NAR Narrinyeri Land System

Escarpments on the eastern margin of the Mount Lofty Ranges between Palmer and Murray Bridge

Area: 33.1 km^2

Annual rainfall: 345 – 535 mm average

Geology: The two discrete occurrences of the System are underlain by different geological formations. The larger northern section is formed on metasandstones and schists of the Backstairs Passage Formation. The southern section is formed on younger granitic rocks, including pegmatites and gneisses. Locally derived coarse to medium grained alluvium occurs in minor depositional areas.

Topography: The landscape is characterized by moderately to strongly dissected escarpments. Frontal slopes (facing east) are moderately steep (up to 30% slope), but dissection slopes formed by east flowing watercourses tend to be steeper (up to 100%), and rockier. Crests are rounded and occasionally arable. However, the bulk of the slopes are usually too rocky for vehicle access. Valley flats and outwash fans are minor overall.

Elevation: 30 m to 300 m

Relief: Up to 100 m

Main soils: The dominant soils features are shallowness, stoniness and sandiness

Main soils

Soils formed on metasandstones

L1 Shallow stony loamy sand – on calcified rock (**L1a**) or non calcified rock (**L1b**)
C2 Gradational loam
D1a Sandy loam over red clay

Minor soils

Soils formed on granitic rocks

L1c Shallow stony sand
D1b Loamy sand over red clay
C2/A2 Gradational sandy loam

Soils formed on metasandstones

K3 Sandy loam over red brown clay

Soils formed on alluvium

M1 Deep alluvial sand
D2/M4 Loamy sand over red sandy clay loam

Main features: The Narrinyeri Land System is dominated by moderate to steep rocky slopes with shallow stony soils. Most of the land is suitable for grazing, but because access is severely restricted, pasture improvement is generally not feasible. The only arable areas are isolated crests and small valleys, the latter with deep coarse textured soils.

Soil Landscape Unit summary: 12 Soil Landscape Units (SLUs) mapped in the Narrinyeri Land System:

SLU	% of area	Main features #
AKC AKD AKY	47.6 22.5 4.3	Strongly dissected rocky escarpment with steep frontal slopes and gully sides and gently sloping rounded crests formed on calcified metasandstones and schists of the Backstairs Passage Formation. There is 10-20% and occasionally up to 50% surface stone and rock outcrop. **AKC** Rocky low hills with rounded crests, relief to 90 m and slopes of 5-30%. **AKD** Steep very rocky slopes up to 100 m high with slopes of 30-80%. **AKY** Rounded crests with slopes of 2-12%. Main soils: shallow stony loamy sand - **L1a/L1b** (E), with gradational loam - **C2** (L), sandy loam over red clay - **D1a** (L) and sandy loam over red brown clay - **K3** (L). The dominant soils are shallow and stony. Their productive potential is limited by low waterholding capacity. The deeper soils have few limitations, but land use is primarily limited by the moderately steep and rocky terrain.
AgA AgB AgC AgD	0.7 7.3 5.6 2.3	Moderately steep to steep extremely rocky escarpment and dissection slopes formed on granitic rocks. **AgA** Undulating rises (above steeper slopes), with slopes of 3-10% and about 50% rock outcrop. **AgB** Moderate slopes of 5-20% with about 50% rock outcrop in clusters. **AgC** Escarpment slopes of 10-25%, up to 60 m high and with about 50% rock outcrop. **AgD** Steep dissection slopes of Rocky Gully. There is more than 50% rocky outcrop and numerous low cliffs. Slopes are very irregular but are in the range 20-100%. Relief is about 40 m. The unit includes the bed of Rocky Gully Creek. Main soils: shallow stony sand - **L1c** (V). Loamy sand over red clay - **D1b** (L) and gradational sandy loam - **C2/A2** (L) are restricted to gentler slopes. Deep alluvial sand **- M1** (M) occurs in creek beds. The land is dominated by extensive to very extensive rock outcrop. Agricultural potential is very low.
DtZ	1.2	Rounded crests with slopes of 2-12%, formed on calcified metasandstones and schists of the Backstairs Passage Formation. Main soils: shallow stony loamy sand - **L1a/L1b** (E), and sandy loam over red clay - **D1a** (E). The soils are moderately shallow, but fully arable. This small occurrence is one of the few highland areas in the System which can be cropped.
EtC	2.0	Gentle slopes of 3-10% formed on granitic rocks, situated above the steep dissection slopes of AgD. There is extensive rock outcrop, but there are significant arable patches. Main soils: shallow stony sand - **L1c** (E) with loamy sand over red clay - **D1b** (C) and gradational sandy loam - **C2/A2** (C). The soils are generally shallow and have low fertility, but are easily worked (once rocks have been removed). Steeper slopes are highly erodible.
KXC KXE KXJ	0.5 1.7 4.3	Gently to moderately inclined outwash fans and drainage depressions, with slopes ranging from 1% to 10%, formed on variable coarse, medium and fine grained locally derived alluvial sediments. **KXC** Moderately inclined outwash fans with slopes of 4-12%. **KXE** Drainage depressions comprising gentle slopes and well defined watercourses. Slopes are 1-5%. **KXJ** Drainage depressions comprising gentle slopes and watercourses which are occasionally eroded. Slopes are 1-5%. Main soils: deep alluvial sand - **M1** (E) and loamy sand over red sandy clay loam – **D2/M4** (E). These soils are generally deep but coarse textured, so natural fertility is low, as is waterholding capacity on the deeper sands. Erosion potential is high due to the large runoff volumes which could be expected in the confined valleys.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

(D) Dominant in extent (>90% of SLU)
(V) Very extensive in extent (60–90% of SLU)
(E) Extensive in extent (30–60% of SLU)
(C) Common in extent (20–30% of SLU)
(L) Limited in extent (10–20% of SLU)
(M) Minor in extent (<10% of SLU)

Detailed soil profile descriptions:

C2 Gradational loam (Hypercalcic, Red Dermosol)
Medium thickness red brown crumbly sandy loam to loam overlying massive soft to semi-hard carbonate grading to metasandstone or schist within 100 cm.

C2/A2 Gradational sandy loam (Calcic, Red Kandosol / Paralithic, Calcic Calcarosol)
Medium thickness (calcareous) loamy sand to sandy loam grading to a highly calcareous reddish sandy clay loam to light clay forming in weathering granite or gneiss at about 80 cm.

D1a Sandy loam over red clay (Calcic, Red Chromosol / Sodosol)
Medium thickness reddish brown loamy sand to sandy clay loam, overlying a reddish brown well structured clay with abundant soft carbonate at shallow depth, grading to weathering metamorphosed sandstone or greywacke occurring between 50 and 100 cm.

D1b Loamy sand over red clay (Calcic, Red Chromosol)
Medium thickness loamy coarse sand over a red well structured clay, calcareous with depth grading to granitic rock within 100 cm.

D2/M4 Loamy sand over red sandy clay loam (Eutrophic / Calcic, Red Chromosol / Kandosol)
Thick loamy sand grading to sandy loam over a red massive sandy clay loam, calcareous from about 60 cm in a third of profiles over red or brown sandy clay loam to sandy clay continuing below 100 cm.

K3 Sandy loam over red brown clay (Eutrophic, Red / Brown Chromosol)
Medium thickness stony sandy loam, overlying a red or brown well structured clay grading to weathering non-calcified sandy schist or metasandstone.

L1a Shallow stony loamy sand (Calcareous, Paralithic, Leptic/Red-Orthic Tenosol)
Medium thickness stony reddish brown loamy sand, overlying moderately to strongly calcified micaceous sandstone or schist.

L1b Shallow stony loamy sand (Lithic, Leptic Rudosol)
Medium thickness reddish brown massive loamy sand to sandy loam with abundant rock fragments, overlying hard metamorphosed sandstone.

L1c Shallow stony sand (Lithic, Leptic Rudosol)
Less than 40 cm stony loamy coarse sand over granitic rock.

M1 Deep alluvial sand (Arenic Rudosol)
Very deep gravelly loamy sand formed on gritty red or brown alluvial sand.

Further information: DEWNR Soil and Land Program