ASV Ashville Land System

Saline flats on the eastern edge of Lakes Alexandrina and Albert

Area: 111.2 km^2

Annual rainfall: 380 – 450 mm average

Geology: Black or grey clay to sandy clay of the St. Kilda Formation dominates the landscape. This deposit was laid down on coastal mudflats during a previous high sea level stand. It grades to gypseous clay of the Yamba Formation in old salt lakes. Recent windblown Molineaux Sand blankets much of the landscape as irregular sand dunes. Minor remnants of ancient coastal dunes (Bridgewater Formation calcarenite) protrude through the clays and sand deposits in places. Underlying the clayey sediments at depths of less than 100 cm through to 400 cm are sandy to clayey marls with limestones, possibly of the Ettrick Formation. Near the margins of the System, soils typical of adjacent land systems (eg sand over clay or sandy loam over calcrete) underlie the clay sediments at shallow depth.

Topography: The landscape characteristically comprises low to moderate and sometimes high sandhills protruding through a flat, marginally to highly saline plain. The flats are underlain by a saline water table at shallow depth. Where this is permanently at the surface, salt lakes occur. Where slightly lower, but within capillary rise depth below the surface, halophytic vegetation is predominant.

Elevation: 0 - 20 m

Relief: Up to 15 m

Soils: The majority of soils are either wet and moderately to highly saline, or are deep sands.

Main soils
Sandhills
H2 Deep sand
Saline flats
N2/M2 Clay loam over black clay
N2/A7 Calcareous loam
N2/G4 Sand over sodic clay

Minor soils
Flats (marginally saline)
E1/N2 Black clay
F1 Sandy loam over black clay
Stony flats and rises
B2/B3 Shallow loamy sand over calcrete

Main features: The Ashville Land System is characterized by a complex of marginally to highly saline flats and low to moderate sandhills. The soils of the flats are mainly deep and fertile, but too salty for most agricultural uses. The soils of the sandhills have low fertility and are highly susceptible to wind erosion and may be water repellent in some seasons. Most of the sandhill country is arable, but high levels of management input are required to sustain productivity.

Soil Landscape Unit summary: 9 Soil Landscape Units (SLUs) mapped in the Ashville Land System:

SLU	% of area	Main features #
UgL UgM UgN UgW	6.0 17.3 18.1 15.5	Complex of sandhills with some stony outcrops, and moderately to highly saline flats. **UgL** 60 - 90% large sandhills. **UgM** 60 - 90% moderate sandhills. **UgN** 60 - 90% small sandhills. **UgW** 30 - 60% moderate sandhills Main soils: deep sand - **H2** (D-E) on sandhills, with black clay - **E1/N2** (M-L) and sandy loam over black clay - **F1** (M) on marginally saline flats, clay loam over clay - **N2/M2** (M-L), sand over sodic clay - **N2/G4** (M-L) and calcareous loam - **N2/A7** (M-L) on saline flats, and shallow loamy sand on calcrete - **B2/B3** (M) on stony rises. The sandy soils are infertile and prone to wind erosion. The marginally saline soils are deep and fertile, but productivity is restricted by soil salt levels. The highly saline flats have little value unless establishment of salt tolerant pastures is feasible. This land is very difficult to manage because of its complexity.
VvG VvN	4.5 12.2	Marginally saline to highly saline flats with extensive low sandy rises. **VvG** Marginally saline flats with about 20% salt pans and about 20% low sandy rises. **VvN** Saline flats with about 40% low sandy rises and about up to 10% salt pans. Main soils: black clay - **E1/N2** (C-L) and sandy loam over black clay - **F1** (C-L) on flats, with deep sand - **H2** (C-E) on sand rises and clay loam over clay - **N2/M2** (L), sand over sodic clay - **N2/G4** (L) and calcareous loam - **N2/A7** (L) on salt flats. The flats are generally too saline for cropping, but most are suitable for the establishment of salt tolerant pastures. The sandy rises are not saline but too small in individual extent to be of much value for cropping.
ZB- ZD- ZK-	0.6 5.5 20.3	Highly saline flats. **ZB-** Samphire flats. **ZD-** Salt lakes. **ZK-** Complex of highly saline flats and low sandy rises (25%) or stony rises (25%). Main soils: clay loam over clay - **N2/M2**, sand over sodic clay - **N2/G4** and calcareous loam - **N2/A7** on flats, with deep sand - **H2** and shallow loamy sand on calcrete - **B2/B3** on rises, both in **ZK-**. This land is too saline for any agriculture.

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:

Sandhills

H2 Deep sand (Basic, Argic, Brown-Orthic Tenosol)
Very thick light brown sand, organically darkened at the surface with slightly clayey lamellae below 100 cm.

Saline flats

N2/A7 Calcareous loam (Marly, Salic Calcarosol)
Highly calcareous light grey loam grading to pipeclay with abundant shells overlying marl or buried sand over clay soil. Highly saline water table usually within 100 cm.

N2/G4 Sand over sodic clay (Sodosolic, Salic Hydrosol / Grey Sodosol)
Very thick sand over a dark grey mottled clay. Highly saline water table usually within 100 cm.

N2/M2 Clay loam over black clay (Dermosolic, Salic Hydrosol)
Medium thickness hard sandy loam to clay loam over a black blocky heavy clay, becoming greyer and gypseous with depth. Saline water table usually occurs at about 100 cm.

Flats (marginally saline)

E1/N2 Black clay (Epipedal, Black / Aquic Vertosol)
Thin (may be absent) dark clay loam over a dark grey stiff clay, becoming lighter grey with yellow mottles at depth. Gypsum crystals and iron segregations are common. Sandier lenses with shells may occur below 100 cm. Saline watertable usually between 100 and 200 cm.

F1 Sandy loam over black clay (Calcic, Black Chromosol)
Thin to medium thickness dark grey loamy sand to sandy clay loam, overlying a black sandy clay to heavy clay with coarse prismatic structure, calcareous at shallow depth, grading to a white mottled shelly sand from about 50 cm. Water table usually occurs within 200 cm.

Stony flats and rises

B2/B3 Shallow loamy sand over calcrete (Petrocalcic Calcarosol / Rudosol)
Medium thickness loamy sand to sandy loam (may or may not be calcareous) over sheet or rubbly calcrete.

Further information: DEWNR Soil and Land Program