Gibson Desert

Undulating buckshot plains supporting hummock grassland with Mulga scrub overstorey in valleys dominate the Gibson Desert Bioregion, W.A.
Photo: N.L. McKenzie

Description

Bioregional description and biodiversity values

The bioregion comprises solitic gravelly sandplains and laterised upland on flat-lying Jurassic and Cretaceous sandstones of the Canning (Gunbarrel) Basin.

Vegetation is described as 'Carnegie Botanical District', Mulga parkland over *Triodia basedowii* on lateritic "buckshot" plains.

There is mixed shrub steppe of *Acacia, Hakea* and *Grevillea* over *Triodia pungens* on red sand plains and dune fields. The lateritic uplands support shrub steppe in the north and mulga scrub in the south. Quaternary alluvia, associated with palaeo-drainage features, support Coolibah woodlands over bunch grasses.

The climate is arid, with mainly summer rainfall, 200mm annually. The two subregions are the Lateritic Plain, a monotonous, gently undulating plain with a few sandstone mesas, and the Dune Field, dominated by red dune fields mantling Permian strata of Gunbarrel Basin.

Rare species include:

- night parrot,
- marsupial mole,
- bilby,
- black-footed rock wallaby,
- malleefowl,
- princess parrot,
- woma python,
- mulgara,
- *Eremophila viscimarginata,*
- *Melaleuca apostiba,*
- *Neurachne lanigera* and
- *Philotheca eremicola.*

There are:

- 12 hummock grassland associations,
- three shrublands,
- two sedgelands,
- two low woodlands,
- two succulent steppes,
- two mosaics (including various forms of hummock grasslands and sparse woodland),
- gorge communities and
- a wooded coolibah freshwater wetland.

Rare features include Lake Gruszka, and the Gibson Desert gnamma holes. The region is rich and diverse in both its flora and fauna however most species are wide ranging and usually occur in at least one, and often several, adjoining deserts. Over 90 per cent of three vegetation associations occur in the Lateritic Plain and could be considered endemic to the region.

Overall condition and trend

There is considerable mineral exploration interest, but there are no major mines in this bioregion.

Numerous critical weight range mammal species have become extinct, while persisting populations of other mammals have declined and are under pressure from foxes and cats.

Feral herbivores (camels and rabbits) are degrading wetlands and other vegetation. Large, intense summer wildfires degrade hummock grasslands and mulga woodland communities. The trend is static. The continental stress class is six (near pristine).

Conservation priorities

Management priorities are:

- the control of feral herbivores and carnivores,
- the introduction of fire management to reduce the size and impact of summer wildfires and
- gaining more knowledge of the bioregion's biota.

In reserve acquisition terms, the reserve system is highly biased because none of the Dune Field subregion is reserved.

Nationally important wetlands

Two wetlands of national significance are listed. The Gibson Desert gnamma holes are in good condition (recovery requires minimum intervention), and have a static trend. Lake Gruszka is in near pristine condition with a static trend.

The Gibson Desert gnamma holes' greatest threat is siltation, as the site is no longer regularly maintained by traditional owners. Feral animals such as camels, foxes, rabbits, goats, and cats are a threat to both wetlands. There are no wetlands of national or regional significance identified in the Dune Field subregion.

Wetlands of regional significance

Six wetlands are regionally significant. One is an ephemeral stream and five are seasonal intermittent freshwater lakes/floodplain lakes. All are in near pristine condition with a static trend. Threatening processes are a changed fire regime and feral animals such as camels, rabbits, foxes and cats.

Riparian zone

The riparian zones follow ephemeral creek lines because no permanent rivers exist in the bioregion. The catchment is divided between the Sandy Desert Basin and the Mackay Basin. No true riparian vegetation exists in the Dune Field subregion.

The riparian vegetation across the region is in a good condition with a static trend. Threatening processes include:

- grazing (camels and rabbits),
- changed fire regimes,
- feral animals indicated previously, and
- exotic weed invasion from buffel grass.

Ecosystems at risk

A variety of ecosystems are proposed to be listed as vulnerable, although none are declared. Generally their condition is good to near pristine and requires minimal management intervention if they are to recover. Ecosysems at risk are of three types:

- Gorge communities in the desert ranges are of static trend but are threatened by grazing pressures, changed fire regimes and feral animals such as foxes, camels and cats.
- The hummock grassland communities have a static trend but are threatened by grazing, changed fire regimes and feral camels.
- The wooded (coolibah) freshwater wetland of Lake Gruszka has a static trend but is threatened by grazing pressures, changed fire regimes and feral animals such as foxes, camels and cats.

Species at risk

More than 40 per cent of the Gibson Desert's original mammal fauna is now regionally extinct.

The night parrot is critically endangered, and the northern marsupial mole is endangered. Three mammals, two birds and a skink are listed as vulnerable under the State legislation. All species are threatened either by:

- grazing pressures,
- changed fire regimes or
- feral animals such as foxes and cats.

The condition of all species at risk is fair to degraded and all are declining. No flora species are listed as declared rare of endangered.

Management responses

Reserve system

The bioregion has two Class-A Nature Reserves – the Gibson Desert Nature Reserve and Mangkili Claypan Nature Reserve.

More than 1.8 million hectares (12 per cent) is in the conservation estate, covering 11 of the region's 24 vegetation associations.

However, this reserve system is highly biased, with no reserves at all in the Dune Field subregion. Reserved vegetations include hummock grasslands, scrublands, low *Acacia* woodlands, sedgelands, mosaic areas, and gorge communities.

Four vegetation associations and many of the 'at risk' communities described above are not on reserves and have a high priority for acquisition. Gaps include:

- low woodland mulga between sandridges,
- hummock grasslands and shrub steppe of acacia and grevillea over *Triodia basedowii,*
- hummock grassland and shrub steppe of mixed herbs over spinifex between sandhills, and
- hummock grasslands and steppe woodland of desert oak and soft spinifex between sandhills.

A total of 12 per cent of the Gibson Desert bioregion is reserved in IUCN I-IV reserves, so it is classified as IBRA reservation Class 4. The Lateritic Plain has 14.7 per cent reserved. The Dune Field subregion has no reserves.

Even so, the Lateritic Plain subregion remains as IBRA reservation Class 4, and the Dune Field subregion as Class 3. The reserve system is highly biased because it is not comprehensive or representative in terms of ecosystem representation. A higher rating is not considered appropriate as threatening processes (fire and ferals) are not as significant as they are in other bioregions.

Reserve management standard is ranked as fair because:

- some resource degradation is occurring though it is retrievable;
- wildfire management is non-existent;
- mining exploration activities are supervised;
- impacts of feral herbivores are likely to be considerable although not quantified; and
- no feral predator control programs exist in the region.

Off reserve conservation for species and ecosystem recovery

The main recovery actions required for 'at risk' ecosystems and species include habitat retention by reservation or by agreements with landholders.

There are no major conflicting land uses as much of the Gibson Desert is unallocated Crown land, Aboriginal reserve or conservation reserve. However, capacity building with community and landholders concerning Aboriginal reserves is required.

Fire management needs to be introduced to reduce the impact of large intense, summer wildfires on habitat and fauna populations, and further research is required to determine threatened species status, distributions and general understanding of species ecology.

Feral animal control would assist with critical weight range species recovery. A major constraint of off-reserve conservation is insufficient resources to implement management activities.

Integrated natural resource management (NRM)

The existing NRM initiative involves industry Codes of Practice guidelines on the extent of vegetation that should be removed during mineral exploration and restorative actions to mitigate damage. Opportunities include:

- legislation for duty of care for leasehold and other lands,
- capacity building in particular developing relationships with Aboriginal communities, and
- NRM threat abatement plans which are necessary for vegetation and threatened species, pest control and fire management.

Impediments to NRM include:

- the Land Administration Act,
- operations of the Pastoral Lands Board,
- conservation through reserves could be limited by mining leases and tenements,
- there is a need to increase awareness of conservation values through education of various industries and the public in general,
- limited financial and staff resources, and
- the remoteness of the subregion.

Major data gaps and research priorities

- There has been no bioregional survey of flora and fauna.
- No systematic fauna survey has been completed, and survey work has been confined to individual species and opportunistic collection.
- Floristic survey is also restricted to opportunistic collections, mostly confined to access routes.
- There is little data on the habitat requirements of virtually all invertebrate species, most ephemeral plans, persisting critical weight range mammals, and uncommon vertebrate and plant species.
- There is no quantitative data on the affect of exotic predators/herbivores, weed invasion, fire, mineral extraction or other threatening processes.