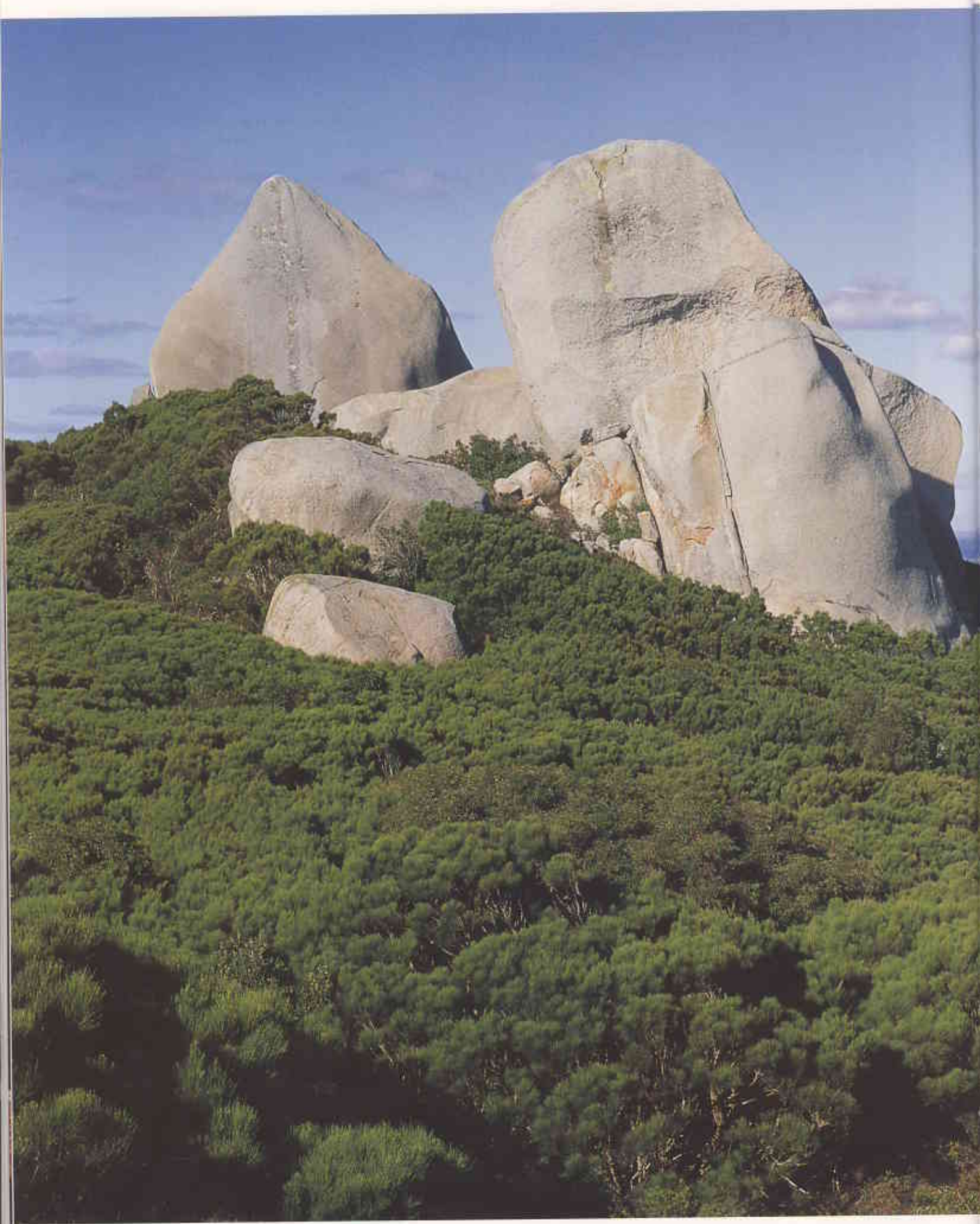


Karri Forest in Microcosm

WILLIAM BAY NATIONAL PARK

William Bay National Park, 15 kilometres west of Denmark, is best known for coastal features such as Greens Pool, Elephant Rocks and Madfish Bay. But to those in the know, its flora is one of its most fascinating attributes. Plant species growing in the heathlands of the national park represent the karri forest in microcosm.

by Neville Marchant

The Denmark district, west of Albany, is a place where the forest meets the sea. Most of the south coast has no coastal plain. Rather, the granitic and related rocks of the Great Western Plateau reach the Southern Ocean as cliffy headlands, with large, rounded outcrops lining the intervening bays. Sheltered inlets in some south coast national parks have karri and other forests growing right down to the water's edge. Instead of having forest close to the sea, William Bay National Park has a complex of heathlands. This habitat is of special interest to the botanically inclined, as it contains many common karri forest species. But at William Bay, they grow under coastal influences as small shrubs, often with leaves very different in shape and texture from their inland relatives.

Previous page
Main: Dense tall heath of peppermint, eucalypts and heart-leaf poison surround the granite tors overlooking William Bay and the Southern Ocean.
Photo – Bill Belson/Lochman Transparencies
Insets from top: Kunzea recurva.
Photo – Bill Belson/Lochman Transparencies
Curry flower (*Lysinema ciliatum*) and yellow-flowered coastal daisy (*Senecio lautus*).
Photos – Jiri Lochman

Left: The coastal banjine flower head is comprised of up to 100 or so individual flowers, each with four petals and two stamens.
Photo – Marie Lochman

Like many south coast areas, William Bay has high hills of granitic rocks. Light grey, windswept tors give the hilltops a primeval, Stonehenge-like appearance. There are pockets of karri, extensive tracts of peppermint and a host of other tree and shrub ecosystems, all developed on particular soil types. Karri trees grow in loam soil, while the open woodlands of sheoak and a number of eucalypts prefer the grey sandy soils that fill the valleys in between the granitic hills.

Below: The shallow soils on top of the tors at Elephant Rocks support red or pink coastal banjine. The dark rock lining the south edge of the bay is a fine-grained basaltic rock.
Photo – Bill Belson/Lochman Transparencies

On the coast, the granitic rocks are well weathered and rounded, providing spectacular coastal scenery and supporting a peculiar flora. Many such headlands along the south coast have a thin capping of limestone, adding to the great variety of soil types. The beach at William Bay is narrow, and the sand tossed up by winter storms blows inland to build up high coastal dunes. Some sand dunes have travelled a few kilometres inland before being colonised by dense scrub and trees, to form an undulating row of sandy hills parallel to the coast. Extensive tracts of bare, moving sand dunes at William Bay are still actively burying living stands of karri forest and, as the sand moves, revealing the upper parts of majestic old karri trees, which were once covered by shifting sand.

DIVERSITY OF PLANTS

It is easy for visitors to become carried away by the spectacular scenery that dominates the park's coastline. However, visitors who take a closer look at the plants will be equally amazed. A great diversity of incredibly different suites of plant species can be encountered over a short distance alongside any road or track. The road into William Bay leaves the highway in a mixed forest of low trees and shrubs, and rapidly passes to a small dell dominated by tall karri. The karri forest has a tangled, impenetrable undergrowth of groundcover plants and small shrubs, tall ferns, huge sedges and small narrow trees, such as karri hazel (*Trymalium spathulatum*) and chorilaena (*Chorilaena quercifolia*). The swamp-dwelling wattie (*Agonis juniperina*) also grows here. It has creamy white flowers.

Closely related to the wattie is the peppermint (*Agonis flexuosa*), a common understorey tree of the karri and the wetter jarrah forests. This is one of the most widespread trees in coastal areas of the south-west and the most common tree in William Bay. Dense thickets of peppermint have colonised the sandy soils closer to the coast. This remarkable species may grow as a tall spindly tree in the forest, where it is away from the relentless sea breezes. However, it is a low, very dense shrub when exposed to constant strong, and often salt-laden, winds. In an undulating coastal environment like that of William Bay, groves of densely-packed peppermints can completely fill the sheltered valleys and depressions, attaining the same heights as neighbouring dune tops, where only shrub-sized peppermints grow. From any hilltop close to Greens Pool you can see swathes of dark green peppermints forming a horizontal canopy, disguising the deep valleys in between.

The shady floor under the tallest peppermints is covered with a carpet of brown leaf litter, which is toxic to most other plants. The very common yellow-flowered cutleaf hibbertia (*Hibbertia cuneiformis*), however, is as much at home here as it is in other south coastal habitats. You can also see the sword sedge (*Lepidosperma gladiatum*) and a few small, shade-loving shrubs and ground covers.

Above: Greens Pool has a narrow beach bordering the coastal heath of peppermint, basket bush, karri hazel and chorilaena.
Photo – Marie Lochman

Right: The William Bay heathlands allow botanists to view a mixture of karri forest and coastal species. In 1981, it was the site for a group of international ecologists to examine the south coast flora. These sensitive areas are now fenced off and protected so that visitors keep to paths.
Photo – Neville Marchant/CALM

The stunning Greens Pool at William Bay, where the granitic rocks reach the water, is backed by a narrow beach with steep sandy slopes. On the beach, few plants can survive the ravages of winter storms. A foreigner, which has adapted well, is the grey-leaved sea spurge (*Euphorbia paralias*), apparently reaching Australia from South Africa some time ago. It is now widespread on beaches between Busselton and Esperance. The sandy cliffs are fragile, and the dense cover may easily give way to allow sand drifts to cover the species-rich coastal heathland.

COASTAL HEATH

The heathlands of William Bay are very varied. There are dense thickets of peppermint, heart-leaf poison (*Gastrolobium bilobum*), chorilaena and basket bush (*Spyridium globulosum*) on the sandy soils around Greens Pool. The fertile soils are very rich in organic matter, becoming almost black in winter time. The shrubs are often covered with the climbing lignum (*Muehlenbeckia adpressa*) and the rampant creeper old mans beard (*Clematis microphylla*), so-called because after its white petals drop, each flower develops a head of fruits with long, bearded hairs. On the ground, in the moist sheltered habitat created by the dense thickets, there are orchids, sundews and the ground-hugging buttercup (*Hibbertia grossulariifolia*).

The low hills east of the Greens Pool car park, and above the rounded granitic rocks that reach the water's edge, are capped with limestone. The different soil supports different species, such as parrotbush (*Dryandra sessilis*) and the ground berry (*Acrotriche cordata*). In the almost bare, rounded granitic rock slopes, the bizarre sticky tailflower (*Anthocercis viscosa*), sometimes called dead kangaroo, will grow in crevices with some respite from salt spray. Its common names come from its sticky, foul-smelling flowers, which are large and creamy white, and its sticky leaves. Where fresh water oozes from the soil mantle and onto the rocky slopes there may be a narrow zone of swamp plants, such as the blue-flowered lobelia (*Lobelia alata*). This species is also found in eastern Australia, New Zealand, South America and South Africa, a reminder that Western Australia was once joined to these lands, forming the supercontinent of Gondwana.

Near the William Bay coast, from Greens Pool to Madfish Bay, there are extensive heathlands. Numerous species of shrub grow in the humus-rich sandy soils, or in the shallow clays over the granitic outcrops. Some species are spectacular, such as the coastal banjine (*Pimelea rosea*), which has dense flower heads ranging from pink to red. There are so many heads on the one shrub that the flowers tend to

Above left: Basket bush (*Spyridium globulosum*) is very common on the southern and western coastal heaths.
Photo – Marie Lochman

Above centre: Parrotbush (*Dryandra sessilis*), a prickly shrub relative of banksia, is a prolific nectar producer that supports honeyeaters.

Above: Sticky tailflower (*Anthocercis viscosa*) grows in crevices or in shallow soil over coastal granites. The flowers and leaves have an unpleasant odour.
Photos – Jiri Lochman

Left: The peppermint tree has many variants. Some have rigid leaves, whereas others have soft pendulous ones.
Photo – Marie Lochman

Sand drifts have covered karri glades and moved on, revealing dead upper branches of once living trees. Dune plants and grasses colonise the bare sand, which may eventually be covered by heath. Photo – Jiri Lochman

hide the leaves. Another species that grows on the clay soil over granitic rocks is *Kunzea recurva*, with its brilliant pink flowers. In these heathlands one can find many species that also grow in the karri and jarrah forests further inland. Away from the winds, they can grow as tall shrubs or even small trees.

Unlike its relatives, rope banjine (*Pimelea clavata*) has only small groups of creamy white flowers scattered along its upper stems. Plants of this species growing near the coast are so different from those of the nearby karri forest that they could be mistaken for another species altogether. The coastal variant is a rounded, compact shrub with shorter, darker-coloured and somewhat fleshy leaves. This species is noted for its incredibly long, rope-like stem fibres, which are so strong that the fibre from large shrubs was used by Aboriginal people to make fish netting.

Similarly, the curry flower (*Lysinema ciliatum*) is just as common on the sandy flats of the inland jarrah forest, as it is on the west and south coastal heaths. The whole plant has a curry-like odour. This small shrub has few stems, and has a head of white flowers, which are long and covered with modified leaves. At William Bay, this species has thick leaves and larger, more closely packed flowers. Like the coastal variant of rope banjine, it too has inland populations with thin leaves and open flowers, and the change can be seen within the national park.

Many of the coastal shrubs of William Bay closely resemble their inland relatives, and can easily be distinguished. However, the common narrow-leaved water bush (*Bossiaea linophylla*), which is a tall graceful shrub with attractive yellow red-tinged flowers inland, grows on the coast as a dense shrub with intense reddish-yellow flowers. *Stackhousia monogyna* also looks remarkably different at William Bay. Here, it has fleshy leaves and thick stems, with a denser head of flowers than its counterparts growing under the jarrah trees inland from the bay. The false boronia (*Phyllanthus calycinus*), which is widespread throughout the jarrah forest, also looks notably different on the William Bay heathlands. It too has fleshy leaves and a more compact habit, which has been modified by the salt-laden winds.

Some shrubs are restricted to the coastal heath. Two that are common at William Bay are the light greenish-grey, broad-leaved, compact shrub *Olax phyllanthi*, which is a partial parasite, and the very common beach dweller, native rosemary (*Olearia axillaris*). An unusual-looking plant of the south coast heathlands is tapeworm bush (*Platysace compressa*). This member of the carrot family has tape-like stems and umbrella-shaped heads of small, creamy flowers. The yellow-flowered coastal daisy (*Senecio lautus*) is also common in the sandy soil near the water's edge.

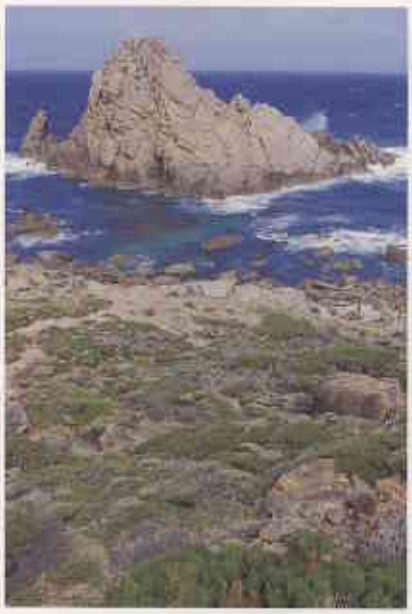
A characteristic feature of south coast national parks such as William Bay is that flowers may be found here at any time of the year. There is a peak of flowering in spring, but, even in the hottest weather, flowers can be found, especially in the concealed habitats under the karri trees or under the dense coastal shrubs.

Neville Marchant, an internationally recognised botanist with an extensive knowledge of the WA flora, is the Group Manager, Biological Information Group, CALMScience Division. He can be contacted on (08) 9334 0500 or by email (nevillem@calm.wa.gov.au).

Winner of the 1998 Alex Harris Medal for excellence in science and environment reporting.

LANDSCOPE

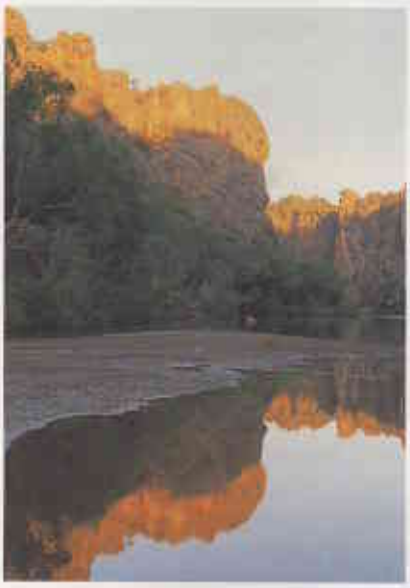
VOLUME SIXTEEN NUMBER 1, SPRING 2000



Sugarloaf Rock is just one of the many features that make Leeuwin-Naturaliste National Park the most visited park in WA. (See page 10.)

Premier Park: John Forrest National Park is Western Australia's oldest park, celebrating its centenary year. (See page 22.)

Pinnacle of Parks: These unusual formations make Nambung National Park well known the world over. (See page 36.)



Windjana Gorge National Park holds important clues to the evolution of fish. See 'Old Fossils' on page 28.

William Bay National Park displays a miniature version of karri forest flora. (See page 42.)

FEATURES

REGULARS

COVER

With 67 national parks spread across the State, park rangers are often the first contact that visitors have with the Department of Conservation and Land Management (CALM). Apart from providing visitors with information and guidance, they perform a vital role in the day-to-day management of their local environment.

Cover illustration by Gooitzen van der Meer, Western Australian artist and a graphic designer with CALM.

Executive Editor: Ron Kawalilak
Editors: David Gough and Carolyn Thomson-Dans
Story Editors: Caris Bailey, Mandy Clews and Verna Costello
Scientific/technical advice: Andrew Burbidge, Keith Morris, Paul Jones and staff of CALMScience Division
Design and production: Tiffany Aberin, Maria Duthie, Gooitzen van der Meer
Illustration: Ian Dickinson, John Long, Gooitzen van der Meer
Marketing: Estelle de San Miguel ☎ (08) 9334 0296 Fax: (08) 9334 0498
Subscription enquiries: ☎ (08) 9334 0481 or (08) 9334 0437
Colour Separation by Colourbox Digital
Printed in Western Australia by Lamb Print

Please do not send unsolicited material to *LANDSCOPE*, but feel free to telephone the Editor.

Visit *LANDSCOPE* online on our award-winning Internet site NatureBase at http://www.naturebase.net

Published by
Department of Conservation and Land Management,
Dick Perry Avenue, Kensington, Western Australia