

CCS Cape Cassini Land System

Rocky gullies, slopes and crests of Kangaroo Island's northern coast. The system is bordered by the sea to the north; by higher level gullies and coastal slopes to the west; by lower-lying dissected rises to the east; and by a dissected plateau area to the south.

Area: 119.4 km²

Annual rainfall: 515 – 710 mm average

Geology: Early Cambrian age basement rock has surface or near surface expression over much of this rocky system. Stokes Bay Sandstone is the dominant basement rock; while areas of siltstone and mudstone occur (Mt. McDonnell Formation). Some summit surface areas have a ironstone gravel layer overlying deeply weathered clay (Pliocene-Quaternary colluvium) which is derived from Cambrian age basement rock.

Early Pleistocene age unconsolidated clay (Hindmarsh Clay) forms the outwash slopes below steep rocky slopes at Cape Cassini itself. While Pleistocene age calcrete capped calcarenite (Bridgewater Formation) occurs on summit surfaces around Cape Dutton, covering older rocks; and minor areas of Pleistocene age alluvium has been deposited in some creek flats.

Topography: Topography is predominantly coastal cliffs and gullies, and north-running creek gullies from Middle River to Smith Bay, which drain into the sea. (Included in this land system are the rocky gullies of Latham Conservation Park.) The creek gullies include those of Sandy Creek, Springy Water Creek, Sheoak Creek, Gum Creek, Hummocky Gorge, and numerous other unnamed creeks. This system includes summit surface areas: and an area of outwash footslopes at Cape Cassini itself. Coastal cliffs are up to 100 m high.

Elevation: Maximum elevation is almost 250 m in the upper-most reaches of Gum Creek and Hummocky Gorge.

Relief: Relief is from 30 m to 110 m

Main Soils: **K4-K3** Stony texture contrast soil on weathered rock
L1 Shallow rocky soil

Minor soils: **F2-F1** Loamy soil over clay
J2 Ironstone soil
B3-B2 Shallow soil on calcrete

Main Features: This land system is mostly non-arable. Steep slopes and shallow rocky soils limit land use options. However, the remnant native scrub provides a habitat for the rare glossy black red-tailed cockatoo, which is known only to occur on the north coast of Kangaroo Island. Drooping sheoaks cover many of the steeper rocky slopes (in areas where the soils lack a clayey subsoil), particularly in the Latham Conservation Park, and provide the *only* food source for these endangered birds. For this and other conservation reasons, protection of the remaining native vegetation is a high priority.

Minor saline seepage occurs along some creek lines.

The eastern boundary of this land system approximately marks the western extent of narrow leaf mallees, and the eastern extent of stringybark gums.



Soil Landscape Unit summary: Cape Cassini Land System (CCS)

SLU	% of area	Main features #
ANC AND ANF	6.3 9.5 2.1	<p>Non-arable gully slopes. Tall eucalypt woodland/forest is common on the steep gully slopes; areas of drooping sheoak, broombush or mallee occur usually on the drier upper slopes.</p> <p>Main soils: <u>shallow rocky soil</u> on weathered sandstone L1 (rocky <i>Tenosol-Rudosol</i>). With <u>stony texture contrast soil on weathered rock</u> - loamy soil over clay on weathered sandstone K4-K3 (<i>stony Sodosol-Chromosol</i>). Minor areas of deep loamy soils in creek flats (M1).</p> <p>ANC - gully slopes (10-30%, 5-4e, 4g); relief mostly >30m AND - gully slopes (20-100%, 6e, 4g); relief 30-90m ANF - gully slopes (>100%, 7e, 4g); relief mostly >90m</p>
AOA AOB AOC AOY	7.9 7.6 19.6 3.0	<p>Non-arable crests, slopes and gully slopes. Vegetation usually dominated by broombush and mallee; areas of drooping sheoak occur.</p> <p>Main soils: <u>stony texture contrast soil on weathered rock</u>, mostly weathered sandstone K4-K3 (<i>stony Sodosol-Chromosol</i>). With <u>shallow rocky soil</u> on weathered sandstone L1 (rocky <i>Tenosol-Rudosol</i>). Minor areas of deep loamy soils in creek flats (M1).</p> <p>AOA - slopes (3-12%, 3-4e, 2g); relief mostly <30m AOB - slopes and gully slopes (10-30%, 4-5e, 3-4g); relief mostly <30m. AOC - slopes and gully slopes (10-30%, 5-4e, 4g); relief mostly >30m. Some more fertile creek gullies are dominated by sugar gums (probably in areas where soils are formed on weathered phyllite), especially in the west of the system. AOY - summit surface (slopes <10%, 3e, 1-2g)</p>
BkH	1.6	<p>Slight basin with drainage lines. Soils mostly formed on phyllite(?) on well-watered slopes with a distinct vegetation dominated by sugar gums. These areas are below the level of adjacent ironstone plateaux and slopes.</p> <p>Main soils: dark and fertile loam to clay loam over brown light clay, which is often sodic, on weathered phyllite K1-K2 (<i>Brown Dermosol-Sodosol</i>). Probably with some <u>loamy soil over clay</u> F2-F1 (<i>Sodosol-Chromosol</i>), where the weathered phyllite occurs below one metre. Some lower subsoils may contain fine carbonate. (Related to Bk* and HK* soil landscape units in the Amen Corner land system).</p> <p>BkH – slopes with drainage lines and creeks (3-10%, 3e, 3g, 3w)</p> <p>Summary: generally these areas are relatively fertile; waterlogging can be a problem.</p>
CAB CAC	1.4 0.4	<p>Semi-arable slopes.</p> <p>Main soils: <u>stony texture contrast soil on weathered rock</u> - often with sandy surface soil, and a few rock fragments, on weathered sandstone K4 (<i>stony Sodosol-Chromosol</i>). With <u>shallow rocky soil</u> on weathered sandstone L1 (rocky <i>Tenosol-Rudosol</i>). Minor to limited <u>loamy soil over clay</u> F2-F1 (<i>Sodosol-Chromosol</i>) and <u>ironstone soil</u> J2 (<i>Ferric Sodosol-Chromosol</i>).</p> <p>CAB - summit surface slopes (1-4%, 2e) CAC - summit surface slopes (3-6%, 3e)</p>
CBA CBB CBC CBD CBH CBI CBIw CBJ	0.1 2.1 11.1 1.3 5.9 6.9 0.2 1.4	<p>Arable to semi-arable slopes.</p> <p>Main soils: <u>stony texture contrast soil on weathered rock</u> - often with sandy surface soil and a few rock fragments, on weathered sandstone K4 (<i>stony Sodosol-Chromosol</i>). With <u>ironstone soil</u> J2 (<i>Ferric Sodosol-Chromosol</i>) and <u>loamy soil over clay</u> F2-F1 (<i>Sodosol-Chromosol</i>).</p> <p>CBA - coastal plain CBB - slopes (0-3.5%, 2e) CBC - slopes (3-10%, 3e) CBD - semi-arable slopes (8-15%, 4-3e) CBH - slopes with drainage lines (3-10%, 3e, 3g) CBI - semi-arable creek slopes with drainage lines (8-20%, 4-3e, 3g) CBIw - waterlogged slope with drainage lines (8-12%, 4-3e, 3g) CBJ - gullies: drainage line and adjacent slopes (8-20%, 4-3e, 4g). The more fertile areas have native vegetation dominated by sugar gums.</p>



DKC DKH	1.0 0.3	Arable slopes. Main soils: loamy soils over brown or red sodic clay on weathered rock, most with fine carbonate in the lower subsoil, and some with hard carbonate fragments F2-F1 (<i>Calcic-Lithocalcic Brown-Red Sodosol</i>); some soils probably include some ironstone. Native vegetation is often dominated by sugar gums. DKC - slopes (3-5%, 3-2e) DKH - slopes with drainage lines (3-5%, 3-2e, 3g)
FVB FVZ	0.3 0.9	Arable summit surfaces. Remnant plateau surfaces. Main soils: brown <u>ironstone soil</u> J2 (<i>Brown Ferric Sodosol-Chromosol</i>). With <u>stony texture contrast soil on weathered rock</u> - weathered sandstone K4 (<i>stony Sodosol-Chromosol</i>); and some <u>loamy soil over clay</u> F2-F1 (<i>Sodosol-Chromosol</i>). FVB - summit surface slopes (1-4%, 2e) FVZ - summit surfaces (0-2%, 1-2e)
FYD	0.1	Non-arable peak. Plateau remnant: cone shaped peak with small flat-topped summit surface. Main soils: red <u>ironstone soil</u> on colluvial slopes J2 (<i>Red Ferric Sodosol-Chromosol</i>). With brown <u>ironstone soil</u> on small flat-topped peak J2 (<i>Brown Ferric Sodosol-Chromosol</i>). FYD - slopes (10-20%, 4e)
JRO	0.4	Semi-arable outwash alluvial drainage depression flat. Main soils: loamy soil over brown sodic clay, mostly(?) with fine carbonate in the lower subsoil F2-F1 (<i>Calcic-Hypocalcic-Eutrophic Brown Sodosol</i>). Approximately 10-20% of soils are formed on basement rock, on lower slopes - <u>stony texture contrast soil on weathered rock</u> K4 (<i>stony Sodosol-Chromosol</i>). JRO - outwash drainage depression flat with <10% saline seepage (3-2 ^o s)
LpH	1.5	Mostly arable outwash footslopes. Main soils: loamy soil, with ferruginised sandstone and/or ironstone fragments, over red sodic clay on slopes F2-F1 (<i>Red Sodosol</i> [Site: 755]). With loamy soil, with weathered sandstone and/or ironstone fragments, over brown sodic clay in drainage depressions F2-F1 (<i>Brown Sodosol</i>). With >20% of soils formed on basement rock on spur slopes - <u>stony texture contrast soil on weathered rock</u> K4 (<i>stony Sodosol-Chromosol</i>). LpH - outwash footslopes (3-8%, 3-2e) with drainage flats and gullies (3g)
MgB MgD MgDg MgE MgYA	0.2 0.5 0.2 0.1 3.5	Mostly non-arable old calcarenite coastal dunes. Main soils: loamy <u>shallow soil on calcrete</u> B3-B2 (<i>Petrocalcic Tenosol-Calcarosol</i>). Some deeper soils, especially in depression areas M1-M3 (<i>Hypercalcic-Lithocalcic Tenosol</i>). Minor to limited shelly dune soils H1 (<i>Shelly Calcarosol-Rudosol</i>). MgB - slopes and very low dunes (1-3%, 2e) MgD - slopes (10-20%, 4e) MgDg - slopes with drainage line (10-20%, 4e, 3g) MgE - depression area (1-8%, 3-2e) MgYA - low dunes (1-10%, 3-2e)
WAB	0.9	Unconsolidated coastal cliffs. Calcarenite and shelly sand over rock. WAB - unconsolidated cliffs (slopes >100%)
WBB	1.8	Rocky coastal cliffs. WBB - rocky cliffs (slopes >100%)
WDE	0.01	Sandy beach with siliceous sand (H3). WDE - beach/very low dunes.
WGE	0.02	Low coastal cliff-top shell sand dunes. Main soils: shell sand H1 (<i>Shelly Rudosol</i>). WGE - low dunes (<5m).

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 Soils:**

- K4-K3** Stony texture contrast soil on weathered rock (*stony Sodosol-Chromosol*). Medium thickness to thick loamy or occasionally sandy soil, often with a bleached layer, and usually with some sandstone fragments, over brown or sometimes red, clay to clay loam, on weathered sandstone, or occasionally siltstone or mudstone. The weathered rock is within 1m of the soil surface; and the subsoil clay is often sodic. The sandstone fragments can be highly ferruginized; ironstone fragments/segregations can occur. Mostly slopes and crests. Vegetation is usually dominated by broom bush and mallee.
- L1** Shallow rocky soil (*rocky Tenosol-Rudosol*). Sandy to loamy soil with sandstone fragments, and often with a bleached layer, over weathered sandstone which can be very hard rock (or occasionally over finer textured and softer rock). The weathered rock can have some brown or sometimes red clayey subsoil material (<50%) incorporated within it. These soils are generally found on the steep gully slopes. Vegetation is often dominated by eucalypt trees on the steepest gully slopes: drooping sheoaks often occur on the drier upper slopes. Drainage and fertility are superior compared to those soils with an impeding clay subsoil over weathering rock.

Minor soils:

- F2-F1** Loamy soil over clay (*Sodosol-Chromosol*). Medium thickness to thick loamy soil, often with a bleached layer, over brown or occasionally red clay. The subsoil clay is often sodic; and sometimes there are some ironstone segregations. Usually with weathered rock below 1m. Slopes and drainage depressions.
- A variant of this soil has brown or red sodic clay subsoil overlying weathered rock with fine carbonate in the lower subsoil. Some soil profiles include hard carbonate fragments. Also ironstone nodules may be found in the profile.
- J2** Ironstone soil (*Ferric Sodosol-Chromosol*). Medium thickness to thick loamy soil with ironstone gravel, sometimes with a bleached layer, over brown or occasionally red clay. The clay subsoil can be sodic. Mostly found on crests.
- B3-B2** Shallow soil on calcrete (*Petrocalcic Tenosol-Calcarosol*). Shallow loamy soil with hard carbonate rubble on calcrete or rubbly calcrete. Some soils are calcareous; most are non-calcareous. Remnant calcarenite dunes on coastal slopes and clifftops.

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

