

LOL Lower Light Land System

Alluvial plains of the River Light in the Lower Light area

Area: 68.6 km²

Annual rainfall: 380 – 400 mm average

Geology: The Land System is formed on alluvial sediments deposited by the flooding of the Light River. The sediments are typically fine sandy and silty clays. Near the present river course, the sediments are sandier and siltier. In the north is a remnant deposit of Tertiary age clay (Hindmarsh Clay equivalent), protruding through the younger sedimentary cover. This is sporadically covered by highly calcareous windblown Woorinen Formation sediments. In the western (lowest) areas, the sediments become more saline under marine influence.

Topography: The Lower Light Land System includes the flood plain of the Light River below the 10 metre contour, where the land begins to be influenced by saline water tables. The System is a flat alluvial plain flanking the river channel which occupies a slight depression. There is little evidence of levees adjacent to the river. At the western (seaward) edge, the plains grade to saline flats with intricate channels which appear to be old tidal creeks.

Elevation: 10 m in the east to 2 m in the south west

Relief: Maximum relief is 5 m

Soils: The soils are mostly deep silty loams to clay loams, usually with clayey subsoils. Deep gradational soils with silty textures are common near the river, and calcareous soils occur on older clayey sediments and stony rises. Saline soils are more common towards the sea.

Main soils

D2	Hard silty loam over red clay on alluvial plains
A5	Calcareous loam on Tertiary clay remnants
D3a	Hard silty loam over dispersive red clay on alluvial plains
M2	Gradational silty loam on river terraces

Minor soils

Soils of marginally saline to saline flats

F2	Silty loam over dispersive brown clay
D3b	Marginally saline loam over dispersive red clay
D3c	Sandy loam over dispersive red clay
C4	Gradational clay loam

Soils of river terraces

M4	Silty alluvial soil
A3	Calcareous silty loam

Soils of alluvial plains

C3	Gradational loam to clay loam
F1	Silty loam over dark clay
D5	Loamy sand over red clay

Calcareous soils of rises

A4	Rubbly calcareous sandy loam
B2	Shallow calcareous sandy loam over calcrete



Main features: The Lower Light Land System is an alluvial plain characterized by deep, fertile soils with silty loam to clay loam surfaces and clayey subsoils. Productivity potential is restricted by soil salinity, sodicity and probably boron toxicity induced by saline water tables associated with the land's low elevation. On the eastern side of the System where the soils grade imperceptibly to the Mallala Land System, the effects are minimal and the land is fully arable. With decreasing elevation approaching the sea, conditions deteriorate so that at the western margin, the flats are highly saline and suitable only for light grazing.

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

SLU	% of area	Main features #
HWT	3.2	Marginally saline drainage depression formed on clayey sediments, with occasional low stony rises. Main soils: <u>sandy loam over dispersive red clay</u> - D3c (E), and <u>gradational clay loam</u> - C4 (C), with <u>rubbly calcareous sandy loam</u> - A4 (C) on low rises. These soils are deep and inherently fertile but poor drainage conditions have caused salt to accumulate to the extent that the land is only semi arable. Salt tolerant pasture species should provide some grazing value.
IPA	17.2	Very gently undulating plain formed on relict Tertiary clays, variably capped by highly calcareous Woorinen Formation sediments, marked by stony patches. Main soils: <u>calcareous loam</u> - A5 (V), with <u>calcareous sandy loam</u> - A4 (C) and <u>shallow calcareous sandy loam over calcrete</u> - B2 (M) on stony rises. This land is fully arable, although variations in soil depth and subsoil chemical barriers (eg salinity and boron) may cause patchiness in crops.
JAP	11.8	Marginally saline flats formed on alluvial clayey sediments with gypsum beds. The flats are characterized by old abandoned channels, and black bush, saltbush and nitre bush vegetation. Main soils: <u>silty loam over dispersive brown clay</u> - F2 (E), <u>marginally saline loam over dispersive red clay</u> - D3b (E) and <u>gradational clay loam</u> - C4 (E). These soils are deep and inherently fertile, but elevated salinity, sodicity and probably boron concentrations restrict productivity. This land is transitional between cropping land to the east and chenopod shrub grazing land to the west.
JDA	47.3	Alluvial plains formed on silty to clayey sediments with some gypsum lenses. Slopes are less than 1%. Main soils: <u>hard silty loam over red clay</u> - D2 (E), with <u>hard silty loam over dispersive red clay</u> - D3a (C), <u>gradational silty loam</u> - M2 (L), <u>gradational clay loam</u> - C3 (M), <u>silty alluvial soil</u> - M4 (M), <u>loamy sand over red clay</u> - D5 (M) and <u>silty loam over dispersive brown clay</u> - F2 (M). These soils are deep, fertile and moderately well drained, although the D3 soils, with dispersive clay subsoils are prone to sub surface waterlogging in wet seasons. Many of the silty surfaced profiles are hard setting, which affects water infiltration, workability and seedling emergence / early crop growth. However, use of gypsum and modified surface management practices can overcome this condition. As the elevation falls, subsoil salinity tends to increase, so some yield suppression can be expected.
VPC	10.0	Saline flats formed on clayey sediments. The land is characterized by extensive branching channels (apparently old tidal creeks) and a samphire / saltbush vegetative cover. Main soils: <u>marginally saline loam over dispersive red clay</u> - D3b (E) and <u>silty loam over dispersive brown clay</u> - F2 (E). This land is essentially non arable due to waterlogging and salinity.
XIA	10.5	Flats and very gently inclined levees adjacent to the lower reaches of the Light River. Underlying sediments are coarser textured than on the older flood plains, and are characteristically silty. Main soils: <u>gradational silty loam</u> - M2 (C) and <u>calcareous silty loam</u> - A3 (C), with <u>silty alluvial soil</u> - M4 (L), <u>silty loam over red clay</u> - D2 (L) and <u>silty loam over dark clay</u> - F1 (L). These soils are deep and well drained, and moderately fertile despite their low clay content. However their high silt and fine sand content predisposes them to moisture deficit and compaction.

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:*Soils of alluvial plains*

- C3** Gradational loam to clay loam (Hypercalcic, Red Dermosol)
10 - 30 cm loam to clay loam grading to a well structured red clay with abundant soft carbonate from about 45 cm.
- D2** Hard silty loam over red clay (Calcic, Red Chromosol)
10 - 30 cm hard silty loam to clay loam abruptly overlying a well structured red clay with minor soft carbonate from about 50 cm.
- D3a** Hard silty loam over dispersive red clay (Calcic, Red Sodosol)
10 - 35 cm hard silty loam to clay loam abruptly overlying a coarsely structured dispersive red clay with minor soft carbonate from about 50 cm.
- D5** Loamy sand over red clay (Calcic, Red Sodosol)
Thin hard loamy fine sand over a coarsely structured red medium clay, calcareous from about 20 cm, grading to alluvial clay from about 60 cm.
- F1** Silty loam over dark clay (Hypocalcic, Brown Chromosol)
20 - 30 cm hard dark silty loam over a black or brown coarsely structured clay.

Soils of river terraces

- A3** Calcareous silty loam (Calcic Calcarosol)
Calcareous silty loam grading to a brown calcareous silty clay loam
- M4** Silty alluvial soil (Calcic, Brown Kandosol)
25 - 50 cm dark brown silty loam grading to a brown weakly structured silty clay loam with minor soft carbonate from about 80 cm, over silty alluvium.
- M2** Gradational silty loam (Calcic / Hypocalcic, Red Dermosol)
25 - 40 cm dark brown silty loam to clay loam grading to a well structured red brown clay loam to light clay, over silty alluvium.

Soils of Tertiary clay remnants

- A5** Calcareous loam (Regolithic, Supracalcic / Hypercalcic Calcarosol)
10 - 30 cm calcareous loam over a highly calcareous and usually rubbly sandy clay loam, grading to a very highly calcareous clay loam to light clay with decreasing rubble over Tertiary heavy clay at about 80 cm.
- D3c** Sandy loam over dispersive red clay (Hypercalcic, Red Sodosol)
10 - 20 cm hard sandy loam to loam over a coarsely structured dispersive red clay, highly calcareous from shallow depth, grading to heavy clay within 100 cm.

Calcareous soils of rises

- A4** Rubbly calcareous sandy loam (Regolithic, Supracalcic / Lithocalcic Calcarosol)
Calcareous sandy loam to loam over a rubble layer at about 30 cm, grading to a very highly calcareous clay loam to clay.
- B2** Shallow calcareous sandy loam over calcrete (Petrocalcic Calcarosol)
15 - 35 cm calcareous and variably rubbly sandy loam abruptly overlying sheet calcrete.

Soils of marginally saline to saline flats

- D3b** Marginally saline loam over dispersive red clay (Calcic, Red Sodosol)
10 - 25 cm loam with a thin bleached A2 layer, over a coarsely structured dispersive red heavy clay with occasional gypsum bands, calcareous from about 40 cm, grading to clayey substrate at about 100 cm.
- F2** Silty loam over dispersive brown clay (Calcic, Brown Sodosol)
10 - 35 cm silty loam to clay loam with a bleached A2 layer over a coarsely structured dispersive brown and red mottled heavy clay, weakly calcareous from about 70 cm, grading to clayey sediments.
- C4** Gradational clay loam (Calcic, Red Dermosol)
15 - 20 cm clay loam grading to a strongly structured red clay with variable soft carbonate from about 50 cm.

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

