

MAC Macdonnell Land System

Area:	107.5 km ²
Landscape:	Sub-coastal plains inland from wet, Wylie Land System. Landscape is level to gently undulating with mostly shallow, often stony, soils on calcrete.
Annual rainfall:	745 – 770 mm average
Geology:	Eocene-Miocene Gambier Limestone with rises of calcreted Bridgewater Formation calcarenite.
Main soils:	<p>B7 (42%) Shallow sand over clay on calcrete (sandy Petrocalcic Sodosol-Chromosol)</p> <p>B3 (17%) Shallow sandy loam on calcrete (Petrocalcic Red Tenosol-Kandosol-Rudosol)</p> <p>B4 (16%) Shallow red loam on limestone (Petrocalcic Red-Brown Dermosol)</p>
Minor soils:	<p>Collectively, 21% but contributing only 3 - 5% each.</p> <p>RR Rock or exposed calcrete.</p> <p>B1 Shallow highly calcareous sandy loam on calcrete (Supraescent-Shelly Petrocalcic Calcarosol-Rudosol)</p> <p>B6 Shallow loam over red-brown clay on calcrete (Petrocalcic Red Chromosol-Kandosol)</p> <p>N3 Wet soil (non saline to moderately saline) (Sodosolic-Calcarosolic-Dermosolic Hydrosol)</p> <p>N1 Peat (Organosol)</p>
Summary:	Marine etch-plain on Miocene Gambier limestone with very shallow soils.

Soil Landscape Unit summary: Macdonnell Land System (MAC)

SLU	% of area	Component	Main soils	Prop#	Notes
m-A	1.0	Plain	B3	D	Calcrete-capped Miocene limestone with very shallow red loam on clay loam over rock. >50% calcrete outcrop and >10% very shallow Rudosols-Tenosols-Calcarosols (sometimes shelly). m-A Plains. m-B Rises. Main soils: Plains: <u>Shallow sandy loam on calcrete</u> - B3 . Rises: <u>Shallow sandy loam on calcrete</u> - B3 and <u>Rock or exposed calcrete</u> - RR .
m-B	2.7	Rise	B3RR	D	
mFA	1.5	Rise/Plain	F2	D	Calcrete-capped Miocene limestone plains and rises with less than 50% bare calcrete. Soils are mainly loamy Petrocalcic, Red Kandsols, Tenosols and Chromosols with <10% deep sandy Tenosols-Podosols. Main soils: <u>Sandy loam over poorly structured brown or dark clay</u> - F2 .
MSC	0.2	Dune	I1H3	D	Low dunes with leached siliceous sand on calcreted plain with very shallow loamy sand soils. Dunes: <u>Highly leached sand</u> - I1 and <u>Bleached siliceous sand</u> - H3 . Swales: <u>Shallow sandy loam on calcrete</u> - B3 and <u>Shallow calcareous loam on calcrete</u> - B2 .
		Swale	B3B2	M	



mUA	6.8	Plain	B3	D	Plain with very dark brown sandy loam on brown sandy clay loam over Miocene limestone. Main soils: <u>Shallow sandy loam on calcrete</u> - B3 .
MUB	11.6	Rise	B3B1	D	Mainly shallow calcareous Rudosols, Calcarosols and Tenosols on calcreted, aeolianite with shallow calcareous Rudosols and dark brown Tenosols. Less than 50% bare calcrete. Typically shallow, dark brown sandy loam over calcrete. MUB gently undulating rises MUD rolling rises (with very shallow soils). Main soils: Plains: <u>Shallow sandy loam on calcrete</u> - B3 and <u>Shallow highly calcareous sandy loam on calcrete</u> - B1 .
MUD	6.0	Rise	B3B1	D	
VaA	5.7	Plain	B4	D	Slightly elevated subcoastal plain with very shallow red clay loam on calcreted Miocene limestone. Stony. Main soils: <u>Shallow red loam on limestone</u> - B4 .
VbA	2.0	Plain	B7	D	Shallow coastal plain with flinty sand over poorly structured clay or calcareous sandy loam on limestone. VbA Plains. VbW Complex of flats & stony rises. Main soils: <u>Sand over friable brown clay on calcrete</u> - B7 .
VbW	1.2	Plain	B7	D	
VcW	3.7	Plain	B4	D	Shallow coastal plain with shallow flinty red sandy loam over calcrete. Rock outcrop on rises. Main soils: Plains: <u>Shallow red loam on limestone</u> - B4 . Rises: <u>Shallow sandy loam on calcrete</u> - B3 and <u>Rock or exposed calcrete</u> - RR .
		Rise	B3RR	M	
VdA	43.7	Plain	B7	D	Shallow coastal plain with sand over poorly structured clay on limestone with wet, non-peaty swamps. VdA Plains. VdW Complex of flats & stony rises. Main soils: <u>Sand over friable brown clay on calcrete</u> - B7 .
VdW	4.8	Plain	B7	D	
VfA	3.5	Plain	B7B2	V	Subcoastal plain with shallow sandy loam or sand over clay soils on Miocene limestone. 20-30% Low dunes with siliceous sand. Main soils: Plains: <u>Sand over friable brown clay on calcrete</u> - B7 and <u>Shallow calcareous loam on calcrete</u> - B2 . Dunes: <u>Deep brown sand</u> - H2 .
		Dune	H2	C	
XtA	3.2	Plain	N3	D	Lagoonal deposits with alkaline peaty swamps. XtA lagoonal/lake deposit XtC Alkaline peaty swamps. Used for intensive cropping when drained. Peat depth varies. Xtf Swamps with stony rises or shallow over calcrete. Xtn Swamps with mixed stony and sandy rises. Main soils: Plains: <u>Wet clay loam</u> - N3 . Swamps: <u>Peaty soil</u> - N1 , <u>Wet clay loam</u> - N3 and <u>Shallow dark clay loam on limestone</u> - B5 . Stony Rises: <u>Shallow calcareous loam on calcrete</u> - B2 and <u>Shallow loam on calcrete</u> - B3 . Sandy rises: <u>Wet highly leached sand</u> - I2 .
XtC	0.6	Swamp	N1	D	
Xtf	0.1	Swamp	B5N3	V	
		Rise	B2B3	C	
Xtn	1.4	Swamp	N1	V	
		Stony rise	B2B3	L	
		Sandy rise	I2	L	
XWF	0.2	Swampy flat	N3N2	D	Wet flat with loamy-clay loamy grey soils. Moderate salinity. Main soils: <u>Wet clay loam</u> - N3 and <u>Wet saline clay loam</u> - N2c .



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)

Detailed soil profile descriptions:

- B1** Shallow highly calcareous sandy loam on calcrete (Supravescent-Shelly Petrocalcic Calcarosol-Rudosol)
Shallow, carbonate dominant sandy to loamy soil on calcrete. Carbonate dominates the soil profile as a whole, however, the surface soil may not be carbonate dominant, but needs to contain at least 30% carbonate.
- B2** sandy loam on calcrete (Petrocalcic Calcarosol)
Up to 40 cm calcareous loamy sand to sandy loam with variable calcrete rubble overlying calcreted calcarenite - Shallow calcareous 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.
- 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.
- F2** Sandy loam over poorly structured brown or dark clay (Brown-Dark Sodosol-Chromosol)
Topsoil <30 cm over a poorly structured subsoil. Loamy, often sandy loam, to clay loamy texture contrast soil with a sodic/dispersive/poorly structured brown clayey subsoil. Often sandy loam, usually with a bleached horizon, and thin topsoil over a poorly structured B.
- H2** Siliceous sand (Sandy Calcarosol-Tenosol)
Deep to moderate depth calcareous siliceous sand. Often with non-calcareous topsoil; can be non calcareous throughout. Sometimes the subsoil is a light sandy loam.
- 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.
- I2** Wet highly leached sand (Fragic, Humic, Aquic Podosol)
Grey sand with a thick bleached A2 horizon, overlying a thin to thick layer of coffee rock, grading to pale brown sand sharply overlying a grey, brown and yellow mottled sandy clay loam to light clay.
- N1** Peat (Organosol)
Peaty soil.
- 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

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

