

# MAG Magpie Creek Land System

Flood plain of Magpie Creek

**Area:** 39.6 km<sup>2</sup>

**Annual rainfall** 370 – 445 mm average

**Geology:** Fine grained alluvium deposited by floodwaters of Magpie Creek. These sediments have been coated by soft finely divided windblown carbonates which have leached into the subsoil. Remnant highly calcareous Woorinen Formation deposits (largely eroded away by floodwaters) protrude through the sediments. These are medium to fine grained and often rubbly, and are underlain by a coarsely structured red clay (Hindmarsh Clay).

**Topography:** Level alluvial plain with slopes of 0.5 - 1% including Magpie Creek. This is an incised channel in its upper reaches and eroded in places, but it progressively loses definition downstream where some sections of banks have been built up to contain flood waters. In the area where the watercourse discharges into the saline flats of the Everard Land System, the channel has disappeared. There are two major "islands" of a pre-existing landscape on the plain. These are very low stony rises less than 5 m high above the plain.

**Elevation:** 200 m where the creek emerges from the hills on to the flood plain, to 90 m where it discharges on to the Everard System flats. The lowest point is further south (80 m).

**Relief:** Up to 5 m (remnant stony rises). In its upper sections, the watercourse has eroded to depths of up to 5 m.

**Soils:** Loamy red texture contrast soils and calcareous loams are co-dominant. Associated soils are gradational loams and sandy texture contrast soils.

#### Main soils

- D3** Sandy loam over dispersive red clay - extensive (flats)
- A6** Calcareous clay loam - common (flats and rises)
- D2** Hard clay loam over red friable clay - limited (flats)

#### Minor soils

- C3** Gradational clay loam - flats
- A5/A4** Rubbly calcareous loam - limited (rises and flats)
- D5** Sandy loam over red clay - rises

**Main features:** The Magpie Creek Land System is mostly flat plains characterized by sodic texture contrast soils. These are deep and inherently fertile but have poorly structured hard setting surfaces which restrict infiltration, are difficult to work and may cause patchy emergence and poor root distribution. Less extensive soils on the flats are deep or rubbly calcareous soils which are better structured, but often calcareous, gradational loams which are deep, fertile and well structured, and well structured texture contrast soils. Stony rises are dominated by shallow rubbly calcareous soils with limited water storage capacity. Subsoil boron levels in most soils are toxic below 70 cm.



**Soil Landscape Unit summary:** 2 Soil Landscape Units (SLUs) mapped in the Magpie Creek Land System:

SLU	% of area	Main features #
JFA	92.4	Level alluvial plain with slopes of 0.5-1%, including Magpie Creek and formed on fine grained alluvium. Main soils: <u>sandy loam over dispersive red clay</u> - <b>D3</b> (E), with <u>calcareous clay loam</u> - <b>A6</b> (C), <u>hard clay loam over friable red clay</u> - <b>D2</b> (L), <u>gradational clay loam</u> - <b>C3</b> (L) and <u>rubbly calcareous loam</u> - <b>A5/A4</b> (M). The land is potentially productive cropping country although low rainfall, particularly in the southern parts limits yields. There are minor to moderate soil limitations mainly due to the poor structure of the main soil class. Hard setting surfaces and dispersive clay subsoils cause reduced infiltration, temporary waterlogging, restricted workability and patchy emergence. Subsoil salinity, alkalinity and boron toxicity occur throughout to some degree. Average boron concentrations are 9 ppm (30-70 cm), and 22 ppm (70-100 cm). Occasional flooding causes problems of siltation and weed seed dispersal.
SOA	7.6	Very gently undulating low rises up to 5 m above the surrounding plain, with slopes of 1-2% and a sporadic cover of surface calcrete pebbles and stones. The rises are formed on highly calcareous and often rubbly medium to fine textured sediments. Main soils: <u>rubbly calcareous loam</u> - <b>A4/A5</b> (V), with <u>calcareous clay loam</u> - <b>A6</b> (C) and <u>sandy loam over red clay</u> - <b>D5</b> (L). The rises are fully arable and dominated by calcareous soils. Apart from the low rainfall, effects on productivity are due primarily to moderately shallow potential rooting depth (caused by high subsoil pH and boron) and some fertility problems (caused by the relatively low clay content of many of the soils, and by their alkalinity). Average boron concentrations are 10 ppm (50-70 cm), and 27 ppm (70-100 cm). Stoniness is a slight limitation in places, as is water and wind erosion potential on sloping and sandier areas respectively.

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

(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:****A5/A4** Rubbly calcareous loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)

Calcareous sandy loam to sandy clay loam grading to a highly calcareous sandy clay loam to sandy light clay over Class III B or III C rubble from about 30 cm, becoming less rubbly with depth. About 20% of profiles have Hindmarsh Clay within 100 cm of the surface.

**A6** Calcareous clay loam (Pedal, Hypercalcic / Calcic Calcarosol)

Calcareous loam to clay loam grading to a well structured highly calcareous clayey subsoil over Class I carbonate at about 40 cm over substrate clay at about 90 cm.

**C3** Gradational clay loam (Hypercalcic, Red Dermosol)

Medium thickness clay loam grading to a well structured red clay over Class I carbonate at about 40 cm over alluvium.

**D2** Hard clay loam over red friable clay (Calcic / Hypercalcic, Red Chromosol)

Medium thickness clay loam abruptly overlying a red well structured clay with soft Class I carbonate from about 40 cm over alluvium.

**D3** Sandy loam over dispersive red clay (Calcic, Red Sodosol)

Medium thickness hard sandy loam to sandy clay loam with a bleached A2 layer, sharply overlying a coarsely structured dispersive red clay grading to Class I carbonate from about 60 cm over alluvium.



**D5** Sandy loam over red clay (Hypercalcic, Red Chromosol)

Medium thickness loamy sand to sandy clay loam overlying a well structured red clay with soft carbonate from about 45 cm, continuing below 100 cm.

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

