HMB Hambidge Land System

Area: 2,317.2 km^2

Landscape: Gently undulating plain underlain by Tertiary sediments, covered by a thick mantle of highly calcareous silty sands of the Woorinen Formation. In places these materials have hardened to sheet calcrete. Overlying the plain are dunefields of Molineaux Sand, forming parallel low, moderate and high sand ridges. Basement granites which underlie the region at depth outcrop in two small isolated patches.

Annual rainfall: 335 – 390 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.

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.

Shallow Wiabuna - **B2a** (Petrocalcic, Lithocalcic Calcarosol)
Calcareous sandy loam to 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.

Shallow Lowan - **G2** (Bleached, Eutrophic / Calcic, Brown Chromosol)
Medium to thick sand with a bleached A2 layer, over a brown or yellow sandy clay loam to sandy clay.

Minor soils:

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.

Moornaba - **H2** (Calcareous, Arenic, Red-Orthic / Yellow-Orthic Tenosol)
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).

Wookata - **A1** (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.

Deakin - **D3** (Calcic, Red Sodosol)
Medium thickness hard sandy loam to sandy clay loam over a coarsely structured red sandy clay, calcareous with depth, grading to Tertiary sediments.

Bayley - **A8** (Hypergypsic Calcarosol)
Calcareous loam grading to a highly calcareous sandy clay loam over powdery gypsum.

Heggaton - **G3** (Calcic, Brown Chromosol)
Thick sand to loamy sand with a bleached A2 layer, abruptly overlying a weakly structured brown sandy clay to clay, calcareous with depth, grading to Tertiary sediments.

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

Skeletal soil - **L1** (Lithic / Petroferric, Leptic Tenosol / Rudosol)
Variable gravelly loamy sand to sandy clay loam over basement rock or massive ironstone at depths usually less than 50 cm.
Saline soil - **N2** (Salic / Hypersalic Hydrosol)
Miscellaneous wet saline soil influenced by rising saline groundwater tables.

Summary: The dominant component of the landscape is the system of parallel sandhills and swales. The sandhills have infertile, water repellent and wind erosion prone sands, while the swales are characterized by calcareous sandy loams. These are moderately fertile, but commonly have restricted water holding capacities, and high subsoil boron levels. They are slightly susceptible to wind erosion. Some minor texture contrast soils have dispersive clay subsoils which impede drainage and root growth.

Soil Landscape Unit summary: 28 Soil Landscape Units (SLUs) mapped in the Hambidge Land System:

SLU	% of area	Component	Main soils	Prop#	Notes
A-g	<0.1	Rocky rises	Skeletal	D	Small rocky patches - non arable.
GSA	0.6	Sandy flats	Heggaton	E	Mixture of infertile, wind erosion prone, water repellent, acidic sands; and calcareous sandy loams with moderate fertility and slight wind erosion potential. Minor salinity throughout.
			Deakin / Wiabuna	E	
IeA	0.6	Sandy loam flats	Wiabuna	D	Flats and very gentle slopes formed on Tertiary sediments veneered by Woorinen Formation deposits, with some sandhills. The soil landscapes vary according to component soils, and percentage sandhill coverage. Main soils: Wiabuna: Calcareous sandy loam, moderately fertile, some boron toxicity, 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. Wharminda: Sandy surface (infertile, water repellent, moderate wind erosion potential). Dispersive clay subsoil (waterlogging, poor root growth). Deakin: Sandy loam, moderately fertile, slight wind erosion potential, over dispersive clay (waterlogging, poor root growth). Moornaba: Low fertility, wind erosion prone sand. Lowan: Very low fertility (less than Moornaba), water repellent and wind erosion prone. All sandhills have moderate wind erosion potential. Note salinity in **IIP**, and slight water erosion potential on gentle slopes.
IfA	4.1	Sandy loam flats	Wiabuna	E	
			Rubbly Wiabuna	E	
			Shallow Wiabuna	L	
IkB	0.4	Very gentle sandy loam slopes	Wiabuna / Deakin	V	
		Low sandhills	Moornaba	L	
IlA	5.6	Flats	Wiabuna / Wharminda	V	
		Low sandhills	Moornaba / Lowan	C	
IlP	0.1	Flats with 20-50% salt affected land	Wiabuna / Wharminda	V	
		Low sandhills	Moornaba / Lowan	C	
IoA	0.3	Sandy loam flats	Wiabuna / Deakin	E	
		Sandy flats	Wharminda	E	
		Low sandhills	Moornaba / Lowan / shallow Lowan	L	
IqA	0.3	Sandy loam flats	Wiabuna / Deakin	V	
		Low sandhills	Moornaba	C	
IrB	0.1	Very gentle sandy loam slopes	Wiabuna	E	
			Deakin	E	
O-C	0.1	Moderate sandhills	Lowan	D	Very low fertility, moderately high wind erosion potential, water repellent
OuF	4.6	Moderate	Lowan /	E	Sandhill - swale complexes.

		sandhills	shallow Lowan		Wiabuna: Moderately fertile calcareous sandy loam with 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. Lowan: Very low fertility, moderate to high wind erosion potential, water repellent. Shallow Lowan: As for Lowan, but with higher fertility and water holding capacity.
		Swales	Wiabuna	E	
			Rubbly / shallow Wiabuna	C	
			Heggaton	M	
OuH	0.4	Swales	Wiabuna	E	
			Heggaton	M	
		High sandhills	Lowan / shallow Lowan	E	
OuI	44.1	Moderate sandhills	Lowan / shallow Lowan	E	
		Swales	Wiabuna	C	
			Rubbly / shallow Wiabuna	C	
			Heggaton	M	
OuJ	30.7	Swales	Wiabuna	V	
			Heggaton	M	
		Low sandhills	Lowan / shallow Lowan	E	
OwI	2.3	Swales	Wiabuna / Wharminda	E	Sandhill - swale complexes. Wiabuna: Moderately fertile calcareous sandy loam with slight wind erosion potential Wharminda: Low fertility sandy soil with poorly structured subsoil (waterlogging, poor root growth), moderate wind erosion potential, water repellent. Lowan: Very low fertility, moderate to high wind erosion potential, water repellent. Shallow Lowan: As for Lowan, but with higher fertility and water holding capacity.
		Moderate sandhills	Lowan / shallow Lowan	E	
OwJ	0.5	Swales	Wharminda	E	
		Low sandhills	Lowan / shallow Lowan	E	
QOA	1.0	Stony flats	Shallow / rubbly Wiabuna	E	Stony shallow marginally fertile flats with slight wind erosion potential, and low fertility, erosion prone sandhills.
		Very stony flats	Calcrete	C	
		Low sandhills	Moornaba	C	
QUE	0.1	Very stony depress-ions with sheet rock	Shallow / rubbly Wiabuna	E	Stony shallow marginally fertile flats with some salinity.
			Calcrete	E	
QaA	0.5	Stony flats	Shallow / rubbly Wiabuna	E	Very stony shallow marginally fertile flats with slight wind erosion potential, and low fertility, erosion prone sandhills. Semi arable.
		Flats	Wiabuna	E	
		Very stony flats	Calcrete	L	
		Low sandhills	Moornaba	C	
QdA	0.5	Very stony flats with sheet calcrete	Shallow / rubbly Wiabuna	V	Very stony (semi arable) flats. Marginally fertile soils with low water holding capacity.
			Calcrete	C	
SkA	0.2	Sandy loam flats	Shallow / rubbly Wiabuna	E	Flats and very gentle slopes formed on Woorinen Formation deposits, with some sandhills. The soil landscapes vary according to component soils, and percentage sandhill coverage. Main soils: Wiabuna: Moderately fertile calcareous sandy loam with slight wind erosion potential
			Wiabuna	E	
		Low sandhills	Moornaba	C	
SyB	1.8	Very gentle sandy loam slopes	Wookata	E	
			Wiabuna	E	

		Low sandhills	Moornaba	L	Rubbly Wiabuna: Somewhat less fertile and with lower water holding capacity than Wiabuna Shallow Wiabuna: Significantly reduced water holding capacity compared with Wiabuna. Wookata: Highly calcareous sandy loam with slightly limited water holding capacity, low fertility, subsoil boron and salt, and slight to moderate wind erosion potential. Moornaba: Low fertility, wind erosion prone sand. All sandhills have moderate wind erosion potential.
VJA	0.4	Old lake beds	-	V	Lake beds marginally saline. Lunettes and sandhills are susceptible to wind erosion, and have low fertility.
		Lunettes	Bayley	C	
		Low sandhills	Moornaba	L	
YPp	0.1	Very gentle slopes	Wookata	D	Highly calcareous sandy loam - low fertility and moderate susceptibility to wind erosion.
ZA-	<0.1	Marginally saline flats	Saline soil	D	Some scope for salt tolerant revegetation.
ZD-	<0.1	Salt flats	Highly saline soil	D	Too salty for most plants.
ZL-	0.1	Lunettes	Bayley	D	Low fertility, high wind erosion potential.

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