

LSA Little Sahara Land System

Jumbled shelly sand dune deposits on Kangaroo Island's southern coast. The system includes areas of bare sand drift. This system is bordered by the sea to the south, rises of a dissected plateau area to the west, calcreted rises and plains to the north, and older shell sand dunes to the east.

Area: 49.2 km²

Annual rainfall: 555 – 615 mm average

Geology: Very recent and recent shell sand deposits (Holocene age Semaphore Sand member, and some Gantheaume Sand member, of the St.Kilda Formation). The Semaphore Sands are the younger and more active/bare sand deposits. There are minor areas with near surface to surface expression of calcreted calcarenite (Pleistocene age Bridgewater Formation).

Topography: Jumbled dune morphology with some depression areas. Significant areas of active/bare sand drift occur: Little Sahara and a smaller area adjacent to Mt.Bloomfield in the west of the system; and two unnamed larger areas to the north-east of Bales Bay in the Cape Gantheaume Conservation Park. Dunes can be over 30m high. Coastal calcarenite cliffs form the coastline. These cliffs often have rocky lower slopes, and often have rocky reefs extending from their bases.

Elevation: From sea-level, to inland depressions of less than 10 m, to dune peaks of over 70 m in the east of the system and at Mt. Mary and Mt. Bloomfield near Little Sahara in the west of the system.

Relief: Generally from 10 to 30 m

Main Soil: **H1** Deep shell sands

Minor Soils: **A1-B1** Moderate to shallow shelly soil on calcrete
B2 Shallow to very shallow calcareous soil on calcrete

B2-B1-B3 Very shallow organic soil on calcrete

Main Features: The system is non-arable due to fragile and infertile soils, and is mostly covered by native scrub. Nature conservation is the main priority here. Naturally occurring areas of bare shell sand exist. These bare dunes provide a source of 'lime sand' which is a readily available and relatively cheap source of ameliorant for acid soils. Acidification of soils is a problem for many agricultural areas on the Island; and liming should become a regular part of farming practice in many areas to maintain soil productivity. Provided extraction of this 'lime sand' is carefully and aesthetically done, and extraction areas are rehabilitated, no significant environmental damage need occur.



Soil Landscape Unit summary: Little Sahara Land System (LSA)

SLU	% of area	Main features #
M-B	0.5	Non-arable sheet calcrete areas. Main soils: mostly not soil, but exposed calcrete outcrop (RR). With areas of very shallow, dark and organic loamy to sandy soil on calcrete, sometimes shelly B2-B1-B3 (<i>Petrocalcic Rudosol</i>). With minor to limited deeper shell sand deposits. M-B – slopes (3-10%, 2e)
MbB MbD MbE MbYA	0.6 0.9 0.7 2.4	Non-arable calcreted areas: with moderate depth to shallow shelly soils. Main soils: moderate depth to shallow shelly loamy to sandy soil A1-B1 (<i>Petrocalcic Shelly Calcarosol</i>). Often with some shallow rubbly loamy to sandy calcareous soil on calcrete B2 (<i>Petrocalcic Calcarosol</i>). Some deeper shell sands on very low dunes H1 (<i>Shelly Rudosol</i>). Minor shallow loamy to sandy soil on calcrete B3 (<i>Petrocalcic Tenosol</i>). Also with some patches of sands or sandy loams over sodic clay G4-F2 (<i>Brown Sodosol</i>). MbB – slopes with some low dunes (2-4%, 2-1e) MbD – slopes (12-20%, 4e) MbE – gently undulating depression area. MbYA – mostly jumbled low dunes (<5m, 2e)
MdB	0.8	Non-arable calcreted areas: with shallow to very shallow calcareous soils. Main soils: shallow rubbly loamy to sandy calcareous soil on calcrete B2 (<i>Petrocalcic Calcarosol</i>). Some shallow to moderate depth shell sand soils B1 (<i>Shelly Rudosol-Calcarosol</i>). Minor shallow loamy to sandy soil on calcrete B3 (<i>Petrocalcic Tenosol</i>). MdB – rise (slopes 1-5%, 2e).
WAB	1.8	Unconsolidated coastal calcarenite cliffs. Often with a hard rock base. WAB – calcarenite cliffs (slopes >100%)
WGC WGD WGE WGQ WGN WGR WGS WGd WGe WGn	2.6 43.6 12.9 3.4 0.2 5.5 1.3 1.6 17.6 1.9	Non-arable shell sands. Main soil: mostly deep shell sand H1 (<i>Shelly Rudosol-Calcarosol</i>). Some shallower shell soils occur, especially in depressions (A1-B1). WGC – mostly high jumbled dunes (>15m) WGD – mostly moderate size jumbled dunes (5-15m). WGE – mostly low jumbled dunes/swales (<5m). Some shallower soils occur. WGQ – depressions with very low sand mounds/dunes. Can have some calcrete or 'massive' shell sand at moderate to shallow depth. WGN – sand spread, with some jumbled dunes, mostly on slopes of 10-30%. WGR – wetter depression flats: often with some sand mounds. Can have calcrete or 'massive' shell sand at moderate to shallow depth. WGS – active/bare, marginally saline/waterlogged, depression flats: often with some sand mounds. WGd – active/bare mostly moderate size jumbled dunes (5-15m) WGe – active/bare sand spread/low dunes, with some jumbled dunes. WGn – active/bare sand spread, with some jumbled dunes, mostly on slopes of 10-30%.
WT-	0.3	Rocky reefs at the base of cliffs.
XZX	1.4	Drainage depression and flats. Lower Eleanor River. Main soils: deep shell sands H1 (<i>Shelly Calcarosol</i>). XZX – drainage depression, swamps, and flats. (4-3s overall. Drainage depression: 5w, 3s; swamps: 5-4s, 7w; flats: 4w, 3-4s)

Classes in the 'Soil Landscape Unit summary' table (eg. 2-1e, 3w, 2y, etc) describe the predominant soil and land conditions, and their range, found in Soil Landscape Units. The number '1' reflects minimal limitation, while increasing numbers reflect increasing limitation. Letters correspond to the type of attribute:

a - wind erosion e - water erosion f - flooding g - gullyng
r - surface rockiness s - salinity w - waterlogging y - exposure



Detailed soil profile descriptions:**Main Soil:**

H1 Deep shell sands (*Shelly Rudosol-Calcarosol*). Deep fine shell sand soil: grey-brown, light grey, brown or dark grey topsoil over light grey to brown subsoil. Usually with some organic build-up in topsoil layers. Jumbled dunes, depressions, and bare dunes and sand spreads.

Minor Soils:

A1-B1 Moderate to shallow shelly soil on calcrete (*Petrocalcic Shelly Calcarosol*). Moderate to shallow depth dark grey, grey-brown or brown, often rubbly, fine shell sand on calcrete. Some soils in depressions are rubbly over unconsolidated, but massive coarse light grey shell sand. Organic build-up in surface layers, especially in depressions; and some leaching of carbonate has occurred. Old dunes and some depressions.

B2 Shallow to very shallow calcareous soil on calcrete (*Petrocalcic Calcarosol*). Shallow to very shallow rubbly loamy to sandy soil on calcrete. Usually calcareous throughout. Old dunes and some depressions.

B2-B1-B3 Very shallow organic soil on calcrete (*Petrocalcic Rudosol*). Very shallow, dark and organic rich, usually calcareous, rubbly loamy to sandy soil on calcrete. Can be shelly. Found on wind-swept coastline where the land surface is a mosaic of bare calcrete outcrop and calcrete covered by a thin veneer of soil.

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

