LOC Lock Land System

Area: 363.5 km^2

Landscape: Very gently sloping plains and low rises underlain by basement rocks covered by Tertiary sediments. These are mantled by highly calcareous windblown silty sands (Woorinen Formation), which occur as either masses of soft amorphous carbonates, or as rubble. Occasionally it is indurated into calcrete sheets. Overlying the main landscape are low dunes of Molineaux Sand which occupy 10 - 15% of the area. The underlying basement rock sporadically protrudes through the surface as isolated rocky outcrops.

Annual rainfall: 315 – 395 mm average

Main soils:

Wiabuna - **A5** (Regolithic, Hypercalcic Calcarosol)
Calcareous loam becoming more clayey and calcareous with depth, grading to a very highly calcareous clay (Class I carbonate) over Tertiary clay.

Moornaba - **H2** (Calcareous, Arenic, Brown-Orthic Tenosol / Regolithic, Calcic Calcarosol)
Very thick red to brown sand, becoming weakly calcareous and often grading to an orange clayey sand with depth, overlying variable carbonate (fine to rubbly, occasionally sheet).

Minor soils:

Shallow Wiabuna - **B2a** (Petrocalcic, Supracalcic / Lithocalcic Calcarosol)
Calcareous sandy clay loam over carbonate rubble grading to sheet calcrete.

Rubbly Wiabuna - **A4** (Regolithic, Supracalcic Calcarosol)
Calcareous sandy loam grading to a rubbly very highly calcareous sandy clay loam over light clay from about 100 cm

Wookata - **A1a** (Supravescent, Hypercalcic / Lithocalcic Calcarosol)
Highly calcareous (more than 40% $CaCO_3$) soft loamy sand to sandy loam grading to very highly calcareous sandy loam with variable rubble content.

Wharminda - **G4** (Hypercalcic, Brown Sodosol)
Medium to thick sand with a bleached A2 layer abruptly overlying a hard columnar structured dispersive brown mottled clay, highly calcareous with depth, grading to alluvial or Tertiary sediments.

Shallow Wookata - **A1b** (Supravescent, Petrocalcic, Hypercalcic / Lithocalcic Calcarosol)
Very highly calcareous (more than 40% $CaCO_3$) soft loamy sand to sandy loam grading to very highly calcareous sandy loam with variable rubble content, over calcrete at about 40 cm.

Calcrete - **B2b** (Petrocalcic, Lithocalcic Calcarosol)
Thin calcareous sandy loam to clay loam over hard calcrete, associated with abundant surface calcrete and sheet rock.

Lowan - **H3** (Basic, Arenic, Bleached-Orthic Tenosol)
Thick bleached sand with a thin organically darkened surface layer, grading to a yellowish sand (often with darker lamellae), continuing below 150 cm.

Chintumba - **B1** (Hypervescent, Petrocalcic, Lithocalcic Calcarosol)
Medium thickness highly calcareous sandy loam to sandy clay loam containing increasing amounts of rubble with depth, over sheet calcrete within 50 cm.

Skeletal soil - **L1** (Lithic, Leptic Tenosol / Rudosol)
Variable gravelly loamy sand to sandy clay loam over basement rock at depths usually less than 50 cm.

Summary: Very gently undulating plains and rises with mainly calcareous sandy loam soils, deep and moderately fertile, but with elevated subsoil boron and salt levels. Potential for wind erosion is slight to moderate. Associated with these soils are shallower types with reduced waterholding capacity, and some very stony flats which are non arable. Sandy soils occur to a limited extent. Deep sands on sandhills are infertile and moderately susceptible to wind erosion, while sand over clay soils on flats have the additional limitation of impedances to drainage and root growth.

Soil Landscape Unit summary: 13 Soil Landscape Units (SLUs) mapped in the Lock Land System:

SLU	% of area	Component	Main soils	Prop#	Notes
A-g	0.2	Rocky outcrops	Skeletal	D	Shallow stony soil, rocky outcrop - non arable.
IeA	6.0	Flats	Wiabuna	D	Flats and gentle slopes underlain by Tertiary sediments, veneered by Woorinen Formation carbonates. Land is dominated by calcareous sandy loams, with limited low sandhills, sand over clay soils, and stony soils: Wiabuna Calcareous sandy loam, deep, moderately fertile with high subsoil boron and salinity. Slight wind erosion potential. Rubbly Wiabuna Somewhat less fertile and with lower water holding capacity than Wiabuna Shallow Wiabuna Significantly reduced water holding capacity compared with Wiabuna and with surface stone sufficient to interfere with tillage. Moornaba Sandhill soil, low fertility, moderate wind erosion potential, occasionally water repellent. Wharminda Low fertility sandy soil with poorly structured subsoil (waterlogging, poor root growth), moderate wind erosion potential, water repellent. Calcrete Very shallow and stony with abundant surface stone and sheet calcrete - non arable
IgB	41.7	Very gentle slopes	Wiabuna	V	
		Stony slopes	Shallow/rubbly Wiabuna	L	
		Low sandhills	Moornaba	L	
IhA	5.5	Flats	Wiabuna	V	
		Stony flats	Shallow/rubbly Wiabuna	L	
IiB	1.0	Very gentle slopes	Wiabuna	V	
		Very stony slopes	Calcrete	C	
		Low sandhills	Moornaba	L	
IjB	1.4	Flats	Wiabuna	V	
		Low sandhills	Moornaba	C	
IkB	14.4	Very gentle slopes	Wiabuna	V	
		Low sandhills	Moornaba	L	
InA	5.9	Flats	Wiabuna	V	
		Sandy flats	Wharminda	E	
IpA	13.4	Flats	Wiabuna	E	
		Sandy flats	Wharminda	C	
		Low sandhills	Moornaba	C	
O-C	0.4	Moderate sandhills	Lowan	D	Very low fertility, high wind erosion potential, water repellence.
QdA	1.9	Stony flats	Shallow/rubbly Wiabuna	V	Shallow stony soil, limited water holding capacity, surface stone. Very stony flats non arable.
		Very stony flats	Calcrete	C	
VJA	0.1	Old lake	-	D	-
YPp	8.1	Low rises	Wookata	V	Highly calcareous loamy sand to sandy loam with marginal fertility and moderate wind erosion potential. Shallow soils have restricted waterholding capacity and are semi arable.
			Shallow Wookata	L	
			Chintumba	L	

PROPORTION codes assigned to Soil Landscape Unit (SLU) components:

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)

Further information: DEWNR Soil and Land Program