

EUE Eudunda Escarpment Land System

Moderately steep to steep escarpment slopes from Eudunda north to Brady Creek

Area: 42.2 km²

Annual rainfall: 395 – 495 mm average

Geology: The escarpment is formed on variably metamorphosed siltstones of the Tapley Hill and Wilyerpa Formations (along the western side), and on quartzitic sandstones and tillites of the Appila Formation (along the eastern side). There are prominent quartzite reefs in the Appila rocks which give rise to a characteristic saw tooth topography. Locally derived outwash sediments have accumulated on fans at the foot of the escarpment. These are typically clayey, but with a variable content of quartzite stones. Most of the rocks and sediments are mantled by fine grained carbonates of aeolian origin. In places these have hardened into rubbly or sheet forms.

Topography: The Land System is the abrupt escarpment forming a clear demarcation between the Eudunda - Point Pass - Robertstown plains to the east and the higher land of the Julia and Brady Creek catchments to the west.

The System comprises a more or less consistent sequence of landform features:

- Moderately steep to steep slopes of 10-40% along the western edge (steeper and more abrupt in the north).
- Undulating to moderately steep (5-20% slope) basement rock rises at the foot of the escarpment. This component includes a range of low hills with prominent quartzite reefs in the southern parts.
- Gently inclined outwash fans formed on locally derived outwash sediments along the eastern edge. These have slopes of 3-8%.
- In the north, the escarpment is deeply dissected by Brady Creek which cuts at right angles across the system, then abruptly turns south along the strike for two km, and then turns eastward again to flow out on to the Robertstown Plain
- High runoff rates on the steep slopes have caused considerable erosion in the past, and most water courses are gullied.

Elevation: 560 - 380 m

Relief: Maximum relief from crest of escarpment to toe of outwash fan is 160 m

Soils: Most soils are shallow loams (both calcareous and non calcareous) over rock. Others have red clay subsoils. Deeper loamy texture contrast and gradational soils characterize lower slopes and flats.

Main soils

- L1/B3** Shallow stony loam - steeper, rocky slopes
A2 Shallow calcareous loam - hillslopes
D2 Loam over friable red clay - outwash fans

Minor soils

- D7** Loam over dispersive red clay on rock - hillslopes
C3 Gradational clay loam - outwash fans
A3 Deep calcareous loam - drainage depressions
E2 Red cracking clay - outwash fans



Main features: The majority of the Eudunda Escarpment Land System is too steep and rocky for cultivated agriculture, and is characterized by shallow stony soils and a high degree of exposure, reducing pasture productivity potential. The lower slopes are mostly arable, although rises formed on basement rock have typically shallow stony soils. The most productive component is the strip of gently inclined outwash fan which skirts the foot of the escarpment. The predominant loam over clay soils are deep and fertile, although often with poorly structured surfaces. The slopes have been badly eroded in the past, and protection of both slopes and water courses is a major management consideration.

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

| SLU | % of area | Main features # |
|--------------------------|----------------------------|---|
| AAG AAH AAI AAJ | 4.6 1.8 10.0 23.9 | <p>Eroded escarpment slopes formed on siltstones of the Tapley Hill and Wilyerpa Formations. There is up to 20% outcropping rock and 20-50% surface stone. Most water courses are eroded.</p> <p>AAG Rises to 60 m high with slopes of 5-12%. AAH Rises to 30 m high with slopes of 10-20%. AAI Slopes and rises of 10-20%, up to 60 m high AAJ Steep slopes of 20-75%, up to 70 m high.</p> <p>Main soils: <u>shallow stony loam</u> - L1/B3 (E) and <u>shallow calcareous loam</u> - A2 (E). This land is too steep and rocky for any cultivated agriculture. Shallow stony soils and exposure limit its grazing productivity. Care must be taken to prevent overgrazing and subsequent risk of erosion. Water courses which have been badly eroded in the past need protection.</p> |
| ABI | 13.3 | <p>Low hills with prominent north - south trending quartzite reefs, strongly dissected by west to east flowing water courses, most of which are eroded. Slopes are 20-40% and relief is up to 50 m.</p> <p>Main soils: <u>shallow stony loam</u> - L1/B3 (E) and <u>shallow calcareous loam</u> - A2 (E) with <u>loam over dispersive red clay on rock</u> - D7 (L). This land is too steep and rocky for any cultivated agriculture. Shallow stony soils and exposure limit its grazing productivity. Care must be taken to prevent overgrazing and subsequent risk of erosion. Water courses which have been badly eroded in the past need protection.</p> |
| DHC | 6.1 | <p>Rises to 40 m high with slopes of 6-15% formed on quartzitic sandstones of the Appila Formation. There is 10-20% surface quartzite, but negligible rock outcrop.</p> <p>Main soil: <u>loam over dispersive red clay on rock</u> - D7 (D). This land is arable, although poor soil structure is a limitation. Excessive runoff, reduced water holding capacity and patchy emergence and early growth can be expected.</p> |
| EFC EFH | 2.6 8.8 | <p>Rises formed on mainly fine grained rocks with up to 5% outcrop.</p> <p>EFC Slopes of 5-10% EFH Slopes of 5-10% with eroded water courses.</p> <p>Main soils: <u>shallow calcareous loam</u> - A2 (V) with <u>shallow stony loam</u> - L1/B3 (C). This land is mostly arable, although the soils are shallow, often stony and have moderately low fertility. Because this land often occurs below steep slopes, there is potential for severe erosion by run on water.</p> |
| ESI | 7.3 | <p>Rises formed on interbedded siltstones and quartzitic rocks, with up to 20% rocky reefs and up to 20% surface stone. Slopes are 10-20%. Water courses are commonly eroded.</p> <p>Main soils: <u>shallow stony loam</u> - L1/B3 (E) and <u>shallow calcareous loam</u> - A2 (E). This land is semi arable due to the combination of moderate slopes and rocky outcrop. Soils are usually shallow and stony with moderately low fertility. Erosion potential is moderately high.</p> |



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| JBC | 20.2 | <p>Outwash fans with slopes of 3-8%, formed on stony clay outwash sediments. There is variable surface quartzite, up to 20%.</p> <p>Main soils: <u>loam over friable red clay</u> - D2 (V), with <u>gradational clay loam</u> - C3 (C) and <u>red cracking clay</u> - E2 (M). These soils are deep and inherently fertile, although often with poor surface structure. This can result in low infiltration rates, reduced water holding capacity and patchy emergence and early growth. However, modifications to surface management practices can alleviate the problem. There is minor water course erosion, and there is potential for gully development if channels are unprotected when heavy rain falls on the adjacent escarpment.</p> |
| KYJJ | 1.4 | <p>Narrow deeply incised drainage depression with a well defined water course (Brady Creek), flanked by intermittent flats and lower slopes of adjacent hills.</p> <p>Main soils: <u>deep calcareous loam</u> - A3 (E) on flats and <u>shallow calcareous loam</u> - A2 (C) on slopes where basement rock is close to the surface. This landscape is dominated by the creek.</p> |

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, Calcic / Lithocalcic Calcarosol)
10 - 30 cm calcareous loam grading to soft silty carbonate or calcrete rubble with increasing content of soft weathering rock, over siltstone at 35 cm.
- A3** Deep calcareous loam (Regolithic, Calcic / Supracalcic, Calcarosol)
Calcareous stony (quartzite) loam becoming more clayey, calcareous (soft or rubbly) and stony with depth. 30% of profiles are derived from siltstones and contain siltstone fragments and become silty with depth.
- C3** Gradational clay loam (Calcic, Red Dermosol)
10 - 20 cm friable clay loam to clay grading to a well structured red clay, calcareous from 25 cm.
- D2** Loam over friable red clay (Hypercalcic, Red Chromosol)
15 - 40 cm hard quartzite gravelly fine sandy loam to loam, abruptly overlying a red well structured clay, calcareous from 50 cm, grading to stony clay.
- D7** Loam over dispersive red clay on rock (Calcic, Red Sodosol)
10-30 cm hard quartzite gravelly sandy loam abruptly overlying a coarsely structured dispersive red clay, calcareous from 45 cm, grading to quartzitic sandstone at 70 cm.
- E2** Red cracking clay (Epipedal, Red Vertosol)
Strongly structured red medium clay (seasonally cracking), grading to a red coarse blocky heavy clay, calcareous from shallow depth, continuing below 100 cm.
- L1/B3** Shallow stony loam (Lithic / Petrocalcic, Leptic Tenosol / Rudosol)
Up to 35 cm stony sandy loam to loam directly overlying basement rock or calcreted rock.

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

