

# ARU Ardune Land System

**Area:** 66.3 km<sup>2</sup>

**Landscape:** South East dune "range" or stranded aeolianite beach ridge, forming a low, to moderately high, linear dune range with a surface calcrete cap trending north-west to south-east, with areas of shallow soils, outcropping calcrete and deeper sands. The ridge has been over-blown with Quaternary sands which form deeper soils particularly on the inland or leeward side of the range.

**Annual rainfall:** 575 – 635 mm average

**Geology:** Calcreted calcarenite of the Pleistocene Bridgewater Formation on ridges, with Pleistocene lagoonal deposits of the Padthaway Formation on flats on the landward edge. Holocene Glanville Formation lagoonal deposits occupy the flats where the land system occurs closer to the present day coast.

**Main soils:**

- B3** (26%) Shallow sandy loam on calcrete (Petrocalcic Red Tenosol-Kandosol-Rudosol)
- B6** (20%) Shallow loam over red-brown clay on calcrete (Petrocalcic Red Chromosol-Kandosol)
- I1** (14%) Highly leached sand (Aeric Podosol)
- RR** (10%) Rock or exposed calcrete.

**Minor soils:**

- B4** (6%) Shallow red loam on limestone (Petrocalcic Red-Brown Dermosol)
- B8** (3%) Shallow bleached sand on calcrete (sandy Petrocalcic Rudosol-Tenosol)

**Summary:** Stony Ranges: Shallow siliceous reddish sand to sandy loam on over calcrete (B3, B6), or bare calcrete (RR),

Sandy Ranges: Deeper siliceous sandy soils (H3 Tenosols, I1 Podosols) with calcreted aeolianite at variable depth.

The bare rocky nature of these hills and rises restricts the land-use options due not only to interference with tillage and trafficability problems, but also to low water holding capacity. Generally used for grazing. Drainage is good on these landscapes. Recharge is high.

## Soil Landscape Unit summary: Ardune Land System (ARU)

SLU	% of area	Component	Main soils	Prop#	Notes
MAB	4.4	Rise	B3RR	D	Calcreted former beach ridges with stony, very shallow red and brown loam, occasionally over red clay, on calcrete. More than 50% bare calcrete.  <b>MAB</b> Gently undulating rises Slopes are 1 - 3%, relief is less than 30 m. <b>MAC</b> Undulating rises. Relief is less than 30m, slopes are 3 - 10%.  Main soils: <u>Shallow sandy loam on calcrete</u> - <b>B3</b> and <u>Rock or exposed calcrete</u> - <b>RR</b> .
MAC	17.0	Rise	B3RR	D	
M-B	3.5	Stony rise	B3RR	V	Calcreted former beach ridges with stony, very shallow red and brown loam, occasionally over red clay, on calcrete.
		Swale	B7B6	L	



M-C	1.3	Rise	RRB3	D	<p>Less than 50% bare calcrete.</p> <p><b>M-B</b> Gently undulating rises, but &lt;50% bare calcrete. 10 - 20% swales with shallow sandy loam, mostly over poorly structured brown, or red clay on calcrete; 10 - 30% of swale areas have very shallow sandy loam on calcrete, soils or bare calcrete. Slopes are 1 - 3%, relief is less than 30 m.</p> <p><b>M-C</b> Steeper, undulating rises as above. Relief is less than 30 m, slopes are 3 - 10%.</p> <p>Main soils: <b>Stony rises:</b> <u>Shallow sandy loam on calcrete</u> - <b>B3</b> and <u>Rock or exposed calcrete</u> - <b>RR</b>. <b>Swales:</b> <u>Sand over friable brown clay on calcrete</u> - <b>B7</b> and <u>Shallow sandy loam over red-brown clay on calcrete</u> - <b>B6</b>.</p>
McA	0.3	Plain	H3B8	D	<p>Plains with bleached siliceous sand, deep or shallow over calcreted calcarenite; 10 - 30% shallow sandy loam with thin red clay on calcrete.</p> <p>Main soils: <u>Bleached siliceous sand</u> - <b>H3</b> and <u>Shallow sand on calcrete</u> - <b>B8</b>.</p>
MEB	0.9	Stony rise	B3	V	<p>Gently undulating calcreted former beach ridge with shallow sand on calcrete soils. 10 - 20% dunes with deep, water repellent, acid bleached siliceous sands.</p> <p>Main soils: <b>Stony rises:</b> <u>Shallow sandy loam on calcrete</u> - <b>B3</b>. <b>Dunes:</b> <u>Highly leached sand</u> - <b>I1</b> and <u>Bleached siliceous sand</u> - <b>H3</b>.</p>
		Dune	I1H3	L	
MHA	0.1	Plain	H3G3	D	<p>Calcarenite ridges and plains with deep bleached siliceous sands on dunes, often over brown sandy clay. Co-dominant are shallow stony rises with shallow siliceous sand on calcrete or bare rock, or occasionally, sandy loam on red clay on calcrete.</p>
MHB	2.2	Dune	H3	E	
		Stony range	B3RR	E	
MHC	5.1	Dune range	H3I1B7	D	<p><b>MHA</b> Plains with deep bleached siliceous sand, often over brown clay.</p> <p><b>MHB</b> Gently sloping calcarenite ridges with deep bleached siliceous sands on dunes, often over brown sandy clay. Co-dominant are shallow stony rises with shallow siliceous sand on calcrete or bare rock, or occasionally, sandy loam on red clay on calcrete. Slopes are 1 - 3%, relief is less than 30 m.</p> <p><b>MHC</b> Undulating slopes on calcarenite range as for MHB but with 10 - 30% of rise areas have rock outcrop or shallow sand on calcrete or deep siliceous sand. Relief is less than 30 m, slopes are 3 - 10%.</p> <p>Main soils: <b>Plains:</b> <u>Bleached siliceous sand</u> - <b>H3</b> and <u>Thick sand over clay</u> - <b>G3</b> <b>Stony ranges:</b> <u>Shallow sandy loam on calcrete</u> - <b>B3</b> and <u>Rock or exposed calcrete</u> - <b>RR</b>. <b>Dunes:</b> <u>Bleached siliceous sand</u> - <b>H3</b>. <b>Dune ranges:</b> <u>Bleached siliceous sand</u> - <b>H3</b>, <u>Highly leached sand</u> - <b>I1</b> and <u>Sand over friable brown clay on calcrete</u> - <b>B7</b>.</p>
MKAA	4.3	Low rise	B8B3	D	<p>Low rises with dune core topography, with shallow bleached sand over calcreted calcarenite, or shallow sandy loam over very thin red clay on calcreted calcarenite; 10 - 30% deep bleached siliceous sand. Slopes are 1 - 3%, relief is less than 9 m.</p>
		Swale	B7	M	



					<p>Main soils:  <b>Low rises:</b> <u>Shallow sand on calcrete - B8</u> and <u>Shallow sandy loam on calcrete - B3</u>.  <b>Swales:</b> <u>Sand over friable brown clay on calcrete - B7</u>.</p>
MRB	20.5	Rise	B6B4B3	D	<p>Rises with texture contrast and gradational, moderately shallow to very shallow, reddish sandy loam to clay loam, mostly over friable, well structured red-brown clay, on calcreted calcarenite.</p> <p><b>MRB</b> Gently undulating rises. Slopes are 1 - 3%, relief is less than 30 m.  <b>MRC</b> Undulating rises. Relief is less than 30 m, slopes are 3 - 10%.</p> <p>Main soils: <u>Shallow sandy loam over red-brown clay on calcrete - B6</u>, <u>Shallow red loam on limestone - B4</u>, <u>Shallow sand on calcrete - B8</u> and <u>Shallow sandy loam on calcrete - B3</u>.</p>
MRC	2.9	Rise	B6B3B8	D	
MwB	9.8	Dune range	I1H3	D	<p>Gently sloping dune ranges formed on calcarenite, with mostly deep, bleached, acidic, siliceous sand; 10-30% shallow sandy loam over thin red sandy clay on calcreted calcarenite.</p> <p>Main soils: <u>Highly leached sand - I1</u> and <u>Bleached siliceous sand - H3</u>.</p>
NBu	0.2	Plain	N2cB5	V	<p>Corridor plains with moderately saline wet dark non-cracking clay, or shallow dark clay over calcrete. 20 - 30% salt pans with bare salt surfaces; 10 - 30% water filled. 10 - 20% lunettes with gradational, deep, calcareous, grey, clay loam over gypseous clay; 10 - 30% shallow dark clay loam over dark clay on calcrete.</p> <p>Main soils:  <b>Plains:</b> <u>Wet saline clay loam - N2c</u> and <u>Shallow dark clay loam on limestone - B5</u>.  <b>Salt pans:</b> <u>Wet saline clay loam - N2c</u>.  <b>Lunettes:</b> <u>Gypseous calcareous loam - A8</u></p>
		Salt pan	N2c	C	
		Lunette	A8	L	
NRF	1.6	Plain	G3	V	<p>Plains with deep sand over brown clay; 10 - 30% shallow sandy loam over poorly structured brown clay on calcrete, or shallow red clay loam over red clay on calcrete.</p> <p>Main soils:  <b>Plains:</b> <u>Thick sand over clay - G3</u>.  <b>Swamps:</b> <u>Wet clay loam - N3</u>.</p>
		Swamp	N3	L	
OFD	0.1	Low dune	I1	D	<p>Low dunes with deep, bleached, acid, water repellent, siliceous sand; 10 - 30% bleached sand over red-brown sandy clay or shallow sandy loam over poorly structured red brown clay on calcrete.</p> <p>Main soils: <u>Highly leached sand - I1</u>.</p>
OHB	21.6	Dune range	I1H3	D	<p>Dunes with deep, water repellent acid, bleached siliceous sand; 10 - 30% sandy loam, often over thin red clay, on calcrete. &lt;10% stony rises with shallow sandy loam, occasionally over red clay, on calcreted calcarenite, which outcrops occasionally also.</p> <p><b>OHB</b> High dunes.  <b>OHG</b> Low dunes. 10-20% swales with deep sand over brown clay; 10-30% wet soils and sandy loam over poorly structured brown clay on calcrete.</p>
		Stony rise	B3	M	
OHG	2.5	Low dune	I1H3	V	
		Swale	G3	L	



					Main soils: <b>Dunes:</b> <u>Highly leached sand - I1</u> and <u>Bleached siliceous sand - H3</u> . <b>Stony rises:</b> <u>Shallow sandy loam on calcrete - B3</u> . <b>Swales:</b> <u>Thick sand over clay - G3</u> .
XI-	0.2	Lake	WW	D	Water filled lake.
Xuf	0.1	Swamp	N3	V	Non-peaty dark organic loamy swamps; 20 - 30% stony rises with shallow calcareous loam, or loam over thin red clay on calcrete.  Main soils: <b>Swamps:</b> <u>Wet clay loam - N3</u> . <b>Stony rises:</b> <u>Shallow calcareous loam on calcrete - B2</u> and <u>Shallow sandy loam on calcrete - B3</u> .
		Stony rise	B2B3	C	
XwC	0.9	Swamp	N3N2c	D	Swamps with wet non-saline and moderately saline sandy loam over dark clay; 10 - 30% water filled or with bleached sand over brown clay.  Main soils: <u>Wet clay loam - N3</u> and <u>Wet saline clay loam - N2c</u> .
ZS-	0.3	Salt pan	N2cA7	D	Saline flat with mostly wet saline, calcareous grey clay loam on dark clay on marl; or water filled. 10 - 30% non-saline wet soils, or deep clay grading to dark clay.  Main soils: <u>Wet saline clay loam - N2c</u> and <u>Calcareous clay loam on marl - A7</u> .

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

- 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:

- A7** Calcareous clay loam on marl (Marly Calcarosol)  
Dark calcareous clay with a marly subsoil (often saline in Upper SE). Often with shells and a peaty surface.
- A8** Gypseous calcareous loam (Gypseous Calcarosol)  
Calcareous soil with a Gypsic horizon (>20% visual gypsum in a horizon which is at least 10cm thick). Found on lunettes, flats, etc.
- B2** Shallow calcareous sandy loam on calcrete (Petrocalcic Calcarosol)  
Up to 40 cm calcareous loamy sand to sandy loam with variable calcrete rubble overlying calcreted calcarenite - rises.
- B3** Shallow sandy loam on calcrete (Petrocalcic Rudosol)  
Medium thickness non calcareous sandy loam, often having a slight clay increase with depth, over calcreted calcarenite shallower than 50 cm - rises.
- B4** Red sandy loam over calcrete (Petrocalcic, Red Dermosol)  
Medium thickness red sandy loam grading to friable red clay loam over calcreted calcarenite within 50 cm - rises.



- B5** Shallow dark clay loam on limestone (Petrocalcic, Black Dermosol)  
Black clay loam to light clay over calcreted limestone at shallow depth, grading to highly calcareous clay - flats.
- B6** Shallow sandy loam over red-brown clay on calcrete (Petrocalcic, Red Kandosol)  
Medium thickness sandy loam with slight ironstone gravel overlying a weakly structured reddish brown sandy clay on calcarenite within 50 cm - rises.
- B7** Shallow sand over sandy clay on calcrete (Petrocalcic, Brown Chromosol)  
Medium thickness sand overlying brown friable sandy clay to clay on limestone or calcreted sandy clay within 50 cm - flats.
- B8** Shallow sand on calcrete (Petrocalcic, Bleached-Leptic Tenosol)  
Thick bleached sand over calcreted calcarenite within 50 cm - rises.
- G3** Thick sand over clay (Hypercalcic, Brown Sodosol/ Chromosol)  
Thick bleached sand with an organically darkened surface abruptly overlying a massive to coarsely structured brown to reddish yellow sandy clay to clay, calcareous with depth - rises.
- H3** Deep bleached sand (Basic, Arenic, Bleached-Orthic Tenosol)  
Grey sand over a very thick bleached sand grading to yellow sand continuing below 100 cm.
- I1** Highly leached sand (Fragic, Pipey, Aeric Podosol)  
Grey sand with a very thick bleached A2 layer, over dark brown and yellow massive soft to semi-hard clayey sand (coffee rock), grading to softer yellow and brown sand to sandy clay loam from about 80 cm.
- N2c** Wet saline clay loam (Dermosolic, Salic Hydrosol)  
Medium thickness dark grey to black clay loam to clay grading to a well structured dark grey clay with minor carbonates and a water table within 100 cm.
- N3** Seasonally waterlogged, non to marginally saline equivalents of soils listed above, viz.:  
**N3c** Wet **G3**  
**N3d** Wet **B5**  
**N3e** Wet **B7**
- RR** Bare rock
- WW** Water

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

