SRN Struan Land System

Area: 55.0 km^2

Annual rainfall: 550 - 650 mm average

Geology: The land system is underlain by sediments of the Pleistocene Padthaway Formation, which includes clays and interbedded sands and limestones or dolomites, deposited in coastal lagoons. Protruding through the Padthaway Formation sediments are scattered calcarenites, probably islands in the old lagoons. Deposits of Holocene siliceous Molineaux Sand variably cover the rises.

Topography: The Struan Land System is a NNW-SSE trending flat (interdune corridor), bordered by ancient coastal dune ranges on all sides. The interdune corridor is approximately 2.5 km wide at its widest point to less than 500 m at its narrowest point. The length of the land system is approximately 55km. The flats are seasonally inundated, especially the swampy areas.

Elevation: 60 – 90 m

Relief: Flats with isolated rises with max relief 30 m

Soils:

Sandy soils (flats, rises)

H3 Bleached siliceous sand
G2 Bleached sand grading to sandy clay loam
G3 Thick sand over clay
G4 Sand over poorly structured clay
I1 Highly leached sand

Stony soils (rises and flats)

B2 Shallow calcareous loam on calcrete
B3 Shallow sandy loam on calcrete
B4 Shallow red loam on calcrete
B5 Shallow dark clay loam on limestone
B6 Shallow loam over red-brown clay on calcrete
B7 Shallow sand over clay on calcrete
RR Limestone outcrop

Heavy soils

F1 Loam over brown or dark clay
F2 Sandy loam over poorly structured brown or dark clay
E1 Black cracking clay
M2 Deep friable gradational clay loam

Other soils

N3 Wet soil (non to moderately saline)
D2 Loam over red clay

Main features: The Struan Land System is characterised by flats with minor swamps and isolated calcarenite rises. Main soils: deep sandy texture contrast soils on the flats with deep sandy infertile soils and shallow stony soils on the rises.

Soil Landscape Unit summary: 27 Soil Landscape Units (SLUs) mapped in the Struan Land System

SLU	% of area	Main features #
HzA	0.22	Sandy loam surfaced texture contrast level plain with 0-10% non-saline swamps. Main soils: sandy loam over poorly structured brown or dark clay - **F2**, deep friable gradational clay loam - **M2**, loam over brown or dark clay – **F1** and wet soil - **N3**. These soils are deep, have moderate to high fertility and high waterholding capacity. Drainage on the plains is imperfect and in the swamps poor. There is a slight to severe limitation to root growth due to the dispersive subsoil clays on the plains and swamps respectively. There is some soil acidity.
M-B	0.58	Isolated undulating stony rises formed on calcreted calcarenites of ancient coastal dunes within the NNW-SSE trending flat. There is greater than 50% calcrete within these rises. Main soils: limestone outcrop - **RR**, shallow calcareous loam on calcrete - **B2** and shallow loam over red clay on calcrete - **B6**. The stony soils are very shallow, have moderately low fertility and very low waterholding capacity. The rocky areas are semi-arable with up to 50% exposed outcropping in concentrated areas. Sandy rise soils: bleached siliceous sand - **H3**, thick sand over clay - **G3** and loam over red clay - **D2**. These soils are moderately deep, have moderate fertility and high waterholding capacity. Drainage is rapid. Water repellence and the susceptibility to wind erosion are limitations.
MHB MHC	2.39 3.27	Isolated undulating rises formed on calcreted calcarenites of ancient coastal dunes within the NNW-SSE trending flat. These rises are variably covered by deposits of Molineaux Sand. **MHB** Gently sloping undulating rises **MHC** Undulating rises to low hills Main soils: bleached siliceous sand - **H3** and loam over red clay - **D2**. These soils are deep with low to very low fertility, moderate to high waterholding capacity and rapid drainage. Severe water repellence and the susceptibility to wind and water erosion are limitations. Shallow soils: shallow loam over red-brown clay on calcrete - **B6**, shallow sand over clay on calcrete - **B7**, shallow calcareous loam on calcrete - **B2** and limestone outcrop - **RR**. This land is semi-arable as these soils are very shallow, have low waterholding capacity and moderately low fertility. Drainage is rapid. Surface rockiness may be a slight limitation.
MRB	0.41	Gently sloping undulating rises that have relief of about 10 m. Rises formed on calcreted calcarenites of ancient coastal dunes, partially overlain by Molineaux Sands. Main soils: bleached siliceous sand - **H3**, loam over brown or dark clay – **F1**, sand grading to sandy clay loam - **G2**, thick sand over clay - **G3** and highly leached sand - **I1**. These soils are deep with moderate to low fertility, moderate to high waterholding capacity and rapid drainage. Severe water repellence and soil acidity and the susceptibility to wind erosion are limitations for the sandy soils. Shallow soils: shallow loam over red-brown clay on calcrete - **B6**, shallow red loam on limestone - **B4**, shallow calcareous loam on calcrete - **B2** (M) and limestone outcrop - **RR**. These soils are very shallow, have moderate to low fertility and moderately low to low waterholding capacity. The soils are well to rapidly drained. Surface rockiness may be a slight limitation.
MYB	0.29	Gently sloping undulating rise with less than 3% slope and maximum relief of 10m, which is formed on calcreted calcarenites of ancient coastal dunes. Main soils: loam over brown or dark clay - **F1**, thick sand over clay - **G3**, bleached siliceous sand - **H3**, sand grading to sandy clay loam - **G2**, shallow red loam on limestone - **B4** and shallow sand over clay on calcrete - **B7**. The loamy soils are moderately deep with high fertility and high to moderate waterholding capacity. Drainage is rapid. The sandy soils are deep with low fertility, moderate waterholding capacity and rapid drainage. Water repellence, soil acidity and the susceptibility to wind and water erosion are limitations.
NCA NCF	4.56 6.67	Deeper sandy loam texture contrast level plains with up to 50% non-saline swamps. **NCA** Level plain with 0-10% swamps **NCF** Plains with 30-50% swamps Main soils: loam over brown or dark clay - **F1**, sandy loam over poorly structured brown or dark clay - **F2**, thick sand over clay - **G3**, deep friable gradational clay loam - **M2** and wet soil - **N3**. These soils are deep with high fertility and waterholding capacity. The plains are imperfectly drained

		and the swamps are poorly drained. The swampy areas may have a slight limitation to root growth due to the dispersive subsoil clays.
NGA	0.45	Deeper sandy to sandy loam texture contrast level plain. Main soil: loam over brown or dark clay - **F1**. These soils are deep with moderate fertility and high waterholding capacity. Drainage is imperfect.
NMF NMG	2.29 0.54	Shallow texture contrast and heavy soils on a level plain with up to 50% swamps and less than 10% sandy rises. Some depressions are evident. **NMF** Plains with 30-50% non-saline swamps and 0-10% sandy rises **NMG** Drainage depression Main soils: shallow sand over clay on calcrete - **B7**, thick sand over clay - **G3**, sand over poorly structured clay - **G4** and bleached siliceous sand - **H3**. These soils are shallow with moderate fertility and moderately low waterholding capacity. Drainage is imperfect and there is a moderate limitation to root growth due to the dispersive subsoil clay. Sandy rises and deep plain soils: thick sand over clay - **G3**, sand over poorly structured clay - **G4** and bleached siliceous sand - **H3**. The sandy soils are deep with moderately low fertility and moderate waterholding capacity. Drainage is imperfect. There is a nil to slight limitation to root growth due to dispersive subsoil clay. Depression and swamp soils: deep friable gradational clay loam - **M2**, shallow dark clay loam on limestone - **B5**, wet soil - **N3** and sand over poorly structured clay - **G4**. These soils are moderately deep, have high fertility and moderate waterholding capacity. Drainage is imperfect to poor.
NPA	7.43	Heavy soil level plains with 0-10% swamps. Main soils: deep friable gradational clay loam - **M2**, black cracking clay - **E1**, wet soil - **N3** and shallow dark clay loam on limestone - **B5**. These soils are deep with high fertility and waterholding capacity. Drainage is imperfect to poor. There is a moderate limitation to root growth due to the dispersive subsoil clay.
NSA	2.87	Deeper sandy surfaces plain with occasional heavy soil formed on calcreted sediments of the Padthaway formation Main soils: thick sand over clay - **G3** (E), sand over poorly structured clay - **G4** and deep friable gradational clay loam - **M2**. These soils are deep, have moderate fertility and high waterholding capacity. Drainage is imperfect. There is a slight limitation to root growth due to the dispersive subsoil clays. The heavier clay loam surfaces are slightly more fertile.
NTA NTG NTS	11.28 0.15 3.81	Deeper sandy surfaces plains with 30-50% swamps and 20-30% sandy rises formed on calcreted sediments of the Padthaway Formation. **NTA** Level plain with 0-10% swamps **NTG** Drainage depression **NTS** Plains with 30-50% swamps and 20-30% sandy rises Main soils: thick sand over clay - **G3** (E), sand over poorly structured clay - **G4**, wet soil - **N3** (E) and bleached siliceous sand - **H3**. The plain soils are deep, have moderately low fertility and moderate to high waterholding capacity. Drainage is imperfect. The swamps and depressions have higher waterholding capacity and drainage is poor. There is a slight limitation to root growth due to the dispersive subsoil clays. The low sandy rises are deep with moderately low fertility, moderate waterholding capacity and imperfect drainage. Water repellence and the susceptibility to wind erosion are limitations.
NUA	8.8	Deeper sandy surfaces plain with 0-10% swamps formed on calcreted sediments of the Padthaway Formation. Main soils: thick sand over clay - **G3** (E), loam over brown or dark clay - **F1** and shallow sandy loam on calcrete - **B3**. The plains are moderately deep, have moderate fertility, high waterholding capacity and are imperfectly drained. There are small areas of shallow soil which have moderately low waterholding capacity. The swampy soils are similar to the plain soils although drainage is imperfect to poor.
NIA	0.89	Deeper sandy surfaces plain. Main soils: thick sand over clay - **G3** (E) and sand over poorly structured clay - **G4**.

		Soils are moderately deep, have moderately low fertility, moderate waterholding capacity and are imperfectly drained. There is a moderate limitation to root growth due to the dispersive subsoil clay.
NnA NnF NnG	14.83 3.08 4.29	Shallow flat plains with 10-20% swamps formed on calcreted sediments of the Padthaway formation. **NnA** Level plain **NnF** Plains with 10-20% non-saline swamps **NnG** Drainage depression Main soils: shallow dark clay loam on limestone - **B5**, thick sand over clay - **G3**, sand over poorly structured clay - **G4** and wet soil - **N3**. These soils are shallow, have moderate to high fertility and moderately low waterholding capacity. Drainage on the plains is imperfect and the swamps and depressions poor. There is a slight to moderate limitation to root growth due to the dispersive subsoil clay.
NvA	0.58	Level plain with 0-10% non-saline swamps and 0-10% stony rises. Main soils: thick sand over clay - **G3**, sand over poorly structured clay - **G4** and sandy loam over poorly structured brown or dark clay - **F2**. These plain soils are deep, have moderate fertility and high waterholding capacity. There is a moderate limitation to root growth due to the dispersive subsoil clay. Swampy soils: deep friable gradational clay loam - **M2**, wet soil - **N3** and sand over poorly structured clay - **G4**. These soils are deep, have moderate fertility and high waterholding capacity. Drainage is poor and there is a high limitation to root growth due to the dispersive subsoil clay. Stony rise soils: shallow loam over red-brown clay on calcrete - **B6**, shallow sand over clay on calcrete - **B7**, shallow calcareous loam on calcrete - **B2**, shallow sandy loam on calcrete - **B3** and limestone outcrop - **RR**. These soils are shallow, have moderately low fertility and waterholding capacity. Drainage is imperfect and there is a slight limitation to root growth due to the dispersive subsoil clays. Some soils are calcareous throughout and surface rockiness may be a slight limitation.
NzA	11.34	Plains with 0-10% non-saline swamps. Main soils: thick sand over clay - **G3**, sand over poorly structured clay - **G4**, sandy loam over poorly structured brown or dark clay - **F2**, wet soil - **N3** and deep friable gradational clay loam - **M2**. These soils are deep, have moderate fertility and high waterholding capacity. Drainage of the plains is imperfect and poor in the swamps. There is a moderate to high limitation to root growth due to the dispersive subsoil clays. On the plains and swamps respectively.
XaJ XaK	1.30 1.36	Mosquito and Naracoorte Creeks. The soils within the creek system vary however main soils are: wet soil - **N3**, sandy loam over poorly structured brown or dark clay - **F2** and thick sand over clay - **G3**. These soils are deep with moderately low fertility, have high waterholding capacity and are poorly to very poorly drained. There is a slight to moderate limitation for root growth due to the dispersive subsoil clays. The Mosquito Creek in some areas is permanently filled. This landscape unit is not suitable for agricultural production.
Xq-	3.25	Fresh saline swamps, at least seasonally inundated. Main soils: wet soil - **N3**. These soils are deep with moderately low fertility and high waterholding capacity. Drainage is poor to very poor. There is a high limitation for root growth due to the dispersive subsoil clays. The swamps are underwater for greater than 3 months.
XuC	3.09	Non-saline permanently wet swamps. Main soils: wet soil - **N3** (V). These soils are deep, have moderately low fertility and high waterholding capacity. Drainage is very poor. There is a high limitation for root growth due to the dispersive subsoil clays. The swamps are underwater for the greater part of the year.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

(D) Dominant in extent (>90% of SLU)
(V) Very extensive in extent (60–90% of SLU)
(E) Extensive in extent (30–60% of SLU)
(C) Common in extent (20–30% of SLU)
(L) Limited in extent (10–20% of SLU)
(M) Minor in extent (<10% of SLU)

Detailed soil profile descriptions:

(In alphabetic order)

B2 Shallow calcareous loam on calcrete (Petrocalcic, Supracalcic Calcarosol)
Dark coloured clay loam over a structured dark clay directly overlying calcrete or calcarenite within 30 cm.

B3 Shallow sandy loam on calcrete (Petrocalcic, Orthic Tenosol)
Loamy sand to loam with variable rubble and slight clay increase with depth overlying calcreted calcarenite shallower than 50 cm. Extensive on stony rises.

B4 Shallow red loam on calcrete (Haplic, Petrocalcic, Red Dermosol)
Medium thickness red loam to clay loam over a red structured clay directly overlying calcarenite within 50 cm.

B5 Shallow dark clay loam on limestone (Haplic, Petrocalcic, Black Dermosol)
Thin to medium thickness black clay loam grading to black well structured clay directly overlying calcrete within 50 cm.

B6 Shallow loam over red-brown clay on calcrete (Haplic Petrocalcic, Red Chromosol)
Thin to medium thickness brownish sandy loam to loam over a well structured red to red-brown clay loam to clay on calcrete or calcarenite within 50 cm.

B7 Shallow sand over clay on calcrete (Petrocalcic, Yellow/Brown Chromosol)
Medium thickness sand overlying yellow friable clay on limestone or calcreted sandy clay within 50 cm.

D2 Loam over red clay ((Mottled, Hypercalcic Red Chromosol)
Medium to thick sandy loam to clay loam overlying a well structured red clay grading to red mottled clay with limestone segregations at depth.

E1 Black cracking clay (Black Vertosol)

F1 Loam over brown or dark clay (Melanic, Hypercalcic, Black/Brown Chromosol)
Medium thickness dark brown sandy loam over a thin to medium sand layer over a structured brown to black clay grading to a brown mottled clay with limestone segregations at depth.

F2 Sandy loam over brown or dark poorly structured clay (Mottled, Mesonatric, Grey/Black Sodosol)
Medium thickness brown sandy loam over a thin to medium thickness pale sand layer over a columnar structured dispersive grey to black clay grading to brown mottled clay with depth.

G2 Bleached sand grading to sandy clay loam (Sandy Petrocalcic, Brown Chromosol-Kandosol)
Medium to thick sand with a bleached A2 layer abruptly overlying a brownish friable light sandy clay loam to sandy clay over calcreted calcarenite

G3 Thick sand over clay (Mesotrophic, Mesonatric, Brown Chromosol/Sodosol)
Thick to very thick sand with a pale sand layer directly overlying a brownish clay

G4 Sand over poorly structured clay (Mesonatric, Brown/Grey Sodosol)
Thick organically stained sandy surface overlying a pale sand layer overlying a brown poorly structured clay on limestone or calcrete usually within 100 cm.

H3 Bleached siliceous sand (Arenic, Bleached-Orthic Tenosol)
Thick to very thick bleached sand, organically darkened at the surface over yellow sand continuing below 100 cm.

I1 Highly leached sand (Humosesquic Aeric Podosol)
Organically darkened sand to loamy sand grading to greyish sand overlying dark sands with organic-aluminium compounds.

M2 Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)
Deep well structured red clay loamy soil.

N3 Wet soil (non to moderately saline) (Sodosolic, Eutrophic Hydrosol)
Organically stained sandy surface over a pale brown sand overlying a yellowish brown sandy clay on calcrete.

RR Limestone outcrop

WW Water.

(Grouped on landscape position)

Sandy soils (rises and flats)

H3 Bleached siliceous sand (Arenic, Bleached-Orthic Tenosol)
Thick to very thick bleached sand, organically darkened at the surface over yellow sand continuing below 100 cm.

G2 Bleached sand grading to sandy clay loam (Sandy Petrocalcic, Brown Chromosol-Kandosol)
Medium to thick sand with a bleached A2 layer abruptly overlying a brownish friable light sandy clay loam to sandy clay over calcreted calcarenite

G3 Thick sand over clay (Mesotrophic, Mesonatric, Brown Chromosol/Sodosol)
Thick to very thick sand with a pale sand layer directly overlying a brownish clay

G4 Sand over poorly structured clay (Mesonatric, Brown/Grey Sodosol)
Thick organically stained sandy surface overlying a pale sand layer overlying a brown poorly structured clay on limestone or calcrete usually within 100 cm.

I1 Highly leached sand (Humosesquic Aeric Podosol)
Organically darkened sand to loamy sand grading to greyish sand overlying dark sands with organic-aluminium compounds.

Stony soils (rises and flats)

B2 Shallow calcareous loam on calcrete (Petrocalcic, Supracalcic Calcarosol)
Dark coloured clay loam over a structured dark clay directly overlying calcrete or calcarenite within 30 cm.

B3 Shallow sandy loam on calcrete (Petrocalcic, Orthic Tenosol)
Loamy sand to loam with variable rubble and slight clay increase with depth overlying calcreted calcarenite shallower than 50 cm. Extensive on stony rises.

B4 Shallow red loam on calcrete (Haplic, Petrocalcic, Red Dermosol)
Medium thickness red loam to clay loam over a red structured clay directly overlying calcarenite within 50 cm.

B5 Shallow dark clay loam on limestone (Haplic, Petrocalcic, Black Dermosol)
Thin to medium thickness black clay loam grading to black well structured clay directly overlying calcrete within 50 cm.

B6 Shallow loam over red-brown clay on calcrete (Haplic Petrocalcic, Red Chromosol)
Thin to medium thickness brownish sandy loam to loam over a well structured red to red-brown clay loam to clay on calcrete or calcarenite within 50 cm.

B7 Shallow sand over clay on calcrete (Petrocalcic, Yellow/Brown Chromosol)
Medium thickness sand overlying yellow friable clay on limestone or calcreted sandy clay within 50 cm.

RR Limestone outcrop

WW Water.

Heavy soils

F1 Loam over brown or dark clay (Melanic, Hypercalcic, Black/Brown Chromosol)
Medium thickness dark brown sandy loam over a thin to medium sand layer over a structured brown to black clay grading to a brown mottled clay with limestone segregations at depth.

F2 Sandy loam over brown or dark poorly structured clay (Mottled, Mesonatric, Grey/Black Sodosol)
Medium thickness brown sandy loam over a thin to medium thickness pale sand layer over a columnar structured dispersive grey to black clay grading to brown mottled clay with depth.

E1 Black cracking clay (Black Vertosol)

M2 Deep friable gradational clay loam (Red-Brown-Grey- Black Dermosol)
Deep well structured red clay loamy soil.

Other soils

N3 Wet soil (non to moderately saline) (Sodosolic, Eutrophic Hydrosol)
Organically stained sandy surface over a pale brown sand overlying a yellowish brown sandy clay on calcrete.

D2 Loam over red clay ((Mottled, Hypercalcic Red Chromosol)
Medium to thick sandy loam to clay loam overlying a well structured red clay grading to red mottled clay with limestone segregations at depth.

Further information: DEWNR Soil and Land Program