

PSH Prospect Hill Land System

An old beach ridge area with some modern sand dunes and many old remnant calcreted areas. This system has D'Estrees Bay and Pennington Bay to the south; the American River inlet, rises and coastal slopes to the northeast; and low-lying plains with lagoons to the north and west. Older beach ridges lie parallel to this system further inland. The system is named after Prospect Hill, also known as Mount Thisby, which is a very high dune near the western edge of this system.

Area: 26 km²

Annual rainfall: 500 - 550 mm average

Geology: The system is an old beach ridge underlain at depth by early Cambrian age Kanmantoo Group meta-sediments. Highest (youngest) and second highest member (older) Quaternary age Bridgewater Formations have formed this area. Bridgewater Formation consists of calcreted calcarenite underlain by highly calcareous unconsolidated sediments. In only a few depressions has this Bridgewater material been removed to reveal older underlying clayey sediments. Areas of modern shelly sand deposits of St Kilda Formation have formed coastal and jumbled dunes, which overlie the older calcreted landforms.

Topography: Mostly a jumbled dune topography of rolling hills to undulating rises. Dune heights generally range from less than 5 m to about 25 m, with a few dunes around Prospect Hill up to 50 m high. Prospect Hill itself is around 60 m high. Slopes run down from the dune topography to the adjacent low-lying plains: and there are some rises with no obvious overlying dune topography. Slopes are generally from 1 to 12%. However, some dune slopes are around 20%; and the slopes of Prospect Hill near 80%. Coastal cliffs line the majority of the coastline and are from 10 m to 50 m high. Narrow sandy beaches lie at the base of these cliffs; as do a number of rocky reefs.

Elevation: Elevation varies from sea level to around 90 m above sealevel (on the rise at the very north of this system; and on top of Prospect Hill).

Relief: Typically 30 m, with a maximum relief of about 80 m on the southern slope of Prospect Hill.

Major Soils:

B7-B2-B3-B8	<u>Shallow soil on calcrete</u>
H1	<u>Deep shell sand</u>
B2-B8	<u>Very shallow soil on calcrete</u>
B1	<u>Shallow shell sand on calcrete</u>

Minor Soils:

G4-G3	<u>Sand over sodic clay</u>
B6	<u>Shallow red texture contrast soil on calcrete</u>
D3-F2	<u>Red texture contrast soil</u>

Main Features: Mostly non-arable land. Topsoils are mostly sandy. Mostly shallow soils over calcrete; with some deep shelly sands. Soils over calcrete are limited by shallow depth and the presence of calcrete rubble. Sandy soils pose a wind erosion risk and are naturally infertile. In particular the shelly sands have nutrient availability problems due to their very high free lime (calcium carbonate) contents. Water is prone to runoff calcreted areas with shallow soils. This area is largely covered with native vegetation, so nature conservation is a high priority here.



Soil Landscape Units summary: Prospect Hill Land System (PSH)

SLU	% of area	Main features
WAB	4.5	Non-arable unconsolidated coastal cliffs of calcarenite and highly calcareous unconsolidated sediments. Includes a narrow sandy beach strip and some rocky reefs. Cliff height: 10m - 50m. WAB – cliff slopes >100% Summary: non-arable cliffs.
WGC WGD WGD WGE WGER	4.1 5.4 2.3 3.6 1.7	Non-arable shell sand dominant dunes. Fine shell sand mixed with fine quartz sand, overlying older remnant calcreted dunes. Main soils: <u>deep shell sand</u> - fine shell dominant sand H1 (<i>Shelly Rudosol</i>). With 10% <u>shallow shell sand on calcrete</u> and/or <u>shallow soil on calcrete</u> - calcareous shell sand or quartz sand dominant soil overlying calcreted calcarenite: B1 and/or B2 (<i>Petrocalcic Shelly Rudosol-Calcarosol</i> and/or <i>Petrocalcic Calcarosol</i>). WGC – high jumbled dunes (mostly >15m) WGD – jumbled and clifftop dunes (5-15m). Cleared jumbled dunes in east; clifftop dunes in west. WGD – coastal and clifftop dunes (5-15m) and beach areas. Mostly bare beach dunes and beach areas in east; mostly bare clifftop dunes in west. WGE – low clifftop and coastal dunes (<5m) and beach areas. WGER – sand spreads & hummocks (on 0-10% slopes, mostly on 8-10% slopes) Summary: these areas have an extreme to high wind erosion risk and very infertile sandy soils.
MdB MdC MdYA MdYB MdYF	4.4 2.2 7.8 16.1 7.0	Non-arable siliceous sand dominant soil on calcreted jumbled dune topography, coastal dune topography and slopes. Main soils: <u>shallow soil on calcrete</u> - shallow to very shallow, calcareous to non-calcareous sandy to light sandy loam topsoil over sandy to sandy clay loam subsoil overlying calcrete B2-B3-B8-B7 (<i>Petrocalcic Calcarosol-Tenosol</i>). With 0-30% <u>shallow shell sand on calcrete</u> B1 (<i>Petrocalcic Shelly Rudosol-Calcarosol</i>). MdB – slopes (1.5-3%) MdC – slopes (8-10%) MdYA – low jumbled dune topography (<5m) MdYB – jumbled & coastal dune topography (5-15m) MdYF – high jumbled dune topography (>15m, 10-20% slopes) Summary: non-arable due to shallow rocky soils with very low water holding capacity.
MaC MaD MaYB MaYC MaE	5.3 3.1 2.5 4.8 0.6	Non-arable shell sand dominant soil on calcreted dune topography, slopes and depressions. Mostly shallow shell sand spreads. Shell sand has funnelled up into some depressions. Main soils: <u>shallow shell sand on calcrete</u> - shallow shell sand dominant sandy soil on calcrete B1 (<i>Petrocalcic Shelly Rudosol-Calcarosol</i>). With 10-50% <u>shallow soil on calcrete</u> - shallow to very shallow, calcareous to non-calcareous sandy to sandy clay loamy soil on calcrete B2-B3-B8 (<i>Petrocalcic Calcarosol-Tenosol</i>). MaC – slopes (8-10%) MaD – slopes (10-12%) MaYB – jumbled dune topography (5-15m) MaYC – high jumbled dune topography (mostly >15m) MaE – depressions Summary: non-arable due to shallow rocky soils with very low water holding capacity and very low fertility.
MeB MeE	1.7 2.1	Semi-arable shell and quartz sand on partially calcreted depressions and sloping depressions; and with some deep soils. These areas get seasonally quite wet. Some of the calcrete has been 'dissolved' revealing underlying sediments. Often these areas are cleared strips of land surrounded by uncleared calcreted rises and dunes. Main soils: <u>shallow soil on calcrete</u> and <u>shallow shell sand on calcrete</u> - shallow to very shallow, siliceous or shell sand dominant sandy to loamy soil on calcrete: B2 and B1 (<i>Petrocalcic Calcarosol-Tenosol</i> and <i>Petrocalcic Shelly Rudosol-Calcarosol</i>). With <50% calcareous to non-calcareous sand over highly calcareous sand or sandy loam H2-H3 (<i>Calcarosol-Tenosol</i>) and <u>deep shell sand</u> - shell



		<p>dominant sandy soil H1 (<i>Shelly Calcarosol</i>).</p> <p>MeB – sloping depression (slopes 3-6%) MeE – depression (slopes 0-4%, usually 1%)</p> <p>Summary: mostly stony and shallow non-arable soils with low fertility; with some deeper arable soils; and some waterlogging in depression area.</p>
MpC MpD MpZ MpYA MpYB	4.2 1.4 0.5 1.7 3.5	<p>Semi-arable calcreted dune topography, rises and slopes. Up to 60% of area has very shallow non-arable soils.</p> <p>Main soils: <u>shallow soils on calcrete</u> - shallow non-calcareous to calcareous sandy to light sandy loam topsoil over sandy loam to light sandy clay, overlying calcrete B2-B7-B3 (<i>Petrocalcic Chromosol-Tenosol</i>). With <50% shallow to very shallow, calcareous to non-calcareous sandy soil overlying calcrete, sometimes with a highly calcareous subsoil layer directly overlying the calcrete B2-B8 (<i>Petrocalcic Calcarosol-Tenosol</i>).</p> <p>MpC – slopes (5-10%) MpD – slopes (10-12%) MpZ – summit surface (0-1.5%) MpYA – low jumbled dune topography (<5m) MpYB – jumbled dune topography (5-15m)</p> <p>Summary: mostly shallow rocky/stony soils with moderately low fertility.</p>
MrYB	0.8	<p>Semi-arable calcreted dune topography; and with some sand deposits as low linear sand dunes running NW-SE. Non-arable areas with very shallow soils occur.</p> <p>Main soils: <u>shallow soil on calcrete</u> - shallow non-calcareous to calcareous, sandy to light sandy loam topsoil over sandy to light sandy clay, overlying calcrete B7-B3-B2-B8 (<i>Petrocalcic Chromosol-Tenosol-Calcarosol</i>). With 10-30% deep to moderate depth bleached sand on linear dunes I1-H3 (<i>Podosol-Tenosol</i>).</p> <p>MrYB – jumbled dune topography (mostly 5-15m)</p> <p>Summary: mostly shallow rocky/stony soils with moderately low fertility; and some deep sandy soils of low fertility and high wind erosion risk.</p>
MuB MuE	2.8 1.0	<p>Semi-arable calcreted rises, slopes and depressions; and with some deeper soil with sodic clay subsoil. These areas are characterised by their red clay subsoils ('Red-Brown Earth' soils) indicating better than average drainage for Kangaroo Island.</p> <p>Main soils: <u>red texture contrast soil</u> – a shallow soil with sandy loam topsoil, often with a bleached sub-surface layer of loamy sand, over red-brown to orange-brown sodic mottled clay, overlying calcrete B6 (<i>Petrocalcic Red Sodosol</i>). With approx. 30% <u>shallow red texture contrast soil on calcrete</u> - sandy loam, often with a bleached sub-surface layer of loamy sand, over red-brown to orange-brown mottled clay which is often sodic, over olive clay, overlying clay with abundant fine carbonate, underlain by calcrete at depth D3-F2 (<i>Red Chromosol-Sodosol</i>).</p> <p>MuB – slopes (1.5-4%). 30% arable. MuE – depression (slopes 0-3%). Mostly arable.</p> <p>Summary: these areas are relatively fertile, but are limited by some areas of shallow stony soil, and some waterlogging in depression area.</p>
PcB	5.1	<p>Mostly arable medium thickness, with some thick sandy deposits in sloping depressions; and with some shallow soil on calcrete. Much of the calcrete has been 'dissolved' revealing the underlying sediments.</p> <p>Main soils: <u>sand over sodic clay</u> - medium thickness, with some thick sandy topsoil over sodic clay subsoil G4-G3 (<i>Brown Sodosol</i>). With approx. 30% <u>shallow soil on calcrete</u> – sandy topsoil over sandy loam to light sandy clay subsoil overlying calcrete B7-B3 (<i>Petrocalcic Chromosol-Tenosol</i>).</p> <p>PcB - sloping depressions (0-4%). Situated between higher remnant calcreted areas.</p> <p>Summary: sandy topsoils pose a wind erosion risk and are relatively infertile, and the clayey subsoil is sodic and relatively impermeable; while some shallow stony areas occur.</p>



Detailed soil profile descriptions:**Major Soils:****B7-B2-B3-B8** Shallow soil on calcrete (*Petrocalcic Chromosol-Calcarosol-Tenosol*)

Calcareous to non-calcareous sand to light sandy loam over yellow-brown to brown loamy sand to sandy clay loam (sometimes this sub-surface layer consists mostly of calcrete fragments); overlying calcrete. Some soils may have abundant fine carbonate in the sub-surface layer directly above the calcrete. Found on remnant dunes, slopes and depressions. [Usually associated with very shallow soil on calcrete.]

H1 Deep shell sand (*Shelly Rudosol-Calcarosol*)

Shell sand dominant soils with some quartz sand. Grey-brown to dark brown highly calcareous sandy, with some light sandy loam, topsoil; over light grey to light yellow-brown highly calcareous sandy, with some sandy loam, subsoil. Found on modern jumbled dunes, beach dunes and sand spreads (on slopes and in depression areas).

B2-B8 Very shallow soil on calcrete (*Petrocalcic Rudosol*)

Very shallow calcareous to non-calcareous sandy soil on calcrete. Areas of calcrete outcrop often occur. Found on remnant dunes and slopes.

B1 Shallow shell sand on calcrete (*Petrocalcic Shelly Rudosol-Calcarosol*)

Shell sand dominant soil with some quartz sand. Shallow grey-brown sandy soil over calcrete. Found on remnant dunes, slopes, rises and depressions.

Minor Soils:**G4-G3** Sand over sodic clay (*Hypercalcic Brown Sodosol*)

Medium thickness to thick loamy sand to sand, with a bleached sand sub-surface layer; over sodic yellow-brown to olive-brown clay with some olive and possibly red mottles. Sometimes with calcrete fragments directly overlying the clayey subsoil. Usually with abundant fine carbonate in the lower subsoil. Found in depressions.

B6 Shallow red texture contrast soil on calcrete (*Petrocalcic Red Sodosol-Chromosol*)

Sandy loam topsoil, often with a bleached sub-surface layer of loamy sand; over red-brown to orange-brown sodic clay with some olive mottles; overlying calcrete. Found on low rises and in depressions.

D3-F2 Red texture contrast soil (*Hypercalcic Red Chromosol-Sodosol*)

Medium thickness sandy loam, often with a bleached sub-surface layer of loamy sand; over red-brown to orange-brown clay which is often sodic and includes some olive mottles; over olive-brown clay; overlying clay with abundant fine carbonate; underlain by calcrete at depth. Often with some calcrete fragments directly overlying the clayey subsoil. Found in depressions and on slopes.

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

