



Channel Country bioregion

Description

Area: 306 194 km²

The Channel Country bioregion is characterised by vast braided, flood and alluvial plains surrounded by gravel or gibber plains, dunefields and low ranges. Vegetation is predominantly Mitchell grass, gidgee and spinifex. Major population centres are Birdsville, Windorah and Innaminka.

Location

The Channel Country bioregion is located on the Queensland, New South Wales (NSW), South Australia (SA) and Northern Territory (NT) borders (67% of area in Queensland, 17% in SA, 8% in the NT and 8% in NSW). Figures 1 and 2 show the location of the Channel Country bioregion, as well as monitoring sites and pastoral tenure.

Figure 1 Location of the Channel Country bioregion

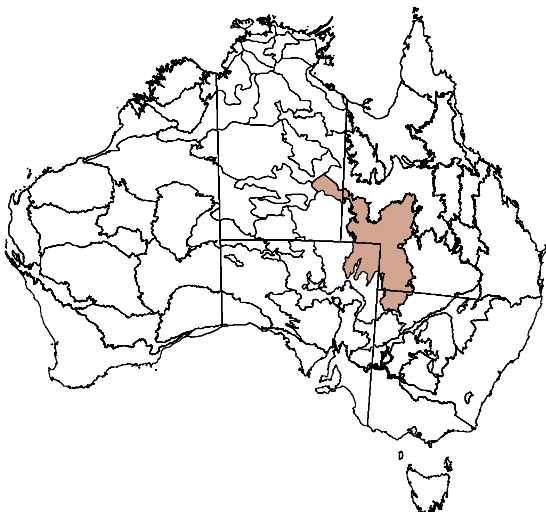
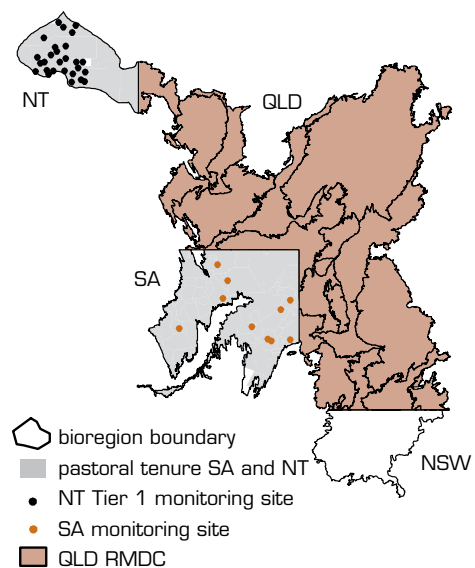


Figure 2 Monitoring sites and pastoral tenure



Data sources available

Data sources include:

- NT Tier 1, which provides moderate reliability for reporting change, with a relatively large number of sites and uniform distribution, estimated (rather than quantitative) data, and a focus on perennial herbage species
- NSW Rangeland Assessment Program (RAP), although it only includes three sites, which is not sufficient for reliable reporting
- SA Pastoral Monitoring, which has low reliability (based on a small number of reassessed quantitative sites)
- Queensland: Rapid Mobile Data Collection (RMDC) supported by AussieGRASS simulation (of pasture growth and utilisation) and remote



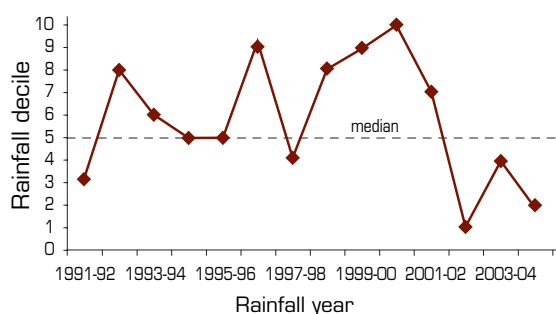
sensing (using the **Multiple Regression Bare Ground Index**, version bi1) — both of these provide moderate reliability (RMDC — road traverses and visual estimates; AussieGRASS — entire rangelands, simulated results with some ground validation)

- 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 climate of the Channel Country bioregion is arid with very dry, hot summers and short, dry winters. Rainfall is unpredictable. Spatially averaged median (1890–2005) rainfall is 168 mm (April to March rainfall year; see Figure 3). However, extensive flooding produces considerable (to phenomenal) pasture growth, often in the absence of appreciable rainfall.

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 variable for the first half of the reporting period, with the period 1998–1999 to 2001–2002 being wetter (improved *seasonal quality*). The years 2002–2003 and 2004–2005 were particularly dry.

Note that regional averaging of rainfall conceals spatial variability. Some parts of the Channel Country bioregion probably 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

Insufficient sites were assessed following above- and below-average *seasonal quality* to report change reliably.

New South Wales and South Australia

Insufficient sites were assessed to report change reliably.

Queensland

RMDC, change in visually assessed vegetation and soil attributes contributing to landscape function score

Over the reporting period, there was a significant loss of function for the Bulloo, Bulloo Dunefields, Goneaway Tablelands, Lake Pure, Noccundra Slopes, Tibooburra Downs and Toko Plains sub-**Interim Biogeographic Regionalisations for Australia (IBRA)**. There was also some loss of function for the Cooper Plains and Sturts Stony Desert sub-IBRAs. The Diamantina Eyre sub-IBRA was stable.

Sustainable management

Critical stock forage

Northern Territory

Tier 1, composition (by biomass) of palatable perennial (2P) herbage species

No sites showed a decline when *seasonal quality* was above average. 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	24	0%	92%	8%
Average	27	22%	70%	7%
Below average	5	n/a	n/a	n/a

New South Wales and South Australia

There were insufficient sites to report change reliably.

Queensland

Levels of simulated pasture utilisation and change were measured for 1976–1990 and compared with those from 1991–2005, using the **AussieGRASS** simulation.

All sub-IBRAs with data for reporting had simulated levels of space- and time-averaged pasture utilisation well above the safe level of use. The Noccundra Slopes, Tibooburra Downs and Bulloo Dunefields sub-IBRAs had greater than 35% utilisation — much higher than the safe level. Three sub-IBRAs had greater than 5% increase in utilisation (in absolute terms) between 1976–1990 and 1991–2005 (Noccundra Slopes, Lake Pure and Sturt Stony Desert). A further three sub-IBRAs (Bulloo Dunefields, Cooper Plains and Tibooburra Downs) had more modest increases in utilisation (1–4%).

The levels of high utilisation reflect low pasture growth for much of the post-1991 period, and utilisation levels are such that there is likely to be detrimental effects on animal production and landscape function.

Note: this section does not report on the Bulloo, Diamantina Eyre and Toko Plains sub-IBRAs.

Plant species richness

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

Change in woody cover

There are no data for the NT or SA.

Queensland

Statewide Land and Trees Study (SLATS) reporting

At sub-IBRA resolution, there were nil to very small changes in SLATS-derived levels of woody cover between 1991 and 2003. Woody cover varied between 1.14% in the Sturt Stony Desert and 23.09% in the Goneaway Tablelands (2003 data). Cumulative clearing between 1991 and 2003 was maximum in the Goneaway Tablelands (0.21% of sub-IBRA area; elsewhere, cumulative clearing was $\leq 0.02\%$ of sub-IBRA area). There is high reliability for reporting change.

New South Wales

SLATS-type reporting

Based on analysis of satellite data using Queensland SLATS methods, there was no detected change in woody vegetation between 2004 and 2006. Woody vegetation is defined as woody communities with 20% crown cover or more (eg woodlands, open forests and closed forests) and taller than about two metres. At this stage, it is not possible to report change for earlier years of the 1992–2005 period using this method.

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. Note that for SA and the NT, the locations of stock waterpoints were sourced from jurisdictional mapping of lease infrastructure, and watered area is reported as the percentage of pastoral tenure within each sub-IBRA. NSW and Queensland data were obtained from Geoscience Australia's GEODATA TOPO 250K vector product (Series 3, June 2006), and watered area is the percentage of sub-IBRA area. The bracketed figures in the SA and NT columns report the percentage area of each sub-IBRA analysed in that jurisdiction (total sub-IBRA area was analysed for NSW and Queensland). Note that mapping differences between the jurisdictional data (SA and NT) and the Geoscience Australia product mean that the percentage watered areas reported by each data type are not directly comparable.

Sub-IBRA	% sub-IBRA area within 3 km of water			
	South Australia	New South Wales	Queens- land	Northern Territory
Toko Plains (CHC1)			14.3	52.0 (92.7)
Sturt Stony Desert (CHC2)	23.5 (99.1)		16.2	
Goneaway Tablelands (CHC3)			25.6	
Diamantina- Eyre (CHC4)	41.2 (93.5)		8.4	
Cooper Plains (CHC5)			13.9	
Coongie (CHC6)	26.0 (99.6)			
Lake Pure (CHC7)	30.5 (98.9)		19.1	
Noccundra Slopes (CHC8)			20.0	
Tibooburra Downs (CHC9)			50.4	
Core Ranges (CHC10)		54.2		
Bulloo (CHC11)			17.0	
Bulloo Dune- fields (CHC12)			39.4	
Central Depression (CHC13)		61.3		

CHC = Channel Country; IBRA = Interim Biogeographic Regionalisation for Australia

Note that this analysis for NSW, Queensland and the NT does not include the locations of natural waters (these water supplies are included for SA). Natural waters can provide additional sources of water for stock, particularly following good rains elsewhere that flood parts of the Channel Country. It is not possible to report change in watered area for any jurisdiction for the 1992–2005 period.

Weeds

Weeds known to occur in the Channel Country bioregion include:

Common name	Scientific name
Athel pine	<i>Tamarix aphylla</i>
Mesquite	<i>Prosopis</i> spp.
Noogoora burr	<i>Xanthium occidentale</i>
Parkinsonia	<i>Parkinsonia aculeata</i>
Parthenium weed	<i>Parthenium hysterophorus</i>
Prickly acacia	<i>Acacia nilotica</i> subsp. <i>indica</i>
Rubber vine	<i>Cryptostegia grandiflora</i>
Silver leaf nightshade	<i>Solanum elaeagnifolium</i>

See www.anra.gov.au for distribution maps

Components of total grazing pressure

Domestic stocking density

Domestic stocking density data report for the grazed area of the whole bioregion. Most (91%) of the Channel Country bioregion is grazed. Data from the Australian Bureau of Statistics showed that domestic stocking density was slightly above the 1983–1991 average (+4%) between 1992 and 1997. Stocking density then increased to approximately 10% above the 1983–1991 base between 1998 and 2001. It then declined to 88% of the base in 2003 and increased to 94% (of the base) in 2004. Although not closely related to *seasonal quality* indicated by decile rainfall above, it is probable that these changes were largely related to seasonal conditions. It is important to note that pasture growth following flooding (resulting from good rains higher in the catchments) contributes significantly to stocking density in this bioregion. Note also that spatial averaging conceals likely variation in stocking density trends across the bioregion.

Kangaroos

New South Wales

The combined density of the three species (red, eastern and western greys — on a dry sheep equivalent basis) decreased from near the 1984–1991 average in 1992 to 78% of the base value in 1996. Kangaroo density then increased sharply in 1997 to 30% above the base and remained similar in 1998. The density then fell to approximately 75% of the base in 1999 and 2000, increased to 9% above the base in 2001 and declined considerably over the next two years (to 33% of the 1984–1991 average in 2003). The higher densities in 1997, 1998 and 2001 reflect better seasonal conditions at that time, while the sharp decline towards the end of the Australian Collaborative Rangelands Information System reporting period occurred during below-average seasonal quality.

There are no suitable data to report change for the Queensland, SA and NT parts of the bioregion.

Invasive animals

Invasive animal species known to occur in the Channel Country bioregion include:

Common name	Scientific name
Feral pig	<i>Sus scrofa</i>
Feral goat	<i>Capri hircus</i>
Deer	<i>Cervidae</i> family
Fox	<i>Vulpes vulpes</i>
Rabbit	<i>Oryctolagus cuniculus</i>
Wild dog	<i>Canis</i> spp.
Feral cat	<i>Felis catus</i>
Starling	<i>Sturnus vulgaris</i>
Camel	<i>Camelus dromedaries</i>
Donkey	<i>Equus asinus</i>
Horse	<i>Equus caballus</i>

See <http://www.anra.gov.au> for distribution maps

Products that support reporting of landscape function and sustainable management

Fire

Fire data apply to the whole bioregion. Fire was insignificant for the period 1997 to 2005, with a maximum of 1.0% of the Channel Country bioregion burnt in both 2001 and 2002.

Dust

Dust data apply to the whole bioregion. The mean Dust Storm Index value (1992–2005) was the highest of all the rangeland bioregions at 8.44. Dust levels were particularly high in the southwest portion of the bioregion (surrounding Haddon's and Cameron's Corners) and much lower in the NT and northeast.

Biodiversity

Characteristics of the Channel Country bioregion include (Biodiversity Working Group indicator: Threatened species; see **Section 7 of Chapter 3 of Rangelands 2008 — Taking the Pulse**):

- 7 threatened plant species
- 12 threatened mammal species, including 3 extinct species (burrowing bettong, crescent nailtail wallaby and desert rat-kangaroo) and one species that is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) but is extinct from this bioregion (the western quoll)
- 4 threatened bird species
- no threatened reptile, amphibian or fish species.

In Queensland, regional ecosystems are defined by Sattler and Williams (1999) as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. Descriptions of regional ecosystems can be sourced from the Regional Ecosystem Description Database.¹

¹ See http://www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/how_to_download_REDD/

Fifty-six regional ecosystems have been described for the Queensland portion of the Channel Country bioregion. Three of these are listed as 'of concern', under the *Queensland Vegetation Management Act 1999*, one of which remains at less than 4% of its pre-clear extent reserved (Accad et al 2006).

For SA, there were more than 500 fauna survey sites and more than 18 000 records of birds by 2005 (Biodiversity Working Group indicator: Fauna surveys; see **Section 7 of Chapter 3** of *Rangelands 2008 — Taking the Pulse*). There were also more than 600 flora survey sites with more than 10 000 flora records of about 860 taxa (Biodiversity Working Group indicator: Flora surveys).

The SA component includes Ramsar-listed wetlands (Biodiversity Working Group indicator: Wetlands).

Socioeconomic characteristics

Land use and value

Key uses and values of the Channel Country bioregion include the following:

- About 91% of the Channel Country bioregion is grazed. This area has not changed appreciably over the 1992–2005 reporting period.
- In the Queensland section of the bioregion, unimproved rangeland values as at June 2006 were, on average, \$598 ± \$133/km² (values expressed in 2005 dollars). There was a considerable range in average unimproved value across sub-IBRAs (\$104 to \$1234/km²). It is not possible to report change in land values for the 1992–2005 period.
- In the NT section, the unimproved land value of NT pastoral leases increased by about 5% between 1991 and 2003.
- In the SA section, the unimproved value of pastoral land increased, on average, by about 65% between 1998 and 2004 (values expressed in 2005 dollars).
- Land value information is not available for the NSW section of the bioregion. Average property size is 6686 ha (maximum size of 51 960 ha) for all land parcels bigger than 10 ha.

Key management issues and features

Key features and issues of the Channel Country bioregion include the following:

- Queensland:
 - Many back-to-back years of high utilisation have affected the ground-layer floristics.
 - There has been a loss of perennial species in non-spinifex areas.
 - There are extensive areas of reduced cover which are susceptible to wind and water erosion. These areas probably contribute to observed elevated atmospheric dust levels for the Channel Country bioregion.
 - Tree death has occurred along drainage lines.
 - High herbivore pressure along drainage lines has contributed to stream bank erosion.
- NT:
 - The majority of the bioregion's biomass is short-lived perennials and annuals.
 - Properties in the bioregion have reduced cattle numbers to accommodate the poor seasons experienced recently.
- NSW:
 - NSW landscapes consist predominantly of gibber plains and low breakaways supporting sparse ground cover. On gibber country, vegetation cover is relatively low (10–40%) but the stony mantle provides good soil protection.
 - The perennial Mitchell grass (*Astrebla lappacea*) is the most significant component of pastures. The dynamics of Mitchell grass is a significant landscape issue, and plant populations appear to have declined through the 1990s.
 - Tree cover is minimal and is generally confined to narrow corridors of woodland along watercourses. Woody thickening is of limited occurrence.

- Large areas of the NSW part of the bioregion are reserved in Sturt National Park. Sturt NP is renowned for its populations of red kangaroos, and this may influence densities in relation to adjacent areas.
- SA:
 - The bioregion experiences long dry periods punctuated by short wet periods when productive cover thrives. The Cooper Creek system provides regular flow into SA. The floodout areas associated with this system are particularly productive and sustain much of the productive capacity during the dry periods.
 - The majority of the bioregion's biomass is short-lived perennials and annuals.
 - There is anecdotal evidence of previously treeless waterways becoming heavily wooded over time.
- Areas remote from the creek floodouts are susceptible to wind erosion when annual cover is absent, particularly in drought conditions.
- The lighter sandy country is prone to increase in rabbit numbers.
- The southern and western portion of this bioregion adjoining the Simpson–Strzelecki Dunefields bioregion is also subject to increasing camel numbers and associated vegetation impacts.
- Petrochemical infrastructure and activity are concentrated in the bioregion.
- The only commercial inland fishery is located in the area (it operates on an opportunistic basis following large flood events).
- Water management issues associated with free-flowing bores are still evident.
- Tourism and land use conflicts are evident (eg the Innamincka Regional Reserve).