

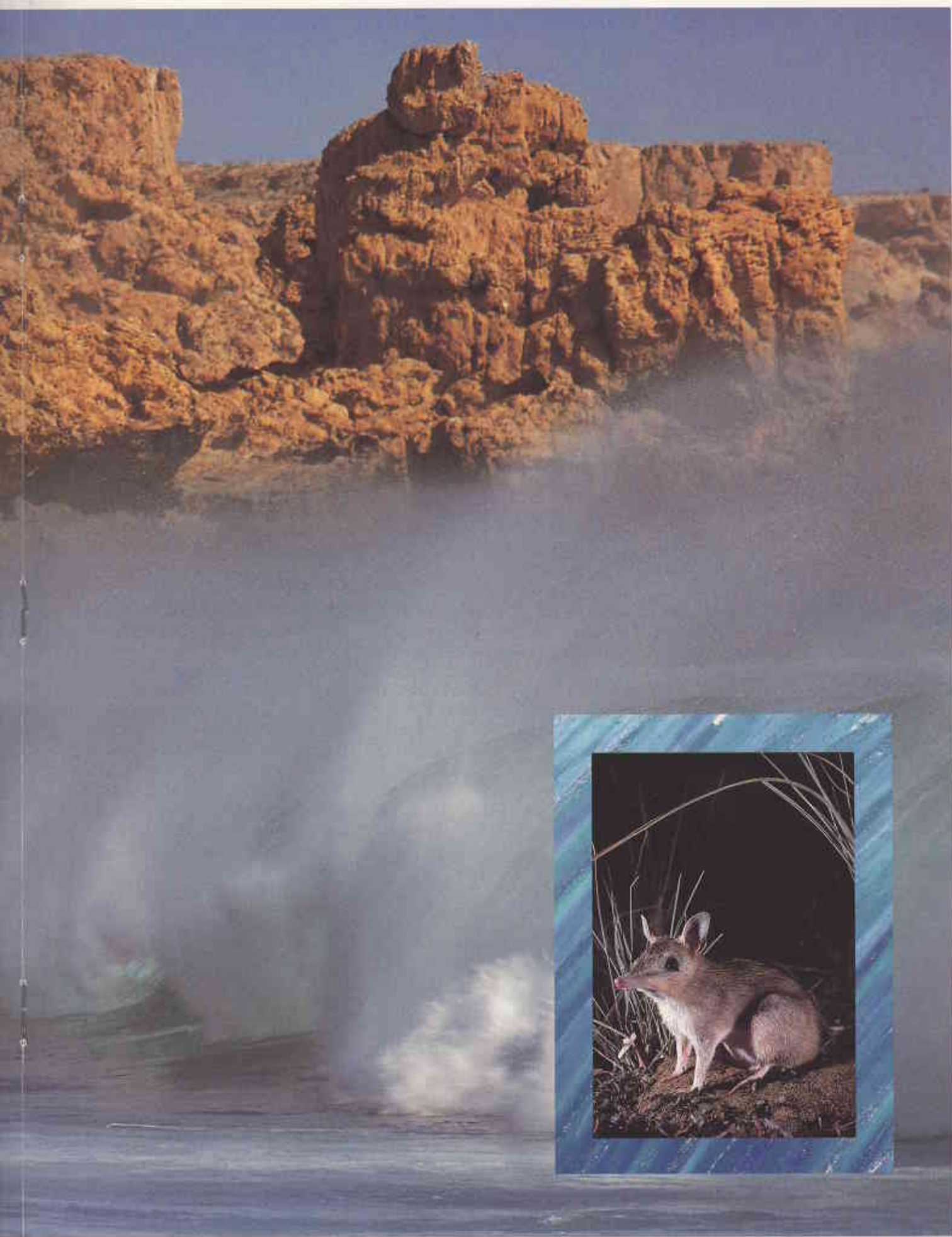
Islands of **CONTRAST**

The islands that dot Shark Bay were belittled by early explorers of New Holland who believed them to be devoid of life.

Yet today they are remnants of how Australia once was: rich in wildlife and vegetation.

By Keith Morris
Jeni Alford
and
Ron Shepherd





"For its entire length it looked arid, disagreeable and dreary. It was in fact worse than the part of Terres de la Concorde that we had seen the day before."

So wrote Nicolas Baudin about Dirk Hartog Island in 1801 as he sailed up the west coast of Australia. Further north he named two islands the 'Barren Isles', since renamed Bernier and Dorre - now two of Australia's most important nature reserves!

Baudin was not the first explorer to make derogatory comments about the Shark Bay area - Dirk Hartog in 1616 and William Dampier in 1699 were equally unimpressed. But despite their misgivings, the Shark Bay islands are anything but barren. They support mammals and birds extinct on the mainland, and offer a snapshot of pre-European ecosystems. This natural diversity is a result of Shark Bay's location at the boundary of two botanical provinces, the dry Eremaean and the moist South West.

The islands, particularly Bernier, Dirk Hartog, and Dorre, have been visited by several naturalists and expeditions since their discovery. The mariners' interests were understandable, as the peninsulas and bays of Shark Bay were depicted on early charts as some of the few safe anchorages along the west coast.

Some of the earliest botanical collections by Europeans in Australia were made in the area by William



Dirk Hartog Island has one of the most diverse island floras in the South West, with species such as Fraser's lantern bush.

Photo - Bert Wells

Dampier in 1699, probably from Dirk Hartog Island. Seventeen of the specimens were the first to be incorporated into European herbaria. Twelve of these are still preserved in the Oxford Herbarium in England, while Dampier himself was commemorated by the plant genus *Dampiera*. Leschenault de la Tour also collected plants extensively during the Baudin expedition in 1801.

Naturalists with the Baudin and Freycinet (1818) expeditions also collected and described many of the now rare mammals on Bernier and Dorre

Islands. Between 1916 and 1920, noted ornithologists Thomas Carter and F. Lawson Whitlock documented the islands' breeding seabirds. More recently, the Department of Conservation and Land Management (CALM) surveyed the fauna of the small islands within the Freycinet Estuary.

CHEQUERED HISTORY

The Shark Bay islands were formed about 6 000 years ago when the sea rose to present levels, and they are geologically similar to the rest of the Shark Bay area. The three largest islands in the region - Dirk Hartog, Bernier and Dorre - form the first group. Dirk Hartog Island, at 62 000 hectares, is the largest island in Western Australia, and one of the largest in Australia. These islands are essentially northern extensions of the Edel Land Peninsula and are limestone overlain by extensive white sand drifts.

The second group of about 22 small



Previous page

Main: Bernier Island, a pastoral lease for 11 years, is now one of Australia's most important nature reserves.

Photo - Jiri Lochman

Inset: The western barred bandicoot is only found on Bernier and Dorre Islands.

Photo - M&I Morcombe

A variety of wildflowers occur on the islands.

Photo - Keith Morris

One of the more attractive inhabitants of the islands - the variegated fairy-wren.

Photo - Bert Wells



islands within the Freycinet Estuary lie to the west of Peron Peninsula. The largest, Salutation Island, is 160 hectares, while the others are all less than five hectares. These islands are also limestone, with little soil. Many lie in shallow water near the mainland and were probably connected to it for longer than the larger islands. The third group, Fauré (5 000 hectares) and Pelican Islands to the east of Peron Peninsula, are sandstone islands overlain with red and white windblown sands.

Most of the islands are nature reserves managed by CALM. Some are isolated from human disturbances found on the mainland, such as grazing, frequent fires and introduced predators, and in some cases mirror the mainland before European settlement. However, many have been subjected to a wide range of uses. In the colony's early days, guano (the accumulated droppings of thousands of seabirds) was mined from some of the small islands near Dirk Hartog and in the Freycinet Estuary, forming part of the State's first export trade. This activity declined by the 1880s as the guano became depleted and pearling and sandalwood-collecting gained momentum in the area.

Dirk Hartog and Fauré Islands have been pastoral leases since the late 19th century, and are still grazed by sheep and goats. Bernier Island was also a

Salutation Island now supports a thriving stick-nest rat population after a successful translocation program.

Photo - Keith Morris

pastoral lease between 1896 and 1907. In 1959, the botanist Royce noted the widespread sand drifts and unstable vegetation on Bernier, compared to the ungrazed Dorre Island. All the sheep were removed when the pastoral activities ceased, but the last goats were only removed from the island in 1984. In the 1920s and 1930s Salutation Island was used as a 'ram paddock' by the former Nilemah (Hamelin spelt backwards) Station over the winter months.

Between 1907 and 1917 a 'Lock' hospital operated on Bernier and Dorre Islands, where Aboriginals with venereal

disease were forced to stay on the islands in isolation, the males on one and the females on the other. They were allowed to live as naturally as possible, hunting game, fishing, and collecting turtles and turtle eggs.

With the exception of Dorre, which can only be visited with CALM permission, the islands are now occasionally visited by fishing parties.

MAMMALS ON THE BRINK

Despite these uses, most of the Shark Bay islands are still free of introduced plants and animals, particularly predators. The larger islands are particularly important habitats for mammals no longer found on the mainland. Bernier and Dorre Islands support eight species, many of which are now extinct or have declined on the mainland.

The Shark Bay mouse, a small native rodent that survives on leaves, stems and flowers, was once found throughout southern WA. Now Australia's most restricted mammal, it is found nowhere else but Bernier Island. The western barred bandicoot and banded hare-wallaby are now found only on Bernier and Dorre Islands.

The boodie (burrowing bettong), a small rat-like kangaroo closely related to the woylie that was once widespread on mainland Australia, only occurs on Bernier and Dorre Islands, and on Barrow Island off the Pilbara coast. This species was also recorded on Dirk Hartog Island



Australia's most restricted mammal, the Shark Bay mouse, is now found only on Bernier Island.

Photo - Bert Wells



Protected seabird nesting sites are among the most important conservation values of the islands.
Photo - Carolyn Thomson

by the early French expeditions, but the introduction of grazing stock and the domestic cat were probably responsible for its demise there.

Important research into conservation of these mammals is now under way on Bernier and Dorre Islands. CALM scientists are studying the ecology of the western barred bandicoot in an attempt to discover why this once widespread species is now restricted to these few islands. Information on population numbers, diet, home ranges, reproduction and nest sites is being obtained and will be useful if a future translocation program is developed for this rare species.

On Bernier Island, research is also proposed for the Shark Bay mouse. In 1989, a search for this species on the Shark Bay mainland was unsuccessful. When research goes ahead, the rodent's population size, diet and distribution on Bernier Island will be determined, and then it will be reintroduced to protected areas (free of foxes, cats, rabbits and stock) on the mainland, and perhaps

later to Dirk Hartog Island, where it also once occurred.

The introduction of the greater stick-nest rat - extinct in WA - to Salutation Island represented a significant contribution to the conservation of rare mammals in Australia (see box on p. 33).

BIRDS AND REPTILES

About 35 per cent (95 species) of the birds in the Shark Bay region are found on the islands. The islands are protected breeding sites for 17 species of sea and shore birds, including the white-bellied sea-eagle, pied cormorant, pacific gull and roseate tern. As boats approach the islands, ospreys can often be seen sitting like sentinels on their impressive stick nests. Pelican Island, to the east of Fauré Island, is one of only nine pelican breeding sites in WA. Most seabird breeding in Shark Bay occurs in winter and spring and, between September and April, migratory waders feed on the shores of the islands on their way to and from their breeding grounds in the northern hemisphere.



CLINGING TO THE PAST

One third of the 30 plant species confined to Shark Bay are restricted to the islands, a further example of how islands can shelter relic populations. Precipitous limestone cliffs, generally standing higher above sea level than most of the mainland to the east, flank the western side of the larger islands. These contribute to increased rainfall,

Many different forms of animals have evolved on the islands, such as the dark form of Stokes' skink.
Photo - Keith Morris

particularly on Dirk Hartog, which has one of the richest floras of any island in the south-west of Australia.

Apart from buffel, the introduced stock-fodder grass on Fauré and Dirk Hartog, few exotic plant species are found on the islands. The limestone islands support an essentially South Western Province flora and are particularly rich in plant species from the daisy and grass families. Heaths, sundews and buttercups, the typically South Western families, do not occur on the islands, and the banksia family is poorly represented.

The diminutive islands within the Freycinet Estuary have a remarkably diverse flora for their size, with more than 150 species recorded. This richness

reflects the number of microhabitats on each island. These are often more numerous on islands than they are within areas of equal size on the mainland. This is because of the influences of the sea, wind, and nesting seabirds. Plant diversity is also influenced by island size, with the larger islands supporting more species. In the Freycinet Estuary, Salutation Island supports 99 plant species, whereas the simplest limestone rock habitats only support one or two plant species. Islands on which guano has been mined, in particular North Guano, White and Freycinet, have been reduced in species richness. After the guano was removed, the dense shrublands that grew on the deep deposits were reduced to simple

herbfields on exposed limestone sheets.

Given the changes to Australia over the last 200 years, and the importance that islands around the country have assumed in conservation terms, it would be interesting to bring Nicolas Baudin back to Shark Bay to see if he still viewed the islands in the same way. □

Keith Morris is a Senior Research Scientist at CALM's Wildlife Research Centre at Woodvale and can be contacted on (09) 405 5100. Jeni Alford is the regional ecologist for CALM's Swan Region, and Ron Shepherd is CALM's District Manager in Denham. All participated in the Department's recent surveys of the Shark Bay islands.

THE STICK-NEST RAT RETURNS TO THE WEST

Among the passengers on Ansett flight 23 from Adelaide on 3 July, 1990 were 40 stick-nest rats, destined for release on Salutation Island in Shark Bay. Their arrival at Perth Airport was a significant step towards conserving one of Australia's rarest mammals.

An ambitious reintroduction program for the greater stick-nest rat was prepared by Peter Copley from the South Australian National Parks and Wildlife Service. Peter aimed to return the stick-nest rat to parts of its former range. The rats reintroduced to Salutation Island came from a successful captive breeding program initiated in Adelaide in 1985. At that time, the greater stick-nest rat was known only on Franklin Island, in the Nuyts Archipelago off the South Australian coast. One thousand individuals were all that remained of a species once found across southern Australia, from the central west coast of WA, through SA and into western NSW. It was last recorded on the mainland in the 1920s. Its extinction on the mainland was probably caused by stock grazing and trampling natural vegetation and by predation by foxes and cats. The rats' habit of building a home of intertwined sticks above the ground (unlike most rodents, which burrow) made them prone to such disturbances.

Salutation Island is in the former range of the stick-nest rat, it has many of the same perennial, semi-succulent plants which form the basis of their diet on



Franklin Island, and it has no introduced animals. It is also a similar size to Franklin Island.

After 40 hours of air and road travel from Adelaide, the stick-nest rats were fitted with radio-collars and released. Over the next three days the rats were tracked almost continuously as they settled in to their new home. Six weeks later monitoring showed that, despite some initial mortality, the stick-nest rats had settled in well. Some stick nests had been built under bushes and the animals had gained weight.

The true test of the rats' ability to adapt to their new environment came over the dry summer months that followed. Only 70 mm of rain fell on the island between their release in July 1990 and April 1991. However, visits in April and October showed the rats were breeding and had spread over the 160 ha island. They seemed to have passed their first survival test! Further visits will be made to monitor the progress of these unique animals. With luck, the population will grow until it is in equilibrium with its new environment, and numbers will be controlled by the abundance of food and natural predators.

The greater stick-nest rat has also been reintroduced to Reevesby Island, another island off the SA coast, and it appears that this has also been successful. It is fortunate that Australia, and in particular WA, has a selection of islands, making such rescue missions possible.

Photo - Keith Morris

LANDSCOPE

VOLUME SEVEN NO.2 SUMMER EDITION 1991-92



When European scientists first set foot on our shores they found a bewildering array of animals and plants. Péron the Explorer takes an intimate look at the French scientist whose name lives in Western Australia's newest national park. See page 20.



Seagrass covers 3 700 square kilometres of the ocean floor around Shark Bay. Grasses of the Sea, on page 42, takes us on a journey through these underwater meadows.



This tour of the Gascoyne's desert coast guides you through Shark Bay and WA's newest national park. See page 10.



Close to where the fictional Gulliver is believed to have been shipwrecked lives one of the world's oldest organisms. Lilliput's Castles, on page 34, describes the creatures and the ecosystem they have built.



At first glance, Shark Bay is dry, arid and inhospitable. But if you look more closely you discover its Hidden Treasures. See page 16.

FEATURES

DESERT COAST CAROLYN THOMSON	10
HIDDEN TREASURES GREG KEIGHERY & MALCOLM TRUDGEON	16
PÉRON THE EXPLORER BARRY WILSON	20
SEA PIGS OF SHARK BAY PAUL ANDERSON	24
ISLANDS OF CONTRAST KEITH MORRIS, JENI ALFORD & RON SHEPHERD	28
LILLIPUT'S CASTLES BOB BURNE	34
GRASSES OF THE SEA DIANA WALKER	42
BIRDS OF THE BAY PHOTO ESSAY	47
MANAGING FOR DIVERSITY RON SHEPHERD	50

R E G U L A R S	
IN PERSPECTIVE	4
BUSH TELEGRAPH	5
ENDANGERED THICK-BILLED GRASSWREN	41
URBAN ANTICS	54

COVER

Green turtles (*Chelonia mydas*), the commonest turtles found along our coast, begin to congregate in the waters of Shark Bay from the end of July. The Bay is the southernmost nesting area for these long-lived animals. During summer, female green turtles lay their eggs on the white sandy beaches of Bernier, Dorre and Dirk Hartog Islands, and occasionally at the northern tip of Peron Peninsula. Illustration by Philippa Nikulinsky.



Managing Editor: Ron Kawallak
Editor: Ray Bailey
Contributing Editors: Verna Costello, David Gough, Tanyia Maxted and Carolyn Thomson
Design: Sue Marais, Stacey Strickland
Finished art: Sandra Mitchell
Advertising: Estelle de San Miguel ☎ (09) 389 8644 Fax: 389 8296
Illustration: Ian Dickinson, Sandra Mitchell and Stacey Strickland
Cartography: CALM Land Information Branch
Colour separation by Prepress Services
Printed in Western Australia by Lamb Print

© ISSN 0815-4465 All material copyright. No part of the contents of the publication may be reproduced without the consent of the publishers.



Published by Dr S Shea, Executive Director
Department of Conservation and Land Management,
50 Hayman Road, Como, Western Australia 6152