

The arid Australian environment

Australia is famous for its beautiful and mysterious desert landscapes. More than 70% of Australia is arid, or semi-arid, where rainfall tends to be unreliable and erratic, which means that the amount and composition of vegetation can change substantially following good rains. These deserts host a fascinating array of plants and animals and are popularly known as the Red Heart from the incredible colour range of the soil, hills, valleys, mountains and vegetation.

Many arid zone species survive because they are able to make the most of the wet times and survive through the dry. Some species that cannot move very far, like frogs, may lie dormant underground in dry river beds until rain comes to stimulate them. Some species that can move long distances, like certain birds such as pigeons and parrots, can fly to where there is water.

Water often only lasts a short time in arid zones, so species have to react quickly to take advantage of their brief opportunity for reproduction.

Natural environmental forces

The environment is dominated by three forces: low, unpredictable rainfall, patchy infertile soils and fire. More recently, since European settlement, the environment, particularly vegetation, has been badly affected by a fourth factor - grazing by introduced animals such as cattle and camels.

Put simply, the arid and semi-arid lands are those remote, sparsely populated areas of inland Australia, defined by the presence of desert vegetation and land forms as well as by low rainfall. They are bound by average annual rainfalls of about 250 mm in the south but up to 800 mm in the north and about 500 mm in the east. Together with subtropical regions and the mountain high plains, they form the rangelands, where rainfall is too low or unpredictable or where terrain is too inhospitable for sustainable cropping or timber harvesting.

Unusual vegetation

The vegetation of the arid lands has been especially adapted and has a strong influence on land use and productivity. The saltbush, mulga and grassy plains provide pasture for sheep and cattle as well as habitat for a range of unique mammals and birds. In the dry infertile interior, the spinifex-covered sand plains and stony deserts are too tough for livestock. Instead they are home to a multiplicity of termite species and the world's richest lizard fauna.

It is an uncompromising environment at times but never monotonous. The climate of arid Australia is more variable than in arid lands anywhere else in the world, with highly erratic rainfall, extremes of long dry periods and flooding deluges. As well, soils are characteristically very infertile over vast areas compared to other deserts of comparable aridity.

The range of flora and fauna occupying the various ecosystems also contrasts with that from other arid regions of the world. Major differences in the Australian arid landscape include the lack of many succulents, the small number of large mammals and the high numbers and diversity of lizards as well as social insects such as ants and termites. These factors combined determine the arid zone's uniqueness. Whoever uses this land must come to terms with its variability or risk destroying its rich potential.

The outback

Many Australian children have learned to recite Dorothea MacKellar's words: "I love a sunburnt country, a land of sweeping plains, of ragged mountain ranges, of droughts and flooding rains." The outback is regarded by most Australians as part of the nation's heritage and, although Australians are largely urban people, many retain a romantic image of the outback pioneers forged in the tradition of mateship and love of the land they wrested from the wilderness.



The spinifex pigeon (Geophaps plumifera), a bird of the arid northern interior. Their habitat is spinifex grassland with rocky outcrops and hills. Diet of the spinifex pigeon mainly consists of seeds of native grasses, especially Triodia



The red kangaroo (Macropus rufus) is the largest marsupial in the world. Males are larger than females, standing a massive two metres tall and weighing approximately 85kg. The female is often called the “blue flyer” because of her blue-grey fur. Their main food is grasses and green herbage. The red kangaroo’s habitat is mulga and mallee scrub and deserts of mainland Australia. A single young is born at anytime of the year. The joey remains in the pouch for eight months and continues to suckle until twelve months of age. Weaning occurs at eighteen months

Realities are different today: rather than fighting nature, we must learn how to live with it. Australia and indeed the world are concerned about land care and the preservation of land use options for future generations. The obligation to maintain the arid lands and its unique wildlife is shared by many groups of people. We must look at the long sustainability of our land and its unique flora and fauna.

The need for a heightened awareness of the arid zone is the more significant because there is no Federal Government ministry with responsibility for arid land affairs. Not one of the Australian states and territories supports a government portfolio for arid land issues. There is no single purpose institute for either pure or applied research into arid zone systems.

Our Society believes there should be a more coordinated approach to arid land management to take into account the holistic management and long term sustainability of our unique flora and fauna. Federal and state/territory governments should review and coordinate their various agencies’ work to more fully protect our precious wildlife in all its forms.

Watering arid Australia

What happens when you introduce water to arid Australia? Do you turn it into a Garden of Eden? Not really. Rather than adding life, the latest research from CSIRO’s Division of Wildlife and Ecology indicates that the widespread introduction of water supplies to the arid outback is actually reducing the variety of life.

Before European settlement the outback was practically waterless. But now, artificial sources of water for livestock (such as bores and dams) have been provided across nearly all the potentially productive rangelands. There are few pastoral areas further than 10 km from the nearest water (the greatest distance most large grazing animals will usually range from water). This has dramatically increased grazing pressure across vast areas that were previously waterless, and lightly and intermittently grazed.



Red-tailed black cockatoo (Calyptorhynchus magnificus) is mostly arboreal but is frequently encountered feeding on the ground on seeds of eucalypts, casuarinas, banksias and also large white grubs. This magnificent bird is noisy, wary and conspicuous. They nest high in a hole in a tree



Thorny devil (Moloch horridus). This bizarre-looking dragon lizard is found only in the drier parts of central and western Australia. It feeds exclusively on ants, and may eat up to 5,000 in a single meal! Despite its fearsome appearance, it is completely harmless

How has this affected native biodiversity? Environment Australia asked CSIRO's Division of Wildlife and Ecology to find out, and their study has revealed some disturbing trends. The Division examined 48 carefully selected sites in eight locations across Australia's rangelands to assess the effects of artificial water sources, and the heavy local grazing they encourage, on biodiversity. The investigation showed that between 15% and 38% of the plant and animal species in each location declined dramatically the closer you got to the water source. Further, many of these species in decline are the less common animals and plants that are quite vulnerable to loss of habitat.

Arid zone degradation

Arid areas are among the worst affected by the impacts of domestic feral cats, other feral animals and damages caused by European settlement. However, few conservation projects have targeted arid areas in the past.

Over the past 100 years, many drastic changes have occurred in the arid environment area. Over 60% of the mammal species have become locally or completely extinct, while many remaining species are threatened. Ground dwelling birds become extinct or endangered. Long-lived arid zone trees and shrubs have been prevented from regenerating.

Long-lived plant species are being replaced by short-lived annual and weed species.

Why have so many plants and animals disappeared?

The main reasons for the decline of local native fauna and flora are overgrazing by rabbits and domestic stock; predation from introduced animals like the feral cat and fox. It is estimated that Australia has some 12 million feral cats doing untold damage to our native fauna!

Feral cats are abundant in arid regions and can each kill up to 30 native animals a day. Medium sized mammals are the most susceptible to predation by both cats and foxes due to their easy prey size and inability to roam out of areas containing feral animals. This loss is calculated to be approximately 3.6 billion native animals lost per year.



Bilby (Macrotis lagotis). Once called the common rabbit bandicoot, the bilby is now restricted to a few small locations in remote Central and Northern Australia. Bilbys obtain water from a diet of insects, tubers, fruits and seeds, found in soil with their acute sense of smell. Two young are reared in a backward opening pouch. They avoid the extreme daytime heat in an extensive warren system about three metres long and up to two metres deep

One feral cat shot at Roxby Downs, South Australia had the following in its stomach:

24 painted dragons, 3 bearded dragons, 2 earless dragons, 3 striped skinks, 1 zebra finch, 1 house mouse the result of a single meal!

In some arid areas, introduced rabbit numbers have been measured at densities of more than 600 per km. Rabbits, along with domestic stock, considerably reduce native grass cover which reduces food and shelter for native species. This reduction in vegetation cover increases susceptibility to predation by cats and foxes.

Since the inception of grazing in arid rangelands of Australia, there have been extensive vegetation changes. These include the decline in long-lived perennial shrub cover and their replacement with shorter lived colonizing species. Many parts of arid Australia were severely over-grazed by sheep and cattle during the advent of pastoralism in the 19th Century. Whilst current pastoral practices are much more conservative there are still areas heavily degraded by pastoralism.

Need for more research

Research by various bodies is still proceeding, but the challenge is clear. We need to manage our artificial water supplies in arid Australia to protect biodiversity. In the first instance scientists are calling for water points to be shut down in national parks. Following this, selected water points on pastoral lands might also be considered where agreement can be reached with local pastoralists and the industry. The aim is to strike a balance between the needs of the pastoral industry with the needs of threatened native plants and animals.

There is still much to learn about our arid interior.



The black honeyeater (Certhionyx niger) is a rarely seen desert nomad that follows the flowering of Eremophila (emu bush) in the semi-arid and arid regions of WA. It is an unmistakable bird, boldly marked with black and white, and has a distinctly curved bill