

MCW Macaw Land System

Belt of low hills extending from the range between Auburn and Hoyleton to Humphreys Springs

Area: 71.7 km²

Annual rainfall: 445 – 595 mm average

Geology: The Land System is formed on a more or less north - south striking group of rock formations including Rhynie Sandstone, Ingomar Quartzite, and Stradbroke Formation of the River Wakefield Subgroup. These rocks are quartzitic sandstones and siltstones, usually weakly metamorphosed. Linear outcrops of quartzite are common on steeper ridges. Most of the rocks have been mantled by soft windblown carbonates, which have hardened to sheet rock (calcrete) over limited areas. There is variable surface quartzite, calcrete and ironstone. Alluvial deposits are minor overall, and are generally fine grained.

Topography: The Macaw Land System comprises mainly rolling low hills and moderately steep ridges in an elongate tract of country reflecting the strike of the underlying geological formations. Slopes over three quarters of the land are 10 - 30%, but there are significant areas of undulating rises with slopes of 5 - 10%, particularly in the south. There are also some minor steeper (ie more than 30%) slopes, notably in the region of Macaw Hill, and where the River Wakefield and Woolshed Flat Creek have dissected the land. Watercourses are well defined and often eroded. In the north, most water drains into the Skillogee / Woolshed / Hermitage Creeks / Wakefield River system. In the south, creeks draining the eastern side of the system flow into the Gilbert River, and on the western side they flow on to the Alma Plains.

Elevation: 410 m (Macaw Hill) to 200 m where the Wakefield River flows out of the western side

Relief: Maximum relief is 90 m

Soils: The most common soils are hard red loams to sandy loams over tough red clayey subsoils, usually on weathering rock. Associated soils include gradational loams and shallow stony loams.

Main soils

Soils formed on basement rock

- D7** Hard sandy loam over dispersive red clay on rock
- D3/D7** Hard sandy loam over dispersive clay on deeply weathered rock
- D1** Hard loam to clay loam over red clay on rock
- C2** Gradational loam

Minor soils

Soils formed on basement rock

- L1** Shallow stony loam
- B4** Shallow clay loam over limestone

Soils formed on alluvial sediments

- D3/D2** Sandy loam over red or brown mottled clay
- E2** Red cracking clay



Main features: The Macaw Land System is substantially non arable due to moderately steep slopes and rockiness. However, most soils are moderately deep, although with moderately low fertility and poor structure. Productive potential for pastures is high, particularly on the better structured and more fertile clayey soils. The gentler grades are arable to semi arable depending on slope. Soils are moderately deep with variable fertility and structural condition. The more clayey gradational textured soils are the best in both regards. The texture contrast soils, particularly those with sodic subsoils, are prone to runoff on slopes, waterlogging on lower ground, workability difficulties and patchy emergence/early growth. Erosion potential is moderate to high throughout, and cropping on the steeper slopes is risky.

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

SLU	% of area	Main features #
AKC AKD AKI AKJ	7.6 5.2 38.6 3.3	<p>Rocky low hills formed on interbedded sandstones, quartzites and phyllites, calcreted in places. There is up to 10% quartzite outcrop on steeper slopes and variable surface quartzite, ironstone and calcrete to 25%.</p> <p>AKC Low hills to 50 m high with slopes of 15-30%. AKD Steep low hills to 90 m high with slopes of 30-40%. AKI Low hills to 70 m high with slopes of 15-30% and some watercourse erosion. AKJ Steep dissection slopes up to 80 m high with slopes of 30-50% near the junction of the Wakefield River and Woolshed Flat Creek. There is some watercourse erosion.</p> <p>Main soils: <u>hard sandy loam over dispersive red clay on rock</u> - D7 (E), <u>hard loam to clay loam over red clay on rock</u> - D1 (C), <u>shallow stony loam</u> - L1 (L) and <u>shallow clay loam over limestone</u> - B4 (M). This land is moderately steep to steep and rocky, but most soils are moderately deep, and the inherently fertile (especially D1 and B4). Although non arable, this land has good pasture productivity potential. The main limitations are associated with poor structure of the D3 soils. Consequences are excessive runoff, waterlogging on lower slopes, and slow early growth. Erosion risk is high if the soil surface is exposed.</p>
DQC DQD DQH DQI	9.5 6.5 6.6 22.3	<p>Rises and low hills formed on interbedded sandstones, quartzites and phyllites, calcreted in places. There is up to 20% surface quartzite, ironstone and calcrete.</p> <p>DQC Rises to 30 m high with slopes of 5-10%. DQD Low hills to 50 m high with slopes of 10-20%. DQH Rises to 30 m high with slopes of 5-10% and eroded watercourses. DQI Low hills to 50 m high with slopes of 10-20% and some watercourse erosion.</p> <p>Main soils: <u>hard sandy loam over dispersive red clay on rock</u> - D7 (C), <u>hard sandy loam over dispersive clay on deeply weathered rock</u> - D3/D7 (C) and <u>gradational loam</u> - C2 (C), with <u>shallow clay loam over limestone</u> - B4 (L) and <u>hard loam to clay loam over red clay on rock</u> - D1 (L). This land has moderately deep soils of variable fertility and structural condition. The gradational loams are the best in both regards. The dispersive texture contrast D7 soils are prone to runoff on slopes, waterlogging on lower ground, workability difficulties and patchy emergence/early growth. Erosion potential is moderate to high throughout, and cropping on steeper slopes of DQD and DQI is risky.</p>
JAO	0.4	<p>Drainage depressions formed on clayey alluvium with minor saline seepage.</p> <p>Main soils: deep <u>sandy loam over red or brown mottled clay</u> - D3/D2 (V) with <u>red cracking clay</u> - E2 (L). These soils are deep and inherently fertile, but most have hard setting, sealing surfaces. They are difficult to work and are prone to waterlogging and emergence/early growth problems. Salt levels should be monitored.</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:

- B4** Shallow clay loam over limestone (Petrocalcic, Red Dermosol / Petrocalcic, Leptic Tenosol)
15 - 30 cm well structured clay loam to light clay either grading to a red clay over calcreted rock (Dermosol), or directly overlying calcrete within 35 cm of the surface (Tenosol).
- C2** Gradational loam (Hypercalcic, Red / Black Dermosol)
10 - 30 cm loam to clay loam grading to a well structured red or dark clay with soft carbonate from 55 cm, grading to weathering phyllite usually deeper than 100 cm.
- D1** Hard loam to clay loam over red clay on rock (Calcic, Red Chromosol / Sodosol)
15 - 25 cm loam to clay loam abruptly overlying a red heavy clay with coarse blocky structure (sometimes dispersive), with soft carbonate from about 60 cm, grading to weathering quartzitic shale or quartzite from 70 cm.
- D3/D2** Sandy loam over red or brown mottled clay (Red / Brown Sodosol / Chromosol)
20 - 60 cm grey brown sandy loam to clay loam with a bleached A2 layer, abruptly overlying a red or brown mottled dispersive coarsely structured clay, generally calcareous from about 70 cm.
- D3/D7** Hard sandy loam over dispersive clay on deeply weathered rock (Hypercalcic, Red Sodosol)
20 - 50 cm hard sandy loam to sandy clay loam (with a bleached A2 layer), abruptly overlying a coarsely structured dispersive red clay, calcareous from about 60 cm, grading to highly weathered rock, continuing below 200 cm.
- D7** Hard sandy loam over dispersive red clay on rock (Hypercalcic, Red Sodosol)
15 - 45 cm hard quartz gravelly sandy loam to sandy clay loam abruptly overlying a red or brown coarsely structured dispersive medium to heavy clay with soft carbonate from about 60 cm, grading to weathering sandstone from 70 cm or deeper.
- E2** Red cracking clay (Red Vertosol)
Dark well structured seasonally cracking clay becoming more clayey, redder, calcareous and coarser structured with depth, continuing below 100 cm.
- L1** Shallow stony loam (Lithic, Leptic Tenosol / Rudosol)
Up to 50 cm stony sandy loam to loam directly overlying basement rock.

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

