DEC Deep Creek Land System

Steep sea facing slopes along the southern coast of the Fleurieu Peninsula

Area: 58.0 km^2

Annual rainfall: 545 – 810 mm average

Geology: The land is underlain by several formations of Cambrian age basement rock. These include metasandstones of the Backstairs Passage Formation, metasiltstones, phyllites and schists of the Tappanappa Formation, and metasiltstones, phyllites and calcareous siltstones of the Strangway Hill Formation. The degree of dissection is such that there are negligible deep weathering remnants, and no significant alluvial deposits.

Topography: The landscape is characterized by steep to very steep slopes dropping into the sea. The slopes are made even steeper by down cutting of water courses, so that gradients of 150% and more are not uncommon. The dissection of the slopes by regularly spaced south flowing water courses, has produced a pattern of razor back ridges, steep side slopes and narrow valleys, none of which are wide enough to map out at 1:50,000 scale.

Elevation: 0 - 320 m

Relief: Up to 250 m

Soils: The soils are all shallow to moderately deep over basement rock. Some have well developed clayey subsoils, but on the steep slopes which dominate the Land System, many soils have little profile development.

Main soils

L1a Shallow stony loam
L1b Shallow stony sandy loam
K4 Sandy loam over brown sandy clay
K2b Loam over red clay

Minor soils

C2 Shallow gradational red loam on calcareous rock
K1 Gradational loam
K2a Loam over brown clay

Main features: The Deep Creek Land System is characterized by steep to very steep slopes adjacent to the south coast of Fleurieu Peninsula. Underlying rocks are coarse to medium grained, giving rise to sandy loam to loam soils, sometimes with clayey subsoils, but more often shallow and stony over rock. However, it is the topography and position of the Land System which are the major determinants of land use. More than two thirds of the area is too steep for vehicular access, so light grazing is the only feasible primary production option. Productive potential is affected by the extreme coastal exposure of much of the land.

Soil Landscape Unit summary: 9 Soil Landscape Units (SLUs) mapped in the Deep Creek Land System:

SLU	% of area	Main features #
AED	18.6	Steep to very steep razor back ridges separated by creeks in narrow valleys flowing southwards to the sea. The underlying rocks are metasiltstones and calcareous siltstones of the Strangway Hill Formation. The deep valleys have side slopes of up to 150% and relief of up to 250 metres. Rock outcrop is extensive on the steeper slopes. There are minor landslips. Soils are loamy, shallow to moderately deep over rock. Main soils: Shallow stony loam - **L1a** (E) Gradational loam - **K1** (E) Shallow gradational red loam on calcareous rock - **C2** (E) The soils, although often shallow, are moderately fertile. However, the steep topography and exposed aspect are the over-riding determinants of land use. Much of the land is inaccessible to vehicles, and is only used for grazing.
AiC AiD	9.3 49.8	Steep sea facing slopes of the south coast, dissected by a series of short streams. Upper slopes and crests are moderately inclined but the land becomes very steep on mid and lower slopes (up to 100%). Relief is up to 250 m, but is usually less than 150 m. Rock outcrop is extensive. Underlying rocks are metasandstones of the Backstairs Passage Formation and metasiltstones of the Tappanappa Formation. **AiC** Upper slopes and crests with slopes of 15-30%, formed on metasandstones. **AiD** Steep to very steep rocky hillslopes with relief of 100 m to 250 m and slopes of 15-100%, formed on mixed metasandstones and metasiltstones. The soils are mostly shallow, sandy and stony, overlying bedrock. Some profiles are deeper with clayey subsoils. Main soils: Sandy loam over brown sandy clay - **K4** (E-C) } coarser grained rocks on Shallow stony sandy loam - **L1b** (C-E) } crests and slopes Shallow stony loam - **L1a** (L-C) } finer grained rocks on steep slopes Loam over red clay - **K2b** (L) } Steep slopes and coastal exposure limit land use, but some of the land is used for grazing.
AjC	3.5	Broad ridge within the AED landscape, formed on metasiltstones and phyllites of the Strangway Hill Formation. The ridges of AED are usually sharp, but this single area is unusual in that it is over 500 m wide. Slopes on the crest are less than 10%, but increase to 20-30% on the margins. The soils are deeper than on the steep slopes of AED. Main soils: Loam over brown clay - **K2a** (E) Loam over red clay - **K2b** (C) Shallow stony loam - **L1a** (L) These soils are mostly deep and fertile. Pasture production potential is high but for the extreme exposure of the land.
AkC	1.2	Elongate crest within the **AiD** landscape, formed on metasandstones of the Backstairs Passage Formation. Slopes are less than 10%. There is minor surface stone. The soils are sandy, with and without subsoils. Main soils: Shallow stony sandy loam - **L1b** (E) Sandy loam over brown sandy clay - **K4** (E) The soils are shallow and infertile and the land is exposed. This is one of the few ridges within the Land System that is wide enough to map, but they all provide access to the steeper parts of properties.
AoC	12.4	Moderately steep slopes formed on metasiltstones and phyllites of the Tappanappa Formation. Slopes range from 10% on upper slopes to 30%. There is minor rock outcrop and up to 10% surface stone. The predominant soils are loamy with characteristic red clay subsoils. Shallow forms without clay subsoils occur on steeper slopes. Soils typical of adjacent landscapes occur on sandier rock strata. Main soils: Loam over red clay - **K2b** (E) Shallow stony loam - **L1a** (E) Gradational loam - **K1** (L) These soils are fertile and mostly moderately deep. Salinity caused by rising groundwater (which is saline in this geological formation), may become a problem in creek lines in future.

BpD	2.9	Moderate slopes formed on metasiltstones and phyllites of the Tappanappa Formation. Slopes range from 10% to 18%. Outcropping rock is rare and there is up to 5% surface stone in places. The predominant soils are loamy with characteristic red clay subsoils. Main soils: Loam over red clay - **K2b** (V) Gradational loam - **K1** (M) Shallow stony loam - **L1a** (M) These soils are moderately deep to deep, inherently fertile and moderately well drained. However, saline water tables which are associated with this geological formation should be monitored.
WFa	2.2	Tunkalilla Beach and two small isolated beaches to the east.
XJJ	0.1	Small flat at the mouth of Coolawang Creek. No soils data.

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 Shallow gradational red loam on calcareous rock (Hypercalcic, Red Dermosol)
Medium to thick dark reddish brown granular loam to clay loam, grading to pale brown massive soft carbonate with clay loam texture and abundant siltstone fragments, over soft weathering calcareous siltstone at about 70 cm.

K1 Gradational loam (Eutrophic, Red Dermosol)
25 - 35 cm dark brown loam with a paler coloured and gravelly A2 layer, grading to a red clay loam with moderate structure and increasing rock fragments over weathering schist or phyllite at about 75 cm.

K2a Loam over brown clay (Bleached-Mottled, Eutrophic, Brown Chromosol)
30 - 55 cm dark grey loam to clay loam with a paler and gravelly A2 horizon, overlying a dark brown, yellowish brown and red mottled clay with strong blocky structure, and increasing rock fragments with depth. The clay grades to weathering metasiltstone or phyllite at about 100 cm.

K2b Loam over red clay (Eutrophic, Red Chromosol)
20 - 50 cm dark brown loam to clay loam with a paler coloured and gravelly A2 horizon, overlying a dark reddish brown to brown medium clay with strong blocky structure, grading to weathering metamorphosed siltstone or schist at depths between 50 and 100 cm.

K4 Sandy loam over brown sandy clay (Bleached, Eutrophic, Brown Kurosol)
10 - 35 cm loamy sand to sandy clay loam with a gravelly and bleached A2 horizon, overlying a yellow brown or brown well structured sandy to light clay grading to weathering metasandstone by 100 cm.

L1a Shallow stony loam (Paralithic, Leptic Tenosol)
20 - 45 cm dark brown loam with a paler brown clay loam A2 horizon containing up to 50% rock fragments, grading to metamorphosed siltstone or phyllite by 50 cm.

L1b Shallow stony sandy loam (Paralithic, Bleached-Leptic Tenosol)
30 - 55 cm stony sandy loam with a very stony bleached A2 horizon, grading to weathering metasandstone.

Further information: DEWNR Soil and Land Program