STS Stansbury Scrub Land System

A land system dominated by 'sand over clay' soils, and includes very extensive dunefield areas. Landscapes consist of undulating to gently undulating rises and plains, and some drainage depressions, saline depressions, and small salt lakes.

Area: 215.0 km²

Landscape: A land system dominated by 'sand over clay' soils, and includes very extensive dunefield

areas. Landscapes consist of undulating to gently undulating rises and plains, and some drainage depressions, saline depressions, and small salt lakes. The system is mostly underlain at depth by Permian age sediments associated with glacial activity (Crawford, A.R., 1965). Soils in this system are either underlain by unconsolidated clayey to clay loamy sediments, which probably grade to sandy sediments, or a calcrete layer. The majority of calcrete is remnant dune core material. In the very centre of the system are a few areas where calcareous loess is exposed. Most depressions are salinised to some extent, and a number are highly saline. Accessions of wind-deposited carbonate dust have infused into profiles in relatively recent geological times: most profiles have calcareous lower subsoils. This area was one of the last areas to be cleared for farming on the Yorke Peninsula.

Annual rainfall: 405 - 450 mm average

Main soils: G4 sand over clay

G3 thick sand over clay

B7 shallow sand over clay on calcrete

Minor soils: N2 saline soil

D3 loam over clay

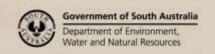
B6 shallow loam over clay on calcrete

A4 calcareous loam

Main features:

The land system has arable, semi arable, and non arable areas. The highly saline land is non arable, as is some land with very stony and shallow soils, while many dunes with thick topsoil sands are semi arable to non arable. Low lying marginally saline areas and some other stony areas are semi arable. Many arable areas are affected by saline seepage to some degree, resulting in raised subsoil salinity levels. Flooding is a risk in drainage depressions and other low lying areas. The most common soils are texture contrast soils with sandy topsoils. Many of these soils are underlain by calcrete at shallow depth. The presence of calcrete and/or hard carbonate rubble, limits profile water holding capacity and hence productive potential. Surface stones also interfere with many farming practices.

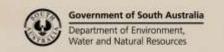
Most soils have dispersive subsoils, many strongly so. Clayey subsoils are often coarsely structured. Dispersive clayey to clay loamy subsoils restrict soil internal drainage and can lead to waterlogged conditions, particularly when situated in low lying areas. Dispersive, hard, and coarsely structured subsoils also limit potential root exploration. Topsoils are mostly sandy. Sandy soils have low nutrient retention capacities, since they allow soluble nutrients to be readily leached. Clayey subsoils restrict the downward movement of these nutrients, however, they may seep laterally along clay surfaces. Wind erosion is a significant issue with sandy soils, especially the loose and infertile sands on dunes, which are often very thick. The water repellent nature of these topsoils compounds this problem. Care needs to be taken with surface management in these areas to minimise the potential for wind erosion.





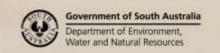
Soil Landscape Unit summary: Stansbury Scrub Land System (STS)

SLU	% of area	Main features
GEO	0.8	Land dominated by sandy texture contrast soil.
GET	0.7	Main soils: sand over clay G4 grading to loam over clay D3 , and some shallow sand over clay on
		calcrete B7 grading to shallow loam over clay on calcrete B6 .
		GEO – depressions/drainage depressions (slopes 0-1%).
		GET – marginally saline drainage area with drainage lows (slopes 1.5%).
GHe	0.03	Land dominated by sandy texture contrast soil.
GHL	1.1	Main soils: sand over clay G4 grading to loam over clay D3 especially in lows. With a few sandy
		rises with some thick sand over clay G3 .
		GHe – sloping drainage depression (slopes 0-2%).
		GHL – gently undulating elevated plain with remnant dune rises, some drainage lows, and a few
		sandy rises.
GJe	0.2	Land dominated by sandy texture contrast soil.
GJO	1.0	Main soils: sand over clay G4 grading to loam over clay D3 in lows.
GJT	0.3	GJe – drainage depression with a somewhat eroded central drainage line in parts and with patches
		of marginal salinity (slopes 0-1.5%).
		GJO – drainage depression with parches of marginal salinity (slopes 0-1.5%).
CNA	2.1	GJT – drainage depression with marginal salinity (slopes 0-1.5%).
GMA	3.1	Land dominated by sandy texture contrast soil.
GMK	1.5	Main soils: sand over clay G4 with some shallow sand over clay on calcrete B7 and loam over clay
GML GMO	10.8 0.4	D3 . There can be minor areas of sandy rises with some <i>thick sand over clay</i> G3 . GMA – gently undulating plains and low rises (slopes 0-1%, 2-3r).
GMT	0.4	GMK – gently undulating plains and low rises (slopes 0-1%, 2-51). GMK – gently undulating plains (slopes 0-1.5%).
GWII	0.2	GML – gently undulating plains (slopes 0-1.5%). GML – gently undulating elevated plains/rises with some drainage lows (slopes 0-2.5%).
		GMO – depressions (slopes <1%).
		GMT – depression with marginal salinity (slopes <1%).
GTK	0.7	Land dominated by sandy texture contrast soil.
GTL	6.5	Main soils: sand over clay G4 grading to loam over clay D3 , and with extensive areas of shallow
GTO	6.5	sand over clay on calcrete B7 grading to shallow loam over clay on calcrete B6 in places.
GTP	0.1	GTK – rise with vague drainage lows (slopes 0-2%).
		GTL – gently undulating to undulating rises with some vague drainage lows (slopes 0-3.5%).
		GTO – relatively low lying gently undulating plain with patches of marginal salinity (slopes 0-1%).
		GTP – marginally saline low lying plain (slopes <1%).
GUK	0.3	Land dominated by sandy texture contrast soil.
GUL	5.7	Main soils: sand over clay G4 , with some loam over clay D3 in lows. Also with some shallow sand
GUO	2.7	over clay on calcrete B7 , and a few sandy rises with some thick sand over clay G3 .
		GUK – relatively low lying gently undulating plains (slopes 0-1%).
		GUL – gently undulating rises with some drainage lows (slopes 0-2%)
		GUO – relatively low lying plain/drainage area, with a few sandy topped low rises in places, and
		areas of marginal salinity (slopes 0-1.5%).
ObD	0.3	Sand over clay dunes.
		Main soils: thick sand over clay G3 grading to sand over clay G4 .
		ObD – low sand dune.
Oeb	6.1	Sand over clay dunefields.
Oee	3.0	Dune soils: thick sand over clay G3 .
Oel	3.7	Swale soils: sand over clay G4 grading to shallow sand over clay on calcrete B7 .
		Oeb – rising land with approximately 60% sand dunes and low sand dunes.
		Oee – rising land with 30-60% sand dunes.
	1	Oel – rising land with 30-60% sand dunes





Ofe	6.5	Sand over clay dunefields.
Off	6.9	Dune soils: thick sand over clay G3 grading to sand over clay G4 .
OfG	1.6	Swale soils: sand over clay G4 grading to shallow sand over clay on calcrete B7 and loam over clay
Ofj	7.4	D3 .
Ofm	1.1	Ofe – rising land with approximately 30% sand dunes and low dunes.
OfQ	4.6	Off – rising land with approximately 30% low sand dunes and sandy rises.
		OfG – gently undulating land with approximately 60% low sand dunes.
		Ofj – rising land with approximately 60% low sand dunes.
		Ofm – rising land with approximately 30% low sand dunes and sandy rises.
		OfQ – gently undulating land with 30-60% low sand dunes.
OhQ	5.2	Sand over clay dunefields.
		Dune soils: thick sand over clay G3 grading to sand over clay G4 .
		Swale soils: sand over clay G4 grading to shallow sand over clay on calcrete B7 .
		OhQ – gently undulating land with 30-60% low sand dunes.
RJB1	0.04	Land dominated by shallow soil on calcrete.
		Main soils: shallow loam on calcrete B3 grading to shallow sand over clay on calcrete B7 and
		shallow loam over clay on calcrete B6 .
		RJB1 – very stony low rises (slopes 0-1.5%).
RRA	0.7	Land dominated by shallow soil on calcrete.
RRK	1.5	Main soils: shallow sand over clay on calcrete B7 sometimes grading to shallow loam over clay on
RRL	0.1	calcrete B6 and shallow loam on calcrete B3 . Possibly with some areas of sand over clay G4 grading
RRP	0.1	to loam over red clay D3 in lows.
		RRA – somewhat elevated gently undulating stony plains/slight slopes (slopes 0-1.5%).
		RRK – elevated gently undulating stony plain with some drainage lows (slopes 0-1.5%).
		RRL – stony slopes (slopes 0-2%).
		RRP – relatively low lying stony plains (slopes 0-1.5%).
RSA	1.9	Land dominated by shallow soil on calcrete.
RSB	1.3	Main soils: shallow sand over clay on calcrete B7 grading to shallow loam over clay on calcrete B6
RSBx	0.1	and shallow loam on calcrete B3 . With some areas of sand over clay G4 grading to loam over red
RSK	0.2	clay D3 in lows.
RSL	1.6	RSA – low stony rises (slopes 0-1.5%).
		RSB – low rises (slopes 0-3%).
		RSBx – more exposed rises (slopes 0-3%).
		RSK – low lying low stony rises (slopes 0-1%)
		RSL – slopes (slopes 0.5-2%).
RTA	1.7	Land dominated by shallow soil on calcrete.
RTL	1.7	Main soils: shallow sand over clay on calcrete B7 grading to shallow loam over clay on calcrete B6 .
		With limited to common areas of sand over clay G4 grading to loam over red clay D3 in lows. And
		a few low sandy rises with some thick sand over clay G3 .
		RTA – low rise (slopes 0-1.5%).
		RTL – low rises with a few drainage lows (slopes 0-1.5%).
RUB	0.3	Land dominated by shallow soil on calcrete.
		Main soils: shallow sand over clay on calcrete B7 .
		RUB – very stony rises (slopes 0-4%).
SAA	0.7	Land dominated by soils formed in calcareous loess
		Main soils: calcareous loam A4 . There may be minor to limited areas of sand over clay G4 .
		SAA – rise slopes (slopes 0-2%).
ZA-	1.7	Saline land.
ZB-	1.5	Main soils: saline soil N2 : mostly saline variants of soil G4 , D3 , B7 and B6 .
ZE-	1.1	ZA- – salinised drainage depressions.
ZH-	0.3	ZB - – highly saline to saline depressions: prone to flooding. Can include minor areas of marginally
	0.5	saline land (eg a sandy rise).
		ZE - – salinised depressions with highly saline land, small salt lakes, and minor to limited areas of
		marginally saline land.
		ZH- – salinised depressions with marginally saline land, highly saline land, and some small salt
		lakes.
		iunes.





Detailed soil profile descriptions:

Main soils:

- sand over clay [Hypercalcic-Lithocalcic Red-Brown Sodosol]

 Medium thickness to thin sandy to light sandy loam topsoil overlying red to brown clayey subsoil which becomes calcareous with depth. Surfaces range from hard to loose. Profiles can contain hard carbonate rubble. Subsoils are dispersive, and typically coarsely structured. Profiles are sometimes underlain by calcrete at moderate depth. Topsoils are often water repellent.
- thick sand over clay [Hypercalcic-Calcic Red-Brown Sodosol]

 These soils are similar to **G4** soils but have thick to very thick loose sandy topsoils. Topsoils are strongly water repellent, and have subsurface layers which are often bleached. Subsoils are dispersive, and are typically calcareous in their lower part. Usually found on sand dunes and sandy rises.
- 87 shallow sand over clay on calcrete [Petrocalcic Red-Brown Sodosol]
 Medium thickness to thin sandy to light sandy loam topsoil overlying a red to brown clayey or sometimes clay loamy subsoil, which is underlain by calcrete at shallow depth. Profiles often contain hard carbonate rubble in the layer directly overlying the calcrete. Surfaces range from hard to loose, and subsoils are often dispersive. Topsoils are often water repellent.

Minor soils:

- N2 saline soil [Salic Hydrosol]Saline variants of a number of soils. Mostly saline variants of soils G4, D3, B7 and B6.
- D3 loam over clay [Hypercalcic-Lithocalcic Red-Brown Sodosol-Chromosol]
 Medium thickness to thin loamy topsoil (mostly sandy loam or light sandy clay loam) overlying red to red brown clayey subsoil which becomes calcareous with depth. Profiles can contain hard carbonate rubble. Subsoils can be coarsely structured, and are typically dispersive at least in their lower part. Surfaces are often hardsetting.
- shallow loam over clay on calcrete [Hypercalcic Red-Brown Sodosol]

 These are to similar to **B7** soils but have loamy topsoils which are often hardsetting.
- *calcareous loam* [Regolithic Hypercalcic-Supracalcic Calcarosol]

 Grey brown to red brown medium thickness calcareous clay loamy to loamy topsoil grading to clay loamy or loamy subsoil with abundant fine carbonate. Surfaces are often hardsetting. Profiles can contain abundant hard carbonate rubble. Subsoils are strongly alkaline and dispersive.

References: Crawford, A.R. (1965). `The Geology of Yorke Peninsula'. Bull. geol. Surv. S. Aust., 39.

Further information: <u>DEWNR Soil and Land Program</u>

