SYM Symon Land System

Area: 204 km^2

Landscape: This land system is a complex of sandy plains on calcarenite and low calcarenite ridges.

Annual rainfall: 625 - 750 mm average

Geology: Calcreted aeolianite of the Pleistocene Bridgewater Formation barrier shoreline deposits on rises. Pleistocene Glanville Formation plains with clayey deposits, often calcreted.

Main soils:

B3 (16%) Shallow sandy loam on calcrete (Petrocalcic Red Tenosol-Kandosol-Rudosol)
H3 (15%) Bleached siliceous sand (sandy Bleached Tenosol)
B7 (15%) Shallow sand over clay on calcrete (sandy Petrocalcic Sodosol-Chromosol)
G3 (11%) Thick sand over clay (sandy Brown-Red Chromosol-Sodosol)
B6 (11%) Shallow loam over red-brown clay on calcrete (Petrocalcic Red Chromosol-Kandosol)

Minor soils:

I1 (9%) Highly leached sand (Aeric Podosol)
B2 (6%) Shallow calcareous loam on calcrete (Petrocalcic Calcarosol-Rudosol)
B8 (6%) Shallow sand on calcrete (sandy Petrocalcic Rudosol-Tenosol)

Summary: On plains, the soils are sandy, well drained and have moderate to low waterholding capacity. They occur in association with less well-drained sand over clay soils on calcreted calcarenite. On rises, very shallow soils or bare rock are common. Sand plains with deep siliceous sands occupy 10% of the land system.

Soil Landscape Unit summary: Symon Land System (SYM)

SLU	% of area	Component	Main soils	Prop#	Notes
MAB	0.1	Rise	B3RR	D	**MAB** Gently undulating calcreted former beach ridge with stony, very shallow red and brown loamy over red clay soils. >50% bare calcrete. **MAC** Undulating as above. Main soils: Shallow sandy loam on calcrete - **B3** and Rock or exposed calcrete – **RR**.
MAC	0.3	Rise	B3RR	D	
M-C	0.4	Rise	RRB3	D	Undulating rises, with stony, very shallow red and brown sandy loam soils as above but <50% bare calcrete. 10-30% with shallow sandy loam, mostly over red clay on calcrete. Main soils: Rock or exposed calcrete – **RR** and Shallow sandy loam on calcrete - **B3**.
McB	7.6	Undulating plain	G3H3	D	Gently undulating plain, underlain by calcreted calcarenite with deep sand, mostly over brown clay. Shallow sand or sandy loam, often over poorly structured brown clay occupies 10-30% of the unit. A further 10-30% is deep bleached sand. Main soils: Thick sand over clay - **G3** and Bleached siliceous sand - **H3**.
MCB	0.5	Dune range	B6B3 H3	D	**MCB** Gently undulating rises with shallow sand, mostly over red clay, on calcreted calcarenite. Deep sands occupy 30%.

MCBA	0.5	Low rise	B6B3 H3	D	**MCBA** Low rises, as above. Main soils: ***Dune range and low rises:*** Shallow sandy loam over red-brown clay on calcrete - **B6**, Shallow sandy loam on calcrete - **B3** and Bleached siliceous sand - **H3**.
MDH	1.4	Stony rise	B6RR	V	Gently undulating stony rises with shallow sandy loam, mostly over thin sandy clay on calcrete; or bare calcrete, especially on crests. 20-30% small swales have shallow sandy loam over; poorly structured brown; or red, clay on calcrete. Main soils: ***Stony rises:*** Shallow sandy loam over red-brown clay on calcrete - **B6** and Rock or exposed calcrete – **RR**. ***Swales:*** Sand over friable brown clay on calcrete - **B7** and Shallow sandy loam over red-brown clay on calcrete - **B6**.
		Swale	B7B6	C	
MEAF	1.7	Plain	B8	D	**MEAF** Plain with shallow, coarse flint gravelly, sand over calcrete. **MEB** Gently sloping calcarenite rises with shallow sand over calcrete soils. 10-20% dunes with water repellent, deep siliceous sands. 20-30% flats with less well-drained sand over clay on calcrete. **MEC** Undulating rises as above. **MEG** Gently undulating plain with shallow, mostly calcareous, loam on calcreted calcarenite. <10% depressions with deeper loams over poorly structured brown/grey clay on calcrete. Main soils: ***Plains:*** Shallow sandy loam over red-brown clay on calcrete - **B6**, Sand over friable brown clay on calcrete - **B7,** Shallow calcareous loam on calcrete - **B2** and Shallow sand on calcrete - **B8**. ***Rises:*** Shallow sandy loam on calcrete - **B3** and Shallow sandy loam over red-brown clay on calcrete - **B6**. ***Dunes:*** Highly leached sand - **I1**, Bleached siliceous sand - **H3** and Shallow sand on calcrete - **B8**. ***Depressions:*** Sand over friable brown clay on calcrete - **B7** and Shallow calcareous loam on calcrete - **B2**.
MEB	6.5	Rise	B6B3	V	
		Plain	B6B7	C	
MEC	0.9	Stony rise	B3	D	
		Dune	I1H3 B8	M	
MEG	5.1	Undulating plain	B2	D	
		Depression	B7B2	M	
MHA	6.2	Plain	H3G3	D	Plains with mostly deep, bleached siliceous sand, often over yellow-brown clay. Calcrete substrate at depth. Main soils: Bleached siliceous sand - **H3** and Thick sand over clay - **G3**.
MHB	3.2	Dune	H3	E	**MHB** Gently sloping calcarenite ridge 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, occasionally sandy loam on red clay on calcrete. **MHC** 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. <10% swales with sand over brown clay or shallow sand over poorly structured clay on calcrete. Minor deep siliceous sands. Main soils: ***Dunes:*** Bleached siliceous sand - **H3**. ***Dune ranges:*** Bleached siliceous sand - **H3**, Highly leached sand - **I1** and Sand over friable brown clay on calcrete - **B7**. ***Stony ranges:*** Shallow sandy loam on calcrete - **B3** and Rock or exposed calcrete – **RR**.
		Stony range	B3RR	E	
MHC	4.7	Dune range	H3I1 B7	D	
		Swale	G3B7 B8	M	

					Swales: Thick sand over clay - **G3**, Sand over friable brown clay on calcrete - **B7** and Shallow sand on calcrete - **B8**.
MJB	1.4	Undulating plain	B8H3	D	Gently sloping rises with shallow sand over calcrete, and deep siliceous sand, soils. Main soils: Shallow sand on calcrete - **B8** and Bleached siliceous sand - **H3**.
MRBA	7.8	Rise	B6B4 B3	D	Gently undulating, calcreted low dune core ridges, with shallow sandy loam to clay loam mostly over red clay on calcrete, but also shallow sandy loam on calcrete. Main soils: Shallow sandy loam over red-brown clay on calcrete - **B6**, Shallow red loam on limestone - **B4**, Shallow sand on calcrete - **B8** and Shallow sandy loam on calcrete - **B3**.
MtA	0.1	Plain	B8	D	Plains with shallow sand over calcreted calcarenite. Main soils: Shallow sand on calcrete - **B8**.
MWA	8.1	Plain	B3B7	D	**MWA** Plains with shallow sandy loam, often over poorly structured brown clay, on calcrete. 10-30% each of shallow sandy loam over red clay on calcrete; deep sand, bleached and unbleached. **MWAA** Plains with low dune core ridges. **MWB** Rises as above soils. **MWH** Plain as above; <10% swampy swales with poorly structured grey/brown clay on calcrete; and deep, dark, calcareous loam grading to clay over marl, soils **MWL** Plain, as above, 20-30% swamps with wet loam over dark clay soils or peat. Main soils: ***Plains:*** Shallow sandy loam on calcrete - **B3** and Sand over friable brown clay on calcrete - **B7**. ***Rises:*** Sand over friable brown clay on calcrete - **B7**. ***Swamps:*** Wet clay loam - **N3** and Peaty soil – **N1**.
MWAA	2.1	Plain	B3B7	D	
MWB	1.8	Rise	B7	D	
MWH	0.8	Undulating plain	B7	D	
		Swampy swale	B7	M	
MWL	2.0	Plain	B3B7	V	
		Swamp	N3N1	C	
MXU	1.4	Rise	RRB3	V	Plain with mostly exposed calcrete and shallow sandy loam over calcreted calcarenite. 10-20% swamps with shallow wet clay loam over dark clay soils; or peat. Main soils: ***Rises:*** Rock or exposed calcrete – **RR** and Shallow sandy loam on calcrete - **B3**. ***Swamps:*** Wet clay loam - **N3** and Peaty soil – **N1**.
		Swamp	N3N1	L	
NBI	0.7	Stony plain	B5B2	V	Stony plains with thin, often calcareous, black cracking clay on calcrete; or shallow dark calcareous clay on calcrete. 10-20% swamps with dark, frequently slightly saline, clay soils. Main soils: ***Stony plains:*** Shallow dark clay loam on limestone - **B5** and Shallow calcareous loam on calcrete - **B2**. ***Swamps:*** Wet saline clay loam – **N2c** and Shallow dark clay loam on limestone - **B5**.
		Swamp	N2B5	L	
NBT	2.4	Swampy stony plain	B5B2	V	Swampy, stony plains as above; 20-30% sandy rises with shallow sand, often over dark brown clay, on calcrete. Main soils: ***Swampy stony plains:*** Shallow dark clay loam on limestone - **B5** and Shallow calcareous loam on calcrete - **B2**. ***Sandy rises:*** Shallow sand on calcrete - **B8** and Shallow sandy loam on calcrete - **B3**.
		Sandy rise	B8B3	C	
NDO	1.1	Plain	G3B7 B5	V	**NDO** Plains with deep sand over brown clay and shallow sandy loam over poorly structured brown clay on calcrete; 20-30%

		Sandy rise	I2G3	C	sandy rises with deep sand, often over coffee rock and/or brown clay; 10-20% stony rises with loam and sandy loam, mostly over red clay, on calcreted calcarenite. **NDP** Plains and sandy rises as above; <10% swamps with wet sandy loam over, often poorly structured, clay soils and shallow equivalents on calcrete. Main soils: ***Plains:*** Thick sand over clay - **G3**, Sand over friable brown clay on calcrete - **B7** and Shallow dark clay loam on limestone - **B5**. ***Sandy rises:*** Wet highly leached sand - **I2** and Thick sand over clay - **G3**. ***Swamps:*** Wet clay loam - **N3**, Thick sand over clay - **G3** and Sand over friable brown clay on calcrete - **B7**. ***Stony rises:*** Shallow sandy loam over red-brown clay on calcrete - **B6** and Shallow sandy loam on calcrete - **B3**.
		Stony rise	B6B3	L	
NDP	3.6	Plain	B7	V	
		Sandy rise	I2G3	C	
		Swamp	N3G3 B7	M	
NIA	0.2	Plain	G3B7	D	Plains with deep sand over brown clay, often on calcrete. Main soils: Thick sand over clay - **G3** and Sand over friable brown clay on calcrete - **B7**.
NjB	0.8	Stony plain	B7	D	Stony plains with shallow sand, mostly over poorly structured brown clay, on calcrete. Main soils: Sand over friable brown clay on calcrete - **B7**.
NkD	0.7	Plain	B7	D	**NkD** Plains with shallow sand over poorly structured brown clay, on calcrete. <10% sandy rises with deep bleached siliceous sand soils, occasionally shallow sand over brown clay, or sand, on calcrete. **NkO** Plains as above, often with deep sand over brown clay soils. 10-20% stony rises with shallow sandy loam, commonly over red clay, on calcrete. 10-20% sandy rises as above. Main soils: ***Plains:*** Thick sand over clay - **G3** and Sand over friable brown clay on calcrete - **B7**. ***Sandy rises:*** Highly leached sand - **I1** and Bleached siliceous sand - **H3**. ***Stony rises:*** Shallow sandy loam over red-brown clay on calcrete - **B6**, Shallow sandy loam on calcrete - **B3** and Shallow calcareous loam on calcrete - **B2**.
		Sandy rise	I1H3	M	
NkO	5.4	Plain	G3B7	V	
		Stony rise	B6B3 B2	L	
		Sandy rise	I1H3	L	
NlF	0.1	Swampy plain	B5	D	Swampy plains with shallow dark clay loam, mostly over dark clay on calcrete. 10-20% swamps. Main soils: Shallow dark clay loam on limestone - **B5**.
NMF	0.6	Plain	B7F2 G3	V	Plains with sandy loam to loam over, commonly poorly structured dark brown clay, mostly over calcrete. 10-20% swamps with commonly wet, dark clay loam to clay soils, often shallow on calcrete. Main soils: ***Plains:*** Sand over friable brown clay on calcrete - **B7**, Sandy loam over poorly structured brown or dark clay - **F2** and Thick sand over clay - **G3**. ***Swamps:*** Wet clay loam - **N3**, Deep friable gradational clay loam - **M2** and Shallow dark clay loam on limestone - **B5**.
		Swamp	N3M2 B5	L	
NTF	0.2	Swampy plain	G3	D	Swampy plain with deep sand over brown clay soils. 10-30% wet soils. Main soils: Thick sand over clay - **G3**.
NUA	2.1	Plain	B8B7	D	Plains with mostly shallow sand, often over poorly structured brown clay, on calcrete; 10-30% with red clay subsoils.

					Main soils: Shallow sand on calcrete - **B8** and Sand over friable brown clay on calcrete - **B7**.
NxA	0.8	Plain	B2	D	Plains with shallow calcareous sandy loam over calcrete. 10-30% with poorly structured brown clay subsoils. 10-30% shallow sand over calcrete. Main soils: Shallow calcareous loam on calcrete - **B2**.
NZF	1.1	Plain	B3B8	V	**NZF** Plains with shallow sand over calcrete. 10-20% swamps with mostly wet sand over brown clay; 10-30% deep siliceous sands, or dark clay loam on calcrete soils. **NZP** Plains with mostly deep, acid sand over acid brown clay. 10-20% sandy rises with deep acid, bleached sand, mostly over acid clay, soils. Main soils: ***Plains:*** Shallow sandy loam on calcrete - **B3** and Shallow sand on calcrete - **B8** and Thick sand over clay - **G3**. ***Sandy rises:*** Sand over acidic clay - **G5** and Wet highly leached sand - **I2**. ***Swamps:*** Wet clay loam - **N3**.
		Swamp	N3	L	
NZP	3.7	Plain	G3	V	
		Sandy rise	G5I2	L	
OFB	0.1	Dune	I1	D	**OFB** High dunes with deep acid water repellent sand; 10-30% swales or lower slopes, less well drained with coffee rock/brown clay subsoils. **OFD** Low dunes, as above, occasional shallow sand over brown clay on calcrete. **OFT** Dunes as above; 10-20% swampy flats with wet, dark cracking clay soils. Main soils: ***Dunes:*** Highly leached sand - **I1**. ***Swampy flats:*** Wet saline clay loam - **N2c**.
OFD	0.1	Low dune	I1	D	
OFT	0.1	Dune	I1	V	
		Swampy flat	N2	L	
OLC	0.3	Dune	H2	D	**OLC** Dunes with deep moderately bleached, water repellent, sands. 10-30% shallow sand over poorly structured brown clay on calcreted calcarenite. **OLD** Low dunes as above. Main soils: Deep brown sand - **H2**.
OLD	0.5	Low dune	H2	D	
ONC	0.9	Dune	H3	D	Dunes with deep bleached, water repellent, sands. 10-30% bleached sand over calcrete.10-30% sand over calcrete with occasional thin red sandy clay subsoils. Main soils: Bleached siliceous sand - **H3**.
PDa	9.5	Plain	I1H3	V	Gently undulating sand plain with deep bleached, strongly water repellent, siliceous sand soils, occasionally shallow loamy sand over calcrete. 10-20% low dunes with deep siliceous sands, as above. Main soils: Highly leached sand - **I1** and Bleached siliceous sand - **H3**.
		Low dune	I1H3	L	
XtC	0.1	Swamp	N1	D	Peat swamps. 10-30% mostly wet, deep dark clays. Main soils: Peaty soil – **N1**.
XxC	0.03	Swamp	N1N3 WW	D	Swamps with deep acid peats, organic loam over clay, or water filled. Main soils: ***Swamps:*** Peaty soil – **N1** and Wet clay loam - **N3**.

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:

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.

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.

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.

G5 Sand over acidic clay (Sandy Brown Kurosol)
Sandy texture contrast soil with a friable brown strongly acidic clayey to clay loamy subsoil. Very acidic soil; incipient Bh horizons; moderate depth topsoils. Some with ironstone.

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.

M2 Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)
Deep well structured red clay loamy soil.

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 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