BEE Beetaloo Land System

Series of north - south ridges in the Beetaloo area between The Bluff Range and White Cliff Range, Southern Flinders Ranges.

Area: 73.7 km^2

Annual rainfall 475 – 610 mm average

Geology: Siltstones, dolomites and minor quartzitic sandstones of the Saddleworth, Skillogalee / Auburn, and Undalya Formations respectively. Minor deposits of sandy clay alluvium in valleys.

Topography: Rolling low hills extending as a series of roughly north - south ridges along the eastern side of a massive sandstone range (Telowie Gorge Land System). The ridge - valley complex is caused by differential weathering of the variety of rock types occurring in the system. Hard dolomites or quartzites commonly occur on ridge crests. Slopes vary from 15% to 50% but are generally in the range 20-30%. Relief is generally less than 70 m. There is little rock outcrop but surface stones and rocks are common in places.

Elevation: 250 m on lower slopes in the south to 530 m at the highest point in Wirrabara Forest in the north.

Relief: Maximum relief is 130 m but is mostly less than 70 m

Soils: Gradational loam and loamy texture contrast soils are predominant. Some are calcareous with depth, some are not. The main soil groups are:

Main soils

C2 Gradational red loam on rock (calcareous at depth)
K2 Loam over red or brown clay on rock (acidic to neutral at depth)
C5/B5 Gradational black loam over soft to hard carbonate

Minor soils

K3 Sandy loam over red clay on rock (acidic to neutral at depth)
L1 Shallow stony loam on rock
D1 Loam over red clay on rock (calcareous at depth)
F1/F2 Sandy loam over brown clay over alluvium
D2 Loam over red clay over alluvium (calcareous at depth)

Main features: The Beetaloo Land System is characterized by shallow to moderately deep loamy to clay loamy soils with favourable structure and fertility. Combined with the high rainfall, productive potential is high. However, the moderate to steep slopes which are typical of much of the land preclude annual cropping. There is potential for forestry and perennial horticulture. Gently inclined lower slopes are characterized by deeper, but poorly structured soils prone to waterlogging, compaction and poor root growth.

Soil Landscape Unit summary: 6 Soil Landscape Units (SLUs) mapped in the Beetaloo Land System:

SLU	% of area	Main features #
ACC ACD ACI	59.0 6.5 5.8	Non arable hills formed on fine grained calcareous and non calcareous rocks. **ACC** Rolling low hills with slopes of 15-40%. **ACD** Rolling low hills with slopes of 30-50%. **ACI** Rolling low hills with slopes of 30-50% and eroded watercourses. Soils include gradational red loam on rock - **C2** (E), with loam to sandy loam over red or brown clay on rock - **K2/K3** (C), gradational black loam - **C5/B5** (L), shallow stony loam - **L1** (L), and loam over red clay on rock - **D1** (L). The hills are generally too steep for cropping, but the soils are fertile and often moderately deep. The main limitations for grazing are the potential for erosion both at re-establishment and during dry periods when cover is likely to be reduced. Limited water holding capacity due to shallow soil depth restricts productivity on steeper slopes. Expansion of forestry is limited by steepness of slopes.
EJD EJI	14.8 11.4	Low hills formed on mixed calcareous and non calcareous fine grained rocks. **EJD** Low hills with slopes of 10-20%. **EJI** Low hills with slopes of 10-20% and significant erosion in watercourses. Main soils: gradational red loam on rock - **C2** (E) and loam to sandy loam over red or brown clay on rock - **K2/K3** (E), with gradational black loam - **C5/B5** (L), loam over red clay on rock - **D1** (L) and shallow stony loam - **L1** (M). Sandy loam over brown clay - **F1/F2**, and minor deep sandy loam and black cracking clay soils occur on lower slopes. The land is generally too steep for regular cropping and the extent of eroded watercourses indicates that there have been problems in the past. The soils are mostly fertile, moderately deep and well drained, indicating high productive potential for both pastures and forestry.
JQE	1.9	Lower slopes and flats with gradients of 0-4%, formed on fine grained alluvium. Main soils: sandy loam over brown clay - **F1/F2** (V), with loam over red clay - **D2** (L) and minor deep sandy loam and black cracking clay soils. The land is characterized by profiles with slowly permeable subsoils which develop perched water tables and cause waterlogging. Root growth is also restricted by these clays. Surface soils often set hard, contributing to poor water use efficiency (ie water runs off instead of infiltrating). There is significant potential for water erosion despite the low slopes, due to the high soil erodibility.
-R-	0.6	Beetaloo Reservoir.

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 red loam on rock (Hypercalcic, Red Dermosol)
Loam to clay loam grading to a friable well structured red clayey subsoil over soft to semi-hard carbonate at moderate depth grading to siltstone.

C5/B5 Gradational black loam (Black Hypercalcic / Petrocalcic Black Dermosol)
Loam to clay loam grading to a well structured black clay loamy to clayey subsoil over soft to hard carbonate within 50 cm. Soil is occasionally moderately calcareous throughout.

D1 Loam over red clay on rock (Calcic, Red Chromosol)
Sandy loam to clay loam abruptly overlying a well structured red clayey subsoil with fine carbonate at depth grading to weathering rock within a metre.

D2 Loam over red clay (Calcic, Red Chromosol)
Sandy loam to clay loam abruptly overlying a well structured red clayey subsoil with fine carbonate at depth grading to alluvium.

F1/F2 Sandy loam over brown clay (Calcic / Eutrophic, Brown Chromosol / Sodosol)
Thick hard sandy loam to sandy clay loam, sometimes with a bleached A2 horizon over a brown mottled coarsely structured, sometimes dispersive clay subsoil, and sporadic fine carbonate at depth.

K2 Loam over red or brown clay on rock (Eutrophic, Red / Brown Chromosol)
Loam to clay loam abruptly overlying a well structured non calcareous red or brown clayey subsoil grading to weathering fine grained rock within a metre.

K3 Sandy loam over red clay on rock (Eutrophic, Red Chromosol / Sodosol)
Sandy loam to sandy clay loam abruptly overlying a coarsely structured non calcareous red clayey subsoil grading to weathering coarse grained or quartzitic rock within a metre.

L1 Shallow stony loam (Basic / Calcareous, Paralithic, Leptic Tenosol)
Shallow stony sandy loam to clay loam grading to weathering rock within 50 cm. Fine carbonate may occur in cleavages in the rock.

Further information: DEWNR Soil and Land Program