

# HAV Happy Valley Land System

Gently undulating plains dominated by carbonate sands. The system consists of plains, with some depressions and low rises. Extensive areas are overlain with low jumbled dunes. Adjacent and interspersed rises form the Coonarie Land System.

**Area:** 124.5 km<sup>2</sup>

**Landscape:** The land system consists gently undulating plains, with some depressions and low rises. The land is completely overlain by calcrete and carbonate sand deposits. In recent geological times deep carbonate sands blanketed this area. Leaching of carbonate has led to the formation of a calcreted calcarenite core. Some areas have lost much of their cover of carbonate sand; exposing the calcrete core. Extensive areas are covered by low jumbled sand dunes. Soil depth often varies drastically over short distances - from deep to very shallow - this is due to the mobile nature of the carbonate sand and the presence of the underlying calcreted calcarenite core.

**Annual rainfall:** 445 – 490 mm average

**Main soils:** **B1** Shallow carbonate sand on calcrete (around 62% of area)  
**H1** Carbonate sand (around 38% of area)

**Main features:** Soils range from deep to very shallow over calcrete, with textures of fine loamy sand to light fine sandy loam. These soils are composed almost entirely of finely ground shell fragments. The main issues are the highly infertile nature of carbonate sand, wind erosion, water repellence, stoniness and soil depth. High carbonate levels reduce the availability of phosphorus, manganese, zinc and iron. Regular applications of manganese are needed for productive agriculture. Copper is also commonly deficient but can be corrected by occasional applications.

These sandy soils need adequate vegetative cover at all times to minimise the risk of wind erosion. Water repellence in surface soils is common and exacerbates the potential for wind erosion. Many soils are too stony and shallow for cropping. Conversely, deep sands occur on many low dunes, and these are semi arable at best due to infertility and wind erosion risk. Saline seepage occurs as raised subsoil salinity levels, and marginal salinity in some depressions. Many areas of native vegetation exist, so nature conservation is an issue.

## Soil Landscape Unit summary: Happy Valley Land System (HAV)

In this land system report, soil landscape areas with a '1' as the fourth character of the label are deemed to be non arable. This may be due to deep sandy soils, stony soils, or such areas may just be covered with native vegetation.

SLU	% of area	Main features #
YAC1	0.7	Land dominated by deep to moderate depth carbonate sands. Main soils: carbonate sand (soil <b>H1</b> ). Minor to limited areas of shallow carbonate sand on calcrete can occur (soil <b>B1</b> ). <i>Land with &gt;90% jumbled low sand dunes:</i> <b>YAC1</b> – non arable to semi arable level to gently undulating plains overlain with >90% jumbled low sand dunes (slopes 0-3%, 5-4a, 1-2s, 2-1r, 2-1y).
YEL	0.7	Land dominated by deep, moderate depth, and shallow carbonate sands.
YEU	6.2	Main soils: carbonate sand (soil <b>H1</b> ) and limited to extensive areas of shallow carbonate sand on calcrete (soil <b>B1</b> ). Many relict calcreted low dunes occur, and are mostly non
YEV	4.7	



YEVI	0.8	<p>arable due to shallow stony soils. Some low sand dunes are non arable; the rest are semi arable.</p> <p><i>Land with 0-30% jumbled low sand dunes:</i></p> <p><b>YEL</b> – mostly arable rises with 0-30% jumbled low sand dunes (slopes 0-3.5%, 1-2e, 3-4a, 1-2s, 3-2-4r, 2-1y).</p> <p><b>YEU</b> – mostly arable gently undulating plains with 0-30% jumbled low sand dunes and relict calcreted low dunes (slopes 0-2%, 5-20% non arable stony areas, 0-10% non arable deep sand, 3a, 2s, 0-5% non arable stony areas, 3-2-4r).</p> <p><b>YEV</b> – mostly arable relatively low lying plains/depressions (slopes 0-1.5%, 2-3a, 2-3s, 3-2r).</p> <p><b>YEVI</b> – non arable depressions (slopes 0-2%, 1-2e, 2-3a, 2-3s, 3-2r).</p> <p><b>YEW</b> – mostly arable depressions with some saline seepage (slopes &lt;1%, 1-2w, 2-3a, 3-2s, 3-2r).</p> <p><b>YEW1</b> – non arable depressions with some saline seepage (slopes 0-1.5%, 1-2w, 2-3a, 3-2s, 3-2r).</p> <p><b>YEX</b> – semi arable depression with marginal salinity (slopes &lt;1%, 2w, 2a, 4-3s, 3-2r).</p> <p><i>Land with 30-60% jumbled low sand dunes:</i></p> <p><b>YEI</b> – arable to semi arable low rises overlain with 30-60% jumbled low sand dunes (slopes 0-3.5%, 1-2e, 5-10% non arable stony areas, 5-20% non arable deep sand, 4-3a, 1-2s, 2-3-1r, 2-1y).</p> <p><b>YEI1</b> – non arable low rises overlain with 30-60% jumbled low sand dunes (slopes 1-3%, 1-2e, 4-3a, 1-2s, 2-3-1r, 2-1y).</p> <p><b>YER</b> – arable to semi arable gently undulating plains overlain with 30-60% jumbled low sand dunes (slopes 0-2%, 4-3a, 2-1s, 2-3-1r, 1-2y).</p> <p><b>YERs</b> – arable, semi arable to non arable low lying plains overlain with 30-60% jumbled low dunes with some saline seepage (slopes 0-2%, 4-3a, 2-3s, 2-3-1r).</p> <p><b>YEd</b> – semi arable low lying plains overlain with 30-60% jumbled low sand dunes with some saline seepage (slopes 0-2%, 4-3a, 3-2s, 2-3r).</p> <p><i>Land with 60-90% jumbled low sand dunes:</i></p> <p><b>YEF</b> – mostly semi arable to non arable jumbled low to moderate height dunes overlying low rises (slopes 0-3.5%, 4-5a, 10-30% non arable deep sand, 1-2s, 2-1r, 2-1y).</p> <p><b>YEO</b> – mostly semi arable jumbled low dunes overlying relatively low lying level to gently undulating plains (slopes 0-2%, 4a, 2-1s, 0-15% non arable stony areas, 5-20% non arable deep sand, 2-1r, 1-2y).</p> <p><b>YEOs</b> – mostly semi arable jumbled low dunes overlying low lying plains with some saline seepage (slopes 0-2%, 4a, 0-10% non arable stony areas, 5-20% non arable deep sand, 2-3s, 2-1r).</p> <p><b>YEN</b> – non arable to semi arable jumbled moderate height to low sand dunes overlying low lying level plains (slopes 0-4.5%, 4-5a, 2-1s, 2-1r, 2-1y).</p>	
YEW	2.0		
YEW1	1.1		
YEX	<0.1		
YEI	1.8		
YEI1	0.1		
YER	10.3		
YERs	4.0		
YEd	0.8		
YEF	2.4		
YEO	7.7		
YEOs	1.9		
YEN	0.1		
YdB	<0.1		Land dominated by shallow to moderate depth carbonate sands.
YdL	8.7		Main soils: shallow carbonate sand on calcrete (soil <b>B1</b> ), with limited to extensive areas of moderate depth to deep carbonate sand (soil <b>H1</b> ).
YdL1	0.6		
YdU	5.8	<b>YdB</b> – moderate size dune (slopes 0.5-4.5%, 2-1e, 3-4a, 1-2s, 4-3r, 2-1y).	
YdU1	0.8	<b>YdL</b> – mostly arable gently undulating plains, and a few low rises and slight slopes (slopes 0-2%, 1-2e, 2-3a, 2-1s, 4-3r).	
YdUn	10.0		
YdW	7.3	<b>YdL1</b> – non arable gently undulating plains to very low rises (slopes 0-1.5%, 2-3a, 2-1s, 4r).	
YdW1	2.3	<b>YdU</b> – arable, semi arable, and non arable low lying plains or occasionally lower slopes with some saline seepage (slopes 0-1.5%, 2-3a, 2-3s, 5-20% non arable stony areas, 4-3r).	
YdX1	2.9	<b>YdU1</b> – non arable low lying plains with some saline seepage (slopes 0-1%, 2-3a, 2-3s, 4r).	
		<b>YdUn</b> – low lying level plains with 0-10% jumbled low sand dunes and some saline seepage (slopes <1%, 3-2a, 2-3s, 0-5% non arable stony areas, 3-4r).	
		<b>YdW</b> – mostly arable depressions with some saline seepage (slopes <1%, 2-3a, 3-2s, 0-15% non arable stony areas, 3-4r).	
		<b>YdW1</b> – non arable depressions with some very low rises and with some saline seepage (slopes <1%, 2-3a, 3-2s, 4-3r).	
		<b>YdX1</b> – non arable depressions with some very low sand dunes and marginal salinity (slopes 0-1.5%, 2a, 4-3s, 4-3r).	



YaL	0.9	Land dominated by very shallow to shallow carbonate sands.
YaL1	9.5	Main soils: shallow carbonate sand on calcrete (soil <b>B1</b> ). With minor to limited areas of moderate depth carbonate sand (soil <b>H1</b> ). And some areas of shallow calcareous loam on calcrete can occur (soil <b>B2</b> ).
YaU	0.8	
YaU1	4.6	
YaW	0.2	<b>YaL</b> – arable, semi arable and non arable low rises to rises (slopes 0-2.5%, 1-2e, 2a, 1-2s, 4-5r).
YaX	0.2	
Yap1	<0.1	<b>YaL1</b> – non arable stony plains and very low rises and slight slopes (slopes 0-2%, 1-2e, 2a, 2-1s, 5-4r). <b>YaU</b> – semi arable to non arable relatively low lying stony plains (slopes <1%, 2a, 2-3s, 4-5r). <b>YaU1</b> – non arable relatively low lying stony plains (slopes <1%, 2-1a, 2-3s, 5-4r). <b>YaW</b> – semi arable low lying plains (slopes 0-1%, 2-1a, 3-2s, 4-5r). <b>YaX</b> – semi arable to non arable depressions with marginal salinity (slopes <1%, 2-1a, 4-3s, 4-5r). <b>Yap1</b> – non arable stony slopes and low rises (slopes 1.0-3%, 2-1e, 2a, 2-1s, 5-4r).

# 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:

- B1** *Shallow carbonate sand on calcrete*  
[Petrocalcic Shelly Calcarosol, or occasionally Petrocalcic Supravescant Calcarosol]  
Loose to powdery, grey brown fine loamy sand to light fine sandy loam, composed of finely divided shell fragments, overlying calcreted calcarenite at shallow or very shallow depth. Many of these soils are too stony and shallow to be cropped. Found on plains, depressions, and rises.
- H1** *Carbonate sand* [Shelly Calcarosol]  
Loose to powdery, grey brown fine loamy sand to light fine sandy loam, composed of finely divided shell fragments, overlying calcreted calcarenite at moderate depth or more. Grey organic stained topsoils overlie light coloured subsoils (pale brown to very pale brown). Found on low dunes, plains, depressions, and rises.

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

