

# KRF Kangaroo Flat Land System

Stony plains with marginally saline and saline depressions, and two ancient salt lakes in the south. A few of the small salt lakes are named on the 1:50 000 topographic map: Boolathurla Lagoon and Cudoorowie Lagoon.

**Area:** 94.3 km<sup>2</sup>

**Landscape:** This system is predominantly stony plains; and is typically lower lying than surrounding land. Slopes are mostly less than 1%. There are numerous non arable stony areas where very shallow soils or calcrete outcrops occur. Depressions and low lying areas are saline to marginally saline. Two ancient salt lake depressions occur in the south of the system: they lie adjacent to the Bookamurray land system which has numerous ancient salt lakes.

**Annual rainfall:** 400 – 420 mm average

**Main soils:** **B3** *Shallow loam on calcrete*  
**B2** *Shallow calcareous loam on calcrete*

**Minor soils:** **N2** *Saline soil*

**Main features:** Surface soils are mostly loams and clay loams: many have weak structure, and most set hard on drying. Subsoils are mostly clay loams or loams. Most soils are slightly calcareous to non calcareous throughout, and underlain by calcrete at shallow or very shallow depth. Many areas are non arable because the soils are too shallow and stony. Non arable saline depressions are common. Most arable land is affected to some degree by saline seepage. Although soil conditions above the calcrete are generally satisfactory, the calcrete is generally underlain by very highly calcareous sediments which are often clayey, have very high pH, high sodium and boron levels, and raised to high salinity levels. Calcareous soils have reduced availabilities of certain nutrients, in particular, phosphorus, zinc and manganese; this especially affects highly calcareous soils.

## Soil Landscape Unit summary: Kangaroo Flat Land System (KRF)

| SLU  | % of area | Main features #  |
|------|-----------|--|
| ObD  | 0.1       | Sand over clay soils (soil <b>G4</b> ).<br><b>ObD</b> – low dunes (slopes 0-3%, 2-3s, 4a, 2w, 2r).   |
| QnK  | 25.6      | Shallow non calcareous and calcareous soils on calcrete.<br>Main soils: <i>shallow calcareous loam on calcrete</i> (soil <b>B2</b> ) and common to extensive areas of <i>shallow loam on calcrete</i> (soil <b>B3</b> ). Minor to limited areas of <i>deep rubbly calcareous loam on clay</i> (soil <b>A5</b> ): more in <b>QnK</b> , less in <b>QnP</b> .<br><b>QnK</b> – stony plains with very low stony rises and some saline seepage and some marginally saline depressions (slopes mostly <1%, 3-2s°, approx. 5% outcrop, 3-4r).<br><b>QnP</b> – low lying very stony plains with very low stony rises and some saline seepage and some marginally saline depressions (slopes mostly <1%, 3-4s°, 10-20% outcrop, 4-5r).<br><b>QnPr</b> – semi arable very stony plains with approximately 50% non arable stony ridges and some saline seepage (slopes 0-1.5%, 3-4s, approx. 50% outcrops, 5-4r).<br><b>QnP1</b> – non arable very stony plains with some saline seepage (slopes <1%, 3s, 5r).<br><b>QnT</b> – non arable to semi arable low lying very stony plains/depressions with marginal salinity (slopes <1%, 4-3s°, >50% outcrop and very shallow soils, 5-4r). |
| QnP  | 53.8      |  |
| QnPr | 1.3       |  |
| QnP1 | 1.8       |  |
| QnT  | 3.0       |  |



|                                 |                                 |  |
|---------------------------------|---------------------------------|--|
| QsK                             | 4.7                             | Shallow non calcareous and calcareous soils on calcrete, with some shallow texture contrast soils. Relict sand over clay dune areas with some sand remaining (as per <b>QsK</b> areas in the Bookamurray land system).<br>Main soils: <i>shallow loam on calcrete</i> (soil <b>B3</b> ), <i>shallow calcareous loam on calcrete</i> (soil <b>B2</b> ), and shallow sandy loam to loamy sand over red-brown clay on calcrete (soil <b>B6-B7</b> ). Minor areas of <i>deep calcareous loam on clay</i> (soil <b>A5</b> ).<br><b>QsK</b> – slightly elevated gently undulating to undulating plains with some saline seepage (slopes 0-3%, 2-3s, 5-20% outcrop, 4-3r).  |
| QoT                             | 0.4                             | Shallow non calcareous and calcareous soils on calcrete, with some deeper soils.<br>Main soils: shallow loam on calcrete, some texture contrast with clayey subsoils (soil <b>B3-B6</b> ) and <i>shallow calcareous loam on calcrete</i> (soil <b>B2</b> ). With some deeper soil in the lowest lying areas with loam and sandy loam over clay loam or clay (soils <b>C1-D3-A5</b> ).<br><b>QoT</b> – depressions with marginal salinity (slopes <1%, 4-3s, 3-4r).   |
| QTK<br>QTT                      | 1.3<br>1.5                      | Shallow calcareous soils on calcrete, deeper calcareous soils, and some shallow non calcareous soils on calcrete.<br>Main soils: <i>shallow calcareous loam on calcrete</i> (soil <b>B2</b> ), with <i>calcareous loam</i> (soil <b>A4-A5</b> ) and <i>shallow loam on calcrete</i> (soil <b>B3</b> ).<br><b>QTK</b> – plains (slopes <1%, 3s, 3-4r).<br><b>QTT</b> – marginally saline depressions (slopes <1%, 4-3s, 3-4r).  |
| ShK<br>ShT                      | 0.5<br>0.5                      | Calcareous loams and shallow calcareous soils on calcrete<br>Main soils: <i>calcareous loam</i> (soil <b>A4</b> ) and <i>shallow calcareous loam on calcrete</i> (soil <b>B2</b> ).<br><b>ShK</b> – slight rise (slopes 0-1.5%, 3-2s, 3-2r).<br><b>ShT</b> – depressions with marginal salinity (slopes <1%, 4-3s, 3-2r).  |
| ZA-<br>ZB-<br>ZC-<br>ZD-<br>ZX- | 2.6<br>2.2<br>0.3<br>0.4<br>0.1 | Saline depressions and saline margins of salt lakes.<br>Main soils: <i>saline soils</i> (soil <b>N2</b> ). The <b>ZA-</b> soil landscape unit includes extensive areas of <i>shallow calcareous loam on calcrete</i> (soil <b>B2</b> ) and possibly some <i>calcareous loam</i> (soil <b>A4-A5</b> ). The <b>ZX-</b> soil landscape unit has extensive to very extensive areas of <i>gypseous calcareous loam</i> (soil <b>A8</b> ).<br><b>ZA-</b> – non arable salinized depressions and ancient salt lake margins (3w, 5-4s).<br><b>ZB-</b> – highly saline and saline depressions (5-4w, 7-5-8s, 2-1f).<br><b>ZC-</b> – small salt lakes and less saline margins (7-4w, 8-7s, 2-1f).<br><b>ZD-</b> – ancient salt lakes (7w, 8s, 2f).<br><b>ZX-</b> – gypseous margin to ancient salt lake (slopes 0-1.5%, 7-5s, 3-2a, 1-2r, 1f). |

# Classes in the 'Soil Landscape Unit summary' table (eg. 2-1e, 3w, 2y, etc) describe the predominant soil and land conditions, and their range, found in Soil Landscape Units. The number '1' reflects minimal limitation, while increasing numbers reflect increasing limitation. Letters correspond to the type of attribute:

a - wind erosion      e - water erosion      f - flooding      g - gullyng  
r - surface rockiness      s - salinity      w - waterlogging      y - exposure

### Detailed soil profile descriptions:

#### Main soils:

##### **B3** *Shallow loam on calcrete* [Petrocalcic Tenosol]

Red-brown loams, clay loams or sometimes sandy loams, overlie red-brown or red loams or clay loams, which overlie calcrete at very shallow to shallow depth. Soils are often very stony. Very shallow soils often have no discernible subsoil. Surface soils are often slightly calcareous, while subsoils are non calcareous. Surface soils often have weak granular to polyhedral structure, but typically set hard when dry.

##### **B2** *Shallow calcareous loam on calcrete* [Petrocalcic Calcarosol]

These soils are morphologically very similar to the **B3** soils, and grade into them. The main differences are the higher fine carbonate contents, and less red colours. Surface soils and subsoils are typically moderately calcareous, sometimes highly calcareous. Surface colours are mostly brown, grey or red-brown, and subsoils are typically brown, grey or red-brown.



**Minor soils:****N2** *Saline soil* [Salic-Hypersalic Hydrosol]

A range of saline soil profiles occur on land which is not very highly saline. Shallow soils on calcrete are the most common. Deeper clay loamy and loamy soils are also common, especially in the more saline depressions where the calcrete has been 'dissolved'. These are likely to be underlain by clayey substrates. Samphire, sea barley grass, and bare patches are common.

In the very highly saline ancient salt lakes, these soils are bare of vegetation and have a thin surface salt crust, which is underlain by sediments rich in salt crystals and 'fluffy' gypsum. A typical profile has calcareous sandy loam to light clay overlying green-grey to olive-brown non calcareous clay.

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

