

# BRR Burra Creek Land System

Undulating rises and steep hills of the Burra Creek catchment south of Burra.

**Area:** 136.8 km<sup>2</sup>

**Annual rainfall:** 335 – 510 mm average

**Geology:** The majority of the Land System is formed on fine grained rocks of the Saddleworth Formation, with prominent reefs of Gilbert Range Quartzite and Auburn/Nackara Dolomite. The lineation of the formations is markedly north - south, and the main Burra Creek water course follows the direction of strike of the rocks. There are extensive areas of locally derived outwash sediments on outwash fans and creek flats. These are generally clayey, with interbedded sandy and gravelly layers. Most rocks and sediments are mantled by fine grained carbonate of aeolian origin.

**Topography:** The Land System includes the ranges section of the Burra Creek catchment from Burra southwards, and a small part of the Logan Creek catchment adjacent to its junction with Burra Creek. The catchment consists of a series of north - south trending topographic features, very strongly linked to the geology. From west to east the features are:

- A quartzite ridge of the Tothill Range Land System marks the western edge.
- From the foot of the quartzite ridge to Burra Creek is a complex of basement rock rises and alluvial/colluvial outwash fans.
- A secondary quartzite ridge runs through the centre of the basement rock/fan complex.
- A series of rises and low hills formed on Auburn/Nackara Dolomites runs along the western edge of Burra Creek.
- Burra Creek flats.
- A steep strongly dissected range marks the eastern side of the Land System.

**Elevation:** 660 m on the quartzite ridge to 370 m at the junction of Burra and Logan Creeks

**Relief:** Maximum relief is 90 m

**Soils:** Shallow stony loamy soils with loamy texture contrast soils characterize hillslopes. Deep sandy loam texture contrast soils, and deep gradational sandy loams to loams occur on lower slopes and flats.

## Main soils

*Soils formed on basement rocks*

**L1** Shallow stony loam

**A2** Shallow calcareous loam

*Soils formed on outwash sediments*

**D3** Hard sandy loam over dispersive red clay

## Minor soils

*Soils formed on basement rocks*

**D7** Hard sandy loam over poorly structured red clay on rock

**D1** Hard loam over red clay on rock

*Soils formed on outwash sediments*

**F2** Hard sandy loam over dispersive mottled clay

**M4** Gradational sandy loam

**M2** Gradational clay loam



**Main features:** The Burra Creek Land System comprises undulating to steep land grading to the main creek channel. The steeper slopes are very rocky, and much of the gentler sloping land is only semi arable due to rocky outcrop and shallow stony soils. The deeper soils are highly erodible and there is evidence of significant erosion in the past. Given the nature of the soils, the slopes, erosional history and marginal rainfall conditions, there is only limited potential for cropping. Careful grazing management is needed to maintain protective surface cover and to prevent further water course erosion.

**Soil Landscape Unit summary:** 24 Soil Landscape Units (SLUs) mapped in the Burra Creek Land System:

SLU	% of area	Main features #
AAC AAH AAI AAh	1.6 1.3 19.4 1.3	<p>Rocky slopes formed on mainly fine grained rocks, with up to 20% rock outcrop and 20% or more surface stone.</p> <p><b>AAC</b> Low hills to 60 m high with slopes of 10-25%</p> <p><b>AAH</b> Rises to 40 m high with slopes of 8-20%, eroded water courses and minor scalding.</p> <p><b>AAI</b> Dissected slopes up to 90 m high with slopes of 20-40%, eroded water courses and minor scalding.</p> <p><b>AAh</b> Dissected rises to 40 m high with slopes of 8-20%, severely eroded water courses and 5-10% scalded areas.</p> <p>Main soils: <u>shallow stony loam</u> - <b>L1</b> (V) with <u>shallow calcareous loam</u> - <b>A2</b> (C). This land is too steep and rocky for any agricultural uses other than rough grazing. Much of the land has been eroded in the past, so maintenance of surface cover and control of run off are the main management issues.</p>
ABB ABC ABD	0.9 2.1 0.5	<p>Low hills to 50 m high formed on interbedded siltstones and quartzites. There is 20% or more surface stone and up to 20% rocky quartzite reefs.</p> <p><b>ABB</b> Rises to 30 m high with slopes of 8-15% with about 20% arable strips between rocky outcrops.</p> <p><b>ABC</b> Low hills and ridges to 80 m high with slopes of 15-30%</p> <p><b>ABD</b> Steep low hills to 90 m high with slopes of 30-40%.</p> <p>Main soils: <u>shallow stony loam</u> - <b>L1</b> (V) with <u>hard loam over red clay / poorly structured red clay, on rock</u> - <b>D1/D7</b> (E). This land is moderately steep, stony, exposed and with mainly shallow soils. Agricultural use is restricted to rough grazing.</p>
ADA ADB ADC ADD ADJ	0.3 2.3 5.8 0.8 17.9	<p>Series of rounded low hills and ridges formed on interbedded Auburn/Nackara Dolomites and Saddleworth Formation siltstones. There is up to 20% surface calcrete and siltstone and sporadic rock outcrop.</p> <p><b>ADA</b> Very low rises, less than 10 m high with slopes of less than 10%.</p> <p><b>ADB</b> Low rises to 20 m high with slopes of 10-20%</p> <p><b>ADC</b> Low hills to 50 m high with slopes of 15-30%.</p> <p><b>ADD</b> Steep ridges to 70 m high with slopes of 30-75%.</p> <p><b>ADJ</b> Dissected low hills to 80 m high with slopes of 30-60% and eroded water courses.</p> <p>Main soils: <u>shallow calcareous loam</u> - <b>A2</b> (E) and <u>shallow stony loam</u> - <b>L1</b> (E). These rises and low hills have shallow although moderately fertile and well structured soils. This is due to the strong influence of calcium from parent rocks, and makes the soils relatively stable. The combination of shallow soils, moderate to steep slopes and low rainfall restricts land use to rough grazing. These soils are easily bared off, so control of grazing pressure is needed to prevent soil erosion.</p>
AKB	1.1	<p>Dissected lower slopes with gradients of 10-20%, sporadic rock and extensive surface stone. The slopes are crossed by frequent water courses (mostly eroded) flowing from the higher ground to the west.</p> <p>Main soils: <u>shallow stony loam</u> - <b>L1</b> (V) with <u>shallow calcareous loam</u> - <b>A2</b> (C). These soils are shallow and stony, and the slopes are moderate – the land is non arable, at risk of erosion and suitable only for grazing.</p>
ALH ALi	3.8 3.9	<p>Moderately steep rocky low hills formed on tillites. Slopes are 15-30%, and relief is up to 60 m. There is 10-20% rock outcrop and 20% or more surface stone.</p> <p><b>ALH</b> Rises to 40 m high with slopes of 8-20%, eroded water courses and minor scalding.</p> <p><b>ALi</b> Dissected low hills to 50 m high with slopes of 15-30%, severely eroded water courses and 5-10% scalded areas.</p>



		Main soils: <u>shallow stony sandy loam - L1 (V)</u> with <u>hard sandy loam over dispersive red clay on rock - D7 (L)</u> . This land is moderately steep and rocky with shallow soils. Erosion potential is high.
AQD	4.6	Abrupt steep rocky ridge, 70 m high with slopes of 25-50% formed on Gilbert Range Quartzite. There is up to 50% surface quartzite and up to 20% reefs of outcropping quartzite. Main soils: <u>shallow stony sandy loam - L1 (V)</u> , with <u>hard loam over red clay / poorly structured red clay, on rock - D7/D1 (L)</u> . This land is steep, stony, exposed and has mainly shallow soils. Agricultural use is restricted to rough grazing.
DZC DZH	3.7 15.5	Complex of rises and low hills formed on basement sandstones and siltstones, and locally derived alluvium on fans and in valleys. Slopes are 3-10%. There is 2-5% rocky outcrop. <b>DZC</b> Water courses generally not eroded. <b>DZH</b> Water courses usually eroded.  Main soils: <u>hard loam over red clay / poorly structured red clay, on rock - D7/D1 (E)</u> , <u>shallow calcareous loam - A2 (L)</u> and <u>shallow stony loam - L1 (M)</u> on rises, with <u>hard sandy loam over dispersive clay - D3/F2 (E)</u> on fans. The soils are inherently moderately productive but historic erosion has degraded their structure. They are consequently prone to excessive runoff and further erosion. Most of the land is potentially arable, but the combination of unreliable rainfall and sloping ground entails a significant risk of erosion. Maintenance of surface cover and protection of eroded water courses are key management issues.
ETI	1.1	Rocky rises formed on siltstones with up to 20% rocky reefs and eroded water courses. Main soils: <u>shallow calcareous loam - A2 (E)</u> , <u>shallow stony loam - L1 (E)</u> and <u>hard loam over red clay / poorly structured red clay, on rock - D7/D1 (E)</u> . Rocky reefs, shallow stony soils and moderate slopes limit cropping of these areas. The arable land is generally confined to strips between the reefs of rock. Water erosion is a potential problem because of the high runoff from the shallow soils and rocky areas.
EUI	2.8	Complex of rocky rises formed on Appila Tillites and outwash fans formed on alluvium. Slopes are 10-20%. Water courses are commonly eroded. Main soils: <u>shallow stony sandy loam - L1 (E)</u> with <u>hard sandy loam over dispersive red clay - D7 (L)</u> on rises, and <u>hard sandy loam over dispersive clay - D3/F2 (E)</u> on fans. This land is largely undeveloped due to its irregular topography, rocky ground and moderate slopes. On the parts that are cropped, the land must be worked around rocky reefs and water courses. The soils are poorly structured and highly erodible, and the shallow types run out of moisture early in spring. The remaining areas with tree cover provide useful stock shelter.
JBH JBJ JBo	1.1 3.7 3.5	Outwash fans and drainage depressions formed on clayey and sandy alluvial sediments. <b>JBH</b> Fans with slopes of 4-10% and eroded water courses. <b>JBJ</b> Burra Creek flats with slopes of less than 2% and eroded banks. <b>JBo</b> Burra Creek flats with slopes of 1-2%, eroded banks and 10-20% scalding.  Main soils: <u>hard sandy loam over dispersive clay - D3/F2 (V)</u> , with <u>gradational sandy loam - M4 (L)</u> and <u>gradational clay loam - M2 (L)</u> . Although deep and moderately fertile, these soils have poorly structured surfaces, shed water readily and are highly erodible. The land is subject to considerable run on water from adjacent steeper slopes, so control of water flow and maintenance of surface cover are critical. Soil acidity and salinity should be monitored on this land.
JWB	1.0	Lower slopes of 2-3% formed over a complex of alluvium with basement rock rises. Main soils: <u>hard sandy loam over dispersive clay - D3/F2 (E)</u> , <u>gradational sandy loam - M4 (M)</u> and <u>gradational clay loam - M2 (M)</u> , with <u>hard sandy loam over dispersive red clay - D7 (E)</u> on low rises. This land has mostly deep soils, but they are poorly structured. Provided that surface structure is improved, they can be productive.

# PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

- (D) Dominant in extent (>90% of SLU)  
(V) Very extensive in extent (60–90% of SLU)  
(E) Extensive in extent (30–60% of SLU)

- (C) Common in extent (20–30% of SLU)  
(L) Limited in extent (10–20% of SLU)  
(M) Minor in extent (<10% of SLU)



**Detailed soil profile descriptions:**

- A2** Shallow calcareous loam (Paralithic, Hypercalcic / Supracalcic Calcarosol)  
Calcareous loam grading to a very highly calcareous brown silty loam, sometimes with carbonate rubble, over weathering calcareous siltstone or dolomite at about 50 cm.
- D1** Hard loam over red clay on rock (Calcic, Red Chromosol)  
15 - 35 cm hard siltstone gravelly sandy loam to clay loam abruptly overlying a well structured red clay, calcareous with depth, grading to weathering siltstone or sandstone within 100 cm.
- D3** Hard sandy loam over dispersive red clay (Calcic, Red Sodosol)  
30 - 60 cm hard gritty sandy loam to sandy clay loam abruptly overlying a dispersive coarsely structured red clay, variably calcareous with depth, continuing below 100 cm.
- D7** Hard sandy loam over poorly structured red clay on rock (Calcic / Hypercalcic, Red Sodosol)  
15 - 35 cm hard quartzite gravelly sandy loam to clay loam abruptly overlying a coarsely structured and dispersive red clay, calcareous with depth, grading to weathering quartzitic sandstone or quartzite within 100 cm.
- F2** Hard sandy loam over dispersive mottled clay (Calcic, Brown / Red Sodosol)  
10 - 40 cm hard gritty sandy loam to sandy clay loam abruptly overlying a dispersive coarsely structured brown and red mottled clay, calcareous with depth, continuing below 100 cm.
- L1** Shallow stony loam (Paralithic / Lithic, Leptic Tenosol / Rudosol)  
Variable thickness stony sandy loam to clay loam grading to hard or weathered basement rock, usually within 50 cm.
- M2** Gradational clay loam (Red Dermosol)  
Medium thickness clay loam grading to a well structured red clay.
- M4** Gradational sandy loam (Red / Brown Kandosol)  
30 - 60 cm sandy loam to sandy clay loam grading to a poorly structured red or dark brown clay.

**Further information:** [DEWNR Soil and Land Program](#)

