

NER Nerowie Land System

Valley on the eastern side of the Razorback - Mt. Bryan range

Area: 93.6 km²

Annual rainfall: 320 – 535 mm average

Geology: Siltstones and fine sandstones of the Tapley Hill and Tindelpina Formations, and locally derived alluvial deposits. The rocks are relatively soft and easily eroded compared with the rocks forming the adjacent Razorback - Mt. Bryan range, so there is a substantial difference in elevation between the two areas. The land has been eroded down into a valley of relatively low relief, consisting of basement rock rises and intervening outwash fans and drainage depressions formed on alluvial deposits. Both the rocks and the alluvial sediments are mantled by a veneer of aeolian carbonate which is either soft or indurated into rubble or sheets.

Topography: The Nerowie Valley comprises two drainage systems. The southern half flows south westwards into the Mt. Bryan Creek system and the northern half flows eastwards into the Caroon Creek system. The drainage depressions are flanked by a complex of undulating rises and moderately steep low hills, and gently inclined outwash fans. Slopes on the rising ground are typically between 5% and 30%, and less than 10% on the fans. Watercourses are commonly eroded.

Elevation: 700 m adjacent to the Razorback Land System to 400 m at the southern end

Relief: Maximum relief is 80 m

Soils: Soils on hillslopes are moderately deep to shallow over rock, and include shallow stony loams, calcareous soils and texture contrast profiles. Deeper soils on lower slopes and flats are mainly sandy loams over clay and gradational loams.

Main soils

- A2** Shallow calcareous loam - over weathering rock on rises and hills
- L1** Shallow stony loam - over rock on rises and hills
- D3** Hard sandy loam over dispersive red clay - over alluvium on fans

Minor soils

Soils formed over basement rock on rises and hills

- D1** Loam over red clay on rock
 - C2** Gradational loam on rock
- Deep soils formed over alluvium on fans*
- C3** Gradational red loam
 - D2** Hard sandy loam over red clay
 - A3** Calcareous loam
 - D4** Loam over red friable clay
 - M4** Gradational stony sandy loam
 - M1** Deep sandy loam

Calcareous soils formed on calcified Tertiary sediments

- A4/B2** Rubbly calcareous sandy loam
- A5** Calcareous loam over clay



Main features: The Nerowie Land System is characterized by an irregular landscape of stony rises, and lower slopes and flats with eroded watercourses. This complexity, combined with the position of the land in a rain shadow, reduces its productivity potential. The main soil limitations are poor surface structure, particularly on lower slopes, causing excessive runoff and increasing erosion potential, and shallow stony soils with rocky reefs on the rising ground. Watercourse erosion, and salinity and scalding adjacent to watercourses, are additional management issues.

Soil Landscape Unit summary: 28 Soil Landscape Units (SLUs) mapped in the Nerowie Land System:

SLU	% of area	Main features #
AAB AAI AAJ AAh	0.9 5.6 1.2 19.6	<p>Non arable slopes, rises and low hills formed on siltstones and fine sandstones. There is sporadic rocky outcrop and extensive surface stone.</p> <p>AAB Rises to 30 m high with slopes of 10-30%.</p> <p>AAI Series of rocky spurs with slopes of 10-30% up to 50 m high, separated by narrow alluvial flats with eroded watercourses.</p> <p>AAJ Low hills to 65 m high with slopes of 20-50%.</p> <p>AAh Rolling low hills to 80 m high with slopes of 10-30%, scalding in places, and eroded watercourses.</p> <p>Main soils: <u>shallow stony loam</u> - L1 (E) and <u>shallow calcareous loam</u> - A2 (C) with <u>gradational loam on rock</u> - C2 (L) and <u>loam over red clay on rock</u> - D1 (L). <u>Hard sandy loam over dispersive red clay</u> - D3 (L) occurs on lower slopes. Except for the drainage valleys, this land is largely inaccessible, due to steep slopes or rockiness. Pasture productivity is limited mainly by shallow soils and the difficulty in undertaking improvements (sowing, fertilizing etc). Erosion potential is high, so control of grazing pressure is crucial.</p>
EGC EGH EGI EGW	4.8 1.1 6.9 6.2	<p>Rises formed on basement rock.</p> <p>EGC Gentle slopes of 4-10% up to 20 m high.</p> <p>EGH Rises with slopes of 6-12%, relief of 20 m and eroded watercourses.</p> <p>EGI Dissected rises with slopes of 10-20% and relief to 50 m.</p> <p>EGW Gentle slopes of 4-10% up to 20 m high with areas of scalding.</p> <p>Main soils: <u>shallow calcareous loam</u> - A2 (V), with <u>gradational loam on rock</u> - C2 (L) and <u>loam over red clay on rock</u> - D1 (L). The land is mostly arable (except for minor outcrop and occasional short steep slopes), although low rainfall restricts cropping opportunities. Most of the soils are relatively shallow, so moisture shortages may limit crops in dry finishes. Reduction of water loss and erosion through runoff control is the main management issue, together with fertility maintenance.</p>
ESC ESD ESI	0.7 3.0 3.3	<p>Low rocky rises formed on interbedded fine grained and quartzitic rocks, with rocky reefs accounting for 20-50% of the land surface.</p> <p>ESC Slopes 5-10%, relief to 20 m.</p> <p>ESD Slopes 10-20%, relief to 40 m.</p> <p>ESI Slopes 10-20%, relief to 40 m, with eroded watercourses.</p> <p>Main soils: <u>shallow calcareous loam</u> - A2 (E) and <u>shallow stony loam</u> - L1 (E), with <u>gradational loam on rock</u> - C2 (L). Apart from the low rainfall, rocky reefs, shallow stony soils and sometimes moderate slopes limit cropping of these areas. The arable land is generally confined to strips between the reefs of rock. Water erosion is a potential problem because of the high runoff from the shallow soils and rocky areas.</p>
ITI	2.8	<p>Outwash fans formed on Tertiary clays with slopes of 3-7%. There is extensive erosion of watercourses.</p> <p>Main soils: <u>calcareous loam over clay</u> - A5 (E) and <u>hard sandy loam over (dispersive) red clay</u> - D3/D2 (E), with <u>rubbly calcareous sandy loam</u> - A4/B2 (E). These soils are generally deep, but have limitations due to poor structure (D3/D2 soils), and alkaline subsoils (A5 soils). The rubbly soils have shallow potential root zone depths. Erosion potential is significant, and watercourses damaged in the past need protection.</p>



JBB JBO JBo	3.2 0.4 2.4	<p>Outwash fans and drainage depressions formed on locally derived alluvium:</p> <p>JBB Very gently inclined fans with slopes of 2-4%. JBO Drainage depression with sporadic scalding and saline seepage. JBo Drainage depression with an eroded watercourse and sporadic scalding.</p> <p>Main soils: deep <u>hard sandy loam over (dispersive) red clay</u> - D3/D2 (V) with <u>gradational red loam</u> - C3 (C). The soils are deep and naturally fertile, but are generally poorly structured in the surface and often dispersive in the subsoil. Past erosion has further degraded surface structure. This leads to excessive runoff and erosion, difficulty in working and patchy emergence. Erosion of even moderate slopes is a constant threat. Sporadic saline seepages should be monitored to assess the status of the problem.</p>
JIB JIH JIJ JIL JIO JIV JIW JII JIm JIo	2.3 1.5 0.9 0.3 5.3 0.9 0.3 6.1 1.3 2.1	<p>Outwash fans and drainage depressions formed on locally derived gravelly outwash sediments.</p> <p>Watercourses are generally eroded.</p> <p>JIB Fans with slopes of 2-4%. JIH Fans with slopes of 4-10% and eroded watercourses. JIJ Drainage depressions with slopes to 10 % and eroded watercourses. JIL Fans with slopes of 2-3%, eroded watercourses and scalding. JIO Severely eroded and scalded drainage depressions. JIV Fans with slopes of 2-3% and moderate scalding. JIW Fans with slopes of 3-5% and moderate scalding. JII Fans with slopes of 2-3%, eroded watercourses and scalding. JIm Fans with slopes of 3-10%, eroded watercourses and scalding. JIo Eroded and scalded drainage depressions</p> <p>Main soils: deep <u>gradational red loam</u> - C3 (E) and <u>hard sandy loam over (dispersive) red clay</u> - D3/D2 (C), with <u>loam over friable red clay</u> - D4 (L), <u>calcareous loam</u> - A3 (L) and <u>gradational stony sandy loam</u> - M4 (L). These areas have deep fertile soils which are potentially productive, although low rainfall is a permanent limitation to cropping. Many areas are fragile due to the effects of historic watercourse erosion and scalding.</p>
JXB JXH	8.5 5.3	<p>Complex of fans and intervening basement rock rises with slopes of 4-10%. Watercourses on fans are commonly eroded.</p> <p>Main soils: deep <u>hard sandy loam over (dispersive) red clay</u> - D3/D2 (V) on fans and <u>shallow calcareous loam</u> - A2 (L), with <u>gradational loam on rock</u> - C2 (M) and <u>loam over red clay on rock</u> - D1 (M) on rises. The soils on the fans are deep and naturally fertile, but are generally poorly structured in the surface and often dispersive in the subsoil. This leads to excessive runoff and erosion, difficulty in working and patchy emergence. Soils on the rises are better structured, but all land is prone to water erosion.</p>
KVm	3.1	<p>Outwash fans with slopes of 3-8%. There is significant watercourse erosion, and 5-10% of the land surface is affected by past scalding.</p> <p>Main soil: <u>calcareous loam</u> - A3 (D). Soils are deep and moderately fertile, although strongly alkaline at depth. Erosion control is a key management issue.</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, 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.
- A3** 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.
- A4/B2** Rubbly calcareous sandy loam (Lithocalcic Calcarosol)
Calcareous sandy loam over a rubbly pan, grading to a very highly calcareous sandy clay loam continuing below 100 cm.
- A5** Calcareous loam over clay (Regolithic, Hypercalcic Calcarosol)
Calcareous loam to clay loam becoming more clayey and calcareous with depth, grading to Tertiary clay within 120 cm.
- C2** Gradational loam on rock (Calcic, Red Dermosol)
Hard red loam to clay loam grading to a well structured red clayey with soft to rubbly (or sheet) carbonate at depth, over weathering rock within 100 cm.
- C3** Gradational red loam (Calcic / Supracalcic, Red Dermosol)
Loam to clay loam grading to a well structured clay with soft to rubbly carbonate at depth over alluvium.
- D1** Loam over red clay on rock (Calcic, 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 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.
- D4** Loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness fine sandy loam to loam over a finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.
- L1** Shallow stony loam (Lithic, Leptic Tenosol / Rudosol)
Shallow stony loam, sometimes calcareous with depth, overlying basement rock within 50 cm.
- M1** Deep sandy loam (Calcareous, Regolithic, Red-Orthic Tenosol OR Eutrophic / Calcic, Red Kandosol)
Thick sandy loam, continuing below 100 cm, or gradually becoming more clayey, with minor fine carbonate at depth, and variable stone content.
- 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](#)

