

# CYR Cygnet River Land System

Low lying alluvial and colluvial plains and valley flats. The floodplain and terminal section of the Cygnet River meanders through this system from west to east. The valley flats of Gum Creek, Brown Creek, and other tributaries of the Cygnet River are included in this system. There is an isolated rise in the south-east of the system. The system is bordered by slopes and rises to the north, west and south, and by low-lying saline coastal plains to the east.

**Area:** 98.2 km<sup>2</sup>

**Annual rainfall:** 495 – 570 mm average

**Geology:** Pleistocene age alluvium, giving rise to texture contrast soils on clayey sediments, forms many of the low-lying plain areas. Plains and gentle slopes in the southern part of the system, adjacent to the southern escarpment slope, are composed of late Pleistocene age colluvium (Hindmarsh Clay), also giving rise to texture contrast soils. The system includes an isolated rise, with very gently undulating summit surfaces, and with slopes composed of Hindmarsh Clay colluvium. There are a few areas on these slopes overlain by calcreted material (the result of aeolian deposition of highly calcareous loamy sediments).

Other colluvial/alluvial deposits give rise to cracking clay soils, which are mostly derived from more northerly areas with Basalt topped flat hills and Permo-Carboniferous age (Cape Jervis Formation) glacial derived clayey sediments. Some other cracking clay deposits are derived from weathered material transported from the southern escarpment and plateau of Cambrian age (Kanmantoo Group) phyllites and metasandstones.

Finally, the most recent sediments are fluvial deposits which have been deposited in creek beds and creek flats, consisting of deep loamy and clay loamy sediments.

**Topography:** Plains dominate this system. These are cut by river beds and drainage depressions. The plains include many depression areas, often relict after stream course direction changes. The north-west and west of the system comprise many valley flats. Slopes are generally less than 1%, but reach a maximum of 8% on the steeper slopes of the isolated rise in the south-east of the system.

**Elevation:** From 2 m at the edge of the saline coastal flats in the very east of the system, to 33 m on the summit of the isolated rise in the south-east of the system, to 70 m at the upper reaches of the creek flats in the north-west of the system.

**Relief:** Generally less than 10 m; with a maximum of just over 20 m

**Main Soils:**

|              |   |
|--------------|---|
| <b>F2-F1</b> | Loamy to clay loamy topsoil over sodic clay |
| <b>G3-G4</b> | Sandy topsoil over sodic clay               |
| <b>E3-C5</b> | Clayey soil                                 |

**Minor soils:** **M1-N3** Deep loamy soil

**Main Features:** Salinity is a potential threat to this system. Presently only small patches of land are affected by saline scalds, especially along creek flats, however, salinity levels are raised in many subsoils. Subsoils are dominantly sodic, which results in soils with poor drainage characteristics, and reduces soil moisture storage available for plant growth. Cracking clay soils, although inherently fertile, provide management difficulties due to their poor surface structure, heavy textures, and the gilgai landscape pattern of small mounds and depressions. Gilgai depressions are often water-filled and can be marginally saline. Those soils with sandy surfaces provide a wind erosion risk and are inherently infertile.



**Soil Landscape Unit summary:** Cygnet River Land System (CYR)

| SLU                                    | % of area                               | Main features #   |
|--|---|---|
| DRA                                    | 0.1                                     | Semi-arable very low rise.<br>Main soils: loamy to sandy topsoil over sodic clay, formed on weathering rock, possibly with some stone fragments in topsoil <b>D7-K4</b> (Brown Sodosol, formed on weathering rock).<br><b>DRA</b> - very low rise (1e, 1-2s)  |
| FFB                                    | 0.04                                    | Arable low rise.<br>Main soil: sandy to loamy surface topsoil over sodic clay, probably, at least 50% of soils have ironstone gravel; forming on deeply weathered clayey sediments: <b>J2-J1</b> and <b>F2-G4</b> (Ferric and non-Ferric Brown Sodosol).<br><b>FFB</b> - slight rise, slopes (approx. 3%, 2-1e)   |
| KWA<br>KWB<br>KWK<br>KWT               | 0.1<br>0.4<br>7.3<br>1.8                | Semi-arable, colluvial/alluvial plains, slopes, and depressions with 'gilgai' flats, mounds, and depressions. Gilgai depressions are often water-filled, and can be marginally saline.<br>Main soils: <u>clayey soil</u> <b>E3-C5</b> (Brown Vertosol-Dermosol), with 10-50% <u>loamy to clay loamy topsoil over sodic clay</u> with <u>sandy topsoil over sodic clay</u> - loamy to sandy topsoil: <b>F2-F1</b> with <b>G4-G3</b> (loamy with sandy Brown Sodosol).<br><b>KWA</b> - plains<br><b>KWB</b> - slopes (approx. 3%, 2-1e), some with some rill erosion<br><b>KWK</b> - low-lying plains with <10% saline seepage (2-3s)<br><b>KWT</b> - depression with marginal salinity (4-3s, 5-7w)  |
| HYe<br>HYK<br>HYO<br>HYT               | 9.5<br>17.2<br>0.4<br>0.4               | Arable, with some semi-arable, alluvial/colluvial plains, valley flats, depressions and slopes.<br>Main soils: <u>loamy to clay loamy topsoil over sodic clay</u> ; many of these subsoils are cracking or 'vertic' clays <b>F2-F1</b> (loamy Brown Sodosol) giving the landscape a slight gilgai (mounds/depressions) look. Some patches with sandy topsoil occur - <u>sandy topsoil over sodic clay</u> <b>G4-G3</b> (sandy Sodosol). Minor to limited areas of <u>clayey soil</u> <b>C5-E3</b> (Brown Vertosol-Dermosol) occur. Organic <u>deep loamy soil</u> <b>M1</b> (Tenosol-Kandosol) can occur in creek beds. There are minor areas of texture contrast soil forming over weathering rock occur; as well as minor occurrences of ironstone.<br><b>HYe</b> - valley flats (low-lying drainage areas, which include: valley flats, creek lines, and alluvial deposition/wash plains) with <10% saline seepage (3-2°s-3-2°s: some saline patches along creek flats), minor gullyng (2g), and some swampy patches<br><b>HYK</b> - low-lying plains with <10% saline seepage (2-3s)<br><b>HYO</b> - depression with <10% saline seepage (2-3s, 5w)<br><b>HYT</b> - marginally saline depression (4s, 5w) |
| HZA<br>HZK<br>HZL<br>HZO<br>HZP<br>HZT | 6.9<br>19.6<br>0.3<br>2.7<br>1.4<br>0.7 | Arable, with some semi-arable, alluvial plains and depressions.<br>Main soils: <u>loamy to clay loamy topsoil over sodic clay</u> - sandy loam to clay loam topsoil <b>F2-F1</b> (loamy Brown Sodosol); with very few of the subsoils composed of cracking clay.<br>Patches of sandy topsoil occur - <u>sandy topsoil over sodic clay</u> <b>G4-G3</b> (sandy Brown Sodosol).<br><b>HZA</b> - colluvial plains and very gentle slopes (1-2s, 1e)<br><b>HZK</b> - low-lying plain with <10% saline seepage (2-3°s)<br><b>HZL</b> - slopes (approx. 3%, 2e) with <10% saline seepage (2-3s) and minor gullyng (2g)<br><b>HZO</b> - slight depression/old flood plain with <10% saline seepage (2-3s)<br><b>HZP</b> - low-lying plain with marginal salinity (4s)<br><b>HZT</b> - depression with marginal salinity (4s)   |
| PkC<br>PkE<br>PkK<br>PkU<br>PkZ        | 2.6<br>0.3<br>13.2<br>0.9<br>0.4        | Arable, with some semi-arable, alluvial plains and depressions. Also including summit surfaces, and associated slopes and depression/valley.<br>Main soils: <u>sandy soil over sodic clay</u> - sandy to light sandy loam topsoils <b>G4-G3</b> (sandy Brown Sodosol). Patches of <u>loamy to clay loamy topsoil over sodic clay</u> occur - sandy loam topsoils <b>F2-F1</b> (loamy Brown Sodosol). Some ironstone gravel probably occurs in soils on summit surfaces.<br><b>PkC</b> - slopes (3-6%, 3-2e) with minor rilling (2g)<br><b>PkE</b> - depression/valley with minor saline seepage (2s)<br><b>PkK</b> - low-lying plains with <10% saline seepage (2-3s)<br><b>PkU</b> - depression with marginal salinity (4-3s). Mostly thick sands over sodic clay.<br><b>PkZ</b> - summit surfaces.  |
| RYC                                    | 0.3                                     | Arable slopes with shallow soil on calcrete.<br>Main soils: rubbly and shallow grey-brown sandy to light sandy loam over calcrete <b>B3</b>   |



|                          |                          |   |
|--------------------------|--------------------------|---|
|                          |                          | (Petrocalcic Tenosol), with minor to common areas of <u>sandy topsoil over sodic clay</u> - sandy to light sandy loam topsoils <b>G4-G3</b> ( <i>sandy Brown Sodosol</i> ).<br><b>RYC</b> - slopes (3-5%, 3-2e) with minor rilling (2g)   |
| XNL<br>XNM               | 6.4<br>1.2               | Recent alluvial deposits in creek beds and flats.<br>Main soils: organic <u>deep loamy soil</u> <b>M1-N3</b> ( <i>Tenosol-Kandosol-Hydrosol</i> ), with some <u>sandy topsoil over sodic clay</u> and <u>loamy to clay loamy topsoil over sodic clay</u> - sandy to loamy soil topsoils: <b>G3-G4</b> and <b>F1-F2</b> ( <i>sandy and loamy Brown-Grey Sodosol</i> ). Deeper sandy soils often occur as banks built up at the margins of creek flats ( <b>G3</b> ).<br><b>XNL</b> - swampy creek flat with minor saline seepage (7w, 2-3s)<br><b>XNM</b> - creek flat with saline patches (3+s-3*s)   |
| XVA<br>XVL<br>XVM<br>XVO | 0.7<br>0.5<br>1.1<br>1.8 | Older alluvial deposits in creek flats.<br>Main soils: <u>sandy topsoil over sodic clay</u> and <u>loamy to clay loamy topsoil over sodic clay</u> - sandy to loamy topsoils: <b>G3-G4</b> and <b>F1-F2</b> ( <i>loamy and sandy Brown-Grey Sodosol</i> ), with some organic <u>deep loamy soil</u> <b>M1-N3</b> ( <i>Tenosol-Kandosol-Hydrosol</i> ).<br><b>XVA</b> - alluvial plain/flat with some swampy patches and <10% saline seepage (2-3s)<br><b>XVL</b> - swampy creek flat with <10% saline seepage (7w, 3s)<br><b>XVM</b> - marginally saline creek flat (4-3s) with some saline depressions<br><b>XVO</b> - swampy and saline creek flat (7w; 4-3*s, 10-50% saline seepage)               |
| ZA-<br>ZB1<br>ZB2<br>ZB3 | 0.3<br>0.3<br>1.0<br>0.2 | Non-arable, saline depressions, low-lying plains, and creek flats.<br>Main soils: <u>loamy to clay loamy topsoil over sodic clay</u> with <u>sandy topsoil over sodic clay</u> - clay loamy, loamy or sometimes sandy topsoils: <b>F1-F2</b> with <b>G3-G4</b> ( <i>loamy with sandy Brown-Grey Sodosol</i> ). Some <u>clayey soil</u> occurs <b>C5</b> ( <i>Brown-Grey Dermosol</i> ), especially in saline channels.<br><b>ZA-</b> - saline low-lying plain or depression (5s).<br><b>ZB1</b> - saline and sloping drainage depressions (7s, 3e)<br><b>ZB2</b> - saline and swampy creek flats and watercourse (7-5s)<br><b>ZB3</b> - saline and swampy depression (stranded old stream bed) (7-5s) |

# 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:

- F2-F1** Loamy to clay loamy topsoil over sodic clay (*loamy; Brown-Grey Sodosol*). Medium thickness to thick sandy loam to light clay loam, often with a bleached layer, over olive-brown, yellow-brown, brown, olive, or even red-brown sodic clay with mottles. Some of these subsoils are cracking (Vertic) clays. Sometimes there is fine carbonate in the lower subsoil, and occasionally there is some ironstone in the sub-surface layer. Flats, drainage depressions, and creek flats.
- G3-G4** Sandy topsoil over sodic clay (*sandy; Brown-Grey Sodosol*). Medium thickness to very thick loamy sand to light sandy loam, with a bleached layer, over olive-brown, yellow-brown, brown, or even red-brown sodic clay with mottles. Sometimes there is fine carbonate in the lower subsoil. Flats, drainage depressions, creek flats, creek banks, slopes and summit surfaces.
- E3-C5** Clayey soil (*Brown Vertosol-Dermosol*). Thin to medium thickness clay loam to clay topsoil, which is often coarsely structured, over olive-brown, grey-brown or olive medium to heavy sodic clay. These soils are usually composed of cracking clay, which expands or contracts depending on moisture content, and which form the characteristic 'gilgai' mound/depression landscape, however, it is the flats surrounding the mounds and depressions which usually dominate in area. Often there is fine carbonate in the lower subsoil or subsoil. In a gilgai landscape, the soils formed on the flats have carbonate in their lower subsoil, those formed in the depressions have no detectable carbonate in the soil profile, while those on the mounds can have carbonate in the subsoil or even the topsoil. The depressions often fill with water, and can be marginally saline. Flats, gilgai mounds and depressions, drainage depressions, and creek flats.



**Minor soils:**

**M1-N3** Deep loamy soil (*Tenosol-Kandosol-Hydrosol*). Recent stream deposits. Very thick to thick organic rich loamy topsoil, which is often layered, overlying sandy to light clayey sediments. Those soils in creek beds are very wet (Hydrosols). Creek flats, river terrace flats, stream beds, drainage depressions, floodplain flats, and river banks.

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

