

UCY Upper Cygnet Land System

The creeks, remnant plateau surfaces, and slopes of the upper reaches of the Cygnet River area. This system is bordered by poorly drained plateau surfaces to the south and west; and by the steep, stony slopes and gullies of the Snelling-Cygnet fault scarp to the north and east.

Area: 86.3 km²

Annual rainfall: 650 - 800 mm average

Geology: The remnant plateau areas consist of Pliocene age ferricrete regolith; while many adjacent slopes consist of related Pliocene-Quaternary age colluvium. These areas have loamy topsoil, usually with a layer of ironstone gravel or ferricrete, underlain by deeply weathered clayey sediments, usually with a mottled zone over a grey pallid zone, with weathered meta-sandstone rock below this. The very north east of this system, which is adjacent to the gap between the Snelling and Cygnet fault scarps, is underlain by 'softer' and/or 'dirtier' sandstones, or even some phyllite, giving rise to more fertile and better drained soils with dark loam topsoil.

On numerous slopes and in creek gullies, the underlying early Cambrian Kanmantoo Group meta-sandstones have been exposed to soil forming processes. This results in loamy to sandy topsoils, usually with some rock fragments, over clay subsoil, forming in weathered meta-sandstone

Areas occur of Quaternary age deep clayey sediments, especially on lower slopes and in upper drainage depressions. Resultant soils have loamy topsoil over clay. These sediments result from a combination of sedentary weathering and colluvial/alluvial processes. Most ironstone nodules are 'dissolved' from these soils due to constant sub-surface water flow and wetness.

Deposits of recent loamy alluvium occur in many creek flats.

Topography: Creeks and creek slopes, with remnant plateau surfaces and associated slopes. Slopes are mostly from 0 - 10%, but reach up to 40% on some creek gully slopes. This system covers the many creek lines/gullies draining the main Kangaroo Island plateau which flow east, north-east, and northward into the upper Cygnet River, including Snaky Creek, Capsize Creek, Deep Creek, Grassy Creek, Sheep Creek, Two Storey Creek, Bullock Creek, Tin Hut Creek, and many unnamed creeks. Drainage is sluggish in the upper reaches of many creeks.

Elevation: The highest elevation, of almost 250 m, is reached in the very south-west of the system at the upper reaches of the Tin Hut Creek. The lowest elevation, of around 90m, occurs in the creek flat in the east of the system near Pioneer Bend.

Relief: From 10 m to 40 m

Main soils:

J2	<u>Ironstone soil</u>
K4	<u>Stony texture contrast soil</u>
F2-F1	<u>Texture contrast soil</u>

Minor soils: **M1** [Deep loamy soil](#)

Main features: Arable to semi-arable remnant plateau surfaces and slopes, with non-arable creek lines and gullies. Topsoils are mostly loamy. The main soils are loamy over clay, with or without ironstone gravel.

Relatively impermeable subsoils limit infiltration and result in waterlogging and wetness. Ironstone limits fertility by 'fixing' phosphorous. Many soils are strongly acidic. Soils which



are strongly acidic, especially when ironstone soils, can have topsoils with aluminium levels which are marginally toxic to plants, and lower subsoils, where the highest acidity levels are reached, with aluminium levels which are highly toxic. Many slopes are steep enough to pose a water erosion risk. Saline patches occur in creeks, and raised subsoil salinity levels occur on many adjacent slopes.

Soil Landscape Unit summary: Upper Cygnet Land System (UCY)

SLU	% of area	Main features #
APm	33.2	<p>Non-arable creeks and associated slopes. Some dead trees can occur in the upper sluggishly drained drainage depression areas due to rising salinity levels.</p> <p>Main soils: <u>stony texture contrast soil</u> overlying weathered sandstone or meta-sandstone K4 (<i>stony Brown Chromosol-Sodosol</i>). And deeper <u>texture contrast soil</u> especially on gentler slopes and in drainage flats (F2-F1). Also <u>deep loamy soil</u> occurs in drainage flats (M1). Patches of soils with ironstone gravel can occur (J2).</p> <p>APm – creek lines/gullies with minor areas of saline seepage (slopes 1-40%, 5e, 2-1°s, 5w). Summary: these areas are non-arable due to frequent flooding, wetness, and steep slopes.</p>
CBZ	0.4	<p>Arable to semi-arable summit surfaces.</p> <p>Main soils: <u>stony texture contrast soil</u> overlying weathered sandstone or meta-sandstone K4 (<i>stony Brown Chromosol-Sodosol</i>). With some <u>ironstone soil</u> (J2).</p> <p>CBZ – summit surfaces (slopes 0-2%, 1e) Summary: waterlogging, acidity, stoniness, and low fertility due to ironstone are the main issues.</p>
CCBa	0.1	Arable to semi-arable slopes and summit surfaces.
CCCa	0.6	Main soils: <u>stony texture contrast soil</u> overlying weathered sandstone or meta-sandstone K4
CCDa	0.5	(<i>stony Brown Chromosol-Sodosol</i>). With deeper <u>texture contrast soil</u> (F2-F1). With only minor areas
CCM	1.3	of <u>ironstone soil</u> (J2).
CCMw	0.6	<p>CCBa – slopes with mostly sandy topsoil (slopes 0-3%, 2-1e) CCCa – slopes with mostly sandy topsoil (slopes 4-10%, 3e) CCDa – semi-arable slopes with mostly sandy topsoil (slopes 10-20%, 4e) CCM – slopes with areas of raised subsoil salinity (slopes 4-10%, 3e, 2-3s) CCMw – waterlogged concave slopes with areas of raised subsoil salinity (slopes 3-6%, 3e, 2-3s, 4w) Summary: waterlogging, acidity, water/wind erosion risk, fertility, raised subsoil salinity levels, and stoniness are the main issues.</p>
CEL	1.5	Mostly arable slopes.
CEC	8.3	Main soils: <u>stony texture contrast soil</u> overlying weathered sandstone or meta-sandstone K4
CEM	15.1	(<i>stony Brown Chromosol-Sodosol</i>). With deeper <u>texture contrast soil</u> (F2-F1) and <u>ironstone soil</u>
CEZ	0.03	(J2).
		<p>CEL – slopes with areas of raised subsoil salinity (1-4%, 2e, 2-3s) CEC – slopes (3-12%, 3e, 2g). CEM – slopes with areas of raised subsoil salinity (3-12%, 3e, 2g, 2-3s) CEZ – summit surface (slopes 0-2%, 2e) Summary: waterlogging, acidity, water erosion risk, raised subsoil salinity levels, low fertility due to ironstone, and stoniness are the main issues.</p>
CFC	0.3	Semi-arable stony slopes and summit surfaces.
CFD	1.7	Main soils: <u>stony texture contrast soil</u> overlying weathered sandstone or meta-sandstone K4
CFM	2.0	(<i>stony Brown Chromosol-Sodosol</i>)
CFN	0.8	CFC – slopes (3-12%, 3-4e)
CFZ	0.6	CFD – semi-arable slopes (8-20%, 4e)
		<p>CFM – slopes with areas of raised subsoil salinity (3-10%, 3e, 2-3s) CFN – semi-arable slopes with areas of raised subsoil salinity (8-20%, 4e, 2-3s) CFZ – summit surface (slopes 2-5%, 3-2e). Summary: stoniness, waterlogging, acidity, water erosion risk, raised subsoil salinity levels, and fertility are the main issues.</p>



FOB	1.6	Mostly arable slopes.
FOC	1.6	Main soils: <u>ironstone soil J2</u> (<i>Ferric Brown Chromosol-Sodosol</i>) often with some quartz fragments.
FOL	0.7	With <u>stony texture contrast soil</u> overlying weathered sandstone or meta-sandstone K4 (<i>stony Brown Chromosol-Sodosol</i>) and <u>texture contrast soil F2-F1</u> (<i>Brown Sodosol-Chromosol</i>).
FOM	5.3	FOB – slopes (1-3%, 2e) FOC – slopes (3-6%, 3-2e) FOL – slopes with areas of raised subsoil salinity (slopes 1-3%, 2e, 2-3s) FOM – slopes with areas of raised subsoil salinity (slopes 3-8%, 3-2e, 2-3s). Summary: waterlogging, acidity, water erosion risk, raised subsoil salinity levels, and low fertility due to ironstone are the main issues.
FRB	0.3	Mostly arable slopes and remnant plateau surfaces.
FRZ	3.3	Main soils: <u>ironstone soil J2</u> (<i>Ferric Brown Chromosol-Sodosol</i>): with minor to limited areas where soils have a ferricrete layer underlying the ironstone gravel layer usually at moderate depth. FRB – upper slopes (1-3%, 2e) FRZ – remnant plateau surfaces. Summary: waterlogging, acidity, and low fertility due to ironstone are the main issues.
FUB	0.6	Mostly arable plateau surfaces and slopes.
FUZ	2.3	Main soils: <u>ironstone soil J2</u> (<i>Ferric Brown Chromosol-Sodosol</i>). With some non-ferric <u>texture contrast soil F2-F1</u> (<i>Brown Sodosol-Chromosol</i>).
FUAn	1.6	<i>Slopes and plateau surfaces:</i>
FUBn	2.9	FUB – slopes (1-4%, 2-3e, 3-4w) FUZ – plateau surfaces (3-4w). <i>More fertile slopes and plains:</i> FUAn – mid-level plains with increased natural fertility. With dark loam surface soil and large native eucalypt trees: stringybarks and some sugar gums. The sugar gums occur on those soils without ironstone. Found in the north of the system. (slopes 0-1.5%, 1e) FUBn – slopes (as above) (1-4%, 2-3e) Summary: waterlogging, acidity, and reduced fertility due to ironstone are the main issues.
FVC	0.5	Arable to semi-arable remnant plateau surfaces and slopes.
FVZ	0.7	Main soils: <u>ironstone soil J2</u> (<i>Ferric Brown Chromosol-Sodosol</i>) often with some quartz fragments. With <u>stony texture contrast soil</u> overlying weathered sandstone or meta-sandstone K4 (<i>stony Brown Sodosol-Chromosol</i>). FVC – slopes (3-8%, 3e). FVZ – remnant plateau surfaces (slopes 0-4%, 2-3e). Can include some ironstone soils with red subsoil. Summary: waterlogging, acidity, and low fertility are the main issues.
HCO	4.7	Non-arable creeks and associated slopes. Relatively fertile areas, with upper storey native vegetation dominated by sugar gums, except in the very wet creek flats where swamp wattles tend to dominate. Main soils: <u>texture contrast soils F2-F1</u> (<i>Brown Sodosol-Chromosol</i>). With some <u>deep loamy soil</u> in creek flats (M1) and some <u>stony texture contrast soils</u> on steeper slopes (K4). HCO – creeks with minor patches of saline seepage in creek flats (slopes 1-20%, 3e, 2 ^s , 5-4w). Summary: relatively fertile creek areas with minor salinity: non-arable due to wetness and inundation frequency.
HZE	2.3	Non-arable drainage depressions: the more sluggish upper reaches of the drainage system. Upper
HZO	3.8	storey vegetation includes swamp wattle in the creek flats, and stringybark on the lower slopes.
HZT	0.9	Some dead trees occur due to rising salinity levels; and sea barley grass, another indicator of saline conditions, occurs in many cleared creek flats. Main soils: loamy, with some sandy, <u>texture contrast soil F2-F1-G4</u> (<i>Brown Sodosol-Chromosol</i>). (Some areas with weathered rock at less than 1m: K4 .) With some <u>deep loamy soil</u> in drainage flats (M1). HZE – upper creek lines with no obvious salinity (slopes 0-3%, 3e, 2-3s, 7-5w). HZO – upper creek lines with <10% saline seepage (slopes 0-3%, 3e, 3 ^s , 7-5w). HZT – upper creek lines with 10-50% saline seepage (slopes 0-3%, 3e, 4-3 ^s , 7-5w). Summary: marginally saline and wet creek line – subject to fairly frequent inundation.



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 - gullying
r - surface rockiness	s - salinity	w - waterlogging	y - exposure

Detailed soil profile descriptions:

Main soils:

J2 Ironstone soil (*Ferric Brown Chromosol-Sodosol*)

Medium thickness to very thick loamy topsoil with ironstone gravel; over yellow-brown, brown, or olive-brown mottled clay. The topsoil will often include fragments of quartz. Topsoils are occasionally sandy clay loams. A bleached sub-surface layer can occur. On plateau surfaces the ironstone gravelly layer can be very thick, or is occasionally underlain by a ferricrete layer. Also ironstone nodules/gravel can occur in the upper clay subsoil. Subsoils can be sodic. pHs vary from acidic to strongly acidic. Found on remnant plateau surfaces, slopes, especially upper slopes, and plains.

A more fertile and better drained variant of this soil with dark loam topsoil occurs in the very north of the land system.

K4 Stony texture contrast soil (*stony Brown Chromosol-Sodosol*)

Medium thickness to thick loamy topsoil, often with a bleached sub-surface layer; over yellow-brown or olive-brown mottled clay subsoil; overlying weathered meta-sandstone or sandstone. The topsoil usually includes fragments of quartz, and often sandstone/meta-sandstone fragments and ironstone nodules. Subsoil clays can be sodic, especially in lower-lying situations. pHs vary from acidic to strongly acidic. Found on slopes, especially the steeper ones, and some crests.

A variant of this soil is found in the east of the system and has sandy topsoil with a bleached sub-surface layer and some quartz fragments on a sodic clay subsoil.

F2-F1 Texture contrast soil (*Brown-Grey Sodosol-Chromosol*)

Medium thickness to thick loamy topsoil, very often with a bleached sub-surface layer which can sometimes be sandy; over yellow-brown, olive-brown, olive or grey mottled clay. Topsoils can even be clay loamy to light clayey in depositional situations such as drainage flats, but will still have a sandy to loamy bleached sub-surface layer. Ironstone nodules can occur throughout the profile; some quartz fragments can occur, particularly in the subsoil. The subsoil clay is most often sodic. pHs vary from acidic to strongly acidic. Found on slopes, especially lower slopes, plains, plateau surfaces and drainage depressions.

A more fertile and better drained variant of this soil with dark loam topsoil occurs in the north of the land system.

Minor soils:

M1 Deep loamy soil (*loamy Tenosol*)

Thick to very thick dark loamy topsoil, which sometimes has alternate layers of lighter colour and texture. This can be underlain by sandy to loamy soil which can be bleached. Found in creek flats.

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

