# The **Geraldton** to **Shark Bay** sandplain

## A strikingly beautiful biodiversity hotspot

A biologically significant area, the Geraldton to Shark Bay sandplain is home to rich and diverse plant and animal life. A number of acquisition and rehabilitation projects are working to restore the area to its former state and protect it from threats.

by Samille Mitchell and Maria Lee

Take the time to wander through an expanse of native bush in the Geraldton sandplains bioregion (which includes Shark Bay) and you'll discover a natural wonderland rich in strikingly beautiful landscapes and plant and animal life. Tiny reptiles scurry through the undergrowth, birds soar on the winds above and rare marsupials hide in the undergrowth. The flora is especially impressive in spring, when the true nature of this incredibly biodiverse region is revealed. For, in spring, the earthy colour of the soils and the greens and browns of the bush erupt into seas of dazzling colour. Brilliant yellows, pinks and whites carpet the landscape as everlastings burst into bloom. The bushland explodes with the colour of thryptomenes, grevilleas, eremophilas and a kaleidoscope of other flowers—all with their own unique design.

However, many of these animals and much of this spectacular annual wildflower display are confined to roadsides and conservation reserves. You see, large tracts of this flora-rich landscape have succumbed to pressures such as land clearing, stock grazing and weeds. The biodiverse nature of the region and the fact that it is threatened has earned the Geraldton to Shark Bay sandplain its position as a national biodiversity hotspot.

The Geraldton to Shark Bay sandplain hotspot also falls within the confines of the south-west of Australia—an area listed as an international biodiversity hotspot. This listing also recognises the region's biodiverse nature, endemic species and the fact that it is under immediate threat.

## What's a hotspot?

Biological diversity—these days more commonly known as biodiversity—has arisen as a result of millions of years of evolution. Each species has evolved and adapted to result in today's incredible selection of life. This myriad of living diversity is forever dynamic, increasing with the onset of a new genetic variation, a new species or a new ecosystem and decreasing when species become extinct, when genetic variation decreases or when an ecosystem dies.

Hotspots are areas that are rich in plant and animal species, particularly endemic species, that is, species that live nowhere else in the world. If the world were to lose any of these areas, it would also lose the plants and animals that inhabit them. In the case of endemic plants and animals, these species would be lost forever.

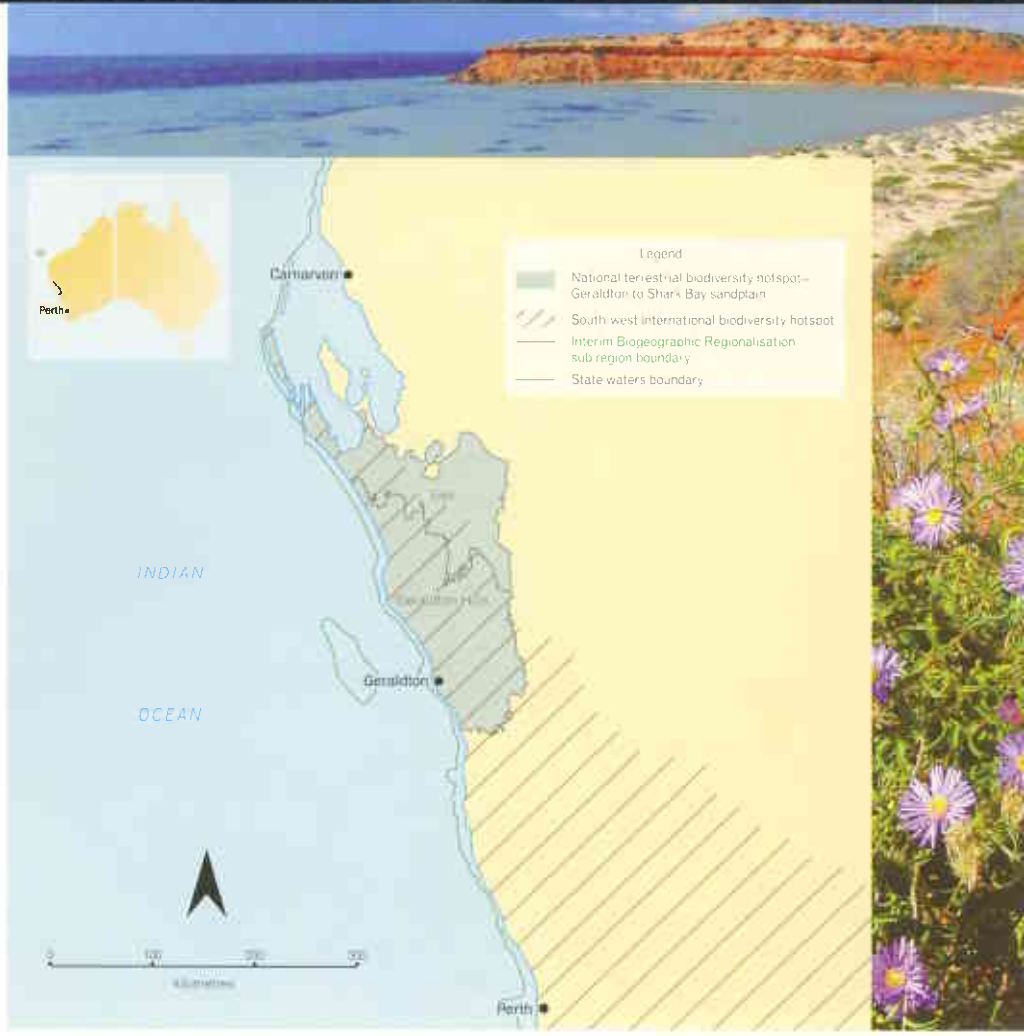
While this is an abhorrent thought, it is a possibility. To be classified as a hotspot, a region must also be under immediate threat. This means the region's plants and animals could succumb to impacts such as land clearing, development pressures, salinity, weeds and feral animals. Classifying these special areas as biodiversity hotspots is designed to raise public awareness of our environmental heritage at risk and to support strategic actions to conserve it.

There are two levels of hotspot rating—international and national. Conservation International, a non-profit international organisation working to conserve the Earth's biodiversity, identified 34 international

*Previous page*
**Main** Sand dunes at Cape Lesueur, in Francois Peron National Park.
*Photo – Jiri Lochman*
**Inset** Thorny devil.
*Photo – Cliff Winfield*

**Above** A sea of wildflowers south of the Overlander Roadhouse.

**Left** Everlastings.
*Photos – Samille Mitchell*




**Above** The Murchison River in Kalbarri National Park.
*Photo – Samille Mitchell*

biodiversity hotspots across the globe, of which one lies in Australia—the south-west of Western Australia. This region stretches from the southern shores of the State, north to Shark Bay. Conservation International selected these special areas because of their plant diversity.

To qualify as a hotspot, a region must support 1500 endemic plant species—0.5 per cent of the global total. As well as this unusually high species number, to be classed as a hotspot the region should also have lost at least 70 per cent of its primary vegetation.

Following the lead of Conservation International, the Australian government's Threatened Species Scientific Committee, and recognised experts in the field, identified 15 national biodiversity hotspots in Australia in 2003—the first government in the world to do so. The guidelines for selection were not as exacting as for international hotspot classification, but the results are the same—recognition of areas of high biological diversity that are under threat. By classifying these areas, the government has earmarked them for special protection and funding.

## Biological importance

The Geraldton to Shark Bay sandplain biodiversity hotspot sweeps from the Shark Bay peninsulas, at the westernmost tip of Australia, to the patchwork of rolling hills around Geraldton and Dongara. It includes landscapes as varied as the sand dunes of Shark Bay's Francois Peron National Park to the plummeting river gorges at Kalbarri National Park and the flat-topped slopes of the Moresby Range near Geraldton.

The region is the meeting place of the South-West and the Eremaean botanical provinces. This makes for an unusually diverse selection of flora. Here, you'll find the cooler climate plant varieties of the south-west, such as banksias, growing side by side with desert plants of the semi-arid north and interior, like eremophilas. What's more, this region has also recently become known for its examples of gigantism, that is, species growing in forms much larger than normal.

However, many of these flora species have suffered the consequences of threats such as grazing and land clearing. Some 25 plant species have been declared critically endangered, 23 are endangered and 17 are vulnerable.

Animals in the Geraldton to Shark Bay sandplain are just as important to biodiversity. This region is so diverse in reptiles, particularly in the north, that some nine reptile species in the Shark Bay area are found nowhere else in the world. However, more than 40 per cent of the region's original mammal fauna is now regionally extinct. Three mammal, three turtle and two bird species have been declared endangered and five mammal, seven bird and two reptile species are vulnerable. These include the malleefowl, bilby, Baudin Island spiny-tailed skink, woma python, black-footed rock-wallaby and tammar wallaby.

## Threats

While the Geraldton to Shark Bay sandplain boasts an incredible selection of plant and animal life, these seemingly hardy life forms are

**Left** Skipjack Point, Francois Peron National Park.
*Photo – Samille Mitchell*

## Peron Peninsula – a haven for threatened wildlife

Peron Peninsula is home to one of the most successful captive breeding and reintroduction projects in the State—Project Eden (see 'Approaching Eden', *LANDSCOPE*, Autumn 1998). Here, on the rust red sand dunes among the desert shrubs, some of the State's most threatened mammal species have been given another chance to become reestablished.

These mammals once roamed the peninsula naturally. In 1801, when François Peron visited on the Nicolas Baudin expedition, some 23 species of mammals were present. However, by 1990, less than half of these species remained. Predation by ferals such as cats and foxes, habitat destruction, and competition for food by stock and rabbits had taken a deadly toll.

After the State government purchased the former Peron Station, CALM removed all the station's sheep and cattle in 1994 and more than 12,500 goats, prior to making part of the area a national park. The following year, CALM erected a 3.4-kilometre, two-metre-high fence across the peninsula to control reinvasion from the south and embarked on extensive baiting of feral animals, through its massive *Western Shield* program. This proved highly successful at eradicating foxes and cut the cat population by 50 to 70 per cent.

Next, CALM reintroduced locally extinct animals such as the woylie, bilby, malleefowl, banded hare-wallaby and rufous hare-wallaby. The banded hare-wallaby and rufous hare-wallaby introductions floundered because of cat predation and starvation during drought but the malleefowl, woylie and bilby populations flourished. Indeed, the bilbies bred to the extent that the Peron reintroductions are regarded as the most successful yet.

During this time, CALM established a captive breeding centre to provide animals for reintroductions. The centre has since bred more than 450 animals.

Today, CALM continues to control feral animals through baiting and trapping programs and plans further releases of native animals. With continued work, one day Peron Peninsula's animal population may approach something akin to that which François Peron himself enjoyed more than 200 years ago.

threatened by a range of impacts—largely caused by people.

Land clearing, livestock grazing, weed introduction, and feral animal predation and competition for food have brought about the demise of several mammal species and put many endemic flora species under threat. Just 14 per cent of the Geraldton Hills subregion is protected in conservation reserves, while 64 per cent is used for dry land agriculture. Of the conserved area, 68 per cent lies within the Kalbarri National Park. In Edel subregion a large proportion of the land is used for pastoral purposes.

While land clearing is not as much of a problem that it is in southern regions of WA, it has had some effect throughout the region, particularly around Geraldton. Here, large tracts of land have been cleared for agricultural purposes. In many areas only land unsuitable for farming, such as the Moresby Range and breakaway country, remains. This reduces the amount of native flora in a region and results in destruction of habitats for native wildlife. In severe cases, it can also contribute to serious widespread environmental problems throughout the agricultural landscapes.

Although the Geraldton to Shark Bay sandplain has escaped much of the perils of land clearing, livestock has taken a heavy toll. The hooves of countless sheep and cattle have roamed the region's pastoral plains during the past 100 years, trampling native flora in the process. This has contributed to erosion, lack of feed for native animals and destruction of habitats. While pastoralists today are much more environmentally aware than in previous times, their work to remedy the effects of overgrazing will take years. In many areas, the effects of overgrazing are clear—landscapes once covered with vegetation are degraded.

Introduced species have also taken a toll on the region's natural environment.

**Above** Black-footed rock-wallaby.
*Photo – Jiri Lochman*

**Above right** The Moresby Range.
*Photo – Bill Belson/Lochman Transparencies*

These weeds strangle native vegetation and take over entire ecosystems, wiping out habitats and food sources for native animals in the process. Over time, these weeds can also transform landscapes from areas of shrubland to open communities that are more prone to fire. Weed growth is generally greatest in areas of disturbance.

The spread of feral animals into the Geraldton to Shark Bay sandplain is a key reason for the alarming extinction rate of native mammals in the region. Foxes in particular, and probably cats, have decimated small mammal populations. Native species like the Shark Bay mouse, boodie, rufous hare-wallaby, banded hare-wallaby and western barred bandicoot are now restricted to islands such as Bernier and Dorre, 50 kilometres from Carnarvon. These islands have remained free of cats and foxes and are tiny remnants of these species' former range.

While foxes and cats prey on the native mammal and reptile species, rabbits, goats and pigs compete for food, trample native vegetation and soil and erode landscapes by grazing the native growth. Together, these species are also responsible for native plant and animal decline.

## Protecting wildlife habitats

The Department of Conservation and Land Management (CALM) has embarked on a host of initiatives to protect the wildflowers, wildlife and ecosystems of the Geraldton to Shark Bay sandplain. Key to this protection is the *Western Shield* program—CALM's Statewide battle to combat introduced predators and reintroduce native animals into their former habitats. The program has three main focuses: baiting foxes on an unprecedented scale, controlling feral cats and reintroducing native animals. In the Geraldton to Shark Bay sandplain area, the program has been most used in Francois Peron and Kalbarri national parks.

CALM has also embarked on a major land acquisition program, selectively purchasing pastoral leases from owners looking to sell. In the Geraldton to Shark Bay sandplain region, CALM manages Francois Peron National Park (part of what was once Peron Station and now the site of Project Eden—see box opposite) and has purchased Nanga Station. The State government recently agreed to purchase the historic and biologically important Dirk Hartog Island from the current owners of the island's pastoral lease. It is also negotiating to take on the northern portion of Carrarang Station (see 'Steeped in beauty' on pages 10–17). By managing these areas, CALM hopes to dramatically increase the relatively small proportion of land protected in conservation reserves. The removal of stock will allow the land to rejuvenate and encourage native plants and animals to return.

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# contents



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