HNK Hincks Land System

Area: 506.0 km^2

Landscape: Dunefields of low to moderate parallel siliceous sandhills (Molineaux Sand), overlying a very gently undulating plain formed on highly calcareous silty sands (Woorinen Formation). These materials overlie Tertiary sediments. Basement rocks protrude through the surficial unconsolidated deposits in two isolated areas.

Annual rainfall: 355 – 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.

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.

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.

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).

Shallow Wiabuna - **B2** (Petrocalcic Calcarosol)
Calcareous sandy clay loam over carbonate rubble on sheet calcrete within 50 cm.

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.

Minor soils:

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.

Mangalo - **D1** (Hypercalcic, Red Chromosol / Calcareous, Inceptic, Red-Orthic Tenosol)
Thin to medium thickness coarse loamy sand to sandy loam over a red well structured clay forming in weathering rock with abundant fine carbonate in fissures.

Summary: Sandhills dominate the landscape. Soils are deep sands, very infertile and highly susceptible to wind erosion and water repellence. On flats and inter-dune swales, sand over clay soils are characteristic. These have low fertility and are prone to wind erosion and water repellence. They also have poorly structured subsoils which impede water movement and root growth. Calcareous sandy loams are co-dominant in swales. These are more fertile and less prone to wind erosion than the sandy soils, but they often have limited water storage capacities.

Soil Landscape Unit summary: 17 Soil Landscape Units (SLUs) mapped in the Hincks Land System:

SLU	% of area	Component	Main soils	Prop#	Notes
AMC	0.2	Rocky slopes	Skeletal / Mangalo	D	Basement rock "islands" with mainly shallow soils and extensive rocky outcrop - semi to non arable.
ETB	<0.1	Very gentle slopes	Mangalo / skeletal	D	
IiA	0.3	Depressions	Wiabuna / rubbly Wiabuna	V	Flats and very gentle slopes formed on Tertiary sediments veneered by Woorinen Formation carbonates, overlain by up to 30% low sandhills. Main soils: 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 and interference with tillage (stones). 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. Moornaba: Similar to Lowan, but more fertile and less prone to water repellence.
			Shallow Wiabuna	C	
IiP	0.7	Depressions	Wiabuna / rubbly Wiabuna	V	
			Shallow Wiabuna	C	
IjK	1.3	Depressions	Wiabuna / rubbly Wiabuna	E	
			Shallow Wiabuna	L	
		Sandy rises	Wharminda	L	
			Lowan / Moornaba	E	
IlA	8.3	Flats	Wharminda / Wiabuna	V	
		Low sandhills	Lowan / Moornaba	C	
IlB	2.9	Very gentle slopes	Wiabuna / rubbly Wiabuna	E	
			Shallow Wiabuna	L	
		Low sandhills	Lowan / Moornaba	C	
InB	1.4	Very gentle slopes	Wiabuna / Wharminda	D	
OtE	1.7	High sandhills	Lowan / Moornaba	E	Dunefields where low to moderate parallel sandhills occupy more than 30% of the land. Low sandhills have moderate wind erosion potential, moderate sandhills have moderately high wind erosion potential. Main soils: Lowan: Very low fertility, moderate to high wind erosion potential, water repellent. Moornaba: Similar to Lowan, but more fertile and less prone to water repellence. 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.
		Swales	Wharminda / Lowan	E	
OtI	31.1	Swales	Wharminda / Wiabuna	E	
		Moderate sandhills	Lowan / Moornaba	E	
OtJ	21.4	Swales	Wharminda / Wiabuna	E	
		Low sandhills	Lowan / Moornaba	E	
OtK	2.4	Swales	Lowan /Moornaba	E	
		Sand spreads	Wharminda	E	
OuI	3.4	Swales	Wiabuna	E	Dune-swale complex, with mainly calcareous sandy loams (Wiabuna) in swales, and Lowan / Moornaba sands on sandhills. Wind erosion potential is moderate (**OuJ**) to moderately high (**Oul**). Soils as for **Ot*** above.
		Moderate sandhills	Lowan / Moornaba	E	
OuJ	6.9	Swales	Wiabuna	V	
		Low sandhills	Lowan / Moornaba	E	
OwJ	15.1	Swales	Rubbly Wiabuna	E	As for **OuJ**, but swale soils have limited water holding capacity.
		Low sandhills	Shallow Wiabuna	L	
			Lowan /	E	

			Moornaba		
SJA	2.8	Stony sandy loam flats	Rubbly Wiabuna	E	Flats and very gentle slopes formed on Woorinen Formation carbonates, overlain by up to 30% low sandhills. Main soils: 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 and interference with tillage (stones).
			Wiabuna	E	
			Shallow Wiabuna	C	
ZJ-	0.1	Saline flats	Saline soil	V	Too saline for agricultural use
		Gypsum rises	Gypseous soil	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