

ULO Ulooloo Land System

Moderately steep to steep hills east of Hallett

Area: 166.8 km²

Annual rainfall: 300 – 400 mm average

Geology: Appila Tillite, Saddleworth Formation siltstone, Mintaro Shale and interbedded quartzites are at or near the surface over much of the area. Alluvial sediments occur on fans and in narrow drainage valleys. The rocks over much of the area are mantled by aeolian carbonates which are either soft, nodular, or in cemented sheet form.

Topography: The landscape comprises moderately steep to steep rocky low hills with slopes of 15 - 40%, the steeper slopes having razorback crests. There are large areas of gently rolling country with slopes of 8 - 20% and up to 20% coverage of rocky reefs. Watercourses generally occupy narrow drainage depressions, but there are also some broader outwash fans. Most channels have been eroded in the past. The main watercourse draining the land is the Ulooloo - Banbury - Terowie - Wittow Creek system which flows out to the east. Short watercourses drain the northern and western slopes.

Elevation: 450 m on the eastern edge to 726 m in the north.

Relief: Maximum local relief is 130 m, but 50 - 100 m is more usual in the steeper country, and 20 - 40 m in the more gently sloping areas.

Soils: Most soils are shallow to moderately deep over basement rock, and include shallow calcareous and non calcareous sandy loams and loams, and hard sandy loam over red clay soils. Deeper sandy loam over red clay soils dominate lower slopes, and are associated with deep gradational sandy loams.

Main soils

Soils formed over basement rock on rises and hills

- L1** Shallow stony sandy loam to sandy clay loam
- A2** Shallow calcareous loam
- D1** Loam over red clay on rock

Minor soils

Deep soils formed over alluvium on outwash fans

- D2** Hard sandy loam to loam over well structured red clay
- D3** Hard sandy loam over dispersive red clay
- M4** Gradational stony sandy loam
- A4** Deep calcareous loam

Soils formed over basement rock on rises and hills

- D7** Hard sandy loam over dispersive red clay on rock

Main features: The Ulooloo Land System comprises an extensive area of moderately steep to steep hill country, much of which has been only partially cleared and is used only for light grazing. Easily accessible and arable land falls into two categories: undulating to gently rolling slopes, and drainage depressions. There is some cropping in these areas, but marginal



rainfall, erosion potential and limiting soil conditions restrict acreages. The main soil limitations are shallow stony profiles and rocky outcrops on slopes, and poor surface structure in drainage valleys. The whole area has been severely eroded in the past, with eroded watercourses and scalding widespread. The focus of any management strategy should be protection from further degradation.

Soil Landscape Unit summary: 26 Soil Landscape Units (SLUs) mapped in the Ulooloo Land System

SLU	% of area	Main features #
AAC AAI AAJ AAi AAj	3.3 6.1 0.6 19.5 14.4	<p>Rough, irregular low hills with extensive rock outcrop and variable degrees of watercourse erosion and scalding, as indicated:</p> <p>AAC Low hills, 30-70 m high with slopes of 15-30%.</p> <p>AAI Low hills up to 50 m high, with slopes of 10-30% and minor watercourse erosion.</p> <p>AAJ Steep low hills to 60 m high with slopes of 25-40% and minor watercourse erosion.</p> <p>AAi Low hills, 30-60 m high, with slopes of 10-30%, eroded watercourses and 5-10% of land affected by scalding.</p> <p>AAj Razor back hills, 50-130 m high, with slopes of 25-40%, eroded watercourses and 5-10% of land affected by scalding.</p> <p>Main soils: <u>shallow stony loam</u> - L1 (V) with <u>loam over red clay on rock</u> - D1 (L) and <u>shallow calcareous loam</u> - A2 (L). This land is non arable due to the roughness and steepness of the terrain - large areas are so steep as to be inaccessible to vehicles. Runoff is rapid and exposure is high, so a proportion of rainfall does not infiltrate the soil. There is a significant area of moderately deep fertile soils on the slopes and these are potentially productive for grazing. Erosion potential is a major management issue. Watercourses and areas scalded in the past are particularly susceptible to erosion.</p>
AQC AQF	0.7 0.4	<p>Moderately steep to very steep and rocky quartzite ridges.</p> <p>AQC Ridges, 50 m high, with slopes of 20-30%.</p> <p>AQF Very steep and very rocky ridge, 50 m high with slopes of 50-100%.</p> <p>Main soils: <u>shallow stony sandy loam</u> - L1 (E) and <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 very exposed and have limited grazing value.</p>
DXH	1.8	<p>Undulating lower slopes comprising low basement rock rises separated by alluvial fans. Slopes are 4-10%. Watercourses are eroded.</p> <p>Main soils on rises: <u>loam over red clay on rock</u> - D1 (E) with <u>shallow calcareous loam</u> - A2 (L) on upper slopes, and on the fans, deep <u>hard sandy loam over dispersive red clay</u> - D3 (L) and <u>hard sandy loam over well structured red clay</u> - D2 (L) are typical. This is one of the few areas in the Land System which is cropped. The soils are relatively deep and fertile, and slopes are moderate. The main limitations are poor surface soil structure, and associated erosion potential. Run off water from the steeper slopes to the south accentuates the erosion risk.</p>
EFC	1.4	<p>Low rises to 20 m high with slopes of 4-8%, formed on calcareous basement rocks. Main soil is <u>shallow calcareous loam</u> - A2 (D). The soils are mostly arable, although shallow depth and therefore low waterholding capacity is a limitation. Although infiltration rates are moderately high, there is always the potential for runoff and consequent erosion of unprotected soil during heavy rain.</p>
EGC	0.6	<p>Gentle slopes of 4-10% formed on fine grained basement rocks, with 10-20% rocky outcrop.</p> <p>Main soils: <u>shallow calcareous loam</u> - A2 (E) and <u>loam over red clay on rock</u> - D1 (E) with <u>shallow stony loam</u> - L1 (L) associated with rocky areas. The land is mostly arable, 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.</p>
EOC EOm	0.8 1.7	<p>Undulating lower slopes with rises of basement rock, separated by alluvial fans.</p> <p>EOC Low rises and flats with slopes of 3-10%.</p> <p>EOm Low rises and gentle slopes of 3-8% with eroded watercourses and 5-10% of the land affected by scalding.</p> <p>Main soils: <u>shallow calcareous loam</u> - A2 (E) and <u>shallow stony loam</u> - L1 (E) on rises, and deep <u>hard sandy loam over dispersive red clay</u> - D3 (L) with <u>gradational stony sandy loam</u> - M4 (M) and <u>deep calcareous loam</u> - A4 (M) on fans. Shallow stony soils and marginal rainfall are the main limitations on this land. Erosion potential, particularly on the slopes of EOm, is moderate to high.</p>



ESC	3.4	Undulating to gently rolling rises and slopes formed on basement rocks with extensive rocky reefs.
ESD	4.6	ESC Gentle slopes of 5-10%.
ESH	0.5	ESD Gentle to moderate slopes of 5-15%.
ESW	1.6	ESH Undulating rises with slopes of 6-10% and eroded watercourses.
ESX	8.3	ESW Undulating rises with slopes of 3-5% and 5-10% of land affected by scalding.
ESm	4.6	ESX Gently rolling rises with slopes of 8-20% and 5-10% of land affected by scalding.
ESn	0.9	ESm Gentle slopes of 5-10% with eroded watercourses and 5-10% of land affected by scalding. ESn Moderate slopes of 10-20% with eroded watercourses and 5-10% of land affected by scalding. Main soils: <u>shallow stony loam</u> - L1 (E) and <u>shallow calcareous loam</u> - A2 (E) with <u>loam over red clay on rock</u> - D1 (L). Most of this land is not farmed due to a combination of marginal rainfall, rocky reefs, shallow stony soils and often moderate slopes. Water erosion is a serious threat because of the high runoff from the shallow soils and rocky areas.
EZW	1.2	Lower slopes with basement rock rises separated by alluvial fans.
EZn	1.6	EZW Slopes of 4-10% and 5-10% of the land affected by scalding. EZn Slopes of 8-20% with eroded watercourses and 5-10% of the land affected by scalding. Main soils: <u>shallow calcareous loam</u> - A2 (E) and <u>shallow stony loam</u> - L1 (C) on rises, with deep <u>hard loam over well structured red clay</u> - D2 (E) on fans. The predominantly shallow stony soils, high erosion potential and marginal rainfall restrict the use of this land mainly to grazing.
JJJ	2.3	Narrow drainage depressions with soils formed on valley floor alluvium. Slopes are variable up to
JJY	0.2	10%. Watercourses are invariably eroded.
JJo	8.6	JJJ Depressions with eroded watercourses. JJY Shallow depressions with more than 5% of land affected by scalding. JJo Depressions with severely eroded watercourses and more than 5% of land affected by scalding. Main soils: deep <u>hard sandy loam over dispersive red clay</u> - D3 and <u>hard sandy loam over well structured red clay</u> - D2 , with <u>gradational stony sandy loam</u> - M4 and <u>deep calcareous loam</u> - A4 . Run off water from surrounding steeper slopes concentrates in these narrow valley floors. Moderate to severe watercourse erosion has resulted, along with sheet erosion on the flats. Protection from further degradation is the main management issue.
JYH	2.1	Fans formed on local alluvial outwash, with low basement rock rises. Slopes are 4-10%.
JYm	8.8	JYH Undulating fans with eroded watercourses. JYm Undulating fans with eroded watercourses and 5-10% of land affected by scalding. Main soils: deep <u>hard sandy loam over dispersive red clay</u> - D3 (E) and <u>hard sandy loam over well structured red clay</u> - D2 (E), with <u>gradational stony sandy loam</u> - M4 (C) and <u>deep calcareous loam</u> - A4 (L) on fans, and <u>shallow calcareous loam</u> - A2 (M), <u>shallow stony loam</u> - L1 (M), and <u>loam over red clay on rock</u> - D1 (M) on rises. The soils of the fans are deep and moderately fertile, but with poor surface structure. They are subject to substantial run on water, so the erosion potential is high. On the rises, shallow stony soils are predominant. These are well structured, but are only moderately fertile and prone to moisture deficit.

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 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 with a layer of soft to rubbly carbonate within 50 cm, grading to silty alluvium.
- D1** Loam over red clay on rock (Hypercalcic / Supracalcic, Red Chromosol)
Hard red loam to clay loam overlying a well structured red clayey subsoil with soft to rubbly (or sheet) carbonate at depth, over weathering rock within 100 cm.
- D2** Hard sandy loam to 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.
- 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 subsoil with soft carbonate at depth, over weathering quartzitic rock, deeper than 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 (Eutrophic, 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](#)

