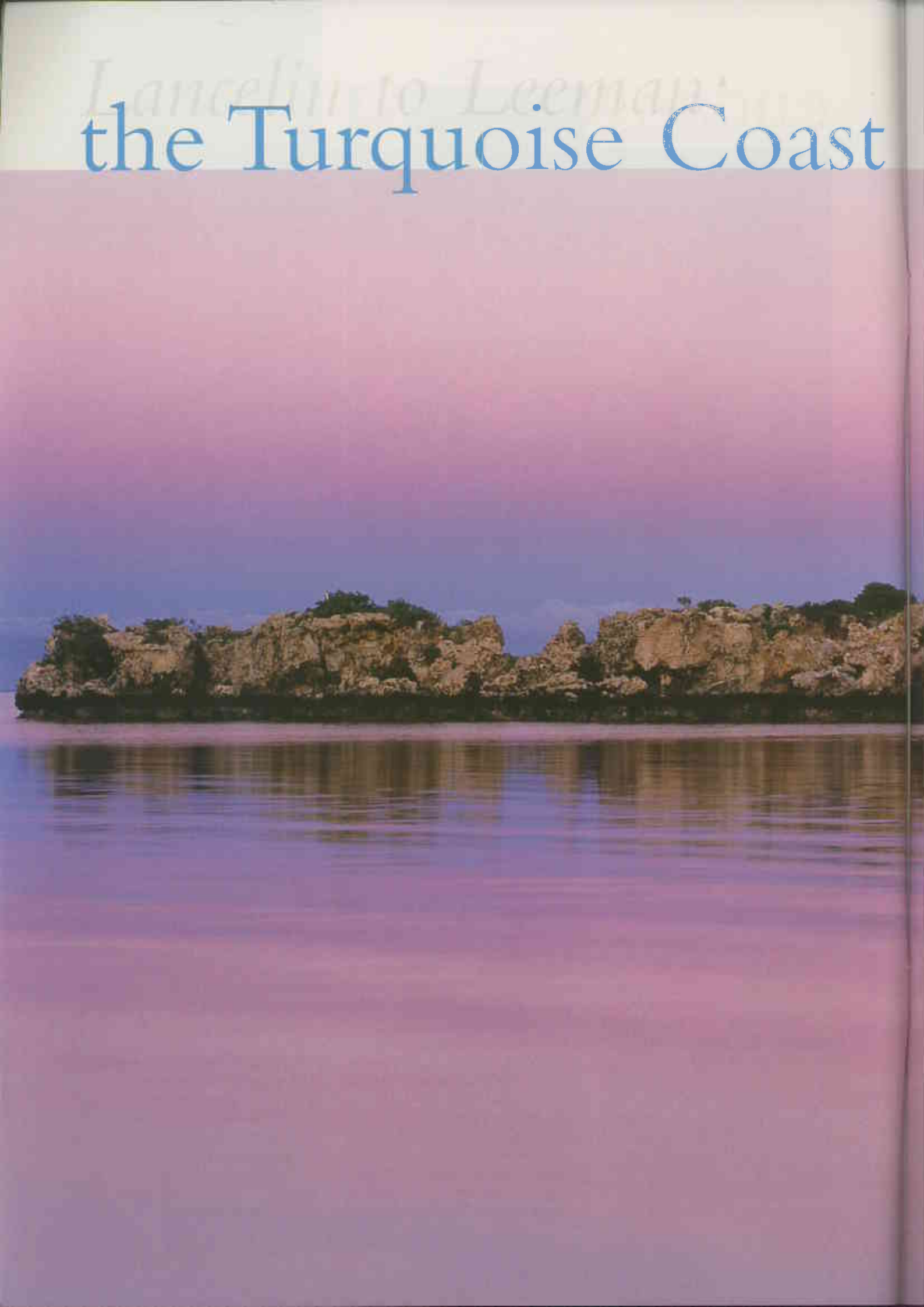
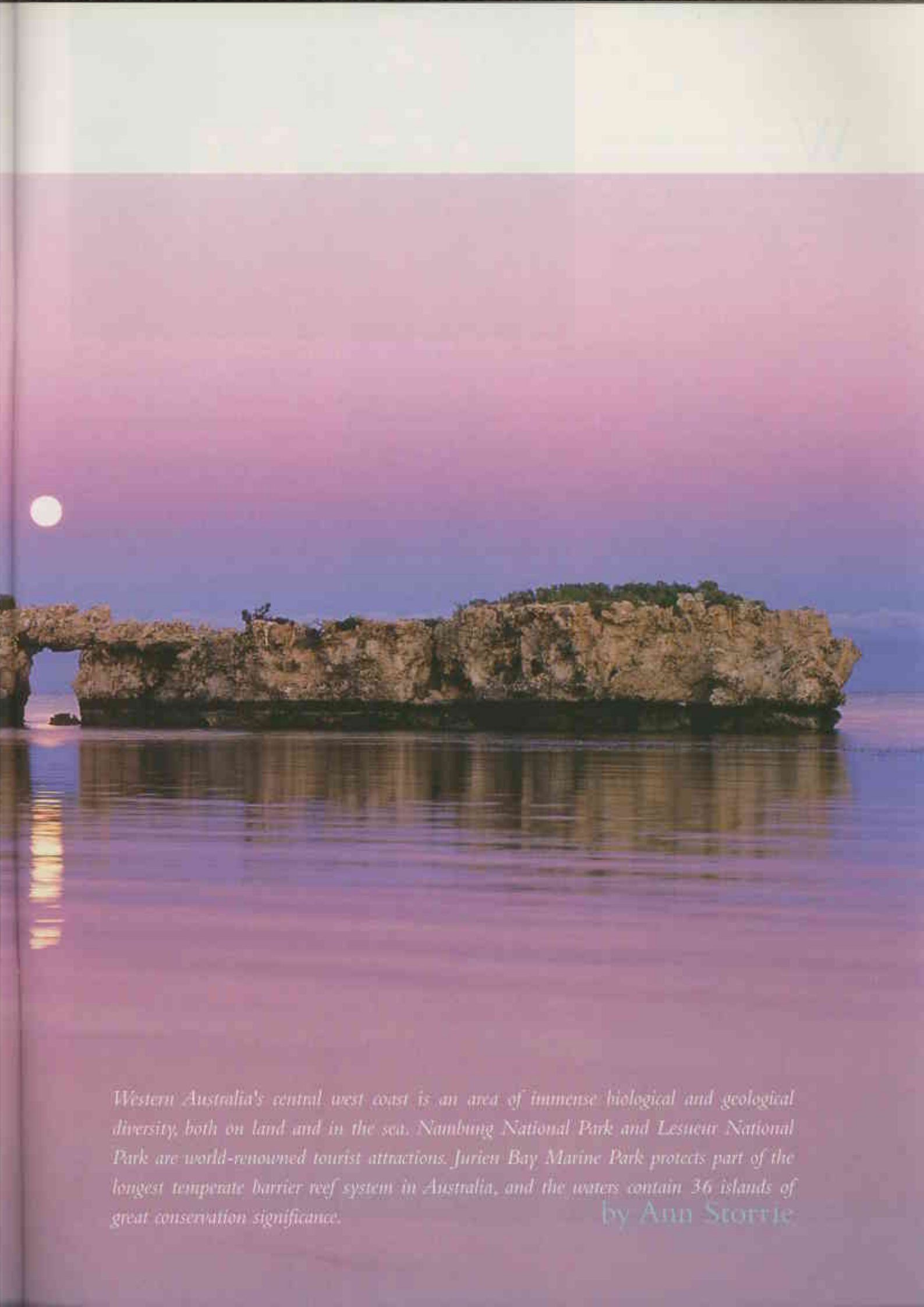
the Turquoise Coast





Western Australia's central west coast is an area of immense biological and geological diversity, both on land and in the sea. Nambung National Park and Lesueur National Park are world-renowned tourist attractions. Jurien Bay Marine Park protects part of the longest temperate barrier reef system in Australia, and the waters contain 36 islands of great conservation significance.

by Ann Storrie

Previous page
Main Window Rock in the Turquoise Coast area.

Above A local jewel beetle on a *Kunzea* species.

Below A western grey kangaroo on the grasstree-studded slopes of Lesueur National Park.
Photos – Ann Storrie

Western Australia's central west coast is one of the most diverse wildflower areas in the world, with more than 2600 species of flowering plants—an amazing 30 per cent of the species found in the south-west. The low kwongan (a Nyoongar word meaning sandy country with open, scrubby vegetation) heathland bursts into flower in late winter and spring, with perennial herbs and shrubs such as acacias, grevilleas, bottlebrushes, smokebushes, peas, coneflowers, starflowers, leschenaultias, featherflowers and orchids.

Many plants grow only in the area, and some, such as Lesueur hakea (*Hakea megalosperma*), Mount Lesueur grevillea (*Grevillea batrachioides*) and star orchid (*Thelymitra stellata*), are threatened. It is likely that several more species will be declared rare, as more than 50 species found in this area are on the Department of Conservation and Land Management's (CALM's) Priority List for further survey to assess their need for declaration.

Orchids are abundant and include the spectacular northern Queen of Sheba (*Thelymitra variegata*), Cleopatra's needles (*Thelymitra apiculata*) and Arrowsmith spider orchid (*Caladenia crebra*). Red beaks (*Pyrorchis nigricans*) and several species of large leek orchids flower profusely after fire. Other beautiful spider orchids, donkey orchids, blue orchids and tiny, delicate midge, mignonette and shell orchids are common.

Although colourful flowers are most prolific in spring, the kwongan contains flowering plants and other features of interest all year round. WA Christmas trees (*Nuytsia floribunda*), woody pear trees (*Xylomelum angustifolium*) and many eucalypts and banksias flower at the height of summer. The small white flowers of quandong (*Santalum acuminatum*) are followed by bright red round fruits on pendulous stalks in summer. The edible fruits are a favourite food for emus, which play an important role in spreading the seeds.

Nearly all plants of the kwongan have special adaptations that enable them to survive in the ancient, infertile

soils that are largely nutrient-poor and sandy. The various leaf forms help the plants to cope in the harsh environment by assisting in water conservation, more efficient nutrient production, and by deterring grazers. Many leaves are needle-like or have waxy outer cuticles that retard water loss, while others have their pores sunk below the surface. Some have spiky ends and unpalatable cuticles to keep grazers away, while one of the hakeas produces two kinds of leaves, one of which looks like a seed pod. Cockatoos tire of finding the few real pods among the many false lookalikes.

Many plants utilise bacteria or fungi that live among their root systems to take up nutrients. Some of these microorganisms convert nitrogen from the air into a usable fertiliser. Another method of obtaining nutrients is to steal them. The quandong and Christmas tree parasitise other plants through their roots.

Habitat and wildlife

Salt lakes, woodlands, mallee shrublands and swamps also provide important habitats for wildlife. Woodlands of several different types occur in sandy valleys and areas with heavier soils. Wandoo (*Eucalyptus wandoo*) and other tree species provide important habitat for cockatoos, including the endangered Carnaby's cockatoo (*Calyptorhynchus latirostris*) (see 'Recovering the rainbird', *LANDSCOPE*, Spring 2005). The birds use hollows that form in the older trees for nesting sites and feed on marri fruits, dryandra flowers and insects such as moth larvae that live in banksia cones. Jarrah (*Eucalyptus marginata*) grows in this region as a small mallee shrub, sometimes only a metre tall. It is at its extreme northern limit in the Lesueur area, with the next stand occurring more than 100 kilometres further south.

Right Spiny-tailed gecko.
Photo – Ann Storrie

Breakaway country is formed when the softer sides of a laterite-topped hill erode away. The remnant laterite breaks away from the edge in chunks and rolls down the hill, forming a scree, or boulder, slope. The additional water run-off from the rocks allows slightly taller shrubs to grow here. Many breakaways overlook the low undulating plains of this region, and provide good cover for many reptiles and small mammals, including echidnas.

The rough limestone country of the Turquoise Coast has produced many subterranean caverns. Many are deep, dangerous to negotiate and hold delicate cave formations. Hence, they are closed to the public. The Stockyard Gully Tunnel is a spectacular cave that can be negotiated with care. An excellent walk, around and through the tunnel, has been constructed for visitors. At least four species of bats

Top left Wandoo at Coomallo Nature Reserve.

Centre left Abundant melaleuca blossoms at Beekeepers Nature Reserve.

Left Stockyard Gully Tunnel is an accessible cave.
Photos – Ann Storrie

Above Firewood banksia (*Banksia menziesii*).
Photo – Sue Morrison

have been found in the region, and many swallows build their nests on the ledges at cave entrances.

Some remarkable wildlife is found in the region. East Beagle, North Fisherman and Buller islands are the only Australian sea-lion (*Neophoca cinerea*) breeding sites on the west coast of Australia, apart from some small colonies on the Houtman Abrolhos Islands. The endangered dibbler (*Parantechinus apicalis*) is now found on three islands in the area, having been introduced to the mouse-free Escape Island in Jurien Bay. The threatened Boullanger Island dunnart (*Sminthopsis griseoventer boullangerensis*) is known only from Boullanger Island in Jurien Bay and the threatened Lancelin Island skink (*Ctenotus lancelini*) is known only from the 7.6-hectare Lancelin Island.

Pinnacle of scenery

One of the most scenic attractions in WA is the Pinnacles Desert in Nambung National Park. More than 200,000 visitors (many on day trips from Perth) view these amazing pillars of limestone every year. The pillars formed over thousands of years as a result of chemical, water and wind erosion, that left all but the most resilient limestone standing. Some pinnacles reach nearly four metres high and can be two to three metres wide at the base. They are sculpted into fantastic shapes and forms. Watching the sunset from the pinnacles, looking west to the ocean, can be spectacular, along with sunrises, full moons, thunderstorms and lightning flashing through the surreal forest of limestone.

The shifting yellow sands surrounding the pinnacles are fascinating in themselves. Photographers are drawn to the mobile dunes, and the shadows and windswept patterns that cascade down their steep leeward sides. These naturally mobile sand dunes can advance up to 10 metres a year, smothering vegetation in their path. They stabilise as plants recolonise the trailing dune slopes.

Right The Turquoise Coast is the only breeding site on the west coast of Australia for Australian sea-lions.

Below The Pinnacles in moonlight.
Photos – Ann Storrie

To obtain the most sweeping views of this area, climb Mount Lesueur. On a clear day, you can see west to the ocean while surrounded by the hills and valleys that make up the many different vegetation systems of Lesueur National Park.

Underwater wonders

The coast between Wedge Island (north of Lancelin) and Green Head (north of Jurien) was declared a marine park in August 2003 (see 'Vision Spendid', *LANDSCOPE*, Spring 2003). The Jurien Bay Marine Park surrounds many offshore islands and protects limestone reefs, lagoons, seagrass meadows, and rocky and sandy shores.

Jurien Bay Marine Park has been described as a temperate version of Ningaloo Reef. Its extensive limestone reefs contain breathtaking caves, walls and overhangs. Colourful sedentary invertebrates such as sponges, hard and soft corals, hydroids, bryozoans and sea squirts densely cover the limestone walls and provide food and shelter for thousands of mobile invertebrates such as banded coral shrimp (*Stenopus hispidus*), crabs, cowries, nudibranchs, sea stars and urchins. Western rock lobsters or crayfish (*Panulirus cygnus*) crowd beneath crevices and overhangs, waving their long antennae to detect danger.

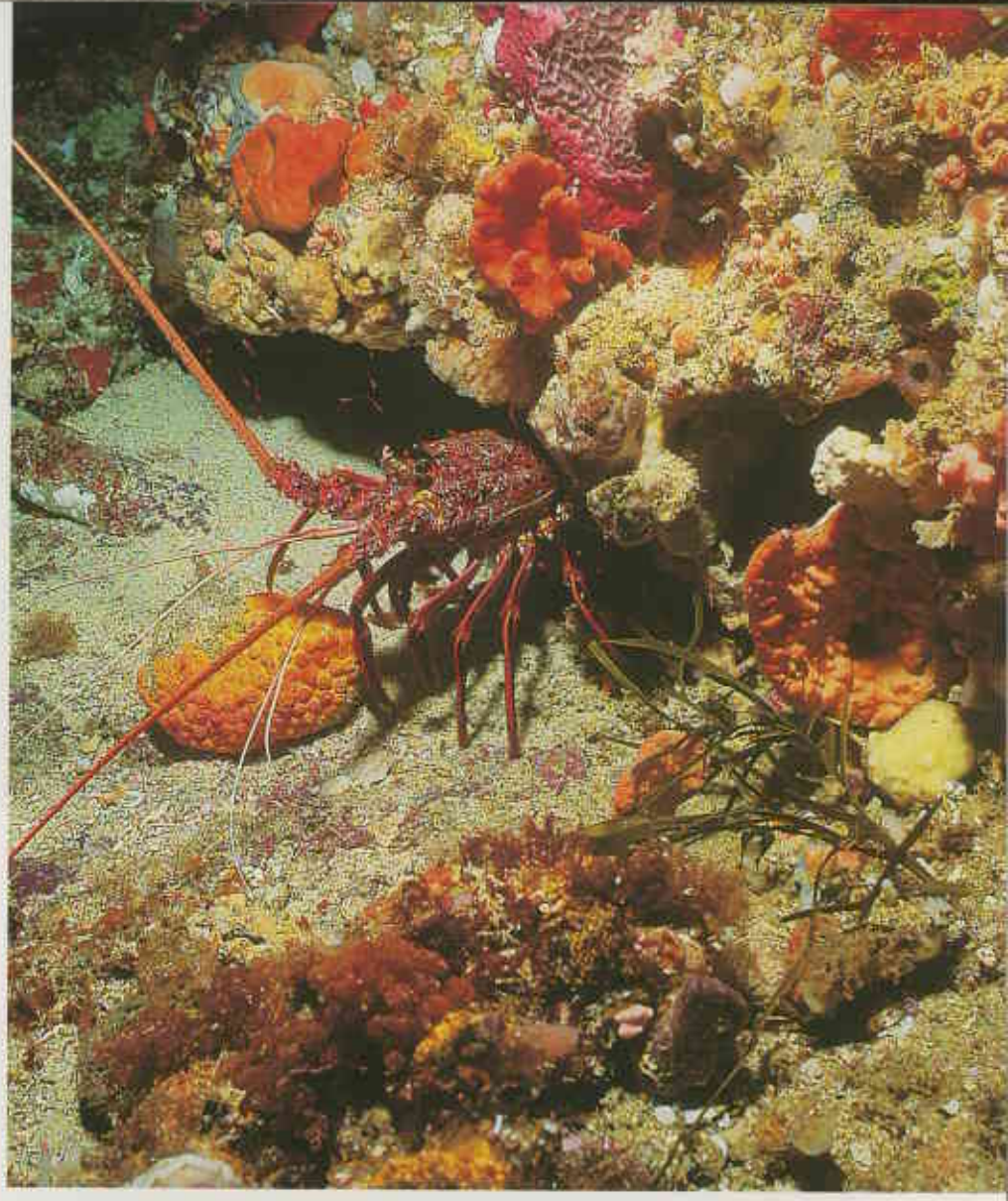
Species from warm, tropical northern waters and those more typical of cool, temperate waters of the south overlap in the park's biologically diverse marine environments, and the waters are relatively pristine. Divers can marvel at the presence of tropical fish such as red firefish (*Pterois volitans*) and Miller's damselfish (*Pomacentrus milleri*) living side by side with temperate water harlequin fish (*Othos dentex*) and western scalyfin (*Parma occidentalis*). Tropical sabretooth blennies (*Aspidontus dussumieri*) and blue-striped cardinalfish (*Apogon cyanosoma*) are at the most southerly limits of their distribution, while Jurien Bay Marine Park is at the northernmost limits of the range of temperate species such as queen snapper (*Nemadactylus valenciennesi*), moonlighters (*Vilodon sexfasciatum*) and King George whiting (*Sillaginodes punctatus*).

Primary producers

Rocky reefs make up around 33 per cent of the marine park. As well as the colourful invertebrates and fish life

Left Jurien Bay Marine Park is packed with spectacular marine life.

Below The beautiful Spanish dancer, one of the larger nudibranchs, swims by undulating its mantle.
Photos – Ann Storrie



Right At night, western rock lobsters emerge to feed amongst algae and seagrass.
Photo – Sue Morrison

Below right Common seadragon.
Photo – Ann Storrie

that congregate on the reefs, their solid surfaces are essential for the growth of many types of algae (seaweeds) that are, in turn, an essential part of the ecosystem. Preliminary results from current survey work indicate that there are at least 300 species of algae in Jurien Bay Marine Park, making it one of the more diverse areas for seaweeds in Western Australia. Algae produce energy by photosynthesis (they use energy from sunlight to convert carbon dioxide into food) and, in turn, provide energy for the many animals that eat them. Algae also provide huge surface areas and a wide variety of nooks and crannies in which animals can live and hide. Although often overlooked by divers, many algae are very colourful with unusual textures and shapes.

More than 25 per cent of the park contains seagrass meadows (see 'Microcosm in the ocean meadows' in this issue). At least 11 seagrass species occur here, some of which are at the northern and southern limits of their distribution. The seagrass beds provide important habitats and nursery areas for many marine species including important commercial fish species and western rock lobsters. Like algae, seagrasses are primary producers, supplying food at the bottom of the food web. Some animals such as spider crabs, swimmer crabs, garfish and leatherjackets graze directly on living seagrass, while a host of animals such as shrimps, amphipods, molluscs, sea stars, sea cucumbers and worms feed on decaying seagrass leaves.

Another important food source in the seagrass beds is the algae that grows on the seagrass. The seagrasses provide the only substantial site for the attachment of algae in sandy areas. These epiphytic algae are eaten by a huge range of invertebrates that attract many predators such as small fish, crabs and lobsters, which in turn attract larger predatory fish. Invertebrates such as sponges, anemones, corals, hydroids, bivalves and sea squirts also live in the seagrass beds.

Seagrass beds also stabilise sediments and shorelines with their root systems. They absorb dissolved nutrients and convert them into plant material. The filter-feeding invertebrates living in the seagrass meadows are estimated to be able to filter the overlying water at least once a day. As seagrasses are very susceptible to any decrease in water clarity, these invertebrates help the seagrasses survive, by reducing turbidity in the water.

Above Australian pelican near Milligan Island.
Photo – Ann Storrie

Below Variety of red algae and a yellow sea star (*Fromia polypora*).
Photo – Sue Morrison

Exceptional marine life

Bizarre and fascinating sea creatures found in the Jurien Bay Marine Park include weedy seadragons (*Phyllopteryx taeniolatus*) and leafy seadragons (*Phycodurus eques*), which shelter in the beds of kelp and seagrass. These amazing plankton-eating fish are camouflaged so perfectly among the waving fronds that they can disappear within the blink of an eye. Divers tempted to hold the dragons and take them to the surface to show fellow divers and snorkellers could rupture their delicate swim bladders. If you are lucky enough to find a dragon and cannot attract your buddies to it, savour the experience all for yourself.

If you dive anywhere within Jurien Bay, don't be surprised if you are being watched. Lying in the seagrass or on the sand just behind you may be an Australian sea-lion. These curious mammals delight in watching and playing with divers. Divers may be startled by a huge dark shadow zooming past, just metres in front of them. Sea-lions usually come back for a second look, and will often play in your bubbles and follow you around for part of the dive. Australian sea-lions—the rarest sea-lions in the world—are given special protection under WA's Wildlife Conservation Act. Although sea-lions rarely show aggression underwater, people have been bitten. If approached in the water, the Act states that you must maintain a distance of at least 10 metres from the animal. Don't try to follow or touch and never attempt to feed them. If a sea-lion becomes aggressive, it is best to leave the water.

Park management

To protect this important marine environment, CALM has implemented a 10-year management plan developed by a community-based committee. This includes setting up areas for scientific monitoring of fish stocks and puerulus (the tiny, post-larval stage of the rock lobster), high-protection sanctuary zones, general purpose areas and aquaculture. Recreational and commercial fishing of fish species, abalone and rock lobsters are being monitored, along with ecotourism activities. Public education and participation activities, school programs and research programs are well under way.

Effective management of Jurien Bay Marine Park is vital to preserve its unique marine environments and ensure sustainability of our fisheries. It will depend largely on cooperation and participation from local communities and visitors. Management of the marine park can be undertaken in parallel with the adjacent land-based national parks of the Turquoise Coast, where research and ecotourism play a big part in education and general appreciation of our wonderful landscape, wildflowers and wildlife.

Ann Storrie, a freelance writer and photographer, has coauthored the CALM books *The Marine Life of Ningaloo Marine Park and Coral Bay*, *Wonders of Western Waters* and *Beneath Busselton Jetty*. She is a regular contributor to *LANDSCOPE* and can be contacted on (08) 9385 9355.

A forthcoming book, *The Turquoise Coast*, written and photographed by Sue Morrison, Ann Storrie and Peter Morrison, will be published by CALM in the near future as a guide to the wildflowers, wildlife, history, towns, sights and industry of this area.

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