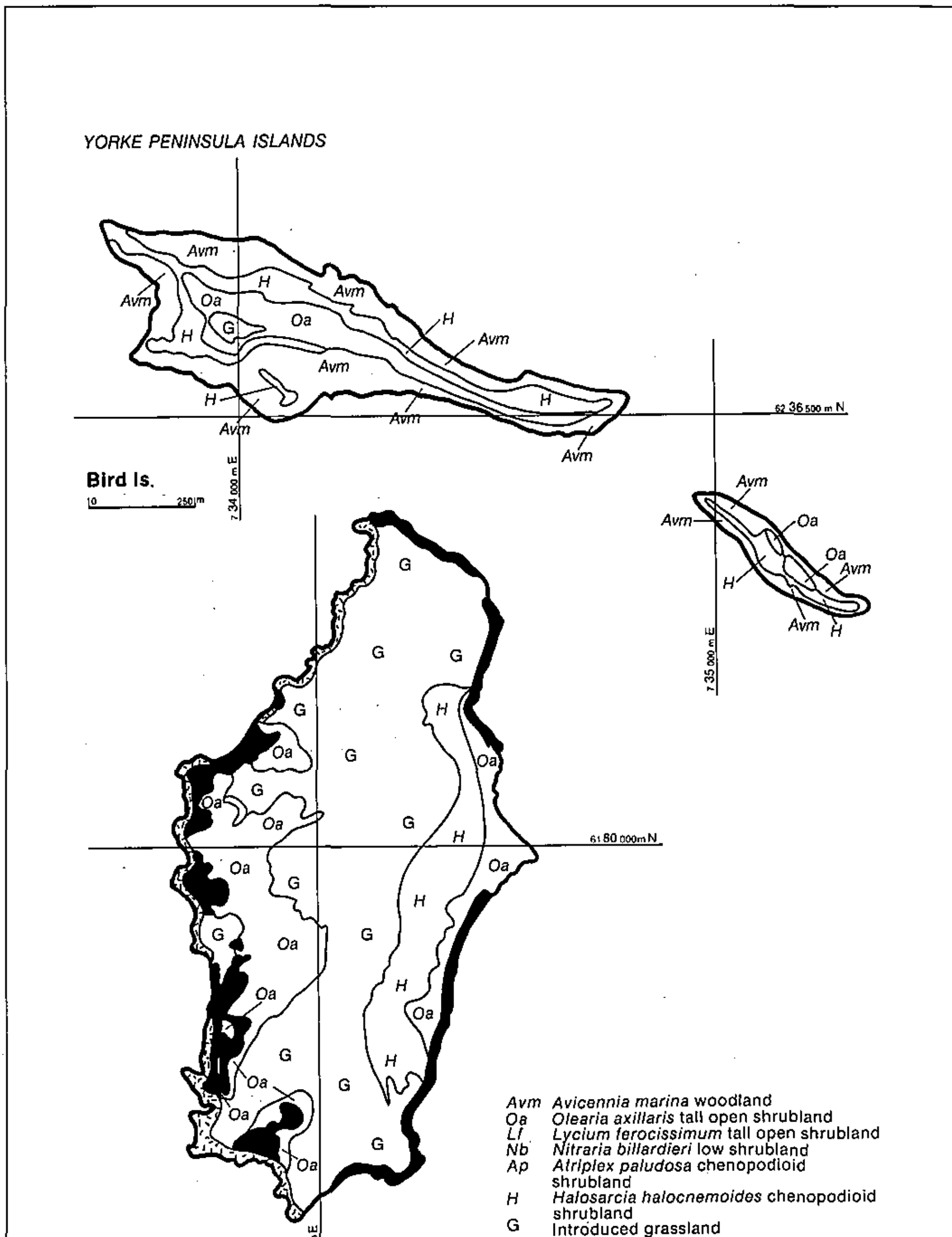



Figure 100. Yorke Peninsula—Wardang and Bird Islands.

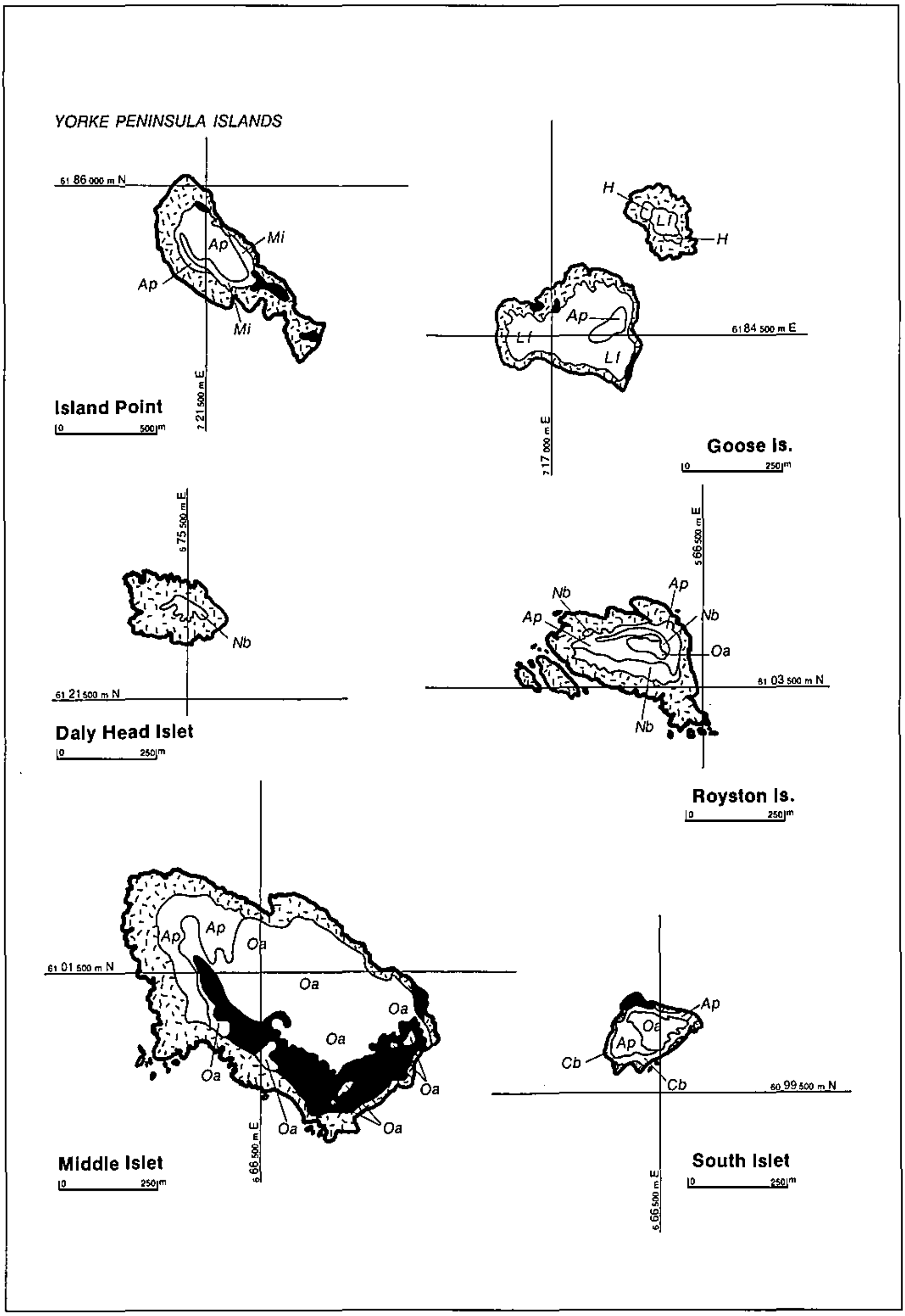
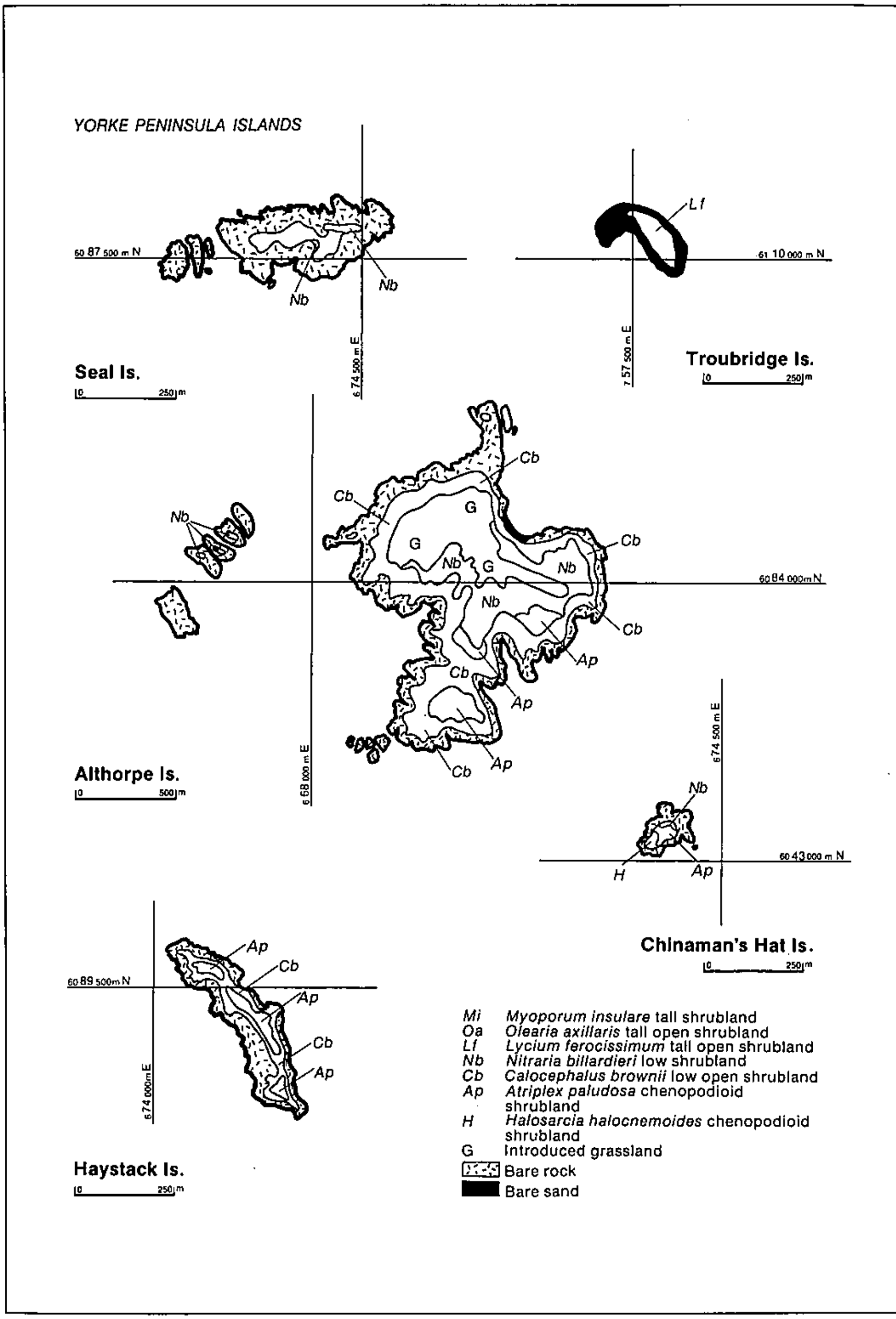



Figure 101. Yorke Peninsula—Goose, Little Goose and Royston Islands, Daly Head, Middle, and South Islet, and Island Point.

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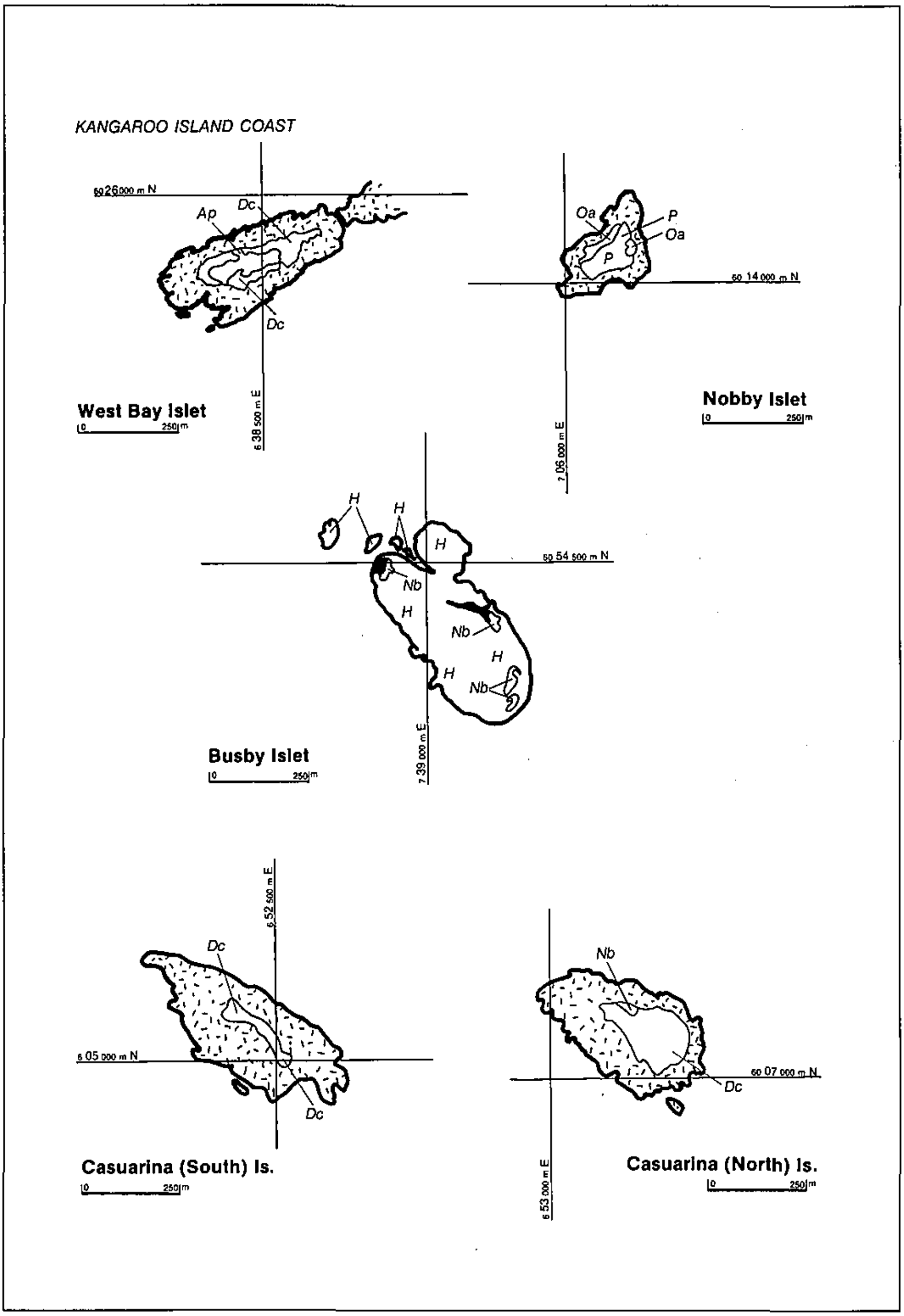
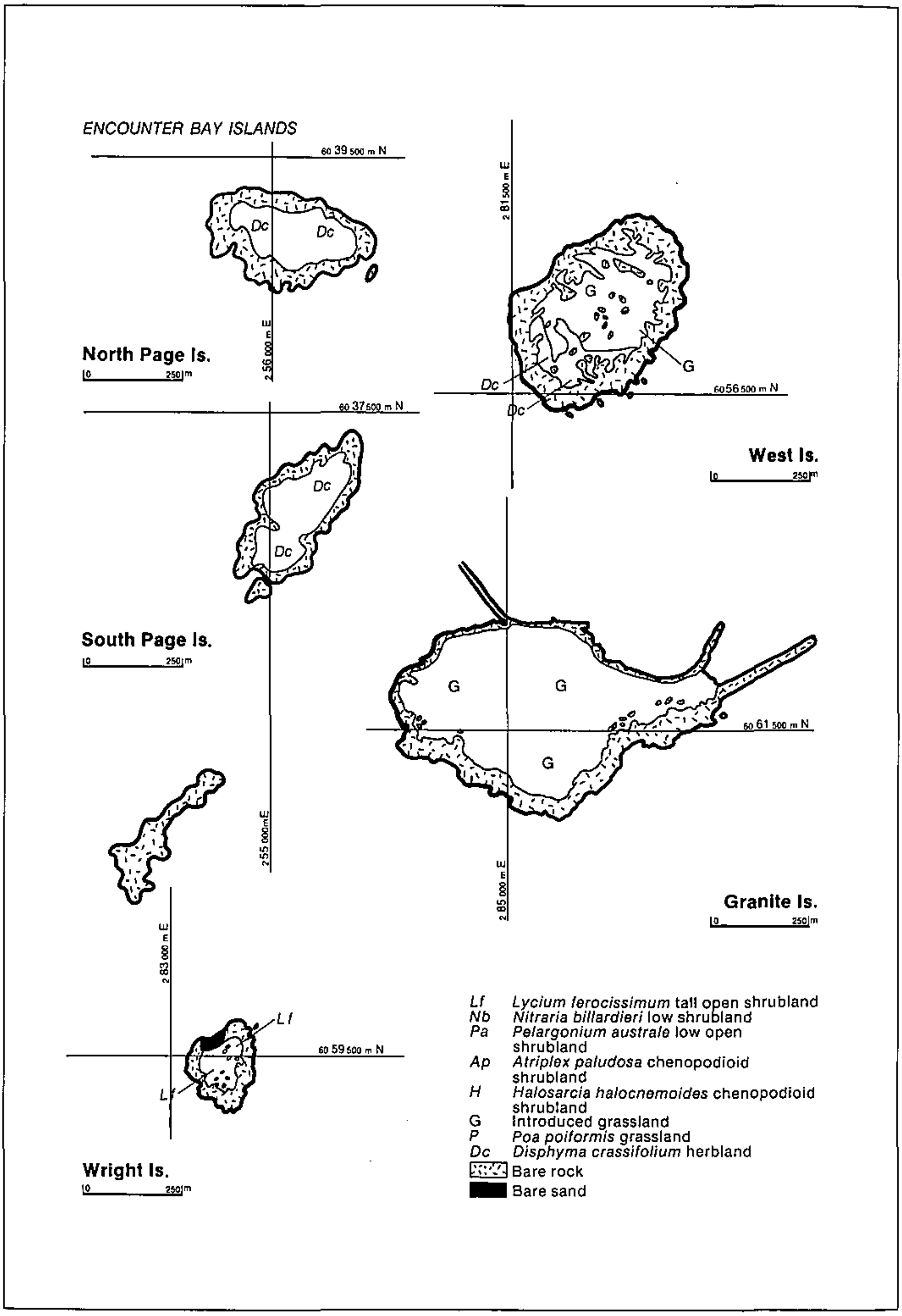



Figure 103. Kangaroo Island Coast—South Casuarina and North Casuarina Islands, West Bay, Nobby and Busby Islets.

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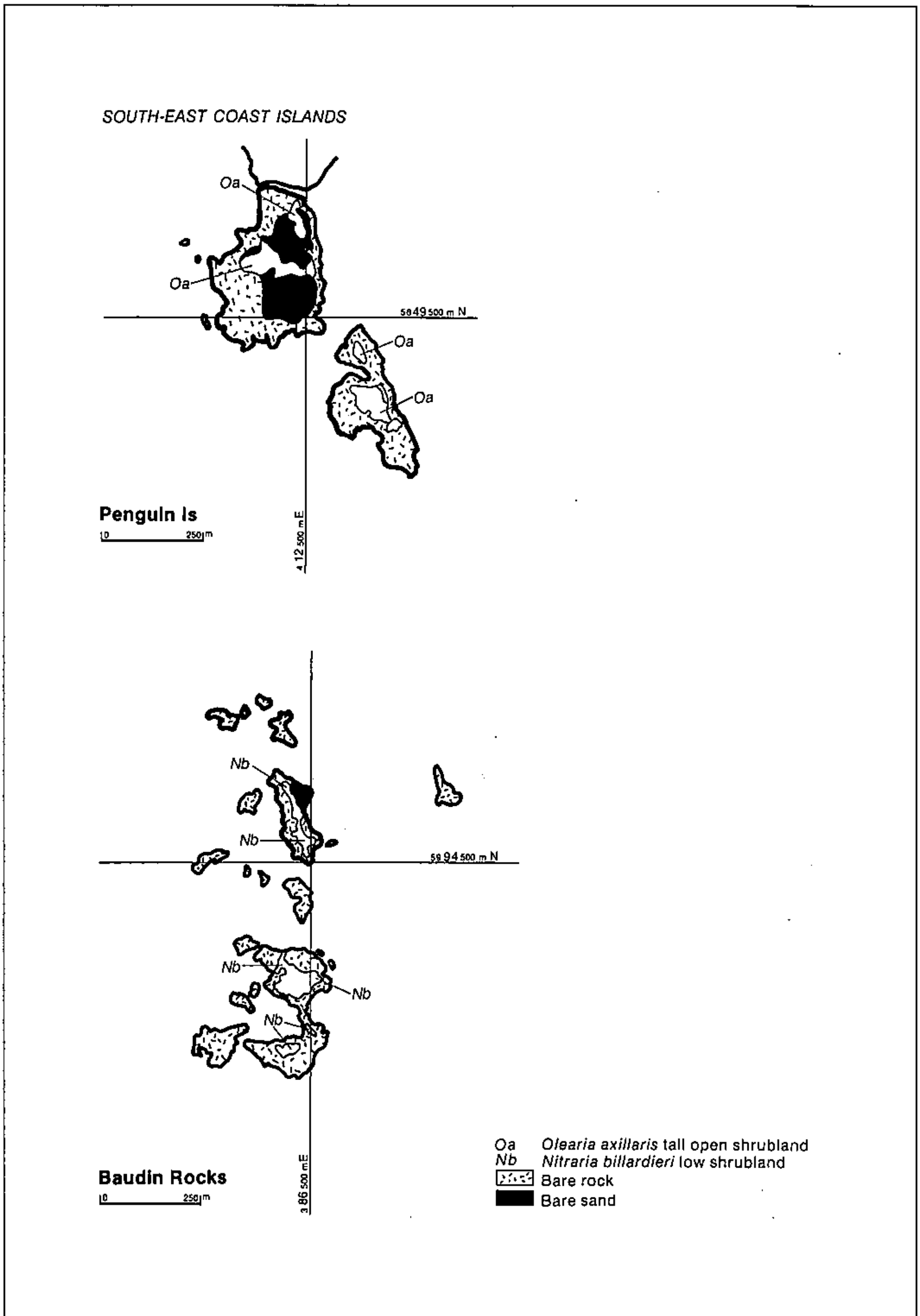


Figure 105. South-East Coast—Penguin Island and Baudin Rocks.

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Page references in italics are to illustrations. The letter *m* indicates a reference to a map. Illustrations or maps occurring on the same page as the textual discussion are not indicated.

Lists of geological features and species given in island entries in Part 2, 'A Guide to the Islands' (pp.141–315) are normally not indexed separately. You should look under the name of the island where the feature/species occurs to find this information. Entries describing additional information, including about the former existence of a species on the island, are indexed under name and/or subject.

Appendix E, 'Island Species Lists', is indexed by island but not by species. You should look under the name of the island and then under the subheading 'plant species' etc. (Subheadings have been omitted in short entries).

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*Leave only footprints, take only photographs*

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