The Complex Coast

Where the sea meets the land, a complex world is formed. Born of water and rock, it is both—and neither. Hugh Chevis looks at the challenges this presents.

by Hugh Chevis

Whether it's a sunny beach, an outcrop of windswept granite cliffs, or a gallery of sculpted limestone, Western Australia's coast is important to us all. Unique and diverse, the zone where land meets sea is a cultural and ecological rendezvous, an encounter between two worlds. Yet the ambiguity of what we mean by 'coastline', its physical diversity, and its many different uses, have in the past undermined its proper management. Authorities are traditionally set up to deal with either the land or the sea. We have come to think of the coast as a boundary, the end of one world and the beginning of another. In fact it is a seam, joining two environments that could not exist alone, and it needs to be managed accordingly.

The evidence of earlier coastlines dates back millions of years; a vast time span which defies comprehension. Even those features that formed within human times command a sense of wonder at their age. Enigmatic faces engraved by Aboriginal people into the rocks of the Burrup Peninsula, for example, have gazed at the present coast for 7 000 years, from the time when the sea level last rose.

Culturally, the coast is an important part of Australian life. It is the edge of our continent, the point of arrival and departure, the tangible frontier. Most Western Australians live and work in coastal cities and towns. And if it's not where we work, it's where we go to relax: the beaches, the nearby waters of the sea, and the adjacent hinterland are our most favoured holiday destinations.

But the more significant aspect of the coast is its geography and biology, because this is at the heart of its survival. The coast itself is a diverse environment, the result of an interplay of processes between the land and the sea. The fall and rise of

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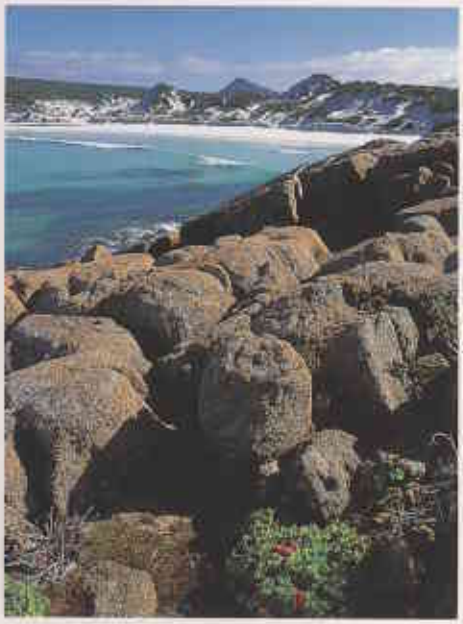
Shark Bay Marine Park meets Francois Peron National Park—the essential integration within the Shark Bay World Heritage Area.
Photo - Marie Lochman

Above: The coral reef of Ningaloo Marine Park is one of the icons of our coastal conservation system.
Photo - Geoff Taylor/Lochman Transparencies

Below: Surf breaking on the coast of Walpole-Nornalup National Park. Future marine reserves would ideally be linked to terrestrial reserves.
Photo - Alex Bond



Above left: Dusk gathers over Marmion Marine Park—the view from the beach.
Photo - Ann Storrie

Above: The granite coast of Cape Le Grand National Park.
Photo - Alex Bond

Below: Normans Beach Inlet, typical of south coast estuaries, is backed by the Waychinicup National Park.
Photo - Jiri Lochman

the sea level over many thousands of years has resulted in limestone deposits, which have subsequently been isolated to form islands and reefs. Estuaries have formed behind barrier dunes, which were themselves formed by wave and wind. The coast continues to change under its own forces, often in spite of our best efforts to control it.

The coast is complex, and the management of the wide range of recreational and commercial activities that go on there is equally complex. The task before the community, and particularly the Department of Conservation and Land Management (CALM), is to organise management that recognises and protects the integrity of the coast while still allowing these diverse uses.

THE OLD AND THE NEW

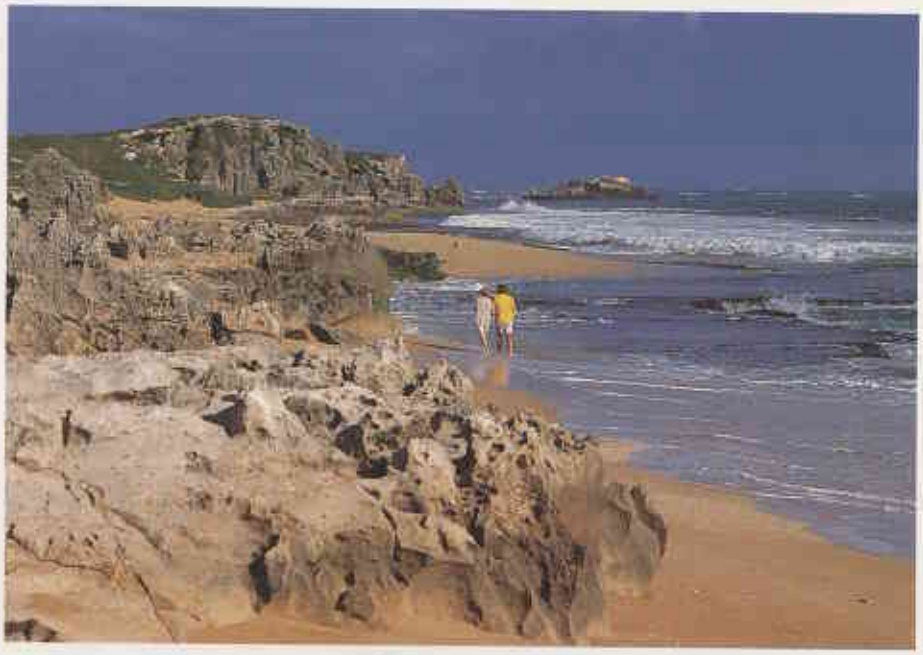
National parks and nature reserves have long been established in the terrestrial part of the coast. These reserves have traditionally stopped at the beach, sometimes at the high water mark and sometimes at the low. Either way, the boundary was often hard to define and suggested, wrongly, that the beach was a barrier between sea and land.

Meanwhile, the development of a conservation ethic for the sea followed a different timetable. In the Western tradition, the resources of the sea were seen as common property until the last few decades. The idea of marine conservation reserves, where an area of water is set aside for specific purposes, is relatively recent. In WA, such reserves have only been set up in the last ten years.

Today, CALM has found that these marine conservation areas provide an opportunity to integrate the management of conservation reserves across the coastal zone. There are also strong ecological arguments for having a reserve system which spans the land and sea.

DRAWING THE LINE

The past system separating terrestrial national parks and nature reserves from marine conservation reserves required a line to be drawn between land and sea. But drawing such a line is, at best, a biological compromise. For example, in



the north of the State, where there is a tidal range of up to 11 metres vertically, the corresponding area affected horizontally can stretch over 10 or 15 kilometres, with vast expanses of supratidal flats, which are inundated by the sea on only a few occasions each year. This intertidal area is a rich biological zone contributing substantially to the productivity of the surrounding waters through the input of nitrogen and organic matter from communities such as algal mats and mangrove forests. Terrestrial animals use mangroves for shelter and for foraging. In these circumstances, a line separating the land, the sea, and the interzone between them makes no ecological sense.

It is equally difficult to draw a line separating ecological processes around estuaries. In the south-west of the State there are bodies of water at the mouths of rivers, such as the Swan and Canning Rivers, which are permanently or regularly open to the sea and, therefore, have a gradient of river water to sea water. If the deciding factor for plotting the line was the point where the fresh river water becomes salty sea water, the line is also somewhat indistinct. Indeed, the gradient changes with time and season, as happens when rivers flow strongly after winter rain and push the salt water further downstream.

Quite apart from the obvious difficulties in drawing such a dividing line, there are other tangible arguments for integrated land-and-sea management. Some water bodies, such as the Hamersley Inlet in the Fitzgerald River National Park, only rarely are open to the sea and, thus, are mostly affected by activities and processes in their inland catchments. Inputs of nutrients and silt, by both natural and human-induced processes, come from the upstream catchment and

Top: A small flock of waders in the intertidal zone of the Swan Estuary Marine Park.
Photo - Dennis Sarson/Lochman Transparencies

Above: The islands within Shoalwater Islands Marine Park are managed to encourage visitors to appreciate both the land and the sea.
Photo - Alex Bond

Left: Australian sea lions rely on island haul-out sites such as here on Little Island in Marmion Marine Park.
Photo - Ann Storrie

flow into the estuary. Roads leading to the estuary provide access to this scenic part of the national park, but they must be designed in such a way as to limit damage to both the land and the water body. These are just two examples that suggest an integrated land-and-sea management would be the best option for fragile areas of that kind, where activities on the land bear directly on the marine environment.

VISITOR SERVICE

While individuals spend money on boats and other gear for their seaside recreation, the financial burden of getting them there falls on the public purse. In WA, the construction and maintenance of roads has largely been a matter for local government. But in the case of coastal access roads, CALM has also provided a significant service, as many of the recreation areas that people want to get to are in national parks or nature reserves. Roads and other access infrastructure are another example of the need for integrated management of land and sea environments.

Although the dissemination of information to visitors to coastal and marine conservation areas is essentially a land-based operation, the information itself relates to both the land and the sea. For example, Milyering Visitor Centre, located in Cape Range National Park, provides information about that park as well as the adjacent Ningaloo Marine Park. From the Centre, the visitor can look both inland to the ancient hills of the Cape Range (itself formed by marine processes, originating in part as coral reefs) and seaward to the azure blue waters and the Ningaloo Reef.

MANAGING LAND AND SEA

The tourism values of the conservation reserves of the North West Cape are now receiving local, national and international recognition. Visitors are being attracted to the area for many days or weeks. There are opportunities for walking and abseiling in the gorges, watching turtles coming in to nest, fishing, diving, and the unique opportunity to swim with whalesharks. All these activities occur within conservation reserves managed by CALM in close liaison with other agencies.

The success of the North West Cape experience is being pursued in other parts of the State. The land and waters of the Shoalwater Islands region near Rockingham, south of Perth, are being managed to maximise recreation and conservation in both. The sea lions and little penguins, which are proving such a drawcard for the islands, are dependent on a healthy marine environment. This can be ensured through the integrated management of the islands with the surrounding marine park.

In the same vein, CALM is also developing management plans for the reserves that make up the Shark Bay World Heritage Area. Its World Heritage Area status provides an additional stimulus to ensure that all parts of the region, both wet and dry, are planned and managed in sympathy with each other.

Such integrated management practices could set an example outside the State and even beyond Australia. One of the world's most famous marine conservation areas, the Great Barrier Reef Marine Park, is considered by many authorities to have an exemplary management structure. However, there is a potential threat to the integrity of the park in the fact that uses of the landward component of the adjacent coast do not fall within the same management control as the waters of the Great Barrier Reef. In contrast, WA is fortunate to have so many circumstances where national parks, nature reserves and marine parks are located next to one another and, because they are managed by CALM, can be managed together.

The coast is not, as we may once have thought, a dividing line between land and sea. If it is seen as such, its health can suffer because there may be no clear mandate for its management. Alternatively, if the coastline is seen to be the fabric that binds the land and sea together, and all elements are managed accordingly, it can be kept intact. In WA, CALM is working towards this integrated vision, and aims to manage marine and terrestrial reserves in order to preserve the coastal fabric as an integrated whole.

Above: Mangroves, such a these white mangroves, provide habitat for marine and terrestrial animals.
Photo - Jiri Lochman

Above right: Hamersley Inlet is nestled within the Fitzgerald River National Park and is only occasionally open to the sea.
Photo - Grant Wardell-Johnson

Right: People learn about the sea from the land-based Milyering Visitor Centre.
Photo - David Gough

Hugh Chevis is Manager of CALM's marine unit and is currently involved in the development of a marine reserves system and policies related to its management. He can be contacted on (09) 442 0313.

Yellow-billed spoonbills have visited Star Swamp for the last three years. They sift small crustaceans from the shallow water. The story of this suburban wetland is told on page 45.

About a quarter of Stirling Range National Park has been closed to protect its unique flora from dieback desease. Turn to page 10 to discover these plants on the edge.

LANDSCOPE

VOLUME TEN NO. 1 SPRING ISSUE 1994

A marine park is proposed to adjoin the Prince Regent Nature Reserve. The Complex Coast (page 49) discusses the need for integrated management of land and sea around our coast.

Found all over Australia, short-beaked echidnas are one of two Australian egg-laying mammals. They still occur around Perth. See page 18.

The orange-bellied frog is part of the South West's fine-scale richness and variety. Find out more about these fascinating creatures on page 35.

FEATURES

REGULARS

SPECIALS

COVER

The coral gardens in the sheltered lagoons of the Rowley Shoals contain dozens of different varieties of staghorn coral and are inhabited by a huge range of colourful reef fish. See 'Coral for Keeps' on page 28.

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