Gascoyne

Acacia low open woodlands on footslopes of the Collier Ranges. Photo: N.L McKenzie

Description

Bioregional description and biodiversity values

The bioregion is underlain by the Ashburton Basin (shales, sandstones and conglomerates), Capricorn Orogen and Marymia and Sylvania Inliers (on the northern margin of the Yilgarn Craton), and the north-western and south-eastern parts of Bangemall Basin (sandstone, shale, carbonates).

Rugged low Proterozoic sedimentary and granite ranges are divided by broad flat valleys associated with the catchments of the Ashburton and Gascoyne River systems and headwaters of the Fortescue River. Open mulga/snakewood low woodlands occur on shallow earthy loams over hardpan on the plains, with mulga scrub and *Eremophila* shrublands on the shallow stony loams of the ranges. There are extensive areas of hummock grass. The climate is arid with winter and summer rainfall.

There are three subregions – Ashburton, Augustus and Carnegie. The Carnegie Salient, in the east, is characterised by extensive salt lake features supporting samphire and saltbush steppes.

The area has many special values.

- There are spectacular exposures of banded sedimentary formations.
- Gorges of the Barlee Range Nature Reserve contain spring-fed streams, waterfalls and pools with relictual/refugial species of landsnail, frog, plants and the bat *Rhinonicteris aurantius.*
- The Lake Carnegie system is a breeding site for water birds. Unique flora of claypans such as Yadjiyugga. Minnie Spring (on the Henry River) and the Irragully Creek (Wanna Station) are permanent refugia.

There are several rare species including:

- the Great Desert skink, *Ctenophorus yinnietharra, Diplodactylus kenneallyi,*
- mallee fowl,
- Alexandra's Parrot,
- Mulgara,
- two reptiles (*Diplodactylus wilsoni* & *Lerista stictopleura*),
- elements of two stygofaunas,
- endemic species of *Eremophila* on Landor Station and 12 vegetation associations and
- a diverse Lerista fauna.

Overall condition and trend

The continental stress class ranges from three to five (see Glossary) across the bioregion but weed invasions, extensive hot fires, grazing by introduced herbivores, and ubiquity of foxes and cats are causing a general loss of fertility, vegetation cover and simplification of ecosystem species composition.

Erosion from increased runoff velocities has occluded even major drainage lines. Land uses in the bioregion include grazing, unallocated Crown land and Crown reserves, and conservation.

Conservation priorities

The reserve system needs to be more comprehensive and representative. Pastoral lands need to be managed along ecologically sustainable development principles. Weed and fire control is a priority.

Nationally important wetlands

There are four nationally important wetlands including a gorge system, a spring, a claypan and a salt lake system. They include populations of threatened species and ecosystems; three are drought refuges. Their condition is poor to fair and, on average, declining. Windich Spring and Kookhabinna Gorge require significant management. However, the others should recover with minimal intervention if protected from grazing pressure and weeds.

Wetlands of regional significance

Eight wetlands or wetland-types of regional significance as drought refuges and sites of threatened species and communities are identified (three springs, three pools, a creek, and all major pools along the Ashburton and Hardy rivers). The river pools are degraded, Irragully Creek and Minnie Spring require significant management intervention to recover, but the others will recover with minimal intervention if grazing pressure by (cattle, goats and donkeys) is removed and weeds (especially buffel grass) are controlled.

Riparian zone

Vegetation of riparian zones associated with the Ashburton and headwaters of the Fortescue River systems is in only fair condition, continuing to degrade, and requires significant management intervention to recover. The catchments of the Gascoyne and Lyons Rivers are degraded. All are infested with weeds such as buffel grass and affected by grazing (mainly cattle) and feral animals.

Ecosystems at risk

Most of the 28 threatened ecosystems/taxonomic groups are low in the landscape. They comprise alluvial plains, drainage lines, river pool aquatic invertebrate communities, springs, claypans, a salt lake system and stygofauna of calcrete aquifers.

Higher in the landscape are communities found on geological intersections, and declared rare plant communities of Robinson Range and Landor Station.

Most are degrading or static, being suppressed by grazing pressure. Drainage line communities are infested with buffel grass.

Species at risk

Thirty per cent of the Gascoyne's original mammal fauna is now regionally extinct due to habitat change and predation.

One bird, two critical weight range mammals and one bat, two lizards and one plant are listed as vulnerable. In addition a further two bird species, one fish, two mammals, one lizard and a variety of Priority plants are identified as being at risk. Their populations require significant management intervention if they are to recover from the habitat changes (feral herbivore and fire) and fox and cat predation suppressing their populations. Barbed-wire fences are known to kill ghost bats. Grazing, particularly by cattle and goats, and invasive weeds are affecting the plant populations

Management responses

Reserve system

Regional conservation lands comprise one large nature reserve (Barlee Range), two large national parks (Mount Augustus Collier Range) and two recently purchased areas of pastoral lease (Earaheedy and Lorna Glen).

A total of 2.1 million hectares (21 of the region's 80 vegetation associations) is in this conservation estate, which is 10.4 per cent of the region's area. Management standard in all cases is classed as poor to fair because:

- no weed or feral predator controls are in place,
- they are seldom visited, and
- (while firebreaks are in place in two) there are few resources for wildfire suppression.

Feral herbivores are culled periodically only on Barlee Range Nature Reserve. The reserves cover large tracts of country, but focus on ranges country, uplands and sandy plains unsuitable for pastoral use. The recently purchased leases are lowland areas, but on the margin of the desert.

Twenty-five vegetation associations, and 13 ecosystems at risk (discussed above) have high priority for acquisition and are not on reserves. The associations include:

- woodlands of coolibah, river gum and waterwood,
- low open acacia woodlands,
- shrublands of various acacias, eremophilas and cassias,
- hummock grasslands with scattered tree, mallees and shrubs,
- sedgeland, and
- succulent steppes of samphire and saltbush.

Ecosystems at risk are:

- three river pools,
- *Eremophila* shrublands on Robinson Range and Landor Station,
- two chenopod plains,
- stygofauna of a calcrete aquifer,
- a claypan,
- geological intersections,
- alluvial plains and Erong Springs.

They are also unreserved; therefore it remains a priority to reserve them.

Overall, riparian river pool, claypan, spring, and alluvial plains with tree, shrub and acacia communities, have the highest priority. The main constraints are the cost of land and its subsequent management. More than 70 per cent of the region is pastoral lease and gaps in reserve system are often productive mosaics of high commercial value, or geologically prospective for mining.

The region was ranked as Reservation Class 2 because only 1.92 per cent of its area is in strict conservation reserve (IUCN I-VI), but 10.4 per cent is under some form of conservation tenure due to land purchases in the Augustus subregion.

Priorities for acquisition are now in Ashburton (2.88 per cent in IUCN I-IV) and Carnegie (2.5 per cent in IUCN I-IV). There is strong bias in the reserve system's comprehensiveness, even at the regional level.

Off-reserve conservation for species and ecosystem recovery

In relation to rare species, there is a need for basic survey to determine status, and research into life history, so that threatening processes (if any) can be identified for:

- two birds (*Ardeotis australis* and *Burhinus grallarius*),
- a fish (*Leiopotherapon ahenius*),
- two bats (*Macroderma gigas* and *Rhinonicteris aurantius*),

- a ground-dwelling mammal (*Sminthopsis longicaudata*), and
- 17 ephemeral plants and grasses (*Eremophila rigens, Euphorbia drummondii* subsp *Pilbara, Gonocarpus ephemerus, Goodenia berringbinensis, Helichrysum oligochaetum, Hemigenia* sp., *Homalocalyx chapmanii, Pityrodia augustensis, Ptilotus astrolasius* var. *luteolus, Ptilotus lazaridis, Ptilotus trichocephalus, Rhodanthe frenchii, Rhodanthe sphaerocephala, Sida* sp. Barlee Range, *Stylidium weeliwolli* & *Wurmbea saccata*).

Habitat retention through reserves, on other State lands or on private lands is required for these plants as well as for seven rare perennial plants (*Acacia wilcoxii, Eremophila arguta* ms, *Eremophila flaccida* subsp. *attenuata* ms, *Eremophila gracillima* ms, *Eremophila lanata* ms, *Eremophila micrantha* ms, *Eremophila prolata* ms and *Eremophila rigida* ms). For nearly all plants above, herbivores and invasive weeds may pose a direct threat.

Specific recovery actions have been identified for:

- three birds (*Acanthiza iredalei iredalei, Falco peregrinus* and *Polytelis alexandrae*),
- two critical weight range mammals (*Dasycercus cristicauda* and *Macrotis lagotis*) and
- three lizards (*Ctenophorus yinnietharra, Diplodactylus kenneallyi* and *Egernia kintorei*).

Recovery requirements are already published for two of the birds, both mammals and two of the reptiles. *Dasycercus cristicauda* requires a specific fire age spinifex habitat; the *Macrotis* is extinct in the region and requires a translocation project. The *Ctenophorus* has a restricted range and reservation is required. In general their problems are caused by habitat degradation through fire, grazing pressure and by feral herbivores, and for the mammals, its conjunction with feral predators.

Main recovery actions required for ecosystems at risk are habitat retention in conservation reserves, on other State lands (including pastoral leases) or on private lands. Other needs, both on and off reserves, include:

- fencing to keep stock away from sensitive areas (especially in selected examples of highly palatable communities like blue-bush and salt-bush);
- weed and feral animal control (date palms, buffel grass, cats, foxes, goats, camels, donkey and feral cattle);
- specific fire programs to encourage a mosaic fire/age distribution;
- research into troglofaunas, and
- capacity building with industry.

The various species and ecosystem conservation/ recovery efforts listed above are needed in all three subregions, but are equally constrained by limited funding, equipment, knowledge-base and community capacity.

Integrated natural resource management (NRM)

Current NRM actions include:

- There has been institutional reform through the Gascoyne Murchison Strategy, including the purchase of productive land mosaics for conservation estate, and ecologically sustainable management on pastoral lands.
- Threat abatement planning – for example, vegetation management plans, feral animal control (mainly feral herbivores) and weed control – is occurring.
- Industry codes of practice are needed in relation to pastoral, mining and exploration activities.
- Integration of property management planning with catchment planning and Landcare through Land Care District committees is occurring throughout the region.

Opportunities:

- There is a need for legislated 'duty of care' for pastoral leases, Aboriginal lands, and mining areas - e.g. feral herbivore control on pastoral lands. Much of the bioregion is severely degraded through past agricultural practices (primarily sheep and cattle grazing) and feral herbivores, yet the Pastoral Land Act requires leases to maintain stock levels that may can conservation values.
- Conservation should become part of local government planning (e.g. National Action Plan for Water Quality and Salinity).
- Pastoralists require more Government support for attempting to identify and implement ecologically sustainable practices.

Constraints:

- There is a lack of funds to adequately manage our existing reserves and control weeds, feral herbivores and predators.
- The extent of mining leases and tenements limits conservation through reservation.
- There is a need for resources for biodiversity survey and research on threatened species.

A reserve purchase program, better feral animal and weed control and ecologically sustainable pastoral practices should be priorities in all subregions.

Major data gaps and research priorities

- There is no region-wide coverage by environmental geology/regolith mapping at better than 1:250, 000 scale.
- There has been no quantitative (quadrat-based) regional survey of flora or fauna, so regional flora and fauna is poorly known. Only small, local areas have been examined in detail by biologists, usually for industrial development.
- There is little detailed data on the ecological requirements and life histories of virtually all invertebrate species, plants, persisting critical weight range mammals, uncommon vertebrate and plant species, and ecologically dominant plant species (e.g. hummock grasses).
- There is little data to provide a regional context on population-trends for even ecologically significant species such as native rodents, dasyurids, spinifex reptile communities, termites, ants, weeds such as buffel grass, kapok bush and ruby dock.
- There is no quantitative data on the impact of weed colonisation, fire in hummock grasslands, exotic herbivores on aquatic and terrestrial communities and long term effect of mining on stygofaunas.