Broome, in the far north of the State, is internationally known as a tourist destination, yet little published information is available on its landscapes, natural history and botanical treasures. A new book, the result of ten years of investigation by CALM's Kevin Kenneally, volunteer Daphne Edinger, members of the Broome Botanical Society and Aboriginal communities, aims to change all this. BY KEVIN KENNEALLY

BROOME AND BEYOND

The Dampier Peninsula (sometimes referred to as Dampierland or Dampier's Land) has an immense history of Aboriginal settlement and a relatively recent one of European exploration and occupation. It lies in an area extending north of the Great Northern Highway (between Broome and Willare on the Fitzroy River) and bounded to the west by the Indian Ocean and to the east by King Sound. Its position, straddling the arid areas to the south and the monsoonal tropics to the north, has resulted in the development of the pindan soils and the unique vegetation that mantles them.

Aborigines have lived on the Dampier Peninsula for many thousands of years, their intimate knowledge of natural cycles, animals and plants allowing them to survive in the harsh environment. Detailed knowledge of plants was passed on in the oral tradition, but relatively little has been documented until recently. A new book, *Broome and Beyond*, published by the Department of Conservation and Land Management (CALM), attempts to combine the botany of both Aboriginal and European cultures.

PINDAN COUNTRY

The interior of the Dampier Peninsula presents a harsh landscape of low sandstone outcrops and red 'pindan' sandplains. The grasslands of the pindan country are dotted with a variety of eucalypts and low wattles. By mid-year, the golden blaze of the pindan wattle dominates the landscape, and the night air is heavy with its perfume. Throughout the year, the scent of saltwater paperbark pervades the tropical air.

The plant communities of the coast around the peninsula are especially varied, where dense belts of mangroves form a link between the land and sea, constantly flooded by the daily rise and fall of the large tides. Within this green mantle hide unusual marine animals and birds that are adapted to the rich environment. The white sandy beaches are dotted with clumps of spinifex and the creeping purple-flowered beach morning glory.

Behind the beach dunes are vast areas of tidal mudflat, dominated by fields of red-stemmed samphire and saline grasslands. Here, flocks of brolga can be

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Kimberley bauhinia (*Lysiphyllum cunninghamii*), with its distinctive pods, is common in the pindan.
Photo – Kevin Kenneally

Below left: Pindan soil, as seen here near Gantheaume Point, is a distinctive feature of the peninsula. 'Pindan' also refers to the wattle shrublands.
Photo – Kevin Kenneally

Below: The fruits of the mistletoe tree (*Exocarpos latifolius*) turn bright yellow when ripe. They are mainly eaten by birds, which disperse the seeds.
Photo – Kevin Kenneally

Right: Graham Donation and Martina Dixon, both of Broome, with mature fruit of magabala (*Marsdenia viridiflora*).
Photo – Kevin Kenneally

Below right: Pittosporum molluccanum is a declared rare plant restricted on the mainland to the Dampier Peninsula.
Photo – Kevin Kenneally

seen feeding or noisily trumpeting as they perform their display rituals. Fringing the landward side of the coast are pockets of tangled vine thicket. Where the land is wet and swampy, majestic groves of paperbark crowd together, sheltering banks of feathery ferns and myriad butterflies.

To those who take the time to understand its complexities, the vegetation reveals a wealth of fascinating plant communities.

With the current focus on the environment and the move towards nature-based tourism, people everywhere are striving for a better understanding of the natural environment. Arid Australian landscapes, such as those found on the Dampier Peninsula, have often been dismissed as mere 'bush' or 'scrub', without apparent value in strict monetary terms, but their value lies in the wealth of plant and animal species they contain. It is increasingly being recognised that the preservation of this 'biodiversity' is essential to ensuring a sustainable future for Australia and the world.

Because of its novel setting at the transition between the desert and tropics, the Dampier Peninsula contains many unusual plants and plant communities, some of which are threatened by human activities. Exploitation of natural resources and the pastoral impact of introduced European animals have transformed the Kimberley landscape. It is this habitat alteration and destruction that threatens the survival of some Peninsula species.

HUMAN IMPACT

Worldwide, there is an increasing emphasis on the preservation of habitats and conservation of the biodiversity of life on Earth, yet unique natural environments continue to be eroded and destroyed by human activities. There is a perception that areas like the Dampier Peninsula suffer less from human disturbance because they are remote; but 'remote' does not necessarily mean pristine. At first glance, the size of these ancient Kimberley landscapes can mask their fragility. The Kimberley's vast savannas are sparsely settled, but have been exploited by humans for at least 40 000 years. During this period an entire fauna of great mammals disappeared. Other mammals have disappeared, and some plant species have not been re-collected since European settlement began more than 100 years ago. Pervasive damage from cattle, feral donkeys, feral cats and inappropriate fire regimes are now apparent in many parts of the Kimberley, including the Dampier Peninsula.

Much of the peninsula is networked with tracks, and frequently visited by tourists and fishers. Aboriginal communities have established a tourist resort, Kooljaman, at Cape Leveque, and provide guided tours of the area. The large tourist industry centred on Broome is growing rapidly, and more extensive tourist use of the peninsula is inevitable. Roadside populations of tree orchids (*Cymbidium canaliculatum*) have virtually disappeared within the past decade through illegal removal. One particularly ornamental tree species, *Pittosporum moluccanum*, is restricted, on the mainland Kimberley, to coastal vine thickets in the James Price Point area of the peninsula.

REPRESENTATIVE RESERVES

The World Conservation Strategy supports the declaration of conservation reserves to protect representative areas and indigenous species. It is therefore imperative that adequate reserves are established on the Dampier Peninsula, capable of sustaining a broad cross-section of the wildlife. The existing Coulomb Point Nature Reserve contains only a small area of pindan and a

correspondingly small population of the northern nail-tail wallaby (*Onchogalea unguifera*). The uncertain status on the peninsula of the bilby or dalgyte (*Macrotis lagotis*) gives cause for concern.

There is a need to protect adequate areas of all the features typical of the peninsula. The 1991 CALM publication *Nature Conservation Reserves in the Kimberley*, recommended that several reserves be established and that the Coulomb Point Nature Reserve be expanded to create a 'Dampierland National Park'. This new national park would include coastal environments, as well as protecting a greater number of the ephemeral lakes and freshwater springs (for example, Wonganut Spring) on the peninsula. This would conserve examples of the peninsula's riverine environments, as well as examples of pindan on low-level soils.

The proposed Jowlaenga Nature Reserve, presently part of the Waterbank pastoral lease, may still hold populations of the dalgyte. Proposed reserves in the northern part of the Dampier Peninsula, whose boundaries have been the subject of long negotiations between CALM and nearby Aboriginal communities, are expected to be declared in the near future. The proposed Borda Nature Reserve includes the largest single patch of vine forest on the peninsula. This reserve and the proposed Cygnet Bay Nature Reserve contain a great variety of diverse coastal and near-coastal habitats. Cygnet Bay also has important historical significance because of its associations with Allan Cunningham's botanical collecting in 1822.

The proposed Roebuck Bay Marine Park has been selected primarily to conserve areas of intertidal flats and beaches: the landfall and feeding grounds for vast numbers of migratory wading birds. These birds arrive in Australia from their breeding grounds in the Arctic parts of east Asia in August and September, and leave in March and April. More than 850 000 waders use Roebuck Bay and Eighty Mile Beach at migration time. Australia has signed three international treaties protecting migratory wading birds and their habitats. Reservation of the Roebuck Bay area would be a major step forward in meeting obligations under these treaties.

There are negotiations under way to establish a coastal park on the ocean side of Broome, to ensure proper management of fragile dunes, vine thickets, dinosaur footprints and trackways.

FUTURE POTENTIAL

The world's forests and woodlands are shrinking at an alarming rate, at a time when there is an unprecedented demand for their resources. In developing countries, it is seen as critical to expand the use of firewood and charcoal to avoid the expensive infrastructure needed for other energy forms, such as electricity. Australia has many trees and shrubs with characteristics useful for community forestry. It is logical that the search for species suitable for planting in the world's arid areas be centred upon Australia—the world's driest continent.

The Dampier Peninsula has important species of legume and wattle: plants that are capable of fixing nitrogen, tolerant of infertile sites and fast-growing. One such species, *Acacia tumida*, grown from seed collected at Cape Leveque, is regarded as possessing nearly all the attributes to make it a most useful food source for people living in subtropical or tropical dry zones. In the last decade, plants of *Acacia colei* and *Sesbania formosa*, grown from seed collected from the

Top: Podaxis is one of the larger fungi that occur after the wet season.
Photo – Kevin Kenneally

Above: The tropical field lily (*Crinum angustifolium*) flowers during the wet season.
Photo – Tim Willing

Left: Spiny pods of *Caesalpinia major* cut open to show the pair of seeds.
Photo – Kevin Kenneally

Top left: Silverleaf grevillea (*Grevillea refracta*) is a common species on the peninsula.
Photo – Brian Carter

Above left: A native ebony, *Diospyros bundeyana*, occurs in patches of interdunal vine thickets.
Photo – Brian Carter

Below: Numerous scrambling pea plants, such as *Galactia tenuiflora*, occur throughout the peninsula.
Photo – Brian Carter

Broome area, have found widespread favour for regeneration projects in the Sahelian zone of West Africa. Other legume genera found on the peninsula, such as *Vigna* and *Glycine*, have genes that may have an application in improving commercial seed crops like mung bean (*Vigna radiata*) and soy bean (*Glycine max* and *G. soja*). Non-legume genera with commercial potential include *Gossypium* for cotton (*G. hirsutum*) crop improvement. Examples such as these highlight the importance of reserves in maintaining the genetic diversity of all species, so that humanity may benefit from the great potential of nature.

BROOME AND BEYOND

The book, *Broome and Beyond*, will be invaluable in assessing and monitoring the biodiversity of the Dampier Peninsula and the adequacy of its conservation reserves.

It provides a readily useable, yet comprehensive source of natural history and botanical information for Broome and its immediate region. It will help residents and visitors to the region to understand and interpret the landscape of the Dampier Peninsula. In addition, it brings together for the first time a detailed history of botanical exploration in the area, from the early forays of William Dampier in 1688 and Allan Cunningham in 1822 to the present day. It is believed to be the most detailed botanical work yet produced for a restricted geographical area of tropical Australia.

Broome and Beyond contains introductory sections on traditional plant usage, the environment, botanical exploration, plant communities and conservation of the Dampier Peninsula. This is followed by a comprehensive plant list covering descriptions and usages for the more than 700 species known to occur on the peninsula. The wealth of colour photographs will assist in the swift recognition of species.

It is hoped that the book will encourage readers to appreciate the wonders of the bush in this remote part of Australia, and to discover the traditional values and uses of many of the plants.

Broome and Beyond costs $39.95 and is now available from CALM offices and all good bookshops.

Kevin Kenneally is coordinator of CALM's Scientific Publications Unit and the *LANDSCOPE Expeditions* program. He is a co-author, with Daphne Edinger and Tim Willing, of the book *Broome and Beyond—Plants and People of the Dampier Peninsula, Kimberley, Western Australia*.

The book's authors acknowledge the assistance of members of the Broome Botanical Society (Inc.), especially Brian Carter, David Dureau, Paul Foulkes and John Martin, and the Aboriginal communities of the Dampier Peninsula.

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LANDSCOPE

VOLUME ELEVEN NO. 3 AUTUMN ISSUE 1996

Thanks largely to CALM's fox-control programs, the recovery of the woylie has been so swift that the species has now been taken off the threatened fauna list (see page 10).

This killer whale, photographed at Ningaloo, is one of 36 marine mammals living off the WA coastline. Read about them on page 16.

LANDSCOPE *Expeditioners made some interesting discoveries during last year's expedition to Queen Victoria Spring. Read all about them on page 23.*

Spring flowers thrive on a moss carpet —one of the range of attractions on offer in the Porongurup National Park (see page 28).

The rose mallee is just one species benefiting from action by recovery teams working together for conservation (see page 36).

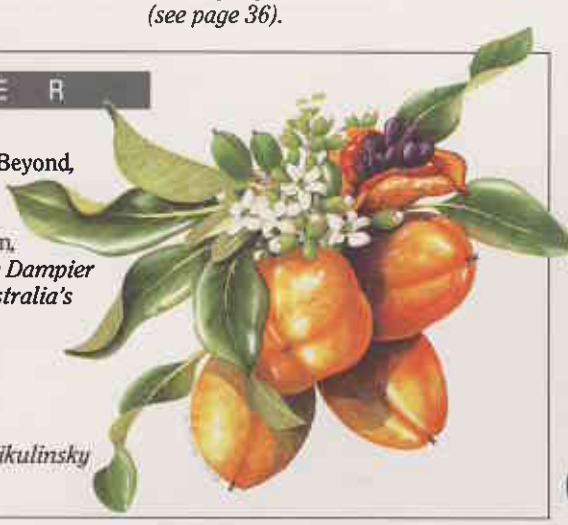
FEATURES

REGULARS

COVER

A new book, Broome and Beyond, *takes an in-depth look at the plants, such as this* Pittosporum molluccanum, *people and cultures of the Dampier Peninsula, in Western Australia's Kimberley Region. The story on page 48 takes a brief glimpse into this exciting new book.*

Illustration by Philippa Nikulinsky



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