

CDW Condowie Land System

Condowie Plains

Area:	145.4 km ²
Annual rainfall	365 – 415 mm average
Geology:	Coarsely structured red and grey heavy clay containing abundant soft (or less commonly rubbly) carbonate in its upper part (Hindmarsh Clay). Rubbly Woorinen Formation overlies the clay on remnant low benches and rises.
Topography:	Very gently inclined (to the west) plains with slopes of 0.5% to 1%. There is a gentle rise at the northern edge, with slopes to 3% and several low stony rises and benches with relief of less than 10 m and slopes of less than 2%.
Elevation:	70 m at the southern end to 170 m in the north
Relief:	Less than 5 m generally, but up to 15 m at the northern edge
Soils:	The soils are mostly deep with clay loamy surfaces and clayey subsoils. Most are calcareous throughout.

Main soils

A6	Calcareous clay loam - plains
A5	Rubbly calcareous clay loam - throughout
C4	Gradational clay loam - plains

Minor soils

A4	Deep rubbly calcareous loam - stony rises
D3	Clay loam over poorly structured red clay - plains and gentle rises
E2	Red cracking clay - plains
B2	Calcareous loam over calcrete - stony rises
D2	Clay loam over red clay - gentle rises and plains

Main features:	The Condowie Land System is a flat to very gently undulating plain characterized by generally deep calcareous or gradational medium to fine grained soils. Although fertility, structure and water holding capacity of the main soils are satisfactory, productivity is limited by the relatively low rainfall. High wilting point soils further reduce the amount of water available for crops. Other limitations include high subsoil boron levels and shallow stony soils on most rises.
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Soil Landscape Unit summary: 5 Soil Landscape Units (SLUs) mapped in the Condowie Land System:

SLU	% of area	Main features #
IAA	50.5	Level plains with slopes of less than 1% (to the west and south west) formed on coarsely structured red heavy clay (Hindmarsh Clay). There are minor low rises. Main soils: <u>calcareous clay loam</u> - A6 (E), with <u>rubbly calcareous clay loam</u> - A5 (L), <u>gradational clay loam</u> - C4 (L) and <u>clay loam over red clay</u> - D3/D2 (L). <u>Deep rubbly calcareous loam</u> - A4 (M) occurs on rises. As the predominant soils are clayey and deep, this land is inherently highly productive, although boron toxicity and high subsoil salt levels reduce yield in places. However, because the soils have high wilting points, they are generally "too heavy for the rainfall", which averages only 325 - 375 mm.
IHA	34.0	Flat plain (less than 1% slope) formed on coarsely structured red heavy clay (Hindmarsh Clay) and characterized by very low rises of less than 2-3 m relief with up to 10% surface calcrete stone. Main soils: <u>rubbly calcareous clay loam</u> - A5 (E) and <u>calcareous clay loam</u> - A6 (E), with <u>red cracking clay</u> - E2 (L). <u>Deep rubbly calcareous loam</u> - A4 (L) occurs on stony rises. This land is potentially productive with slight limitations due to boron toxicity, salinity and water holding capacity. However the mosaic of deeper heavy soils and lighter stony soils can cause difficulties for fertilizer application, spraying etc.
QKA	4.0	Low very gently undulating bench with up to 20% surface calcrete stone cover, formed on sheet and rubbly calcrete of the Bakara Formation. Slopes are less than 2%. Main soils: <u>calcareous loam over calcrete</u> - B2 (E), <u>deep rubbly calcareous loam</u> - A4 (C) and <u>rubbly calcareous clay loam</u> - A5 (C). Shallowness, stoniness and marginal fertility are the major soil limitations. These features, when considered with the low rainfall, indicate poor potential productivity.
SOA	1.7	Very low rises with slopes of 1-2% and 10-20% surface calcrete, formed on rubbly carbonates, associated with outcrops of underlying Hindmarsh Clay. Main soils: <u>rubbly calcareous clay loam</u> - A5 (E) and <u>deep rubbly calcareous loam</u> - A4 (E). This land is arable but with moderate limitations in places due to heavy rubble interfering with tillage and reducing water holding capacity.
TPB	9.8	Gently undulating rises with slopes of 2-3% and relief of up to 15 m, formed on coarsely structured red heavy clay (Hindmarsh Clay). Main soils: <u>gradational clay loam</u> - C4 (E), with <u>calcareous clay loam</u> - A6 (E) and <u>clay loam over red clay</u> - D3/D2 (E). This land is potentially productive, having deep, well drained moderately fertile soils. Slight limitations caused by the physical characteristics of the main soil are potential for hard setting surfaces, temporary waterlogging, uneven emergence and runoff / erosion potential. High subsoil boron and salinity are likely in places, but are generally not likely to be a major problem.

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:

- A4** Deep rubbly calcareous loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
Medium thickness calcareous sandy loam to sandy clay loam over rubbly Class III B / III C carbonate, becoming gradually more clayey and less calcareous with depth.
- A5** Rubbly calcareous clay loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
Calcareous clay loam grading to Class III B or III C rubble at about 30 cm, becoming less rubbly with depth and overlying substrate clay at depths of between 80 and 120 cm.
- A6** Calcareous clay loam (Pedal, Hypercalcic / Calcic Calcarosol)
Calcareous clay loam to light clay grading to a well structured more clayey subsoil with a soft Class I carbonate layer from about 50 cm, overlying substrate clay from about 80 cm.
- B2** Calcareous loam over calcrete (Petrocalcic, Lithocalcic Calcarosol)
Calcareous and very rubbly loam over a rubbly or massive calcrete pan at about 25 cm. Rubble decreases with depth in a sandy or clayey matrix to substrate clay deeper than 100 cm.
- C4** Gradational clay loam (Sodic, Hypercalcic, Red Dermosol)
Medium thickness clay loam to light clay grading to a coarsely structured to well structured red clay with soft Class I carbonate from about 50 cm, overlying substrate clay.
- D2** Clay loam over red clay (Calcic, Red Chromosol)
Medium thickness clay loam abruptly overlying a well structured red clay with soft Class I carbonate deeper than 50 cm, continuing below 100 cm.
- D3** Clay loam over poorly structured red clay (Calcic, Red Sodosol)
Medium thickness clay loam abruptly overlying a poorly structured and dispersive red clay with soft Class I carbonate deeper than 50 cm, continuing below 100 cm.
- E2** Red cracking clay (Epipedal, Red Vertosol)
Well structured seasonally cracking clay becoming more coarsely structured with depth and highly calcareous from about 35 cm (Class I carbonate), over substrate clay from about 80 cm.

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

