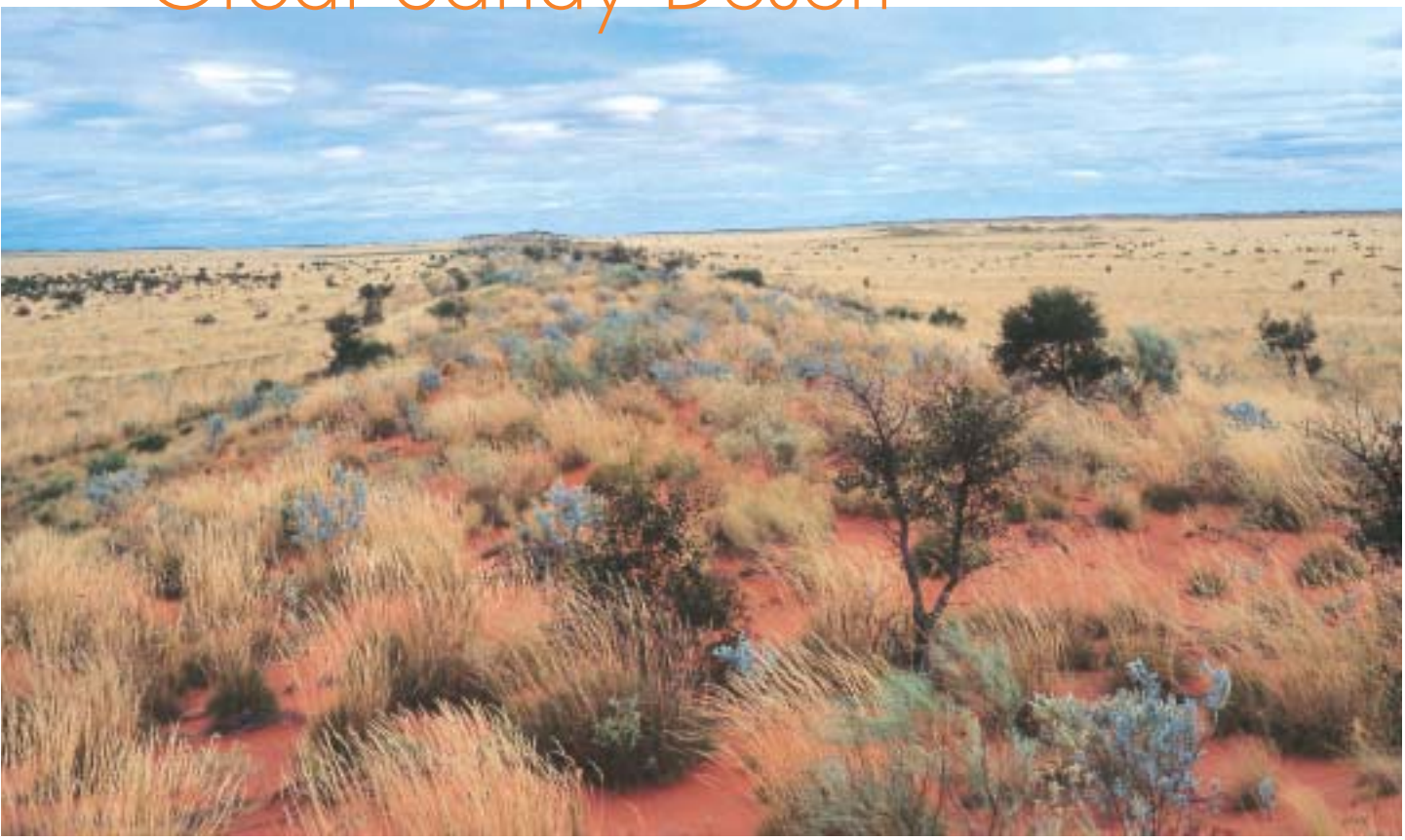
Great Sandy Desert



Shrubs and hummock grass along the top of a red sand dune in the Great Sandy Desert Bioregion, W.A.
Photo: N.L. McKenzie

Description

Bioregional description and biodiversity values

The Great Sandy Desert in Western Australia comprises the McLarty and Mackay subregions, and is mainly a tree steppe in the north grading to shrub steppe in south. The climate is arid tropical with summer rain.

The bioregion is dominated by Quaternary red longitudinal sand dune fields overlying Jurassic and Cretaceous sandstones of the Canning and Armadeus Basins. Vegetation comprises open hummock grassland of *Triodia pungens* and *T. schinzii* with scattered trees of Desert Walnut and Bloodwoods, and shrubs of *Acacia* spp, *Grevillea wickhamii* and *G. refracta*. *Casuarina decaisneana* (Desert Oak) occurs in the far east of the region.

Gently undulating lateritised uplands such as the Ankatell Ridge support shrub steppe such as *Acacia pachycarpa* over *Triodia pungens* hummock grass. Calcrete and evaporite surfaces are associated with occluded palaeo-drainage systems that traverse the desert and these include extensive salt lake chains with samphire low shrublands, and *Melaleuca glomerata - M. lasiandra* shrublands.

Monsoonal influences are apparent in the McLarty subregion. Its dunefields of red-brown sand support savannas that have a greater proportion of bunch grasses than the Mackay subregion, with emergent Desert Walnut trees rather than Desert Oak or Bloodwood.

Dominant land uses are unallocated Crown land, nature conservation and Aboriginal lands.

The region also contains a number of rare features such as Mandora Marsh, Dragon Tree Soak, Salt Creek (inland mangroves), Rudall River, as well as various soaks and rockholes that are significant local sources of water and serve as seasonal refugia.

Endemic troglobitic faunas are almost certainly associated with calcrete systems along palaeo-drainage lines. The bioregion's arid ecosystems are rich in reptiles, particularly in species of *Ctenotus* and *Lerista*.

Overall condition and trend

Both subregions have a continental stress class of five, which is better than most other bioregions. However, historical information on the region's biota is scant, and the effects of fire and exotic herbivores (camels and rabbits) and predators (foxes and cats) on productivity and biomass of mammal and vegetation structure are overt. Therefore, the condition is unknown and the trend is considered to be declining. Herbivores (feral and stock) have visibly degraded wetlands.

Conservation priorities

Land acquisition and management issues are overshadowed by native title legislation and partnership arrangements with Aboriginal communities. A large off-reserve conservation effort is needed to preserve biodiversity, but examples of vegetation associations that are subject to threatening processes also need to be reserved. Reducing the effects of inappropriate fire regimes is a priority. The biggest constraint on effective land management is the absence of data on the composition and status of most of the region's biota.

Nationally important wetlands

There are four wetlands of national importance – Dragon Tree Soak, Mandora Salt Marsh, Rock Pools of the Breaden Hills and Lake Dora at Rudall River.

Their condition is currently fair to good, though all wetlands areas are declining (except Rock Pools of the Breaden Hills which is unknown). Threatening processes are:

- damage and grazing pressure by feral animals (camels),
- changed fire regimes and
- exotic weeds (particularly buffel grass).

Lake Armadeus is a DIWA listed wetland in the Northern Territory which occurs in the Mackay subregion (though the majority is in the Kintore subregion of the Northern Territory, which does not extend into Western Australia).

Wetlands of regional significance

Minor spring wetlands of Percival and other lake systems, soaks that were previously used by Aboriginal people (no longer maintained), salt lakes and underground aquifers are scattered throughout the region. They are regionally important.

In most cases they are the only sources of fresh water for great distances and are therefore vital as refuges as well as for the wetland ecosystems they support. Most surface wetlands are threatened by camels, in fair

condition but are declining or declining rapidly. Very little is known of the stygofauna of calcrete aquifers. Another two wetlands of subregional significance occur in the Northern Territory.

Riparian zone

The Rudall River is the primary riparian area in the Western Australian part of the bioregion. Its riparian zone vegetation is currently in fair condition and declining. Threatening processes are:

- changed fire regimes,
- weeds (particularly buffel grass),
- grazing by feral animals (camels) and
- changed hydrology.

Other vegetation exists around some ephemeral creek lines in the Northern Territory.

Ecosystems at risk

There is one Threatened Ecological Community, the organic mound spring community of Dragon Tree Soak.

In addition, there are nine ecosystems considered to be at risk in the West Australian part of this bioregion. All except one of these ecosystems are relatively small and isolated. They include mound springs, wetlands, mangroves, riparian habitats, and salt lakes which are vital to biota in a very dry environment.

Other ecosystems facing particular threat are those that are sensitive to changed fire regimes. The trend of all ecosystems in this region is either not known or in decline. Key threatening processes include:

- grazing pressure from stock and feral animals (camels, donkeys, goats), and
- changed fire regimes.

Species at risk

No plant species have been declared as critically endangered, endangered or vulnerable under WA State legislation. However there are five priority species listed for the Great Sandy Desert. Further, two mammals (northern marsupial mole and ampurta) and one bird (night parrot) are listed as endangered, while one mammal (bilby) and one reptile (great desert skink) are vulnerable.

More than 30 per cent of the desert's original mammals and a few of its birds are now regionally extinct. In all cases, the trend for species at risk is unknown and the threatening processes include predation by cats and foxes and changed fire regimes.

Management responses

Reserve system

There are 41 vegetation associations which are not reserved or poorly represented in reserves in the bioregion. They include:

- bunch-grass savanna,
- sedgelands,
- samphire,
- *Coolibah, Melaleuca* spp,
- shrublands or hummock grasslands including *Triodia pungens, T. basedowii, T. intermedia, T. wiseana* and *T. bitextura,*
- *Owenia reticulata,*
- *E. brevifolia, E. setosa* and *E. dichromophloia,*
- *Acacia aneura, A. pyrifolia, A. delibrata, A. pachycarpa* and *A. coriacea,*
- *Grevillea refracta,*
- *Hakea* spp,
- *Allocasuarina decaisneana,* and
- *Plectrachne schinzii.*

They include communities on red sand, laterite, alluvial foot-slopes and plains, saltflats, clay plains and claypans. Five of the ecosystems at risk, including a Threatened Ecological Community, remain unreserved. Water is central to all these ecosystems (springs, inland mangroves, microbialite communities and permanent or ephemeral wetlands).

The primary constraint to adding examples of these vegetation associations and ecosystems to the formal reserve system is competing land uses. Many areas are now subject to native title claims. In addition, 27 vegetation associations are not reserved in the Northern Territory part of the Mackay subregion.

Major reserves in the region include Rudall River National Park and Dragon Tree Soak Nature Reserve. McLarty Hills Nature Reserve is very remote and is rarely visited by CALM staff or anyone else.

The Great Sandy Desert bioregion has a ranking priority of two for reserve consolidation (see Glossary). Both of its Western Australian subregions have inadequate and biased reserve systems.

Reserve management in the Western Australian part of the bioregion is ranked as poor because:

- there are no management plans,
- there are no on-site staff (even in parks with high tourist visitation and containing Aboriginal communities),
- there are no feral animal control programmes,
- no prescribed burning takes place,

- stock have uncontrolled access in parks, and
- the extent of other threatening processes (for example weeds) has not yet been determined.

Off-reserve conservation for species and ecosystem recovery

Priority species are critical weight range mammals and granivorous birds. Priority ecosystems include wetlands damaged by feral herbivores and vegetations adversely affected by fire. Little is known of the distribution, status and impact of weed species.

Species recovery actions include:

- detailed fire research and a move towards biodiversity-driven fire management strategies,
- a survey of a wide range of species and communities,
- weed control, and
- the removal of feral stock from the conservation estate.

Links need to be established between Government agencies, traditional owners and the broader community in order to effectively manage and research the bioregion.

Most of the bioregion requires a large off-reserve effort, although limited measures in areas such as Mandora Marsh would result in significant conservation gains.

Integrated natural resource management (NRM)

There are only a few natural resource management actions taking place in the WA section of the bioregion. The La Grange groundwater management committee was established, which may be an important capacity building resource, and some threat abatement planning occurs in the form of pest management.

The Northern Territory has legislation to help with fire management and tourist pressure at Uluru and Kata Tjuta.

Opportunities for NRM to address biodiversity issues include:

- research on the mechanism and impacts of threatening processes,
- threat abatement via pest control,
- improved implementation of existing legislation,
- improved communication between all stakeholders,
- acknowledgement of differing land management objectives,
- development of catchment and regional plans involving all stakeholders, and
- capability building through Aboriginal communities.

Limited financial resources, the low number of people available to implement strategies, recognition that native title will require cooperative work with desert Aboriginal communities, and the need to increase awareness of conservation values throughout the community are major constraints. The NRM rank is two

Major data gaps and research priorities

The major research priorities are:

- vegetation and ecosystem mapping, including fauna and habitat data,
- the effects of feral animals (particularly camels) on wetland areas,
- fire ecology, and population trends even for relatively common species (e.g. native rodents, dasyurids, spinifex reptile communities, termites, ants, and weeds such as buffel grass).