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 km^2

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 GET	0.8 0.7	Land dominated by sandy texture contrast soil. 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 GHL	0.03 1.1	Land dominated by sandy texture contrast soil. 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 GJO GJT	0.2 1.0 0.3	Land dominated by sandy texture contrast soil. Main soils: *sand over clay* **G4** grading to *loam over clay* **D3** in lows. **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%). **GJT** – drainage depression with marginal salinity (slopes 0-1.5%).
GMA GMK GML GMO GMT	3.1 1.5 10.8 0.4 0.2	Land dominated by sandy texture contrast soil. Main soils: *sand over clay* **G4** with some *shallow sand over clay on calcrete* **B7** and *loam over clay* **D3**. There can be minor areas of sandy rises with some *thick sand over clay* **G3**. **GMA** – gently undulating plains and low rises (slopes 0-1%, 2-3r). **GMK** – 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 GTL GTO GTP	0.7 6.5 6.5 0.1	Land dominated by sandy texture contrast soil. Main soils: *sand over clay* **G4** grading to *loam over clay* **D3**, and with extensive areas of *shallow sand over clay on calcrete* **B7** grading to *shallow loam over clay on calcrete* **B6** in places. **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 GUL GUO	0.3 5.7 2.7	Land dominated by sandy texture contrast soil. Main soils: *sand over clay* **G4**, with some *loam over clay* **D3** in lows. Also with some *shallow sand 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 Oee Oel	6.1 3.0 3.7	Sand over clay dunefields. Dune soils: *thick sand over clay* **G3**. 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. **Oel** – rising land with 30-60% sand dunes

Ofe Off OfG Ofj Ofm OfQ	6.5 6.9 1.6 7.4 1.1 4.6	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** and *loam over clay* **D3**. **Ofe** – rising land with approximately 30% sand dunes and low dunes. **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 RRK RRL RRP	0.7 1.5 0.1 0.1	Land dominated by shallow soil on calcrete. Main soils: *shallow sand over clay on calcrete* **B7** sometimes grading to *shallow loam over clay on calcrete* **B6** and *shallow loam on calcrete* **B3**. Possibly with some areas of *sand over clay* **G4** grading 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 RSB RSBx RSK RSL	1.9 1.3 0.1 0.2 1.6	Land dominated by shallow soil on calcrete. Main soils: *shallow sand over clay on calcrete* **B7** grading to *shallow loam over clay on calcrete* **B6** and *shallow loam on calcrete* **B3**. With some areas of *sand over clay* **G4** grading to *loam over red clay* **D3** in lows. **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 RTL	1.7 1.7	Land dominated by shallow soil on calcrete. 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- ZB- ZE- ZH-	1.7 1.5 1.1 0.3	Saline land. Main soils: *saline soil* **N2**: mostly saline variants of soil **G4**, **D3**, **B7** and **B6**. **ZA-** – salinised drainage depressions. **ZB-** – highly saline to saline depressions: prone to flooding. Can include minor areas of marginally 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.

Detailed soil profile descriptions:

Main soils:

G4 *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.

G3 *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.

B7 *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.

B6 *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.

A4 *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: DEWNR Soil and Land Program