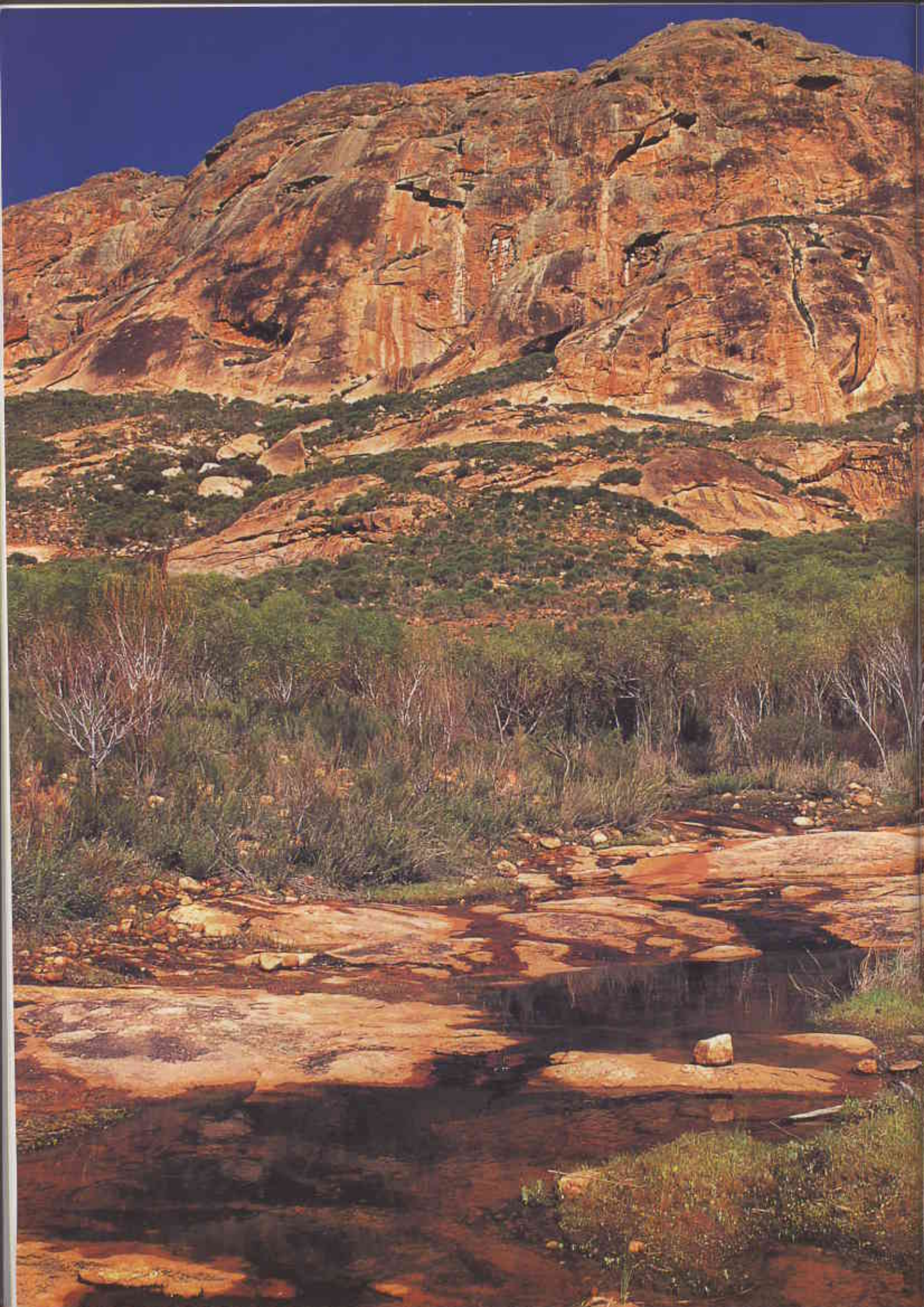


Granite Islands in a Sea of Bush

Peak Charles, an ancient peak, and its companion, Peak Eleanora, have weathered to various orange and brown hues, creating many unusual rock formations. Protected in Peak Charles National Park, they form granite islands in a sea of bush. A climb to the top of Peak Charles will reveal most of the features characteristic of Western Australian rock outcrops.

by Penny Hussey

Somewhat off the beaten track, about 100 kilometres south-west of Norseman, is the little known Peak Charles National Park. This park of about 40,000 hectares protects two interesting granite summits, Peak Charles and Peak Eleanora. Towering 500 metres above the surrounding plain, Peak Charles is visible for more than 50 kilometres in all directions. From the Peak Charles lookout, a two-kilometre climb, there are sweeping views over the surrounding dry sandplain heaths and salt lake systems, and the view from the top reinforces the feeling of being on an island.

Granite is the very stuff of which continents are made, and a huge and ancient chunk of granite, the Yilgarn Block, forms the basic underlying material of most of south-western Australia. Formed between two and three billion years ago, it has worn down over this almost unimaginable time into a gently undulating landscape. Granite tends to decompose quite deeply, so is often covered by a deep layer of weathered material, the topmost of which is soil. Sometimes, however, this material has been stripped away, or the rock is of a harder composition and so has not decomposed quite as fast as elsewhere, and the granite bedrock is visible at the land surface. These rock outcrops are a familiar feature of the south-west.

Previous page
Main: Peak Charles.
Photo – Chris Garnett
Inset: Ornate dragon (*Ctenophorus ornatus*).
Photo – Jiri Lochman

Below: Peak Charles viewed from the north.
Photo – Chris Garnett

The shape and extent of the exposed rock varies. Sometimes only a flat sheet is visible, no higher than the surrounding soil. In other places, a mound of tumbled boulders marks the site. However, because of the rock's crystalline structure, most granite outcrops in Western Australia are basically dome-shaped. When these are large they are called inselbergs, and Peak Charles is an outstanding example. Just as mariners use islands to help them navigate, Peak Charles provides a guide for the traveller to steer by. And when you consider the plants and animals associated with them, granite outcrops have even greater analogies with islands, for they harbour living communities not found in the surrounding areas.

WATER COLLECTION

The most important characteristic of granite islands, in comparison with the bushland around them, is that they have water. In a dry land, this is of immense value. Water brings the rock to life. When rain falls on bare rock, it runs off, filling depressions to form pools, forming streams and eventually soaking into the surrounding soil. This concentration of water permits the survival of plants and animals that would not otherwise be able to live in the area.

The first evidence of the value of water is near the base of the rock, where an apron of brown, gritty soil has built up. Although shallow, it is well watered from run-off, and supports a dense community of trees and shrubs. These contain many of the same species as the surrounding plain, yet they grow more luxuriantly, produce more flowers and set more seed. Thus, with both food and shelter, the area provides good habitat for animals, especially small birds. This apron was a favourite feeding location for rock-wallabies which, unfortunately, no longer occur at Peak Charles, probably because of predation by foxes. The rock-wallabies browsed on tree and shrub seedlings, so the density of vegetation may have increased since their local extinction.

Right: Climbing Peak Charles with Peak Eleanora in the distance.
Photo – Graeme Rundle

Centre right: This granite feature on Peak Charles is known as painted rock.
Photo – Rob Olver

Below right: Rock sheoak (*Allocasuarina huegeliana*) and other dense vegetation grow around the base of the rock.
Photo – Marie Lochman

THE ROCK ITSELF

Once you start to climb onto the granite itself, the nature of the rock can be seen. The exposed surface is often ridged and uneven, because the various minerals of which it is made decompose at different rates. In places, the granite is seamed by veins of quartz-rich rock, which are harder than the surrounding matrix and so stand out as long ridges. Where the minerals are softer than their surrounds, they form furrows, often becoming channels for water to move across the surface. As the minerals decompose, they become the basis of soil, filling the crevices and hollows, accumulating under boulders and building up the soil apron.

As the rock surface heats by day and cools by night, it expands and contracts, eventually breaking up into sheets and slabs. Where the granite is well-jointed, it erodes into boulders with a rounded shape. Erosion at their base may lead to precarious-looking balancing rocks. Sometimes a catastrophic event will cause rapid erosion, and at Peak Charles there is abundant evidence of this. In the summer of 1991, a massive bushfire raged through the whole area, and where shrubs and debris at the junction of the rock and the apron burnt fiercely, the heat was sufficient to crack off huge sheets of rock, exploding them outwards.

These rock sheets and boulders form excellent habitat for animals, providing shelter from the extremes of weather and refuge from predators. On warm days, dragon lizards can often be seen on the bare rock, but if disturbed they race to safety under a slab. Smaller hollows shelter millipedes or spiders, and larger ones provide sites for creatures such as echidnas and carpet

pythons. In the past, stick-nest rats lived here, and the gooey black remains of their nests can still be found jammed under rock overhangs.

LIVING ROCKS

If you look closely, you will see that the apparently bare rock itself supports many species of lichens and algae, which give a black, grey, green or even orange colour to the surface. The acids they produce help to decompose the rock and, when they die, their tissues contribute humus, and especially nitrogen, to the soil. At Peak Charles there are several well-developed 'wave rock' features, where the granite has eroded into the shape of a breaking wave, accentuated by streaks of black algae.

Rock holes that fill with water after rain are called 'gnammas' by Aboriginal people, and were once vitally important to their nomadic lifestyle. These rock pools may be wide and shallow, or narrow and deep, and both may be seen at Peak Charles, although none is specifically marked. The wide, shallow pools dry out quickly, so the plants and animals found in them need to get through their life cycles very fast, and then be able to survive the hot baking temperatures of the long, dry summer. Deeper rock pools, as well as soaks dug out around the base of the rock, provided water for larger animals.

If these pools have a layer of gritty soil on the floor, they support specialised bog plants, including mudmats (*Glossostigma* species), whose tiny flowers may look like a lilac film across the drying surface of the mud at the start of summer. Quillwort (*Isoetes* species), a relative of the ferns, forms tiny, bright green, submerged tufts, and survives the summer as spores within the dry mud. Many small aquatic invertebrates also survive as drought-resistant eggs buried in the mud, and these 'water fleas' can be seen darting around the pools in cooler weather.

Where a depression allows soil and litter to accumulate, a moss sward develops. Such swards often appear to die in summer, but revive once rain falls. A large variety of tiny flowering plants lives in them, surviving the summer by dying back to tubers, such as orchids, or regenerating from seeds, like tiny triggerplants and daisies. The plants in flower in these swards change as the season advances. In winter, tiny sedges and the white-petalled early nancy (*Wurmbea dioica*) may be flowering, then come numerous small daisies and blue beard orchids, followed by pink triggerplants (*Stylidium* species) and native grasses. Swards with soil a few centimetres deep are often dominated by pincushions (*Borya* species), which are able to endure the dry summer because they can function with as little as two per cent water in their leaves. During this period they turn bright orange, greening up again with the rains, so they are sometimes called 'resurrection plants'.

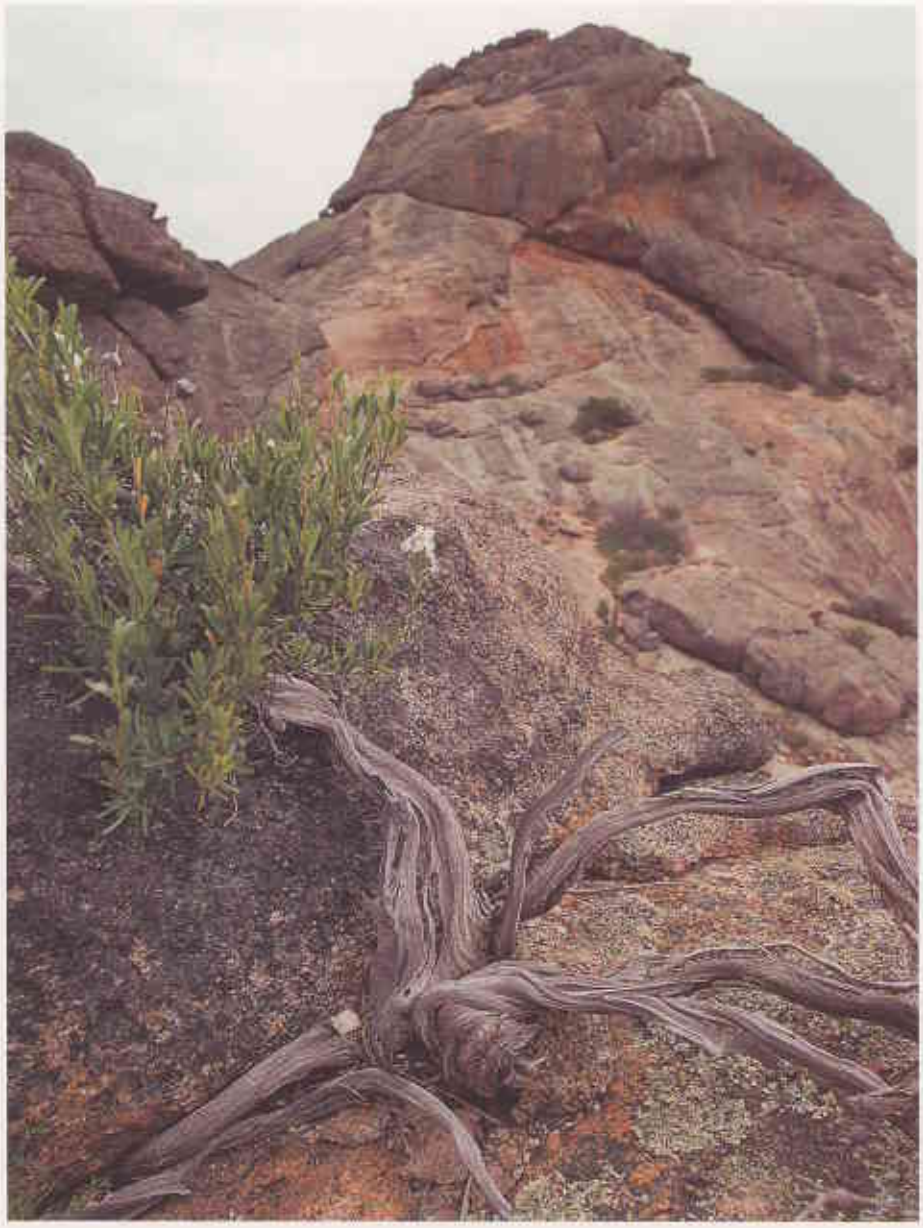
Top left: A fern and a parakeelya take advantage of a moist fissure.
Photo – Chris Garnett

Above left: The tuberous bottlebrush (*Calothamnus tuberosus*) grows in rock fissures on Peak Charles.
Photo – Penny Hussey/CALM

Left: Pincushions, or resurrection plants, turn bright orange in summer, but green up again with the rains.
Photo – Rob Olver

Right: The gnarled stems of natural bonsai that have formed at the summit of Peak Charles testify to their great age.

Below right: Wedge-tailed eagles are often seen at Peak Charles National Park, usually circling high in the sky.
Photos – Chris Garnett



Soil and water also collect in the fissures, and shrubs may grow there, their roots helping to prise the rock apart. Their gnarled, twisted stems testify to their slow growth and great age. This is a difficult habitat for plants, as they are exposed to all the extremes of drying wind and baking heat, so many have special features, such as needle-shaped leaves, to minimise water loss. The tuberous bottlebrush (*Calothamnus tuberosus*), which grows in such fissures at Peak Charles and a few other rock islands in the same general area, is most unusual in that it has fleshy, water-storing roots, a very uncommon feature among Australian flora. It flowers during spring and summer and, like other plants with red flowers, is pollinated by birds.

The combination of water and flowering plants brings numerous birds to these granite islands. Perhaps the most obvious are the raptors, using lift from the rock to spiral upwards and gain height. Often, several pairs of majestic wedge-tailed eagles can be observed, circling high in the sky. The thickets, woodlands and flowering scrub surrounding Peak Charles provide habitat for more than 40 species of small birds. An early morning walk around the apron, out onto the plain and back by the track, can be very rewarding. Wildflower enthusiasts should allow plenty of time to ramble among each different vegetation type along the track in. Have your camera at the ready!

Penny Hussey works for CALM as Coordinator of the Land for Wildlife program. She can be contacted on (08) 9334 0530.

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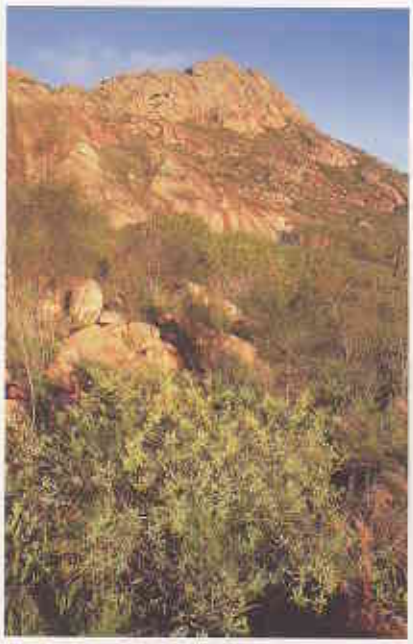

Peak Charles and Peak Eleanora, protected within Peak Charles National Park, form granite islands in a sea of bush. See page 10.

The Swan River is a recreation area for humans and a home for migratory birds. See page 16.

A partnership between State and Commonwealth goverments, and a group of pastoralists is helping to fill the gaps in the conservation estate. See page 43.

Butterflies have a short life span, but they bring pleasure to many people who visit Rottnest Island. See page 23.

Many marine creatures have evolved ingenious survival methods. See page 49.

FEATURES

REGULARS

COVER

Well-known Australian artist Ken Done captures the colour and turbulence of the horizontal waterfalls on the Kimberley's Wandjina Coast.

Painting by Ken Done
Racing Tide, Kimberley Coast, May 1999
(51 x 36 cm) oil crayon and gouache on paper.

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