

BLA Blackoaks Land System

Low lying level to gently undulating stony plains and depressions

Area: 145.3 km²

Landscape: This is a low lying land system dominated by calcreted plains and depressions. This may be an old sea or lake floor area from when sea levels were higher, or else broad drainage areas from when rainfall and drainage was greater than today. A drainage depression links the Cunliffe plain to its outlet in the saline swamp behind the hummocky sandhills of Wallaroo Bay. General drainage also seems to derive from Alford in the north and the Thomas Plain area in the east. Surface drainage is a rarity; subsurface flow is likely. The base unconsolidated sediments are composed of heavy clay (Hindmarsh Clay) – either formed in situ from underlying bedrock or derived from nearby bedrock highs in former geological times. Bedrock underlies the unconsolidated sediments – granite was found at the base of two soil pits near Alford. Clayey sediments have near-surface exposure in some lower lying areas and depressions, where more recent deposits are absent (probably through the 'dissolution of calcrete'). In late Pleistocene times, wind-blown calcareous loess was deposited over the clayey sediments. This material has since become calcreted, and now calcrete and calcrete rubble dominate the system. Some of the calcrete in low lying areas is very hard. This is due to the concentration of carbonate in solution, and its subsequent recrystallisation, in low lying areas. Often with the resultant cementation of concretions or nodules into sheet calcrete. Later depositions of calcareous loess have formed deep to moderate depth gently undulating loamy deposits in a few areas.

Annual rainfall: 345 - 370 mm average

Main soils:

- B2** Shallow calcareous loam on calcrete (around 70% of area)
- A6** Gradational calcareous clay loam (around 7% of area)
- A4-A5** Rubbly calcareous loams (around 14% of area: mostly A4 soil)

Minor soils:

- B3** Shallow sandy loam on calcrete (around 8% of area)
- N2** Saline soil (approximately 1% of area)
- C4-D3** Clay loam to loam over poorly structured red clay (less than 1% of area)

Main features: The main soils are shallow calcareous loams on calcrete. There are some areas where the soils are too shallow to be cropped. Profiles which are shallow and/or contain hard carbonate rubble have limited moisture holding capacity and hence limited production potential. Surface stone also interferes with many farming practices. Fine carbonate in soils limits the availability of certain nutrients. Accumulations of boron and sodium in subsoils is particularly prevalent where clayey subsoils are present, but also occurs in low lying areas without clayey subsoils. Saline seepage associated with saline watertables occurs in many depressions.



Soil Landscape Unit summary: Blackoaks Land System (BLA)

SLU	% of area	Main features
IIA	3.4	Plains with soils formed in clayey sediments. Main soils: <i>gradational calcareous clay loam A6</i> , with some <i>rubbly calcareous loam A4-A5</i> . IIA – low lying plains (slopes <1%).
IKE	0.6	Plains with soils formed in clayey and loamy sediments. Main soils: <i>gradational calcareous clay loam A6</i> , and extensive areas of <i>rubbly calcareous loam A4-A5</i> . IKE – drainage depression (slopes 0-1.5%).
INA INB	2.4 0.7	Plains and slopes with soils formed in clayey sediments. Main soils: <i>gradational calcareous clay loam A6</i> , some related soils with non calcareous surfaces C4-D3 , and some <i>rubbly calcareous loam A4-A5</i> . INA – low lying plains (slopes 0-1%). INB – slopes (slopes 1-3%).
QeA	7.1	Calcreted plains. Main soils: <i>shallow calcareous loam on calcrete B2</i> , with some <i>shallow sandy loam on calcrete B3</i> . Also with limited to common areas of <i>calcareous loam A4</i> , and <i>gradational calcareous clay loam A6</i> (and possibly some variants with non calcareous surfaces D3-C4). QeA – low lying plains (slopes <1%).
QGA	33.1	Calcreted plains: highly calcareous grey and powdery clay loams underlain by very hard concretionary Ripon Calcrete at shallow to moderate depth. Main soils: <i>shallow calcareous clay loam on calcrete B2</i> . Also with <i>calcareous loam A4</i> underlain by calcrete at moderate depth. QGA – low lying level plain (slopes <1%).
QHA QHB QHO	2.2 0.4 0.8	Calcreted plains, slopes and depressions. Main soils: <i>shallow calcareous loam on calcrete B2</i> . QHA – gently undulating plains (slopes 0-1%). QHB – slopes (slopes 1-3%). QHO – depressions with some saline seepage (slopes 0-1%).
QJA	3.7	Calcreted plains. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With limited to common areas of <i>rubbly calcareous loam A4</i> , and <i>gradational calcareous clay loam A6</i> . QJA – gently undulating slightly raised plains (slopes 0-2%).
QKA QKK QKP	3.9 1.7 1.1	Calcreted plains. Main soils: <i>shallow calcareous loam on calcrete B2</i> . With limited to common areas of <i>calcareous loam A4</i> . QKA – gently undulating plains (slopes 0-1.5%). QKK – low lying plains with some saline seepage (slopes 0-1%). QKP – low lying plains with marginal salinity (slopes <1%).
QRA QRB QRE	33.5 0.3 0.7	Calcreted plains, slopes and depressions. Main soils: <i>shallow calcareous loam on calcrete B2</i> , with some <i>shallow sandy loam on calcrete B3</i> . QRA – low lying level stony plains (slopes <1%). QRB – slopes (slopes 1-2.5%). QRE – drainage depression (slopes 0-1.5%).
SbA	0.5	Plains dominated by calcareous loess deposits. Main soils: <i>rubbly calcareous loam A4</i> , with limited to common areas of <i>gradational calcareous clay loam A6</i> . SbA – gently undulating plain (slopes 0-1.5%).
SVA SVE	0.7 1.6	Plains and depressions dominated by calcareous loess deposits. Main soils: <i>calcareous loam A4</i> , with limited to common areas of <i>shallow calcareous loam on calcrete B2</i> . SVA – gently undulating relatively low lying plains (slopes 0-1.5%). SVE – drainage depression with some saline seepage (slopes 0-1.5%).
ZA- ZB- ZD-	0.3 1.3 0.1	Saline depressions. Main soils: <i>shallow calcareous loam on calcrete B2</i> , and <i>saline soil N2</i> . ZA- – saline depressions (5s).



	<p>ZB- – highly saline depressions and salt lake margins (7s): mostly covered by samphire and other halophytes. The low lying area approximately 2 km northwest of Wallaroo is an old coastal backswamp.</p> <p>ZD- – salt lake (8s): an unusual, deep, and isolated depression on an otherwise undistinguished plain.</p>
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Detailed soil profile descriptions:

Main soils:

- B2** *Shallow calcareous loam on calcrete* [Petrocalcic Calcarosol]
Grey brown calcareous sandy loams, loams, and clay loams overlying calcrete at shallow depth. Calcrete in low lying areas is often the very hard concretionary Ripon Calcrete.
- A6** *Gradational calcareous clay loam* [Pedal Hypercalcic-Supracalcic Calcarosol]
Grey brown to red brown calcareous clay loams and loams grading to reddish clay with abundant fine carbonate and sometimes with some hard carbonate rubble. Found in flats and depressions.
- A4-A5** *Rubby calcareous loams* [Regolithic Lithocalcic-Hypercalcic Calcarosol]
Grey brown calcareous loams and clay loams grading to clay loamy and loamy subsoil with abundant fine carbonate. Typically containing significant amounts of hard carbonate rubble; often very rubby. Can be underlain by calcrete at moderate depth. Some variants are underlain by clayey sediments within 120 cm of the surface (soil **A5**). Found on very low rises and flats.

Minor soils:

- B3** *Shallow sandy loam on calcrete* [Petrocalcic Tenosol]
A brown variant of soil **B2** with non calcareous surface soil.
- N2** *Saline soil* [Salic-Hypersalic Hydrosol].
Calcareous clay loamy saline soils which occur in depressions. The soils are often underlain by calcrete at shallow depth, especially in the drier and less saline margins of these areas.
- C4-D3** *Clay loam to loam over poorly structured red clay* [Red Dermosol-Sodosol]
A reddish variant of soil **A6** which has non calcareous surface soil.

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

