



## CHAPTER 3

# The Channel Country Bioregion

### 1. Location

The Channel Country Bioregion is one of few bioregions that span several Australian states. Its 28,885,384 ha incorporate an area in the NT, a large section of southwest Qld, the northwest corner of SA as well as a small section in the far northwest of NSW. The 1,429,584 ha area covered in NSW is minimal, constituting 4.95% of the entire bioregion and 1.78% of the state. In NSW the bioregion is entirely surrounded by the Simpson-Strzelecki Dunefields Bioregion.

The bioregion lies in the Western Division and is traversed by the Silver City Highway, which runs through Milparinka and Tibooburra and south to Broken Hill in the Broken Hill Complex Bioregion.

The bioregion straddles four catchments: Bulloo River, Cooper Creek, Lake Frome and Lake Bancannia but does not extend to the Murray-Darling Basin.

### 2. Climate

The Channel Country Bioregion is one of four NSW bioregions that fall in the arid zone. This climate is characterised by hot temperatures and a persistently low rainfall: the bioregion is known to receive erratic rainfall that usually averages little more than 200 mm per year (Morgan and Terrey 1992).

### 3. Topography

The Channel Country Bioregion is a region of extensive stream systems draining to Lake Eyre. Multiple river channels, very wide floodplains and large waterholes crisscross this subdued landscape of gibber plain, low stony rises and dunefields. Tertiary and Quaternary sediments form the extensive stony plains between low tablelands and mesas of Mesozoic sandstones. The climate is extremely arid and the vegetation sparse. Floods are infrequent but, when they occur, major events trigger huge breeding and growth responses in the biota.

### 4. Geology and geomorphology

The NSW part of the bioregion is atypical geologically in that it contains three small areas of older bedrock at the core of the Mt Arrowsmith – Tibooburra Ranges. These outcrops of late pre-Cambrian and Cambrian rocks reflect a ridge of high bedrock running from Mt Koonenberry to Tibooburra that separates two parts of the Great Australian Basin; the Lake Frome embayment in the east and the Bulloo embayment in the west. The Tibooburra granodiorite has weathered to low hills covered with rounded boulders or tors, with low ridges of resistant quartz veins.

Mean Annual Temperature	Minimum Average Monthly Temperature	Maximum Average Monthly Temperature	Mean Annual Rainfall	Minimum Average Monthly Rainfall	Maximum Average Monthly Rainfall
19 – 21°C	4.6 – 5.4°C	35 – 37.2°C	149 – 216mm	7 – 12mm	23 – 34mm

Marginal to the basement rocks, the Mesozoic and Tertiary sediments form a series of tablelands and mesas with shallow stony soils and prominent low cliff lines of silicified sandstones. Claystones underlie the lower slopes.

Drainage from the hills runs into the Simpson-Strzelecki Dunefields Bioregion on the west and into the Bulloo Overflow on the east. The Bulloo Overflow is a complex of terminal channels, floodplains and lake basins of the Bulloo River. It is dominated by Quaternary sediments of clays in the channels and lakes and sand reworked by wind into lunettes, sand sheets and some dunes. This area of deposition was the source for sand that is now in the Bulloo Dunefield subregion (Simpson-Strzelecki Dunefields Bioregion) and the Ursino Sandplains subregion (Mulga Lands Bioregion).

## 5. Geodiversity

Important features of this bioregion include the following:

- the rounded tors of granodiorite on the hills combined with the tableland scarps, extensive surface cover of rounded siliceous pebbles (gibber), and contour banding on the downs country, make these landscapes unusual in arid NSW;
- the Bulloo Overflow is an important ephemeral wetland in the extreme arid zone, and the lunettes on the lakes contain important evidence of climate change and human occupation; and
- several areas of basement rocks in the ranges have supported small goldfields in the late nineteenth century and retain heritage structures associated with mining.

## 6. Soils

Soil development is limited to shallow, stony, gritty loams on the bedrock hills. On the Cretaceous sediments, yellow-brown to brown loams with stony surfaces are common on the sandstones, and sticky grey-green clays with high carbonate and gypsum content, or shallow stony texture contrast soils are found on the claystones on the lower slopes. Most slopes are contour banded with areas of stony soil alternating with deeper stone-free brown loams.

In floodout areas from the ranges, brown loamy clays occur with thin patches of red sand and low dunes marginal to the creeks. In the Bulloo Overflow, grey cracking clays, often saline, are the norm for the fluvial areas, with pale red sands and earthy sands in the sandplains to the east. Soils and sediment on the lunettes are more complex and similar to those on lunettes in the Menindee Lakes.

## 7. Biodiversity

### 7.1 Plant communities

Vegetation growth in arid and semi-arid zones such as the Channel Country is limited by rainfall. The ranges support open bluebush (*Maireana* sp.) communities with sandalwood (*Santalum lanceolatum*), dead finish (*Acacia tetragonophylla*), western pittosporum (*Pittosporum phylliraeoides*), copperburr (*Bassia* sp.) and sparse mulga (*Acacia aneura*). The lower slopes, tablelands and downs carry open mulga and belah (*Casuarina cristata*) patches, bluebush and bladder saltbush (*Atriplex vesicaria*), with Mitchell grass (*Astrebla* sp.) and other annuals growing on the stone-free steps of the contour bands in good seasons.

Much of the downs country often appears bare. Streams are fringed with coolabah (*Eucalyptus microtheca*), river red gum (*Eucalyptus camaldulensis*) and gidgee (*Acacia cambagei*), with black box (*Eucalyptus largiflorens*), river

cooba (*Acacia stenophylla*), prickly wattle (*Acacia victoriae*) and thorny saltbush (*Rhagodia spinescens*) occurring in floodouts.

The grey clays of the Bulloo carry canegrass (*Eragrostis australasica*), with lignum (*Muehlenbeckia cunninghamii*) and some black box on the edges of the lunettes. Sand plains support sparse mulga, whitewood (*Ayatalaya hemiglauca*), isolated desert poplar (*Codonocarpus cotonifolius*) and western bloodwood (*Eucalyptus terminalis*), as well as patches of woody shrubs and occasional old man saltbush (*Atriplex nummularia*).

### 7.2 Significant flora

Sturt National Park, in the northwest corner of NSW and the northwestern extent of the Channel Country bioregion is home to several species listed under the TSC Act 1995.

One such species is the vulnerable flame spider-flower (*Grevillea kennedyana*). Most of the known populations of the flame spider-flower are present in the “Jump-Up” region in Sturt National Park and the Channel Country bioregion. The species is listed as vulnerable under Schedule 1, part 2 of the Commonwealth EPBC Act 1999 and as vulnerable under Schedule 2 of the TSC Act 1995.

The rare plants *Ruppia tuberosa* and *Lepilaena preissii* have been recorded at the Clifton Downs Lakes, with the only other known location of these plants in NSW at the Salt Lake in the nearby Simpson-Strzelecki Dunefields Bioregion (J. Porter, pers. comm.). Threatened species predicted to occur in the area include desert carpet-weed (*Glinus oxygoides*), a perennial herb recorded in saline areas; saltbush (*Atriplex sturtii*), an annual recorded from claypans and alluvial plains; *Dysphania platycarpa*, an annual herb that grows near ephemeral waters; and *Stackhousia clementii*, a perennial herb that can be found on ephemeral swamp margins, clay and saline soils.

### 7.3 Significant fauna

Fauna surveys in the Channel Country Bioregion have reported at least 34 native mammal, 231 bird, 22 amphibian, 13 fish and 125 reptile species (Sattler and Williams 1999).

Several species are endemic to the region. Reptiles endemic to the region include the Cooper Creek tortoise (*Emydura* sp.), skinks (*Ctenotus astarte* and *C. aphrodite*) and an unidentified blind snake (*Ramphotyphlops* sp.). The



Photo: NPWS

Elizabeth Springs goby fish (*Chlamydogobius* sp.) is endemic to Elizabeth Springs in the Diamantina catchment (Morton *et al.* 1995).

At least 7 mammal species have become extinct from the bioregion. These include the desert rat-kangaroo (*Caloprymnus campestris*), western quoll (*Dasyurus geoffroii geoffroii*), golden bandicoot (*Isodon auratus*), pig-footed bandicoot (*Chaeropus ecaudatus*), lesser bilby (*Macrotis leucura*), burrowing bettong (*Bettongia lesueur*) and the crescent nailtail wallaby (*Onychogalea lunata*) (Australian Terrestrial Biodiversity Assessment 2002).

The birds of the Channel Country Bioregion are typical of those found elsewhere in the semi-arid zone of NSW. The bioregion has significant waterbird populations such as the Australian spotted crake (*Porzana fluminea*), pink-eared duck (*Malacorhynchus membranaceus*), and inland dotterel (*Peltohyas australis*). The bioregion supports one endemic species, the Bulloo sub-species of the grey grasswren (*Amytornis barbartus barbartus*), which inhabits the lignum and cane grass swamps along the Diamantina and Bulloo Rivers. Other threatened and limited range species, such as the Eyrean grasswren (*Amytornis gorderi*) and chestnut-breasted whiteface (*Aphelocephala pectoralis*), occur on the fringes of the bioregion. Some types of birds such as grassland birds and freshwater birds, which have declined in other bioregions across the country, have remained stable in the Channel Country Bioregion and there has been a trend towards an increase in the numbers of granivorous birds (Australian Terrestrial Biodiversity Assessment 2002).

The adoption of reduced, conservative grazing rates in key habitats across the bioregion, particularly in the Bulloo Overflow, needs to be considered if bird diversity in the bioregion is to be preserved. The maintenance of natural flow regimes will also help to protect the diversity of waterbirds.

#### 7.4 Significant wetlands

Both the Bulloo Overflow – Carypundy Swamp and Salisbury Lake, also known as Lake Altibouka, are nationally significant wetlands (ANCA 1996) and are considered to be in good condition in the bioregion. Both these areas are, however, affected by weeds and feral animals.

The Bulloo Overflow – Carypundy Swamp is the terminal basin of an entire inland system of wetlands and is considered to be significant because it is representative of this type of terminal drainage basin and supports large numbers of waterbirds including the freckled duck (*Stictonetta naevosa*) when flooded. The lake is initially freshwater but becomes saline as water evaporates.

Salisbury Lake (Lake Altibouka) is a saltwater lake which is regularly flooded and supports large numbers and a high diversity of waterbirds such as the brolga (*Grus rubicundus*), blue-billed duck (*Oxyura australis*) and freckled duck (*Stictonetta naevosa*). Part of this wetland falls in a wildlife refuge.

Three other wetlands of regional significance occur in the Channel Country Bioregion. These wetlands are considered to be in good condition, although affected to varying degrees by weeds such as Noogoora Burr (*Xanthium occidentale*) and Heliotrope (*Heliotropium peruviana*), and feral animals such as pigs, goats, foxes and cats.

Bullea Lake is an important nesting habitat for waterbirds. The lake has been known to support more than 15,000 waterbirds (Australian Terrestrial Biodiversity Assessment 2002), including the Eurasian coot (*Fulica atra*), pink-eared duck (*Malacorhynchus membranaceus*), grey teal (*Anas gracilis*) and maned duck (*Chenonetta jubata*). The black swan (*Cygnus atratus*), straw-necked ibis (*Threskiornis spinicollis*), great cormorant (*Phalacrocorax carbo*), yellow-billed spoonbill (*Platalea flavipes*) and purple swamphen (*Porphyrio porphyrio*) have also been recorded.

Clifton Downs Lakes consist of two lakes on the “Clifton Downs” property. The great egret (*Ardea alba*), caspian tern (*Hydroprogne caspia*), greenshank (*Tringa nebularia*) and sharp-tailed sandpiper (*Calidris acuminata*), all of which are internationally protected under the China Australia Migratory Bird Agreement (CAMBA), have been recorded on Clifton Downs.

Yantara Lake has recorded sightings of the endangered flock bronzewing (*Phaps histrionica*) and the vulnerable freckled duck (*Stictonetta naevosa*) in 1985 (NPWS 2001). In addition to this, Kingsford *et al.* (1994) sighted about 40 freckled duck (*Stictonetta naevosa*) on the lake in March 1993.

## 8. Regional history

### 8.1 Aboriginal occupation

The Karenggapa people traditionally occupied the far northwest corner of NSW at the Qld border (HO and DUAP 1996).

For further information on the Aboriginal occupation of the Channel Country Bioregion, refer to Chapter 1 under the heading “Regional history”.

### 8.2 European occupation

Charles Sturt reached the Darling River near Bourke in 1829 but did not venture further west until 1844-45 when his expedition became trapped near Milparinka from February to July 1845 due to drought (NSW NPWS 1991). James Poole, a member of the expedition, died there and was buried near Mt Poole, just northwest of Milparinka.

Sturt’s problems with drought did not discourage squatters from settling along the Darling River between 1847-1857. Pastoralists had ventured into the bioregion by 1878, taking up huge runs in order to support their sheep and cattle (NSW NPWS 1991). Most of this land was occupied under pastoral leases during the 1880s and although overstocking occurred across the far west, droughts at the turn of the century tended to reduce grazing capacities in the area (NSW NPWS 1991). Dingoes proved to be a problem for pastoralists as they, along with the droughts, reduced sheep numbers until dingo fences were built and a strategic hunting program was undertaken (NSW NPWS 1991).

Gold was discovered at Mt Poole and Mt Brown near Milparinka in 1880, stimulating a short period of mining success in the area, and by 1890 the population of the area was large enough to warrant the publication of a local newspaper, the *Milparinka Advertiser* (NSW NPWS 1991).

Tibooburra, like many other towns far removed from the major rivers, owes its existence to mineral discovery (HO and DUAP 1996). Three mineral deposits are currently being mined, or will potentially be mined in the bioregion (CSIRO 1996).

Sir Sidney Kidman was one of the great pastoralists of the far northwest corner of NSW. He worked on several stations in the 1870s and 1880s and learnt the ways of the land, often with the aid of a local Aborigine (NSW NPWS 1991). Kidman was successful in his attempts to connect Tibooburra with towns along the Darling and Gipps Station (what was to become Broken Hill) via supply routes. Cobb and Co. coaches (NSW NPWS 1991) linked Milparinka to Wilcannia in 1883.

Throughout the bioregion, including the interstate components, an average of 0.15 head of cattle is grazed per ha, and 0% is affected by intensive production (CSIRO 1996).

There is no commercial forestry of State forests tenure in the bioregion.

## 9. Bioregional-scale conservation

The area of the Channel Country Bioregion under conservation management is about 272,949 ha or 19.09% of the bioregion. With only 3 of the 23 available mechanisms deployed, the range being applied to land management is relatively small.

As with most bioregions, national parks and nature reserves include the largest area of land in conservation-oriented management. Sturt National Park, which extends to the adjacent Simpson-Strzelecki Dunefields Bioregion, is the only national park in the bioregion, occupying 189,044 ha or 13.22% of its area. None of these reserves is also managed as wilderness areas under the Wilderness Act 1987.

Most of the Pindera Downs Aboriginal Area occurs in the bioregion and occupies 0.66% of its area. There are no historic sites, no state recreation areas and no regional parks in the bioregion. There are also no voluntary conservation agreements in the Channel Country Bioregion. There are however, 3 wildlife refuges on properties occupying 74,518 ha or 5.21% of the bioregion.

No property agreements (Native Vegetation Act 1997) have been entered into with landholders in the bioregion.

There are no flora reserves or State forests (Forestry Act 1916) in the bioregion.

## 10. Subregions of the Channel Country Bioregion

(Morgan and Terrey 1992)

Subregion	Geology	Characteristic landforms	Typical soils	Vegetation
Bulloo	Quaternary clays and sands of the Bulloo River floodout.	Channels and floodplains, clay playas with beaches and lunettes, marginal sandplains and dunes.	Saline cracking grey clays. Siliceous sands on dunes, more complex but poorly known loams and sands on lunettes.	Canegrass and ephemerals on clays. Canegrass, lignum with some black box on lake margins. Sparse mulga, whitewood and old man saltbush on sands.
Core Ranges	Pre-Cambrian and Cambrian schist, slate and volcanics intruded by Devonian granodiorite. Fringing Jurassic sandstones.	Low ranges and rounded hills. Strong control by geology, prominent rounded tors on the granodiorite. Low angle stony slopes and dendritic drainage.	Shallow stony profiles on ranges, contour banded and gibber covered lower slopes.	Open bluebush with sandalwood, dead finish, western pittosporum, copperburr and sparse mulga.
Tibooburra Downs	Cretaceous claystones and Cretaceous sandstones capped by Tertiary silcrete. Quaternary slope mantles and alluvium.	Undulating plains with defined creek lines extending to floodouts. Plateaus, tablelands and mesas with prominent low scarps of silicified rock. Low colluvial slopes to floodout areas.	Deep brown loamy clays and sticky grey green clays, some texture contrast soils. Brown and grey clays in alluvium. Stony, contour banded lower slopes. Brown clays and texture contrast soils in alluvium.	Mitchell grass and forbs in good seasons. Often bare coolabah, river red gum, gidgee, black box, river cooba and chenopods along creeks and in floodouts. Sparse mulga, gidgee and belah with bluebush and saltbush on tablelands. Mitchell grass on slopes. Floodouts similar to Central Downs.

## 11. References

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