

YCW Yarcowie Land System

Flats and rises in the upper catchment of Booborowie Creek

Area: 82.1 km²

Annual rainfall: 350 - 450 mm average

Geology: Siltstones, calc-siltstones and tillites of the Tapley Hill and Appila Formations underlie the land system and outcrop extensively, but the majority of the area is covered by alluvial sediments of the Pooraka Formation. All rocks and sediments are coated with a veneer of aeolian carbonate, as either soft or nodular segregations at variable depths within the upper two metres of the soil / rock profile.

Topography: The land system is an alluvial plain and associated outwash fans in the upper catchment of Booborowie Creek. The alluvial deposits are almost entirely surrounded by basement rock rises and low hills of other land systems. Outliers of these rocks protrude through the sedimentary cover of the Yarcowie Land System as rises and occasional low hills. Watercourses are well defined on the fans, but lose their definition on the plains. All surface drainage is via a gap in the encircling rises on the south eastern side of the land system. Slopes on the plains and fans are less than 6% and usually less than 3%. On the basement rock rises, slopes are up to 30% but usually less than 10%.

Elevation: 500 - 600 m

Relief: Maximum local relief is 50 m but usually less than 30 m

Soils: Most soils are deep over alluvium on flats and gentle slopes. Sandy loam to loam surfaces are usual, with red clayey subsoils. A significant proportion of soils is calcareous throughout. On rises, soils are shallower, and include calcareous and non calcareous loams, as well as deeper soils with red clayey subsoils.

Main soils: *Deep soils formed over alluvium on plains and outwash fans*

D2 Hard sandy loam over well structured red clay

C3 Gradational red loam

D3 Hard sandy loam over dispersive red clay

A3 Deep calcareous loam

Moderately deep to shallow soils on basement rock rises

A2 Shallow calcareous loam

Minor soils: *Moderately deep to shallow soils on basement rock rises*

D1 Hard loam over red clay on rock

L1 Shallow stony loam

C2 Gradational loam on rock

Main features: The Yarcowie Land System comprises plains and gentle slopes with deep fertile soils and rising ground with shallower soils over rock. On the flatter areas with hard sandy loam to loam over clay soils, the main soil limitation is poor surface structure causing excessive runoff, working difficulty and emergence and root growth problems. These areas can be expected to be marginally saline in the subsoil. The rises are characterized by mainly shallow calcareous soils which have no structure problems, but are lower in fertility. The non calcareous soils on the rises have similar structural properties to the hard soils of the plains. Shallow stony soils are minor.



Soil Landscape Unit summary: 11 Soil Landscape Units (SLUs) mapped in the Yarcowie Land System

SLU	% of area	Main features #
AAC	0.9	Moderately steep rocky low hill, 50 m high, with slopes of 15-30%. Main soils: <u>shallow stony loam</u> - L1 (E) and <u>calcareous loam</u> - A2 (E). This hill is non arable due to steep slopes and rockiness. Pasture productivity is limited mainly by shallow soils and the difficulty in undertaking improvements (sowing, fertilizing etc). There is considerable potential for erosion. Watercourses are generally stable although there are sporadic occurrences of gully erosion.
DCC	6.7	Gentle slopes and low rises to 20 m high formed on basement rocks with slopes of 3-10%. Main soils: <u>hard loam over red clay on rock</u> - D1 (V) with <u>shallow calcareous loam</u> - A2 (L) and <u>gradational loam on rock</u> - C2 (L). <u>Shallow stony loam</u> - L1 (M) occurs in minor areas of rock outcrop. The soils are moderately fertile, well drained and have moderately high waterholding capacities. The slopes are mostly arable. Gradients are moderate with a consequent potential for water erosion. This is exacerbated by the predominant hard setting, poorly structured soil type which tends to seal over and shed water. Other limitations caused by poor structure are difficulty in working and patchy emergence.
EFB EFC	1.3 18.9	Rises formed on calcareous basement rock. EFB Rises less than 10 m high and with slopes of less than 3%. EFC Undulating rises, 20 m high with slopes of 3-12% and sporadic rock outcrop. Main soils: <u>shallow calcareous loam</u> - A2 (E) and <u>shallow stony loam</u> - L1 (E) with some <u>hard loam over red clay on rock</u> - D1 (L) on lower slopes. The soils are well drained and well structured, but are shallow and only moderately fertile due to their relatively low clay content. Erodibility is moderately low due to the high permeability of the dominant soil type.
ESD	5.6	Gentle to moderately steep uneven rises up to 30 m high formed on basement rock with slopes of 5-20%. Rocky reefs cover 20-50% of the land surface. Main soils: <u>shallow calcareous loam</u> - A2 (V) with <u>shallow stony loam</u> - L1 (L) and <u>gradational loam on rock</u> - C2 (L). Rocky reefs, shallow stony soils and sometimes 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.
JDA JDB JDC JDK	26.3 31.8 1.6 3.4	Plains and outwash fans formed on alluvium. JDA Flats with slopes of less than 1%. JDB Fans with slopes of 1-3%. JDC Fans with slopes of 3-5%. JDK Flats with slopes of less than 1% and sporadic salinity. Main soils: deep <u>hard sandy loam over well structured red clay</u> - D2 (E) and <u>gradational red loam</u> - C3 (E) with smaller areas of <u>hard sandy loam over dispersive red clay</u> - D3 (L) and <u>deep calcareous loam</u> - A3 (L), the latter mostly in JDC . The land is fully arable, except for minor saline patches. Hard setting surface soils are the main management problem, because of their adverse effects on runoff / erosion, workability, seedling emergence, and moisture retention. Most soils are reasonably fertile, deep and moderately well drained.
JXB JXC	1.6 1.9	Complex of outwash fans with basement rock rises. JXB Slopes of 1-3%. JXC Slopes of 3-8%. Main soils: deep <u>hard sandy loam over dispersive red clay</u> - D3 (L), <u>hard sandy loam over well structured red clay</u> - D2 (L), <u>gradational red loam</u> - C3 (L) and <u>deep calcareous loam</u> - A3 (M) on fans, and <u>shallow calcareous loam</u> - A2 (C) with <u>hard loam over red clay on rock</u> - D1 (M) and <u>gradational loam on rock</u> - C2 (M) on rises. The fans are similar to JDB and JDC, while the rises are similar to DCC and EFC .

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

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| (D) | Dominant in extent (>90% of SLU) | (C) | Common in extent (20–30% of SLU) |
| (V) | Very extensive in extent (60–90% of SLU) | (L) | Limited in extent (10–20% of SLU) |
| (E) | Extensive in extent (30–60% 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 very highly calcareous clay loam or rubble merging with calcareous weathering rock within 100 cm, usually 50 cm.
- A3** Deep calcareous loam (Regolithic, Calcic / Hypercalcic Calcarosol)
Calcareous loam to clay loam becoming more clayey and calcareous at depth over a highly calcareous layer grading to alluvium below 100 cm.
- C2** Gradational loam on rock (Calcic, Red Dermosol)
Hard sandy loam to clay loam grading to a well structured red clay with soft carbonate at depth, merging with weathering fine grained rock within 100 cm.
- C3** Gradational red loam (Hypercalcic / Lithocalcic, Red Dermosol)
Loam to clay loam grading to a well structured clay with soft to rubbly carbonate at depth over alluvium.
- D1** Hard loam over red clay on rock (Calcic, Red Chromosol)
Hard sandy loam to clay loam abruptly overlying a well structured red clay with soft carbonate at depth, grading to weathering fine grained rock within 100 cm.
- D2** Hard sandy loam over well structured red clay (Calcic, Red Chromosol)
Medium thickness hard setting sandy loam to sandy clay loam abruptly overlying a well structured red clay with soft carbonate accumulations at depth over alluvium.
- D3** Hard sandy loam over dispersive red clay (Calcic, Red Sodosol)
Medium thickness hard setting sandy loam to sandy clay loam abruptly overlying a poorly structured dispersive red clay with soft carbonate accumulations at depth over alluvium.
- L1** Shallow stony loam (Lithic, Leptic Tenosol / Rudosol)
Shallow stony loam, sometimes calcareous with depth, overlying basement rock within 50 cm.

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

