

# YMR Yackamoorundie Range Land System

Strongly dissected low hills and hills of the Yackamoorundie Range

**Area:** 102.2 km<sup>2</sup>

**Annual rainfall:** 425 - 525 mm average

**Geology:** Complex of Rhynie Sandstone, Stradbroke Formation siltstones, Auburn / Skillogalee Dolomite and Saddleworth Formation (interbedded siltstones and quartzitic rocks including Watervale Sandstone and Undalya Quartzite). The Saddleworth Formation rocks (in the west) are silicified to some extent and carry a sporadic silcrete capping. Aeolian carbonates form a veneer over most of the rocks. The degree of dissection of the rocks has not allowed significant accumulation of outwash sediments.

**Topography:** The Yackamoorundie Range extends from the Broughton River south to Bungaree Hill. It comprises several steep north - south quartzite ridges separated by moderately steep slopes on less resistant rock types. In the southern two thirds of the System, the ridges have slopes of 20-50% and the intervening land has slopes of 10-30%, with generally well defined linear rock outcrops. In the north, the pattern is disrupted by the Broughton River and its tributaries which have created a gorge and associated network of watercourses flowing into the main river channel. Here, the streams, generally flowing west and north west are separated by steep razor back ridges, slopes of which usually exceed 30%. The slopes are characterized by more or less north - south trending quartzite reefs 100-200 m apart. There are only minor mappable areas of alluvial deposition in the land system. Erosion of watercourses is common, and there is evidence of historic scalding in the north western parts (associated with silcreted rocks).

**Elevation:** 492 m (Mt. Gregory on the eastern quartzite ridge) to 170 m where the Broughton River flows out the western edge of the land system.

**Relief:** Maximum relief is 100 m in the Broughton River gorge

**Soils:** Most soils are shallow stony loams over weathering rock. Many have subsurface calcareous accumulations, and others have red clayey subsoils.

**Main soils:** *Formed on basement rocks on hillslopes*

**L1** Shallow stony sandy loam to clay loam - throughout

**D1** Hard sandy loam to loam over red clay on rock - non calcareous rock types

**A2** Shallow calcareous loam - calcareous rock types

**C2** Clay loam over calcareous rock - dolomitic beds

**Minor soils:** *Formed on alluvium on lower slopes*

**D3** Hard loam over red clay

**Main features:** Moderately steep to steep slopes dominate the Yackamoorundie Land System. Soils are generally shallow and stony, although there are deeper soils on the finer grained softer rocks. Most of this land is suitable only for grazing - much of it is inaccessible to vehicles, making improvements very difficult. On the more gently sloping land the soils are deeper and more fertile, but slopes and rocky outcrop are still sufficient that it can only be considered semi-arable. There is a high erosion risk when this land is cropped or over-grazed.



**Soil Landscape Unit summary:** 19 Soil Landscape Units (SLUs) mapped in Yackamoorundie Range Land System

SLU	% of area	Main features #
ABC	4.3	Rocky low hills up to 70 m high with slopes of 15-25%, formed on mainly fine grained rocks interbedded with quartzite reefs. Main soils: <u>shallow stony loam</u> - <b>L1</b> (V) with <u>shallow calcareous loam</u> - <b>A2</b> (L) and <u>hard loam over red clay on rock</u> - <b>D1</b> (L). The hills are non arable due to the roughness of the terrain, moderate slopes and shallow stony soils. Rocky outcrops limit accessibility in places. Runoff is rapid and exposure is high, so a significant proportion of rainfall does not infiltrate the soil.
ADI ADJ	8.0 5.9	Strongly dissected low hills formed on predominantly calcareous rocks of the Auburn / Skillogalee Dolomite Formations. <b>ADI</b> Hillslopes of 20-30% with relief to 70 m and eroded watercourses. <b>ADJ</b> Hillslopes of 30-50% with relief to 90 m and eroded watercourses. Main soils: <u>shallow calcareous loam</u> - <b>A2</b> (E) and <u>shallow stony loam</u> - <b>L1</b> (E), with <u>clay loam over calcareous rock</u> - <b>C2</b> (L). The hills are steep and rocky, and the soils shallow although moderately fertile and well structured due to the strong influence of calcium from parent rocks. There is significant potential for water erosion, particularly in watercourses.
AKB AKC AKD AKI AKJ	0.9 7.1 4.3 14.2 13.4	Strongly dissected steep rocky low hills and moderately steep to steep rocky ridges formed on sandstones and siltstones with interbedded calcareous rocks of the Rhyne Formation. <b>AKB</b> Moderately steep rises of 10-20% with relief to 30 m. <b>AKC</b> Moderately steep ridges and slopes of 20-30% with relief to 70 m. <b>AKD</b> Steep ridges and slopes of 30-50% with relief to 100 m. <b>AKI</b> Strongly dissected low hills with slopes of 20-30%, relief to 80 m and eroded watercourses. <b>AKJ</b> Very strongly dissected low hills up to 90 m high with slopes of 20-50%, razorback ridges and eroded watercourses. Main soils: <u>shallow stony sandy loam</u> - <b>L1</b> (E) and <u>hard sandy loam over red clay on rock</u> - <b>D1</b> (C) on sandstones and siltstones, with <u>shallow calcareous loam</u> - <b>A2</b> (L) and <u>clay loam over calcareous rock</u> - <b>C2</b> (L). The hills are non arable due to the roughness of the terrain, moderate to steep slopes and shallow stony soils. Rocky outcrops and steeper slopes limit accessibility, particularly in <b>AKD</b> and <b>AKJ</b> . Soils are generally sandy surfaced, so natural fertility levels are moderately low. Runoff is rapid and exposure is high, so a significant proportion of rainfall does not infiltrate the soil. Watercourses are particularly susceptible to erosion.
ARB ARC ARD ARE	1.3 3.4 2.3 1.7	Ridges formed on interbedded highly resistant sandstones and quartzites, with softer siltstones. <b>ARB</b> Low ridges less than 30 m high with slopes of 10-20%. <b>ARC</b> Ridges to 40 m high with slopes of 10-30%. <b>ARD</b> Ridges to 50 m high with slopes of 20-40%. <b>ARE</b> High ridges 80-120 m high with slopes of 20-40%. Main soils: <u>shallow stony sandy loam</u> - <b>L1</b> (V) with shallow <u>hard sandy loam over red clay on rock</u> - <b>D1</b> (L). These ridges are mostly steep and suitable only for grazing. Runoff and therefore erosion potential is high to very high.
AXI AXK	1.8 5.5	Rocky rises and low hills formed on basement rocks, commonly deeply weathered and variably capped by Tertiary sands which are partially silcreted. Watercourses are commonly eroded and there are minor scalded areas. <b>AXI</b> Moderately steep slopes of 20-30% with relief of up to 60 m. <b>AXK</b> Steep slopes of 30-100% with relief of 80-100 m. Main soils: <u>shallow stony sandy loam</u> - <b>L1</b> (V), with <u>shallow calcareous loam</u> - <b>A2</b> (L) and shallow <u>hard sandy loam over red clay on rock</u> - <b>D1</b> (L). These slopes are non arable because of their slopes, past erosion, extensive rockiness and shallow, low fertility soils. Deeply weathered, kaolinitic soils are often associated with high levels of stored salts, so recharge of groundwater should be controlled in these areas.



ERI	16.5	Moderately steep rises and low hills formed on interbedded quartzitic and calcareous rocks, with characteristic linear reefs of outcropping rock. Slopes are 10–20% and relief up to 50 m. Watercourses are commonly eroded. Main soils: <u>shallow stony sandy loam</u> - <b>L1</b> (E) and <u>hard sandy loam over red clay on rock</u> - <b>D1</b> (E) on non calcareous rocks, with <u>clay loam over calcareous rock</u> - <b>C2</b> (L) and <u>shallow calcareous loam</u> - <b>A2</b> (L) on calcareous rocks. This land is semi-arable due to moderate slopes, rocky reefs and frequent watercourses. Soils are highly variable, but usually shallow. The soils on calcareous rocks are generally better structured and more fertile than those on quartzitic rocks, which tend to be sandier and highly erodible. Erosion control is a key component of management.
ESC ESD ESI	3.7 3.1 2.1	Undulating to moderately steep rocky slopes formed on interbedded siltstones and more quartzitic rocks of the Saddleworth and Stradbroke Formations. <b>ESC</b> Undulating rises with slopes of 4–10%, minor rock outcrop and saline seepage (lower slopes). <b>ESD</b> Dissected footslopes on the eastern margin of the main range with slopes of 10–20%, formed on Stradbroke Formation rocks. Sporadic saline seepage occurs on lower slopes. <b>ESI</b> Low hills to 40 m high with slopes of 10–20%, linear rocky outcrops and eroded watercourses. Main soils: <u>shallow stony loam</u> - <b>L1</b> (E), with <u>shallow calcareous loam</u> - <b>A2</b> (C), <u>hard loam over red clay on rock</u> - <b>D1</b> (L) and <u>clay loam over calcareous rock</u> - <b>C2</b> (L). Extensive rock outcrop and moderate slopes limit cropping of <b>ESD</b> and <b>ESI</b> . The arable land is generally confined to either strips between the reefs of rock or more gentle slopes. Water erosion is a potential problem because of the high runoff from the shallow soils, rocky areas, and the steep slopes to the west.
JAe	0.5	Eroded and saline drainage depressions. Main soil: deep <u>hard loam over red clay</u> - <b>D3</b> (D). The soils are deep and inherently fertile, but productivity potential is reduced by significant areas affected by saline seepage, waterlogging and erosion.

# 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 an accumulation of soft or rubby carbonate merging with weathering basement rock or highly altered ferruginized rock at between 50 and 100 cm.
- C2** Clay loam over calcareous rock (Hypercalcic, Red / Black Dermosol)  
Well structured red or black loam to clay loam, often grading to a red clayey subsoil overlying highly calcareous rock within 50 cm.
- D1** Hard sandy loam to loam over red clay on rock (Calcic, Red Chromosol)  
Medium thickness hard gravelly sandy loam abruptly overlying a well structured red clay, sometimes calcareous with depth, grading to weathering basement rock or highly altered (kaolinized or ferruginized) material within 100 cm.
- D3** Hard loam over red clay (Calcic, Red Sodosol)  
Medium to thick hard sandy loam to loam abruptly overlying a poorly structured dispersive red clay with accumulations of soft carbonate below 50 cm over alluvium.
- L1** Shallow stony sandy loam to clay loam (Lithic, Leptic Tenosol / Rudosol)  
Medium thickness stony sandy loam to clay loam overlying basement rock or silcrete, commonly at less than 50 cm. There may be an accumulation of carbonate in rock fissures.

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

