



The RUGGED COAST

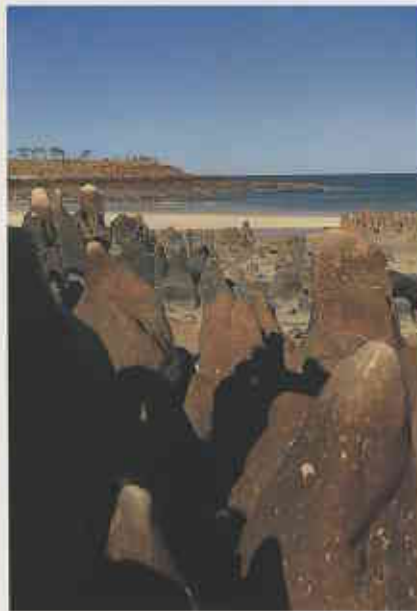


The Kimberley region of Western Australia has one of the most remote and inaccessible coastlines in Australia, leaving much of its wildlife and flora shrouded in mystery. In July 1996, the first maritime *LANDSCOPE* Expedition sailed from Broome to survey part of this wild coast, and returned with a wealth of botanical and biological information.

BY KEVIN KENNEALLY

The rugged Kimberley coast is one of extraordinary beauty, but it also presents an extraordinary challenge. It stretches for more than 1 000 kilometres in the company of some 1 500 islands, offering visitors the outstanding scenery of its colourful, towering, sandstone cliffs, sandy beaches, coral reefs, and a densely vegetated hinterland. Craggy headlands and sheltered inlets create a varied landscape like no other along the Western Australian coastline.

The actual approach by sea is easy, but most early voyagers found that moving about on this stretch of coast was arduous, wearisome and dangerous. The reasons are not hard to find. Reliable sources of fresh water are scarce. The coastline is poorly mapped and has a twice-daily ten-metre tide. It is fringed with dense stands of mangroves concealing winding creeks. It is also home to the saltwater crocodile, which means extreme caution must be exercised when working from small boats. But despite these natural hazards, the Kimberley coast is potentially a world-class scenic attraction.



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Main: The majestic sandstone ramparts of Steep Island.

Inset: Expedition members aboard *Sea Lion*.

Left: Petrified forms of the mythical sea warriors at Langgi.

NEED FOR INFORMATION

There is a long history of maritime contact along the Kimberley coast. For more than 400 years the coast and its Aboriginal inhabitants were visited by people from distant lands. However, much of the coast is now uninhabited. Until the years immediately following World War II, Aboriginal groups lived their traditional lifestyle along these shores, and there were also several mission stations. In recent

times, Aboriginal communities have been re-established at One Arm Point, Cone Bay and Oombulgurri. The ports of Broome and Derby in the west, and Wyndham in the north, are the only major coastal settlements. Between Derby and Wyndham there is no road access to the coast (except for a limited number of difficult four-wheel-drive tracks). The only other settlement along the coast is a small pearling community at Kuri Bay.

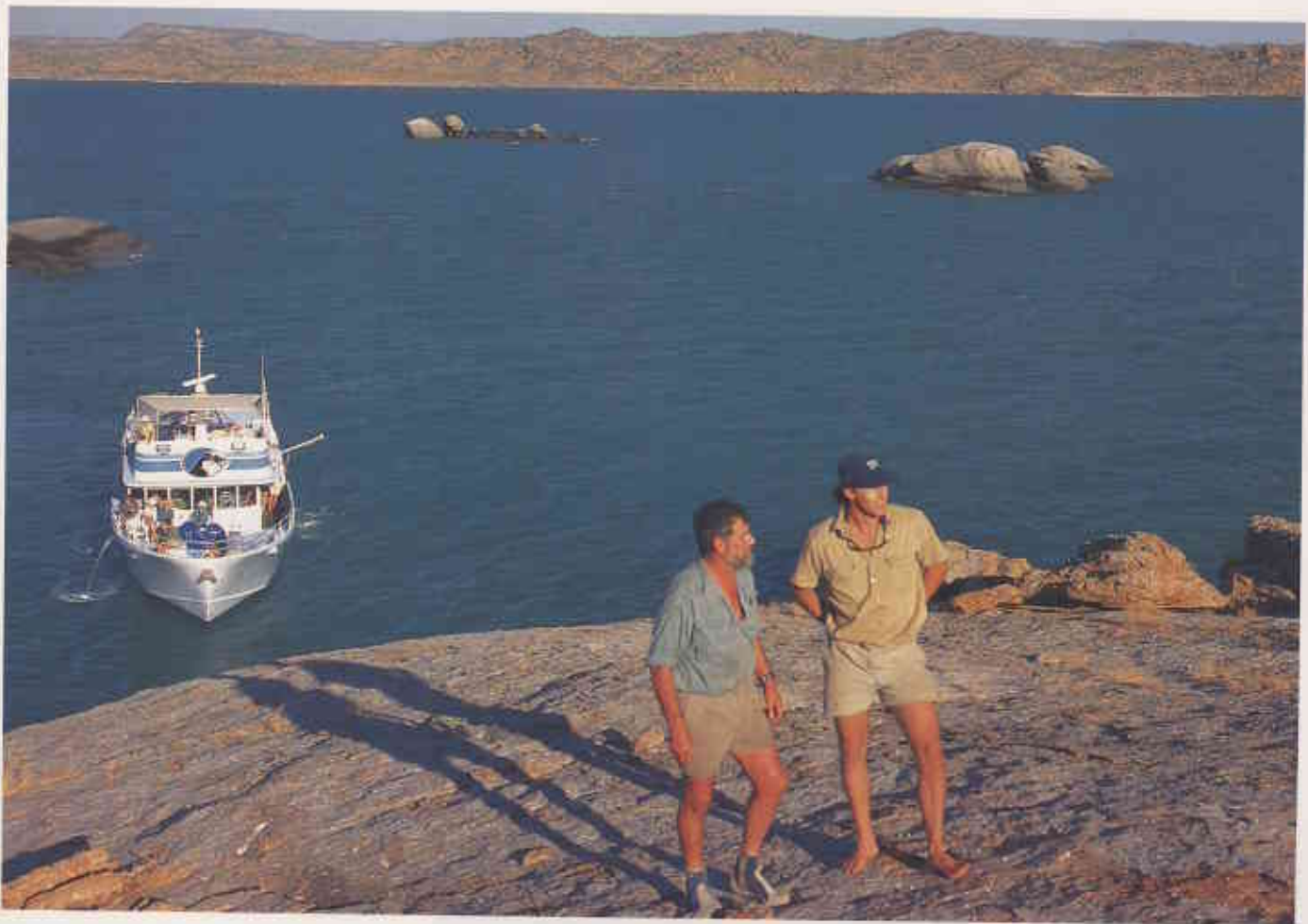
Biological exploration of the Kimberley coast and coastal waters has not been extensive, so information about the marine flora and fauna is sparse. Voyages of discovery in the early 1800s by French and British navigators provided the first natural history accounts from along the coast. The earliest scientific collections appear to be those made during Phillip Parker King's hydrographic surveys of the region from 1819 to 1822, aboard the vessels *Mermaid* and *Bathurst*.

The State Conservation Strategy, published as a draft in 1987, sets as one of its main goals the establishment of a conservation reserves system that represents the flora, fauna and habitats of Western Australia. The strategy applies equally to the marine environment as well as the land. In 1991, the Department of Conservation and Land Management (CALM) published an update of the 1980 Western Australian Environmental Protection Authority report on conservation reserves in the Kimberley (System 7). The update included additional proposals for marine reserves on the Kimberley coast, and highlighted the need for a series of conservation reserves to represent the biological diversity of the area's fragile, rich, marine ecosystems. Furthermore, it identified a lack of biological information for many of these areas.

To manage the coastline effectively, CALM needs a better understanding of the marine and terrestrial ecology.

In 1994 CALM published a report "A representative marine reserve system for Western Australia". In that report Dr





Barry Wilson, the chairman of the Marine Parks and Reserves Working Group, commented that 'it has been our experience that the function of marine reserves is not widely understood in the community' and that 'a public participation program is needed to gain general public support for the recommendations contained in the report'. The Western Australian Museum is currently conducting marine research in the Kimberley, but remote-area research is expensive. This is where *LANDSCOPE* Expeditions can help.

ALL ABOARD!

LANDSCOPE Expeditions are non-profit, self-supported study and research projects. *LANDSCOPE* expeditioners are people who care about the environment. They are CALM volunteers who are willing to contribute financially to research, and have the opportunity to work alongside scientists who are experts in their field. At the same time they are able to visit remote areas that normally would not be accessible to them. In July 1996, the support of a group of paying volunteers made possible for the first time a research expedition to the Kimberley coast.

With life jackets donned, the expeditioners were transported from Gantheaume Point, at Broome, to the MV *Sea Lion*, anchored off shore, and met the crew: Jason Tulipan (skipper), Alexandra Vaughan and Luke Sibon. After receiving the obligatory safety instructions for ships at sea, we weighed anchor.

Under a clear sky and with a light easterly wind blowing we were soon heading for Middle Lagoon on the Dampier Peninsula. En route, large schools of trevally and mackerel circled and bunched up smaller fish into tight packs, as hundreds of brown boobies fell out of the sky, diving into the seething mass of fish.

We anchored off Middle Lagoon late in the afternoon and were met on the beach by Peter and Traci Howard, who have a lease on the area and are developing it as a tourist facility. Local Aboriginal identity George Dans had agreed to take the group on a bushwalk towards Emeriau Point. Along the track, George pointed out edible fruits and seeds, and described traditional ways in which they were prepared. Under a brilliant sunset we made our way back to camp. That night a heavy sea fog rolled in, blanketing the campsite and soaking

Kevin Coate and Luke Sibon on the summit of Bald Rock with the *Sea Lion* standing by.

our swags. We awoke to dripping mosquito nets and eerie shafts of light penetrating the fog.

LACEPEDE ISLANDS

Next day, at first light, we returned on board the *Sea Lion* and headed out through the fog to the Lacepede Islands Nature Reserve, 20 kilometres off the coast and 150 kilometres north of Broome. Named by the famous French maritime explorer Baudin in 1801, they commemorate the noted French naturalist Count Lacépède. The islands, particularly Middle and West, were sources of phosphate-rich guano, a natural fertiliser formed from concentrated bird droppings, usually in areas of dry climate. During the 1870s the Lacepedes were heavily exploited for this resource, with as many as 160 people employed there. Today, naturalists visit the island to marvel at the masses of brown boobies and lesser frigate birds, which nest on the sandy cays and feed on the large schools of fish that teem in these tropical seas. The islands are also an important green turtle nesting rookery.



As we approached, the fog lifted to reveal the low-lying sandy cays. A myriad seabirds had joined us: the graceful brown boobies scudded alongside the boat and skimmed the water, while frigate birds wheeled high above us in ever-climbing circles like stealth bombers.

On East Lacepede Island a recently hatched white-bellied sea eagle chick was recorded in a nest built on the light tower. On nearby Sandy Island we found a large colony of brown boobies, with breeding in all stages from eggs to mature young. Little has been recorded of the booby populations on this island.

Braving a heavy swell, the expeditioners landed on West Island and began the task of counting the nests of lesser frigate birds under the expert guidance of Kevin Coate. Frigate bird numbers fluctuate significantly from year to year, and it is hoped that future counts will provide a better understanding of breeding patterns on the Islands. We counted a breeding colony of caspian terns, but kept to the other side of the lagoon so as not to disturb them and allow predatory silver gulls to rob their nests of eggs and young. Two partially fledged roseate terns with their parent birds were seen near the caspian tern colony. A little later, others were found in a breeding area away from the lagoon on the seaward side of the island. Little is known about roseate tern movement in the Kimberley and whether the birds here come from the south, from Indonesia, or from eastern Australia. Photographs taken of breeding birds at the Lacepedes on this expedition show more black in the wing than those from the Abrolhos Islands in the south.

As we left the Lacepedes, a mast-like stick was seen protruding from the vast open sea. As we made our way towards it, we soon saw a torn remnant of sail, a bamboo cane and some pieces of fishing net—eerie signs of a mysterious fate. We

Top left: Frigate birds nesting on beach spinifex clumps on Lacepede Islands.

Centre left: Boab trees and yellow-flowered kapok bush at Cone Bay.

Left: George Dans leading a walk at Middle Lagoon.

all sensed the drama of what may have happened, of who may have been on board. After towing the remains of the wreck into shallow water, we attached two buoys as warning markers. Our skipper had radioed Coastwatch, who told us it was an Indonesian fishing boat that had sunk under tow. Mystery solved!

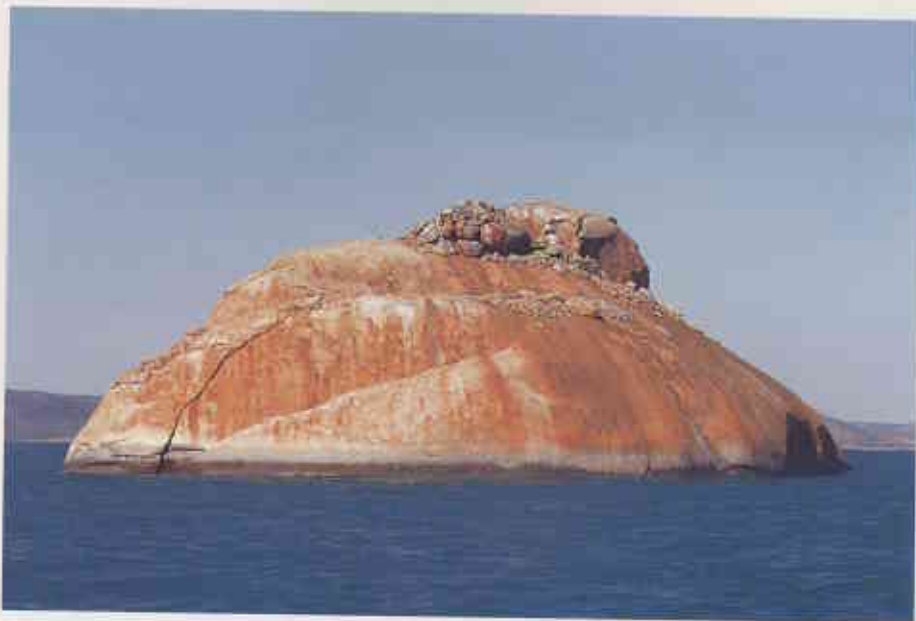
TO THE GRAVEYARD

Departing Middle Lagoon, we were soon rounding Cape Leveque with brown boobies skimming in our wake. Bright oxide colours in the low coastal cliffs were brilliant in the sunshine. As we rounded One Arm Point the tide pushed us along at 23 knots, but when it turned we were reduced to just nine knots. This spectacular water movement produces tidal surges and whirlpools. Crossing the wide expanse of King Sound, the skipper cautiously guided the boat around headlands and between islands, through uncharted waters.

We reach the spectacular entrance to the Graveyard on slack tide, a benign transition through turquoise waters and portals of massive white and reddish sandstone. The Graveyard is thought to have derived its name from the many pearlshells who were buried on the islands throughout Strickland Bay—victims of this unforgiving coastline. A Zodiac inflatable was used to explore the surrounding area and Jinunga River, which empties into the Graveyard. Alighting from the Zodiac, we made our way up the tidal part of the creek to the freshwater pools. We collected and pressed plant specimens and observed birds. Soon we spotted a large saltwater crocodile floating in the creek, a sobering reminder of the natural hazards in these waters.

BALD ROCK AND CONE BAY

Bald Rock, a granite island in Cone Bay one kilometre from the mainland, had been suggested to us as a breeding site for short-billed corellas; these birds are known to nest in crevices in cliff faces and have previously been recorded nesting on offshore islands in the Buccaneer Archipelago. Sure enough, as we approached the dome-shaped rock, 30–40 corellas could be seen sitting among the jumbled rocks near the top. We made a hazardous landing from the Zodiac, while the *Sea Lion* stood by so we could inspect this unique rock. There



was plenty of evidence of nesting, including an abandoned egg and hollows dug out under rock slabs. Two pairs of pied oyster catchers with downy young were also there, and not at all impressed with our approach. These youngsters were eventually shepherded by the parents to shelter under overhanging rock slabs. The island also hosted mysterious circles of stone, obviously arranged by human hand.

In Cone Bay, we landed on an area known geologically as the Cone Bay Granites. These 1 800-million-year-old Archaean granites are among the oldest rocks in the Kimberley, and are poorly surveyed. Dense stands of perfectly shaped boabs (*Adansonia gregorii*) and kapok bush (*Cochlospermum fraseri*) were common in the area. Also common was an undescribed form of the graceful

Top: Jinunga River near the entrance to the Graveyard.

Photo – Kevin Coate

Above: Bald Rock in Cone Bay, a breeding site for short-billed corellas.

Photo – Kevin Coate

wattle (*Acacia gracillima*). This sweetly perfumed species was previously known only from specimens collected from near Kimbolton on the Yampi Peninsula.

Of delight to the ornithologists was a wedge-tailed eagle's nest, with two recently laid eggs sitting on a bed of freshly collected leaves. The nest was quite large and had been used for a number of seasons.

We anchored in Doubtful Bay, between Steep Island and Raft Point. The name Steep Island is description enough, but Raft Point was equally steep and seemingly impregnable.



MONTGOMERY REEF AND LANGGI

Montgomery reef is in Collier Bay, some 60 kilometres east-north-east of Koolan Island. The Montgomery Islands, and adjacent High Clifty Islands, are part of an Aboriginal reserve and are used primarily by Aboriginal people as a dugong and turtle hunting area. The reef was named by Phillip Parker King and commemorates the surgeon on board the *Bathurst*. At low tide the reef empties, and waterfalls and cascades rush over coral walls. This was an opportunity to sample the wide variety of corals, sponges, clams and seaweeds of all shapes and sizes. A cautious eye was kept for saltwater crocodiles that are known to frequent the reef.

Located north of Freshwater Cove is an embayment known to the Aboriginal people as *Langgi*. It is a place of special significance because of the marvellous rock formations that represent the petrified forms of mythical 'sea wandjinas'. The wandjina men stand back against the orange cliff: black, grey and orange they stand, sandstone memorial plinths, heavy with cultural significance since time immemorial.

KOOLAN, COCKATOO—AND HOME

Koolan and Cockatoo Islands are the largest islands in the Buccaneer Archipelago. Both were developed as iron ore mines with residential and port

facilities. Ore is no longer mined on Koolan Island and the end of mining on Cockatoo Island is in sight. Cockatoo Island is currently being redeveloped as a tourist resort. Both islands were visited and specimens were collected. Of interest on Koolan Island was the spread of exotic species that had once graced the gardens on the island.

Up in time to see the sunrise over the rugged headlands, we packed up and headed back to the *Sea Lion* for the day-long haul back to Broome, an opportunity to pack specimens and finalise field notes. Suddenly, 'thar she blows'—a wonderful sight, spouting whales close by. We followed a couple of humpbacks, slowly cruising just below the surface, occasionally rising, blowing once again and raising their flukes, then gently disappearing. It was a great finale to a wonderful trip.

The information gathered on this expedition will be invaluable in formulating future management plans for the Kimberley coast. Coastal areas are in many cases more fragile than their terrestrial equivalents. Therefore careful management is needed to protect these special places, but with more information about their ecology, it will be easier to monitor change and manage them for conservation.

The specimens we collected have been processed and distributed to experts in museums and herbaria within

From the summit of Koolan Island, the *Sea Lion* can be seen anchored in the distance.

Australia and overseas. The knowledge gained from these collections will form a crucial part of the ecological monitoring program.

These particular *LANDSCOPE* expeditioners have now regained their land legs, but their contribution ensures that future generations will continue to enjoy this coast of extraordinary beauty.

Kevin Kenneally is coordinator of CALM's Science Publications Unit and *LANDSCOPE* Expeditions program. He has researched and published on the flora and vegetation of the Kimberley for more than 20 years. Kevin can be contacted on (09) 334 0561 or e-mail: kevink@calm.wa.gov.au.

Special thanks to Daphne Edinger, Kevin Coate, the skipper and crew of the *MV Sea Lion*, and the 1996 *LANDSCOPE* expeditioners.

Two Kimberley boat trips will be offered by *LANDSCOPE* Expeditions in 1997. For details contact UWA Extension on (09) 380 2433, or fax (09) 380 1066.

Photos by Kevin Kenneally, except where otherwise credited.

LANDSCOPE

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VOLUME TWELVE NUMBER 2, SUMMER 1996-97



Shannon National Park is the home of the Great Forest Trees Drive, another nature-based tourist attraction for the south-west. Read the story on page 17.



The rugged Kimberley coast was the location of the first maritime LANDSCOPE Expedition. Read all about it on page 10.



A huge volunteer effort has helped with the renewal of the Montebello Islands and the eradication of feral animals. (See page 47.)



Science has long-known the relationship between plants and habitats. Now we are 'Prospecting for Plants' using landforms as a guide. (See page 23.)

One hundred years ago, two members of an expedition to the Great Sandy Desert became lost. Read what happened to them in 'Land of the Lost' on page 36.

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COVER

The scientific name of the little penguin (*Eudyptula minor*) means 'little diver'. The wings of these flightless seabirds have evolved into flippers for underwater propulsion. The little penguin is the smallest of the 17 penguin species. Penguin Island has the largest colony of little penguins on the west coast. See 'The Changing Face of Penguin Island' on page 28.

Illustration by Philippa Nikulinsky



Managing Editor: Ron Kawallak
Editor: David Gough
Story Editors: Ray Bailey, Verna Costello, Mitzi Vance, Carolyn Thomson
Scientific/technical advice: Andrew Burbidge, Ian Abbott, Paul Jones and staff of CALM's Science & Information Division
Design and production: Maria Duthie, Sue Marais
Finished art: Gooitzen van der Meer, Maria Duthie, Tiffany Abern
Illustration: Gooitzen van der Meer
Cartography: Promaco Geodraft
Marketing: Estelle de San Miguel ☎ (09) 334 0296 Fax: (09) 334 0489
Subscription enquiries: ☎ (09) 334 0481
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