Stony Plains bioregion

Description

Area: 134 200 km^2

The Stony Plains bioregion includes tablelands and low gibber plains within some of the most arid areas in Australia. Vegetation includes chenopod shrublands, gidgee and mulga woodlands. Land use is mostly pastoral, with cattle in the north and both sheep and cattle grazing in the south. Opal mining occurs too. Major population centres are Coober Pedy, Oodnadatta and Marla.

Location

The Stony Plains bioregion is located in northern South Australia (SA) with the northern tip extending into the Northern Territory (NT; 1% of bioregion area). Figures 1 and 2 show the location of the Stony Plains bioregion, as well as the location of monitoring sites and pastoral tenure.

Figure 1 Location of the Stony Plains bioregion

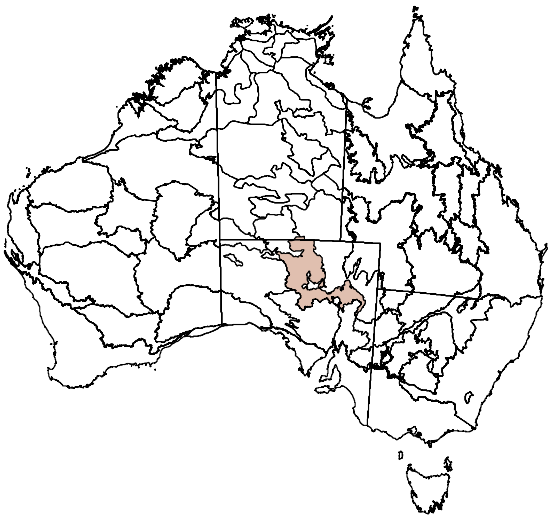
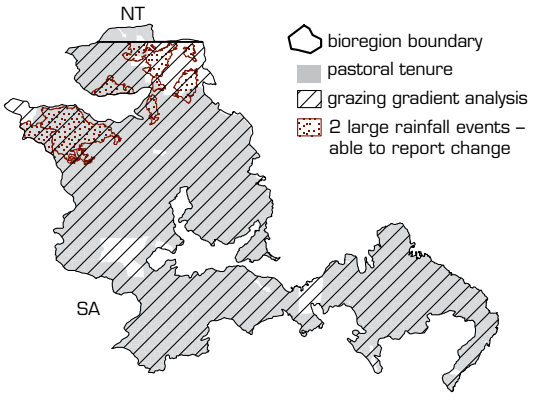


Figure 2 Monitoring data and pastoral tenure



Data sources available

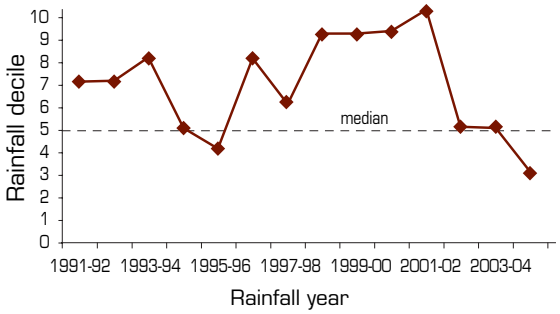
Data sources include:

- SA — grazing gradient analysis (see **Appendix** for a description of methods and regional results); this has moderate reliability for reporting change (total coverage, quantitative data, documented methods but reliant on two or more extensive large rainfall events to report change, and relationship between reported cover production loss index and landscape function is not yet proven)
- NT — Tier 1, but no sites in the very small area extending into the NT
- 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 Stony Plains bioregion has a very arid climate with extreme temperatures. Spatially averaged median (1890–2005) rainfall is 118 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 median for most of the reporting period, with 1998–1999 to 2001–2002 being a generally wetter period. ***Seasonal quality*** as indicated by decile rainfall declined at the end of the reporting period.

Note that regional averaging of rainfall almost certainly conceals spatial variability. Some parts of this extensive and very arid bioregion would likely have experienced poorer *seasonal quality* during the 1992–2005 period and other areas may have fared better.

Landscape function

South Australia

Grazing gradient analysis, % cover production loss index

Stony Plains region 1 (STP1) Coongra, STP1 Mt Willoughby and STP6 Crispe sub-**Interim Biogeographic Regionalisation for Australia (IBRA)** 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.

STP6 Coongra sub-IBRA had a large decrease in the % cover production loss (CPL) index between 1989 and 2000–2001. This is inferred as an improvement in landscape function, although the 1989 rainfall event may not have been sufficiently effective to allow maximum potential vegetation response from previous grazing.

For available Landsat imagery, rainfall was insufficient across other sub-IBRAs to report change in the %CPL index and, from there, infer changes in landscape function.

Note that sub-IBRA names refer to refined mapping of subregions within the Stony Plains bioregion by the SA government. These mapping additions are not included in IBRA v6.1.

Northern Territory

There are no suitable data for reporting change.

Sustainable management

Critical stock forage

There are no suitable data for reporting change in critical stock forage.

Plant species richness

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

Change in woody cover

Based on the Australian Greenhouse Office definition and mapping of forest extent[1], forest cover in the SA part of the bioregion is very minor and there was very little change between 1991 and 2004 (0.05% of bioregion area in 1991 increasing to 0.07% in 2004). There was no forest cover reported for the NT part of the bioregion. This reporting is based on limited coverage of Landsat imagery before 2000.

Distance from stock water

The percentage of sub-IBRA area within three kilometres of permanent and semipermanent sources of stock water (including, for SA, the locations of natural waters) is summarised in the following table. The locations of stock waterpoints were sourced from the lease infrastructure mapping

[1] See http://www.greenhouse.gov.au/ncas/reports/tech09.html

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
Breakaways, Stony Plains (STP1)	32.0	82.3	52.3	100
Oodnadatta (STP2)	28.9	94.2		
Murnpeowie (STP3)	44.3	92.8		
Peake–Dennison Inlier (STP4)	32.0	99.1		
Macumba (STP5)	35.0	82.5	63.7	70.8

IBRA = Interim Biogeographic Regionalisation for Australia; STP = Stony Plains

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 Stony Plains bioregion include:

Common name	Scientific name
Athel pine	*Tamarix aphylla*
Bathurst burr	*Xanthium spinosum*
Calotrope	*Calotropis procera*
Patersons curse	*Echium plantagineum*

See www.anra.gov.au for distribution maps

Components of total grazing pressure

Domestic stocking density

Approximately 90% of the area of the Stony Plains bioregion is grazed. Data from the Australian Bureau of Statistics showed that stocking density fluctuated within 5% of the 1983–1991 average between 1992 and 2000. Stocking density then increased over the next two years (to be 31% above the 1983–1991 base in 2002) and then decreased to 15% above the 1983–1991 average in 2003 and 2004. Stock numbers probably increased in the early years of this decade in response to improved seasonal conditions (indicated by decile rainfall above). Stocking density then declined, probably largely due to drier years towards the end of the reporting period for the Australian Collaborative Rangelands Information System. Note that spatial averaging conceals likely variation in stocking density trends across the bioregion.

Kangaroos

There are insufficient data to report change in kangaroo density reliably.

Invasive animals

Invasive animal species known to occur in the Stony Plains bioregion include:

Common name	Scientific name
Feral goat	*Capri hircus*
Fox	*Vulpes vulpes*
Rabbit	*Oryctolagus cuniculus*
Wild dog	*Canis* spp.
Feral cat	*Felis cattus*
Starling	*Sturnus vulgaris*
Carp	*Cyprinus carpio*
Camel	*Camelus dromedaries*
Horse	*Equus caballus*
Deer	*Cervidae* family

See www.anra.gov.au for distribution maps

Products that support reporting of landscape function and sustainable management

Fire

Fire was insignificant during the 1997–2005 period, with a maximum of 0.4% of the bioregion burnt in 2000.

Dust

The mean Dust Storm Index value (1992–2005) was 4.49, which was the third highest of all rangeland bioregions. Dust levels were highest in the north and east and decreased to the southwest (adjoining the Gawler bioregion).

Biodiversity

By 2005, for the Stony Plains bioregion in SA, there were:

- more than 500 fauna survey sites and more than 30 000 records of birds (260 taxa), more than 6000 records of mammals and more than 8000 records of reptiles (Biodiversity Working Group indicator: Fauna surveys; see Section 7 of Chapter 3 of *Rangelands 2008 — Taking the Pulse*)
- more than 800 flora survey sites and more than 40 000 flora records (Biodiversity Working Group indicator: Flora surveys).

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

- 4 threatened plant species
- 10 threatened mammal species
- 4 threatened bird species
- 1 threatened reptile species.

Socioeconomic characteristics

Land use and value

Approximately 90% of the area of the Stony Plains bioregion is grazed. This area has not changed appreciably over the 1992–2005 reporting period.

The unimproved value of pastoral land in SA has increased, on average, by approximately 65% between 1998 and 2004 (values expressed in 2005 dollars).

Key management issues and features

Key features and issues of the Stony Plains bioregion include the following:

- SA:
  - The Stony Plains bioregion was the first SA rangelands bioregion to be covered by a biodiversity plan, developed by the SA Arid Lands (SAAL) Natural Resource Management Board in collaboration with the SA Department for Environment and Heritage.
  - The bioregion is an important cattle-producing area that also contains important conservation reserves, including Witjira National Park.
  - The Stony Plains bioregion has an extensive drainage network that, when overgrazed, results in the erosion of stream beds and silting of waterholes.
  - The spreading of watering points through piped networks is a prominent land management issue in the area.
  - Due to its location adjacent to the Simpson–Strzelecki Dunefields bioregion, this area is prone to feral camel incursions with associated infrastructure damage. Other large feral herbivores (horses and donkeys) are also present.
  - There are some weed issues, particularly Athel pine in the north and *Acacia farnesiana*.
  - There is a suite of conservation issues associated with the Great Artesian Basin (GAB) Springs located in the bioregion.