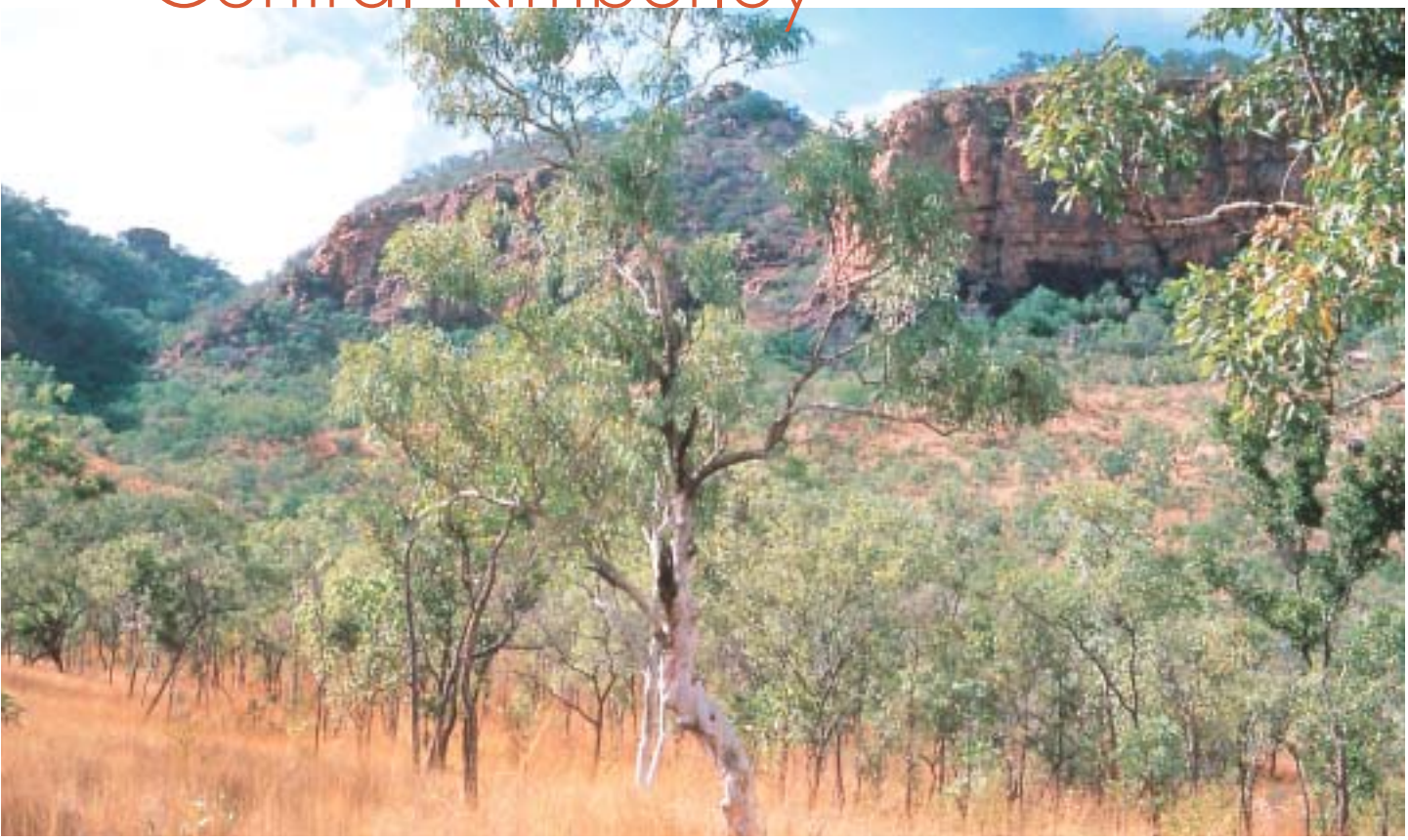
Central Kimberley



Tropical savanna of eucalypts over annual grassland on undulating footslopes of rugged sandstone King Leopold Ranges, Central Kimberley Bioregion, W.A.
Photo: N.L. McKenzie

Description

Bioregional description and biodiversity values

The bioregion is hilly to mountainous. Its parallel siliceous ranges of Proterozoic sedimentary rocks are partially mantled by skeletal sandy soils supporting *Triodia* spp. hummock grasses and scattered trees. Earths on Proterozoic volcanics in valleys support ribbon grass (*Chrysopogon* spp.) with scattered trees. Open forests of river red gum (*Eucalyptus camaldulensis*) and *Pandanus* spp. occur along drainage lines.

The climate is dry hot tropical, sub-humid to semi-arid, with summer rainfall.

There are three subregions:

The Pentecost subregion is the true central Kimberley. It is mostly underlain by middle Pentecost sandstone strata, with King Leopold and Warton sandstone ranges along its southern peripheries. Large areas are mantled by Cainozoic soils and there is moderate dissection by several rivers (Durack, Chamberlain and Fitzroy).

The Hart subregion is dominated by Hart dolerite exposed along the eastern edge of the Kimberley Craton where basement strata are folded. It is the driest subregion, has a rugged topography, and is the headwaters of the Ord, Dunham and Fitzroy Rivers.

The Mount Eliza subregion is on the south-western edge of the Kimberley Craton. It is very rugged with intense folding and exposure of basement strata such as King Leopold sandstone.

Two of the Kimberley's major rivers, the Fitzroy and the Ord, originate in this bioregion. It is fox and rabbit free and essentially uninhabited. The exposed folding of the rock strata in the King Leopold Ranges is of particular note. The Declared Rare Flora *Eucalyptus mooreana* is found in this bioregion.

Overall condition and trend

The Mt Eliza subregion has a continental stress class of six (near pristine), while the other two are rated as five (see Glossary). However, the effects of late dry-season fires, feral animals and stock are equally evident in all three subregions, and substantial changes to vegetation structure are ubiquitous. The trend is for a continued decline.

Conservation priorities

A change in current fire management and feral animal and stock control practices is required across the entire landscape, including conservation reserves. A formal region-wide assessment of species and ecosystem status and of the impact of fire, grazing and weeds is essential. Substantial reservation effort is required to fill gaps in the reserve system.

Nationally important wetlands

One permanent freshwater lake (Gladstone Lake) is listed as nationally important for the maintenance of ecological processes, migratory species, and as a drought refuge, breeding and feeding ground for a diversity of taxa. Its condition is good but declining. The primary threatening process is grazing pressure from cattle.

Wetlands of regional significance

The only wetland of subregional significance is Windjana Gorge which includes a river that runs seasonally and is significant for the maintenance of ecological processes. The condition is near pristine, the trend is static but the threatening process is grazing.

Riparian zone

Vegetation along creeks and rivers is in good condition, but declining. Threatening processes, acting independently or jointly, include:

- changed fire regimes,
- grazing pressure from feral herbivores,
- weeds and
- changed hydrology in the catchments as a result decreasing perennial vegetation cover and loss of top soil in the savanna.

Ecosystems at risk

No Threatened Ecological Communities have been declared in the region, although 10 ecosystems are considered to be at risk. They include:

- tropical and sub-tropical rainforest,
- tropical forests and woodlands,
- paperbark forests and woodlands,
- herbland, sedgeland and rushland and
- freshwater lakes.

The rainforests are in fair condition but declining rapidly; the other ecosystems are fair to good with undocumented trend. The main threatening processes are:

- grazing pressure,
- weeds and
- changed fire regimes.

More work is required in this bioregion to define ecosystems at risk and threatening processes.

Species at risk

One bird is listed as endangered, and three are declared as vulnerable under State legislation. The threatening processes for individual vertebrates are poorly understood or unknown, although a changed fire regime is considered to be the main threatening process for the Gouldian finch.

There is one vulnerable species of Declared Rare Flora in the Central Kimberley (*Eucalyptus mooreana*). The trend in the condition of all species is mostly unknown, as are threatening processes for the plants.

Management responses

Reserve system

The only conservation reserve in the bioregion is part of the large King Leopold Range Conservation Park. This reserve comprises 4.4 per cent of the bioregion, and includes examples of only 12 of the region's vegetation associations.

Reserve management in the bioregion is ranked at poor to fair. Apart from a donkey control program and the presence of a full time ranger, there are no feral animal control programs, only limited prescribed aerial burning, and no formal understanding of threatening processes such as weeds.

Soil and vegetation changes are occurring in the park because of uncontrolled stock access. The presence of pigs is a serious concern.

Fifty-seven vegetation associations are not reserved anywhere in the bioregion and seven of its 'at-risk' ecosystems are poorly reserved or not reserved.

The vegetation associations include grassland, grassland with associated woodland, hummock grasslands, various mosaic communities, shrublands, woodlands, mangroves and bare areas (freshwater lakes and mudflats).

The 'at-risk' ecosystems are riparian zones, swamps, herbfields and savannah communities.

Constraints include:

- competing land uses such as pastoral production,
- land purchase costs and
- the poor resolution of available data on biodiversity patterns.

Off-reserve conservation for species and ecosystem recovery

Recovery actions for mammal, bird and plant species at risk require data on status, population trends and mechanisms of threatening processes, as well as locations of remaining populations.

Ecosystems at risk need feral stock to be removed, closer management of stock on adjacent lands, the eradication of donkeys and pigs, and no frequent, broadscale, hot, late dry-season burning in savanna.

Savanna fire regimes and grazing are the main causes of decline in biodiversity values throughout the region, including its rainforests and riparian zones. To address this issue, coordination between Government agencies, the pastoral grazing industry, traditional owners and the broader community will need to be improved. A large off-reserve effort is needed and there are resource constraints and limited community capacity.

Integrated natural resource management (NRM)

Existing natural resource management actions include legislation for pastoral lease condition inspections by the Department of Agriculture. Pastoralists are notified of any problems and, ultimately, the Commissioner for Soil Conservation can resume the lease. In practice, this process does not appear to be very effective.

Other actions include threat abatement planning by the Department of Agriculture to control donkeys, and Land Conservation District Committees that provide a venue for discussing conservation matters and integrating property and catchment planning.

There is a range of opportunities for natural resource management.

- The duty-of-care for biodiversity on pastoral lands needs to be tightened.
- Environmental management systems for controlling weeds, fire and feral animals should be coordinated across a variety of land tenures through Land Conservation District Committees, supported by research into the mechanism and impacts of these threatening processes and cost effective solutions.

- Shire planning should incorporate biodiversity objectives and acknowledge the worth of the natural environment to tourism and the cost of managing biodiversity and making national parks accessible.
- Catchment and regional plans should be developed collaboratively by all stakeholders. Constraints include financial resources, the small number of people available to implement strategies and that few people recognise biodiversity benefits.

Major data raps and research priorities

- There are no region-wide vegetation, soil and environmental geology maps at better than 1:250,000 scale for planning.
- There is no quadrat based fauna and flora survey of region for assessing species and ecosystem status, condition, trend and effects of threatening processes such as cats, cattle, donkeys, pigs, fire and weeds.