

BBO Booborowie Land System

Flats and outwash fans of the Booborowie and lower Gum Creeks

Area: 129.7 km²

Annual rainfall 385 – 525 mm average

Geology: Fine to medium grained alluvium derived from the erosion and deposition of sediments from surrounding basement rock hills. The sediments are invariably mantled by fine aeolian carbonates which concentrate 50 - 150 cm below the ground surface. Fine grained basement rocks underlie the alluvial valleys, and occasionally protrude through the sedimentary cover.

Topography: Flat plains and gently inclined outwash fans associated with the Booborowie Creek system and lower Gum Creek. Slopes generally increase from the watercourses to the adjacent basement rock hills, with an overall range of 0-10%. The main water courses are well defined with relatively stable channels. However, there is some erosion of tributary streams crossing the fans. The only relief on the flats and fans is provided by the occasional basement rock highs which occur as low rises up to 20 m high.

Elevation: 550 m at the headwaters of Booborowie Creek to 330 m where the creek system becomes the Broughton River.

Relief: There is up to 40 m elevation difference from watercourse to upper margin of outwash fans. The occasional basement high (up to 20 m) is the only other relief.

Soils: The characteristic soils have hard loamy surfaces over red clayey subsoils, some of which are dispersive. Associated soils include mainly deep gradational loams.

Main soils

Soils formed on flats and fans over alluvium

D2 Hard loam over red clay

D3 Hard loam over dispersive red clay

C3 Gradational clay loam

Minor soils

Soils formed on alluvium

M2 Dark clay - wetter flats

M1/M4 Alluvial loam - near present or former watercourses

Soils formed on rises over weathering rock

D1 Hard loam over red clay on rock

C2 Gradational loam on rock

A2 Calcareous loam

Main features: The land system is characterized by deep and inherently fertile soils. The main limitations are physical. Poor surface structure is usual, and is linked to reduced water infiltration, compaction, subsurface waterlogging, difficulty in working, patchy seedling emergence and erosion on the slopes. Some areas which are regularly waterlogged and/or marginally saline are not arable but support productive pastures. Watercourse erosion is significant in places. Saline seepage is sporadic, but it is likely that subsoil salinity levels are moderate and that saline water tables occur in places. Subsoil boron and sodicity levels are also likely to be high in places. Topsoil acidification is an increasing problem, especially on historically more productive ground.



Soil Landscape Unit summary: 13 Soil Landscape Units (SLUs) mapped in the Booborowie Land System:

SLU	% of area	Main features #
DCC	1.0	Rises formed on basement rock with slopes of 2-10% and relief of 10-20 m. Main soils: <u>hard loam over red clay on rock</u> - D1 (V) with <u>calcareous loam</u> - A2 (L) and <u>gradational loam on rock</u> - C2 (L) generally overlying weathering rock within 100 cm. These soils are moderately fertile, well drained and have moderately high water holding capacities. Although slopes have sufficient grades to run water, they are short so erosion potential is moderately low. Most soils have hard setting, poorly structured surfaces which tend to seal over and shed water, are difficult to work and may cause patchy emergence.
EGC	0.4	Gently inclined low rises on basement rock with slopes of 4-12 % and relief of 10 m. Main soils: shallow <u>calcareous loam</u> - A2 (V), with <u>hard loam over red clay on rock</u> - D1 (L) and <u>gradational loam on rock</u> - C2 (L). The land is fully arable (except for minor outcrop), but because most of the soils are relatively shallow, moisture shortages may limit crops in dry finishes. Reduction of water loss and erosion through runoff is the main management issue, together with fertility maintenance. "Lime - induced" nutrient deficiencies may occur on calcareous soils.
JAA JAB	26.4 2.4	Flats and fans of the lower Booborowie and Gum Creeks. The main creeks occupy well defined channels which are generally stable, although they have been eroded in the past. Small subsidiary channels are connected to the main watercourses in flatter areas. Waterlogged patches occur sporadically. These are saline in places. JAA Flats with slopes of less than 1%. JAB Fans with slopes of 1-4%. Main soils: <u>hard loam over red clay</u> - D2 (E) and <u>dark clay loam</u> - M2 (C), with <u>hard loam over dispersive red clay</u> - D3 (L), <u>gradational loam</u> - C3 (L) and <u>alluvial loam</u> - M1/M4 (L). The soils are deep and inherently fertile. The main limitations are physical. Poor surface structure is usual, and the D3 soils have poorly structured subsoils as well. These conditions lead to reduced water infiltration, subsurface waterlogging, difficulty in working and patchy seedling emergence. Some areas which are regularly waterlogged and/or marginally saline are not arable but support productive pastures. High subsoil salinity, sodicity and boron levels are likely in places. Topsoil acidification is an increasing problem, especially on historically more productive ground.
JEA JEB JEC JEG JEH JEK JEL JEP JEV	16.6 29.5 3.7 0.9 3.6 10.6 3.1 0.8 1.0	Flats and fans of upper Booborowie Creek. JEA Flats with slopes of less than 1%. JEB Fans with slopes of 1-4% and well defined and stable water courses. JEC Fans with slopes of 4-10% and well defined and stable water courses. JEG Fans with slopes of 2-3% and eroded water courses. JEH Fans with slopes of 4-10% and eroded water courses. JEK Flats with slopes of less than 1% and sporadic areas of marginal salinity. JEL Gentle slopes of 1-2% with sporadic areas of marginal salinity. JEP Marginally saline depressions. JEV Fans with slopes of 2-3% and more than 5% dry saline scalds. Minor basement rock rises occasionally protrude through the sediments. Main soils: <u>hard loam over red clay</u> - D2 (E) and <u>hard loam over dispersive red clay</u> - D3 (E), with <u>gradational loam</u> - C3 (L), all formed over alluvium. The soils are deep, inherently fertile and generally moderately well drained. The main limitations are poor surface (and subsurface in places) structure. Poor surface structure causes reduced water infiltration resulting in increased erosion potential and surface waterlogging, working difficulty and seedling emergence problems. Dispersive subsoils in D3 soils cause more prolonged waterlogging. Watercourse erosion is significant in JEG and JEH . Saline seepage is sporadic, but it is likely that subsoil salinity levels are moderate and that saline water tables occur in places. Topsoil acidification is an increasing problem, especially on historically more productive ground.

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** Calcareous loam (Paralithic Calcarosol)
Calcareous stony loam grading to a very highly calcareous layer of soft or rubbly carbonate merging with weathering basement rock.
- C2** Gradational loam on rock (Calcic, Red Dermosol)
Loam to clay loam grading to a well structured red clay with fine carbonate below 50 cm grading to weathering rock within 100 cm.
- C3** Gradational clay loam (Calcic, Red Dermosol)
Clay loam grading to a well structured red clay with fine carbonate below 50 cm, grading to alluvium.
- D1** Hard loam over red clay on rock (Calcic, Red Chromosol)
Medium to thick hard loam to clay loam abruptly overlying a well structured red clay with accumulations of fine carbonate below 50 cm, grading to weathering rock within 100 cm.
- D2** Hard loam over red clay (Calcic, Red Chromosol)
Medium to thick hard loam to clay loam abruptly overlying a well structured red clay with accumulations of fine carbonate below 50 cm grading to alluvium.
- D3** Hard loam over dispersive red clay (Calcic, Red Sodosol)
Medium thickness hard loam to clay loam abruptly overlying a poorly structured dispersive red clay with accumulations of soft carbonate below 50 cm grading to alluvium.
- M1/M4** Alluvial loam (Regolithic, Red-Orthic Tenosol OR Red Dermosol / Kandosol)
Very thick sandy loam to clay loam with variable gritty or more clayey lenses, formed over recent alluvium.
- M2** Dark clay loam (Calcic, Black Dermosol)
Thick dark brown clay loam overlying a black to dark brown clay with minor carbonate at depth.

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

