

WON Wonna Land System

Dissected eastern slopes of the Uooloo hills

Area: 96.8 km²

Annual rainfall: 250 - 350 mm average

Geology: Interbedded tillites, quartzites and siltstones of the Appila and Saddleworth Formations. There is a very strong geological lineation in this land system, caused by differential weathering of the various strata which are thin and vertically dipping. Most of the rocks are mantled by a veneer of aeolian carbonates.

Topography: The land system comprises two main components:

- A strongly dissected escarpment slope along the eastern margin of the Uooloo hills, and
- A range of low hills characterized by prominent quartzite ridges. The escarpment is well defined north of Wittow Creek, but to the south the escarpment loses its definition and grades into the quartzite ranges. Slopes on the escarpment range from 10-75%, and in the quartzite ranges, 10-40%.

Elevation: 430 m (Wittow Creek) to 596 m (highest point on the most southerly quartzite ridge)

Relief: Maximum local relief is 70 m (escarpment), and 60 m in the quartzite ranges

Soils: Shallow sandy loams over basement rocks occur on rising ground. Some have red clayey subsoils, others have subsurface carbonate accumulations, but most are formed directly in weathering rock. On lower ground, soils are deeper. Sandy loam surfaces overlie red clayey subsoils, gravelly medium textured subsoils, or carbonates.

Main soils

Soils formed over basement rock on rises and hills

- L1** Shallow stony sandy loam to sandy clay loam
- A2** Shallow calcareous loam
- D7** Hard sandy loam over dispersive red clay on rock

Minor soils

Deep soils formed over alluvium on outwash fans

- A4** Deep calcareous loam
- M4** Gradational stony sandy loam
- D2** Hard sandy loam over well structured red clay
- D3** Hard sandy loam over dispersive red clay
- D4** Crusting loam over friable red clay
- C3** Red gradational clay loam

Main features: The Wonna Land System is rough hill country, mostly uncleared, with marginal rainfall and predominantly shallow stony soils. Where deeper soils occur, usually in valley floors, they have been eroded.



Soil Landscape Unit summary: 17 Soil Landscape Units (SLUs) mapped in the Wonna Land System

SLU	% of area	Main features #
ABC ABD	3.6 16.2	Rolling to moderately steep low hills formed on Appila Tillite with prominent quartzite strike ridges. ABC Ridge slopes 10-25% with relief to 30 m. ABD Ridge slopes 25-40% with relief to 60 m. Main soils: <u>shallow stony sandy loam to sandy clay loam</u> - L1 (V) with <u>hard sandy loam over dispersive red clay on rock</u> - D7 (L). This land is moderately steep and very rocky. Access is difficult. Natural vegetation is only partly cleared.
AQD	2.0	Steep and rocky quartzite ridges up to 40 m high with slopes of 20-40%. Main soils are <u>shallow stony sandy loam to sandy clay loam</u> - L1 (E) and shallow <u>hard sandy loam over dispersive red clay on rock</u> - D7 (E). These ridges are steep and stony, and although they have patches of moderately deep soils they are exposed and have limited grazing value.
AUA AUB AUG	3.2 8.2 2.0	Rises and low hills formed on quartzitic rocks. AUA Rises, 10-20 m high, with slopes of less than 10%. Severe watercourse erosion in places. AUB Rises to 30 m high with slopes of 5-15%. AUG Irregular rises to 30 m high with slopes of 5-15% and significant erosion of watercourses. Main soils: <u>shallow stony sandy loam</u> - L1 (E) and <u>shallow calcareous loam</u> - A2 (E). Shallow soils and rocky outcrops limit the use of this land. Most of it is uncleared.
AWA AWB AWC AWD AWI AWJ AWi	14.5 6.0 17.7 6.8 2.1 9.0 2.8	Rough low stony hills formed on interbedded vertically dipping siltstones, tillites and quartzites. The various strata are as narrow as 50 m, so differential weathering has produced a land surface pattern of closely spaced "stripes". The hills have been variably dissected and eroded: AWA Slopes less than 10%, relief to 20 m. AWB Ridges and rises, 20-60 m high with slopes of 5-25%. AWC Slopes 10-20%, relief to 20 m. AWD Slopes 20-40%, relief to 50 m. AWI Dissected escarpment slopes of 20-30%, relief to 50 m and eroded watercourses. AWJ Dissected escarpment slopes of 30-75%, relief to 70 m and eroded watercourses. AWi Dissected escarpment slopes 10-30%, relief to 50 m; eroded watercourses; 5-10% scalding. Main soils: <u>shallow stony loam to sandy loam</u> - L1 (V), with <u>shallow calcareous loam</u> - A2 (C). Most of this land is uncleared, due to the shallowness of the soils and the rocky outcrops.
JJJ	1.4	Narrow drainage depressions with soils formed on valley floor alluvium. Slopes are variable up to 10%. Watercourses are invariably eroded. Main soils are deep <u>hard sandy loam over well structured red clay</u> - D2 (E) and <u>hard sandy loam over dispersive red clay</u> - D3 (E), with <u>gradational stony sandy loam</u> - M4 (C) and <u>deep calcareous loam</u> - A4 (L). Run off water from surrounding steeper slopes concentrates in these narrow valley floors. Moderate watercourse erosion has resulted. Protection from further degradation is the main management issue. These valleys are only partially cleared and have value as sheltered areas for stock.
KQB	1.7	Outwash fans formed on alluvium with low basement rock rises. Slopes are 2-3%. There is minor watercourse erosion. Main soils: <u>deep calcareous loam</u> - A4 (E), <u>loam over friable red clay</u> - D4 (C) and <u>gradational loam</u> - C3 (C), with <u>shallow calcareous loam</u> - A2 (L) and <u>shallow stony sandy loam to sandy clay loam</u> - L1 (L) on low basement rises. The soils are commonly shallow, although deeper profiles occur, with good waterholding capacities and fertility. However, low rainfall sets a permanent limit on productivity. Erosion by both wind and water is a constant threat - adequate ground cover must be maintained.
KYH KYJ	0.8 2.0	Drainage depressions and outwash fans formed on medium grained alluvium. Fans with slopes of 3-6% and eroded watercourses. Eroded drainage depressions with variable slopes to 10%. Main soils: <u>deep calcareous loam</u> - A4 (E) and <u>gradational stony sandy loam</u> - M4 (E). Severe erosion of these valleys has been caused by concentration of run off water from adjacent slopes. These areas have some use for stock shelter, but erosion control is paramount.

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 Calcarosol)
Calcareous loam grading to a very highly calcareous clay loam or rubble layer merging with calcareous weathering rock within 100 cm, usually 50 cm.
- A4** Deep calcareous loam (Regolithic, Hypercalcic / Supracalcic Calcarosol)
Calcareous loam becoming more clayey and calcareous with depth grading to a layer of soft to rubbly carbonate, over silty alluvium.
- C3** Red gradational clay loam (Calcic / Supracalcic, Red Dermosol)
Medium thickness loam to clay loam grading to a well structured red clayey subsoil with variable soft to rubbly carbonate from 60 cm. The soil grades to alluvium with depth.
- 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.
- 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.
- D4** Crusting loam over friable red clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness crusting sandy loam to loam, commonly with a bleached subsurface (A2) layer, sharply overlying a friable well structured red clayey subsoil, with minor soft carbonate below 60 cm. The soil grades to alluvium with depth.
- D7** Hard sandy loam over dispersive red clay on rock (Calcic, Red Sodosol)
Hard sandy loam to sandy clay loam overlying a poorly structured dispersive red clay with soft carbonate at depth, over weathering quartzitic rock, deeper 100 cm.
- L1** Shallow stony sandy loam to sandy clay loam (Lithic, Leptic Tenosol / Rudosol)
Shallow stony sandy loam to sandy clay loam, sometimes calcareous with depth, overlying basement rock within 50 cm.
- M4** Gradational stony sandy loam (Red Kandosol)
Stony sandy loam to sandy clay loam grading to a stony poorly structured sandy clay with depth.

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

