



# Finke bioregion

## Description

Area: 73 800 km<sup>2</sup>

The main land types of the Finke bioregion are arid sand plains with dissected uplands and valleys, including some major rivers (Finke, Hugh and Palmer rivers). The bioregion is dominated by mulga with various *Senna*, *Eremophila* and other *Acacia* species present over short grasses and forbs. Major land uses are cattle grazing and Aboriginal land management. Major population centres are Finke and Imanpa.

## Location

The Finke bioregion crosses the border of the Northern Territory (NT) and South Australia (SA; 74% of area in the NT, 26% in SA). Figures 1 and 2 show the location of the bioregion.

Figure 1 Location of the Finke bioregion

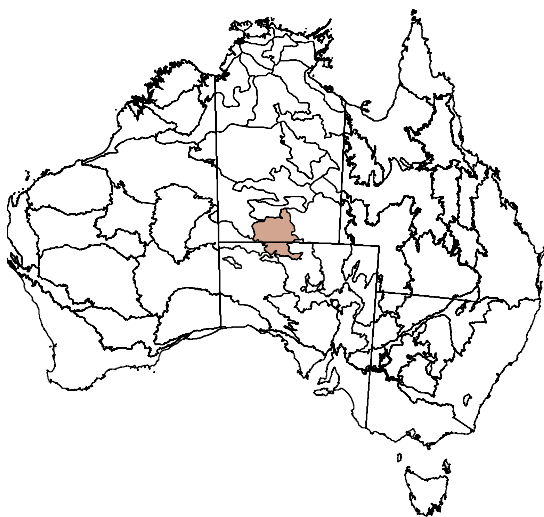
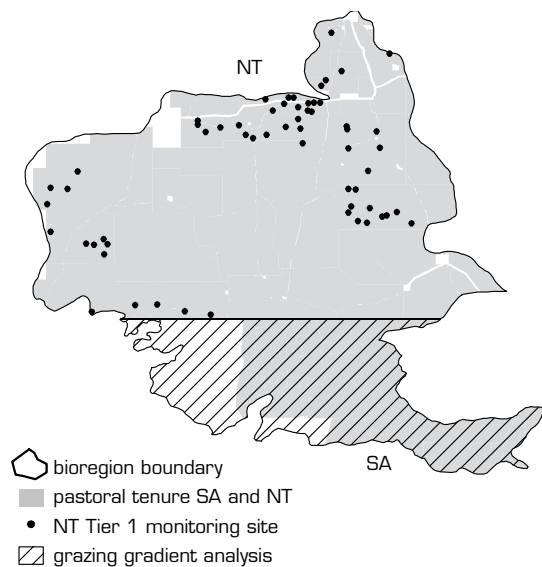


Figure 2 Monitoring sites and pastoral tenure



## Data sources available

Data sources include:

- NT Tier 1, which provides moderate reliability for reporting change, with a moderate number of sites but with patchy distribution, estimated (rather than quantitative) data, and a focus on perennial herbage species
- SA — grazing gradient analysis (see **Appendix** for a description of methods and regional results)
- domestic stocking density, which provides moderate reliability
- fire extent, intensity and frequency, which provides high reliability

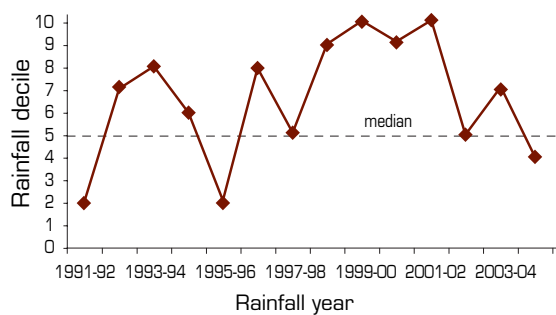


- dust
- distance from water
- distribution and relative abundance of invasive animals and weeds
- land use
- land values.

## Climate

The Finke bioregion is arid and hot, with very low rainfall and high evaporation. Spatially averaged median (1890–2005) rainfall is 152 mm (April to March rainfall year; see Figure 3).

**Figure 3 Decile rainfall for the period 1991–1992 to 2004–2005**



Annual rainfall is for the 12-month period 1 April to 31 March.

Decile rainfall was above the long-term median for most years in the reporting period. The period 1998–1999 to 2001–2002 had higher rainfall, while 1991–1992 and 1995–1996 were drier.

Note that regional averaging of rainfall conceals spatial variability. Some parts of the Finke bioregion may have experienced better *seasonal quality* and others worse during the 1992–2005 period.

## Landscape function

### Northern Territory

**Tier 1, index based on composition (by biomass) and cover of perennial herbage species**

No sites showed a decline in the index of landscape function when *seasonal quality* was above average. It is not possible to report change following below-average *seasonal quality*.

<i>Seasonal quality</i>	Number of sites	Percentage of reassessed sites showing:		
		Decline: > 3 decrease in index	No change	Increase: > 3 increase in index
Above average	24	0%	71%	29%
Average	34	3%	65%	32%
Below average	n/a	n/a	n/a	n/a

### South Australia

**Grazing gradient analysis, % cover production loss index**

The Finke bioregion areas of FIN3 Mooriyanna, FIN4 Alberga and FIN4 Pedirka sub-**Interim Biogeographic Regionalisation for Australia (IBRA)** regions had minimal persistent grazing gradients following large rainfall events in 1989 and 2000–2001. This indicates near-complete recovery from grazing following these wet periods and no loss of landscape function (see **Appendix** for a description of methods).

Note that sub-IBRA names refer to refined mapping of subregions within the Finke bioregion by the SA Government. These mapping additions are not included in the Interim Biogeographic Regionalisation for Australia (v6.1).

## Sustainable management

### Critical stock forage

#### Northern Territory

##### Tier I, composition (by biomass) of palatable perennial herbage species

When *seasonal quality* was above average, 1% of sites showed a decline in composition of **palatable perennial** (2P) herbage species. It is not possible to report change following below-average *seasonal quality*.

Seasonal quality	Number of sites	Percentage of reassessed sites showing:		
		Decline: > 20% decrease in 2P grasses	No change	Increase: > 20% increase in 2P grasses
Above average	95	1%	76%	23%
Average	55	0%	82%	18%
Below average	n/a	n/a	n/a	n/a

#### South Australia

There are no suitable data for reporting change.

### Plant species richness

There are no suitable data for reporting change in plant species richness.

### Change in woody cover

Forest cover, based on the Australian Greenhouse Office definition and mapping<sup>1</sup>, is minor in the bioregion (less than 0.6% of the total area) and there were very small changes in forest extent between 1991 and 2004. There is good coverage of Landsat data for reporting this result.

<sup>1</sup> See <http://www.greenhouse.gov.au/ncas/reports/tech09.html>

### Distance from stock water

The percentage of sub-IBRA area within three kilometres of permanent and semipermanent sources of stock water is summarised in the following table. The locations of stock waterpoints were sourced from the lease infrastructure mapping of each jurisdiction. Watered area is reported as a percentage of the pastorally tenured area within each sub-IBRA.

Sub-IBRA	South Australia		Northern Territory	
	% sub-IBRA within 3 km of water	% sub-IBRA area analysed	% sub-IBRA within 3 km of water	% sub-IBRA area analysed
Finke P1 (FIN1)			49.2	81.8
Finke P2 (FIN2)			58.3	87.7
Tieyon, Finke P3 (FIN3)	28.2	53.8	49.0	81.7
Pedirka (FIN4)	15.5	90.0		

FIN = Finke; IBRA = Interim Biogeographic Regionalisation for Australia

The locations of natural water supplies are included for SA but not for the NT. These additional temporary supplies can provide additional sources of water for stock, particularly following good rains. It is not possible to report change in watered area for the 1992–2005 period for either jurisdiction.

### Weeds

Weeds known to occur in the Finke bioregion include:

Common name	Scientific name
Athel pine	<i>Tamarix aphylla</i>
Bathurst burr	<i>Xanthium spinosum</i>
Bellyache bush	<i>Jatropha gossypifolia</i>
Parkinsonia	<i>Parkinsonia aculeata</i>

See [www.anra.gov.au](http://www.anra.gov.au) for distribution maps

## Components of total grazing pressure

### Domestic stocking density

Domestic stocking density data report for the whole bioregion. Most (92%) of the Finke bioregion is pastoral leasehold. Data from the Australian Bureau of Statistics showed that domestic stock density was close to the 1983–1991 average between 1992 and 2000. Stocking density then increased substantially over the next two years (29% above the 1983–1991 base in 2002) before declining to approximately 15% above the base in 2003 and 2004. Increased stocking density in the first part of this decade probably resulted from better *seasonal quality* in the 1999–2002 period. Note that spatial averaging conceals likely variation in stocking density trends across the bioregion.

### Kangaroos

There are no suitable data for reporting change in kangaroo populations.

### Invasive animals

Invasive animal species known to occur in the Finke bioregion include:

Common name	Scientific name
Fox	<i>Vulpes vulpes</i>
Rabbit	<i>Oryctolagus cuniculus</i>
Wild dog	<i>Canis spp.</i>
Feral cat	<i>Felis cattus</i>
Donkey	<i>Equus asinus</i>
Horse	<i>Equus caballus</i>

See [www.anra.gov.au](http://www.anra.gov.au) for distribution maps

## Products that support reporting of landscape function and sustainable management

### Fire

Fire data report for the whole bioregion. Wildfire was significant in 2002, most likely caused by fuel accumulation in the wetter years of 2000 and 2001. Most fire occurred in the cooler months of April to November.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005
% area burnt	0.0	0.0	0.0	0.0	0.2	25.1	0.2	0.0	0.0

The frequency of fire between 1997 and 2005 was very low, with a mean frequency ( $\log_{10}$  transformed) of 0.01.

### Dust

Dust data report for the whole bioregion. The mean Dust Storm Index value (1992–2005) was 2.91, which was moderate compared with all rangeland bioregions. Dust levels were slightly lower in the centre of the bioregion compared with elsewhere.

## Biodiversity

In the NT part of the Finke bioregion, there were more than 200 bird species recorded by 2005, while in SA there were more than 3400 records of birds (Biodiversity Working Group indicator: Fauna surveys; see **Section 7 of Chapter 3** of *Rangelands 2008 — Taking the Pulse*). Also in SA, there are more than 3000 flora records of about 580 taxa from approximately 50 survey sites.

For both the NT and SA parts of the Finke bioregion, a case study (see **Buffel grass, Transformer weeds in Chapter 3**) exists on how buffel grass is transforming habitats (Biodiversity Working Group indicator: Transformers).

A systematic regional biodiversity survey has been conducted in the NT portion of the bioregion.

In this bioregion, there are (Biodiversity Working Group indicator: Threatened species):

- 3 threatened plant species
- 16 threatened mammal species (including 5 extinct species)
- 7 threatened bird species
- 2 threatened reptile species
- 1 threatened invertebrate species.

## Socioeconomic characteristics

### Land use and value

Most (92%) of the Finke bioregion is held as pastoral leasehold. This area has not changed appreciably over the 1992–2005 reporting period.

In the NT part of the bioregion, the unimproved land value of pastoral leases increased by approximately 8% between 1991 and 2003.

In the SA part of the bioregion, the unimproved value of pastoral land increased, on average, by about 80% between 1998 and 2004 (values expressed in 2005 dollars).

### Key management issues and features

Key features and issues of the Finke bioregion include the following:

#### ■ NT:

- The expansion of *Tamarix aphylla* (Athel pine) west of the Finke River is of major concern within the bioregion. Recordings have been made as far west as Karinga Creek. Efforts to manage the weed have been successful in small concentrated pockets only.

- Due to characteristics of the landscape, the grass cover and biomass levels respond dynamically to rainfall events. Short-lived perennials are important species for landscape function.

#### ■ SA:

- Thickening of woody cover has occurred due to significant recruitment during the 1970s after a run of good seasons. The fire regime appears to have altered, also contributing to thickening of woody cover.
- There is generally a good response of grasses and perennials to rainfall events. However, some production loss has occurred due to grazing in recent times. This trend, while minor at this stage, should be carefully monitored.
- Invasion of buffel grass is evident.