

WPY Waupunyah Land System

Area: 143 km²

Landscape: Gently undulating to undulating pediments with protruding rocky rises adjacent to the western edge of the Porcupine Range and the Parnaroo Land System rises. Pediment soils are mostly red, non-calcareous gradational Kandosols while the rises have very shallow rocky soils.

Annual rainfall: 250 – 325 mm range, but over 80% receives only 250 – 275 mm average

Geology: Proterozoic sedimentary rocks including: Wilpena Group quartzite, siltstone and shale; calcareous in part; siltstone, sandstone, diamictite and tillite in the Umberatana Group. Pleistocene undifferentiated alluvial/fluviol sediments occur in the broader pediment slopes in the northern part of the land system.

Main soils: **M4** (21%) Deep hard gradational sandy loam (Hard Brown-Dark Kandosol- Dermosol)
C3 (20%) Friable gradational clay loam (Calcic-Hypercalcic Red Dermosol-Calcarosol)
A3 (14%) Deep moderately calcareous loam (Calcic Calcarosol)
D4 (12%) Loam over pedaric red clay (Pedaric Red Sodosol-Dermosol)

Minor soils: **A2** (9%) Calcareous loam on rock (Paralithic Calcarosol)
L1 (7%) Shallow soil on rock (Rocky Rudosol-Tenosol)
A4 (6%) Deep (rubbly) calcareous loam (Hypercalcic-Lithocalcic Calcarosol)
A5 (5%) Rubbly calcareous loam on clay (Supracalcic-Lithocalcic Calcarosol on clay)

Summary: The Waupunyah Land System consists of a series of gently undulating rises and fan deposits on the western edge of the Porcupine Range. Underlying rocks are Proterozoic sedimentary rocks with a range of lithologies. Fan soils are mostly red, non-calcareous gradational Kandosols while the rises have very shallow rocky soils.

Soil Landscape Unit summary: Waupunyah Land System (WPY)

SLU	% of area	Component	Main soils	Prop#	Notes
ADA	0.2	Rise	A2L1	D	Non-arable undulating rocky rises formed on limestones and calc-siltstones with very shallow rocky soils, bare rock outcrop. 10-30% calcareous loam on rock. Relief is less than 30m, slopes are 3-10%. Main soils: <u>Calcareous loam on rock – A2</u> and <u>Shallow stony soils on rock - L1</u> .
AIA	3.3	Rise	L1A2	D	Rises with very shallow sandy loam, or rock outcrop or shallow gradational loam over red clay loam on fine-grained rock. AIA Gently undulating rises. Slopes are 1-3%, relief is less than 30m. AIB Rolling rises as above. Relief is 9-30m, slopes are 10-30%. Main soils: <u>Shallow stony soils on rock - L1</u> and <u>Calcareous loam on rock – A2</u> .
AIB	6.3	Rise	L1A2	D	
AKB	0.5	Ridge	L1	D	Hills and rises with very shallow rocky calcareous soils formed on coarse-grained rocks of the Pre-Cambrian Burra Group including the Rhynie Sandstone and Skillingollee Dolomite. AKB Rolling rises. Relief is 9-30m, slopes are 10-30%.
AKC	0.4	Ridge	L1	D	
AKD	0.8	Ridge	L1	D	



					<p>AKC Rolling low hilly ridge. Relief is 30-90m, slopes are 10-30%. AKD Steep low hilly ridge. Relief is 30-90m, slopes are 30-50%.</p> <p>Main soils: <u>Shallow stony soils on rock</u> - L1.</p>
AWA	0.7	Ridge	L1	D	<p>Undulating rises with shallow rocky soils formed on quartzites with more than 50% interbedded calcareous rocks. More than 20% of soils have secondary carbonate accumulations. Relief is less than 30m, slopes are 3-10%.</p> <p>Main soils: <u>Shallow stony soils on rock</u> - L1.</p>
AYA	1.2	Rise	A2L1	D	<p>Undulating rises on fine-grained rocks, especially siltstones of the Tapley Hill Formation with shallow calcareous loam on calcareous siltstone or other fine grained rocks, or bare rock. Relief is less than 30m, slopes are 3-10%.</p> <p>Main soils: <u>Calcareous loam on rock</u> – A2 and <u>Shallow stony soils on rock</u> - L1.</p>
DaV	3.0	Slope	D1D4	D	<p>Gently sloping pediment plains with texture contrast or gradational clay loam over red clay on rock; or clay loam over crumbly red clay. Moderately scalded, with 10-50% of land affected. Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils: <u>Loam over pedaric red clay on rock</u> - D1 and <u>Clay loam over pedaric red clay</u> - D4.</p>
EDB	2.8	Rise	A2C2	E	<p>Rises and fans on quartzite with gradational red loamy sand on rock or very shallow loamy sand on rock.</p> <p>EDB Gently undulating rises and fans. Slopes: 1-3%, relief: < 30m. EDC Undulating rises and fans. Relief: <30m, slopes: 3-10%.</p> <p>Main soils: Rises: <u>Calcareous loam on rock</u> – A2 and <u>Gradational loam on rock</u> - C2. Fans: <u>Gradational loamy sand</u> - M4 and <u>Deep moderately calcareous loam</u> - A3.</p>
		Fan	M4A3	E	
EDC	1.5	Rise	A2C2	E	
		Fan	M4A3	E	
EHB	1.6	Rise	A2	E	<p>Rises and pediments on calcareous siltstones and limestones such as those of the Proterozoic Umberatina Group and Wilpena Group. The soil-landscape units are also associated with some outwash contribution from calcareous calc-siltstones.</p> <p>EHB Gently sloping plains with rocky outcrops. Gently sloping Plains: Slopes are 1-3%, relief is less than 9m. Rocky rises: Slopes are 3-10%, relief is 9-30m.</p>
		Fan	M4	E	
EHC	0.7	Rise	A2D1	E	
		Fan	M4	E	<p>EHC Undulating rises and pediments. Relief is less than 30m, slopes are 3-10%.</p>
EHG	0.9	Rise	A2D1	V	
		Drainage depression	M1M4	E	<p>EHG Gently undulating rise. Drainage lines are incised and gullying is common. Relief is less than 9m, slopes are 1-3%.</p>
EHV	0.7	Rise	A2D1	E	<p>EHV Gently undulating pediments with rocky rises Rocky Rises: Undulating rises, 5-50% of land is scalded. Slopes are 3-10%, relief is 9-30m. Fans: Gently undulating plains, 50-50% of land is scalded. Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils: Rises: <u>Calcareous loam on rock</u> – A2 and <u>Loam over pedaric red clay on rock</u> - D1. Fans: <u>Gradational loamy sand</u> - M4. Drainage depressions: <u>Deep alluvial loam</u> - M1 and <u>Gradational loamy sand</u> - M4.</p>
		Fan	M4	E	
EOB	0.2	Rise	A2	V	<p>Gently undulating rises with pulverulent calcareous soils formed mainly on Wilpena Group calc-siltstones. Slopes are 1-3%, relief is less than 30m.</p> <p>Main soils:</p>
		Fan	M4C3	E	



					<p>Rises: <u>Calcareous loam on rock</u> – A2.</p> <p>Fans: <u>Gradational loamy sand</u> - M4 and <u>Friable gradational sandy clay loam</u> - C3.</p>
EVB	0.8	Rise	A2L1	D	<p>Gently undulating rises with rock outcrops and shallow calcareous soils formed on fine-grained calcareous rocks.</p> <p>Slopes are 1-3%, relief is less than 30m.</p> <p>Main soils: <u>Calcareous loam on rock</u> – A2 and <u>Shallow stony soils on rock</u> - L1.</p>
JFk	10.8	Flat	D4M4	D	<p>Plains with mostly red texture contrast soils with clay loam surfaces, calcareous soils occupy more than 20% and other gradational soils occupy more than 10%. Plains have around 50% scalded land and over 20% is gullied.</p> <p>Main soils: <u>Loam over pedaric red clay</u> - D4 and <u>Gradational loamy sand</u> - M4.</p>
JIB	1.8	Fan	D4M4	D	<p>Gently sloping fan with mostly deep red texture contrast soils. More than 20% are deep rubbly calcareous loam on clay soils.</p> <p>Main soils: <u>Loam over pedaric red clay</u> - D4 and <u>Gradational loamy sand</u> - M4.</p>
JYv	1.4	Fan	D4A3	D	<p>Gently undulating fans with clay loam over red, often crumbly, clay or rubbly calcareous loam on clay. Commonly also shallow on rock.</p> <p>Moderately gullied (10-20%), severely scalded (over 50%). Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils: <u>Clay loam over pedaric red clay</u> - D4 and <u>Deep moderately calcareous sandy loam</u> - A3.</p>
KcB	0.7	Fan	A3A5	D	<p>Fans with mostly gradational calcareous soils, but with more than 20% <u>non</u>-calcareous gradational soils (Kandosols).</p> <p>KcB Gently sloping fans. Slopes are 1-3%, relief is less than 9m.</p> <p>KcE Creek flat.</p> <p>KcG Gently sloping fans. Slopes are 1-3%, relief is less than 9m.</p> <p>Gullying affects 10-20% of land.</p> <p>Main soils: <u>Deep moderately calcareous sandy loam</u> - A3 and <u>Rubbly calcareous loam on clay</u> - A5.</p>
KcG	0.6	Fan	A3A5	D	
KGB	8.2	Fan	C3	D	<p>Pediments and plains with sandy surface-textured red gradational soils with calcareous subsoils.</p> <p>KGB Gently undulating pediments.</p> <p>Slopes are 1-3%, relief is less than 9m.</p> <p>KGV Gently undulating pediments, moderately scalded (5-10%). Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils: <u>Friable gradational sandy clay loam</u> - C3.</p>
KGV	10.4	Fan	C3	D	
KLB	0.2	Low rise	A6A4	D	<p>Pediments with clay loamy calcareous soils.</p> <p>KLB Gently undulating pediments. Slopes: 1-3%, relief is less than 9m.</p> <p>Main soils: <u>Gradational calcareous clay loam</u> - A6 and <u>Deep (rubbly) calcareous sandy loam</u> - A4.</p>
KOB	2.2	Fan	A5A4	V	<p>Pediments with calcareous soils occupying more than 80% of land.</p> <p>KOB Gently sloping pediments.</p> <p>Slopes are 1-3%, relief is less than 9m.</p> <p>KOG Gently sloping pediments. Moderately gullied (5-10%). Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils:</p> <p>Fans: <u>Rubbly calcareous loam on clay</u> - A5 and <u>Deep (rubbly) calcareous sandy loam</u> - A4.</p> <p>Rises: <u>Calcareous loam on rock</u> – A2.</p>
		Rise	A2	L	
KOG	9.1	Fan	A5A4	V	
		Rise	A2	L	



KUB	0.2	Fan	C3M4 A3	D	Gently undulating pediments and associated drainage lines with clayey soils with uniform or gradational texture profiles and calcareous subsoils. Main soils: <u>Friable gradational clay loam</u> - C3 , <u>Gradational loamy sand</u> - M4 and <u>Deep moderately calcareous sandy loam</u> - A3 .
KVB	3.5	Rise	A4A3	D	Gently sloping plains formed on outwash sediments with mostly gradational calcareous clay loam surfaced soils. 10-30% only, are rubbly or deep moderately calcareous clay loam. Slopes are 1-3%, relief is less than 9m. Main soils: <u>Deep (rubbly) calcareous sandy loam</u> - A4 and <u>Deep moderately calcareous clay loam</u> - A3 .
KXB	20.0	Fan	M4C3	D	Fans with gradational sandy loam over red clay on rock; 10-30% deep calcareous sandy loam over, often rubbly, clay. KXB Gently sloping fans. Slopes are 1-3%, relief is less than 9m. KXC Undulating fans. Slopes are 3-10%, relief is less than 9m. KXo Gently sloping fans. Moderately gullied and scalded. Main soils: <u>Gradational loamy sand</u> - M4 and <u>Friable gradational sandy clay loam</u> - C3 .
KXC	0.4	Fan	M4C3	D	
KXI	3.9	Fan	M4C3	D	
KYB	0.5	Fan	A4M4	D	Gently sloping fan deposit formed on outwash materials with predominantly deep calcareous gradational soils with sandy loam to sandy clay-loam surfaces. Slopes are 1-3%, relief is less than 9m. Main soils: <u>Deep (rubbly) calcareous sandy loam</u> - A4 and <u>Gradational loamy sand</u> - M4 .
KZC	0.7	Fan	M4C3	D	Undulating fans with deep sandy loam grading to rubbly clay, or gradational loam over red clay on rock. Slopes are 3-10%, relief is less than 9m. Main soils: <u>Gradational loamy sand</u> - M4 and <u>Friable gradational sandy clay loam</u> - C3 .

PROPORTION codes assigned to Soil Landscape Unit (SLU) components:

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|--|-------------------------------------|
| D Dominant in extent (>90% of SLU) | C Common in extent (20–30% of SLU) |
| V Very extensive in extent (60–90% of SLU) | L Limited in extent (10–20% of SLU) |
| E Extensive in extent (30–60% of SLU) | M Minor in extent (<10% of SLU) |

Detailed soil profile descriptions:

A2/L1 Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol)(A2)

Gradational calcareous sandy loam over clay loam on weathered rock.

OR Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol)(L1)

Shallow calcareous sandy loam on rock.

A3 Deep moderately calcareous (sandy) loam (Calcic Calcarosol)

Calcareous (sandy) loam topsoil grading into loamy-clay loamy subsoil without a significant CO₃ buildup in the subsoil (<20% CO₃ in subsoil). Pediment type Calcarosols.

A4 Deep (rubbly) calcareous loam Hypercalcic-Lithocalcic Calcarosol)

Calcareous sandy-clay loamy topsoil grading into loamy-clay loamy subsoil with a significant CO₃ buildup in the subsoil. Often rubbly. Soil usually >120 cm in depth

A5 Rubbly calcareous loamy sand on clay (Supracalcic-Lithocalcic Calcarosol on clay)

Calcareous loamy sand topsoil grading into loamy-clay loamy subsoil on a clayey substrate. Usually rubbly. Clayey substrate occurs at >60 cm and <120 cm.



- A6** Gradational calcareous clay loam (Pedal Hypercalcic-Lithocalcic Calcarosol on clayey subsoil)
Calcareous loams to clay loams grading into brown-red clay. Often rubbly.
- C2** Gradational loam on rock (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to friable red clay with soft Class I carbonate within 50 cm, grading to weathering rock within 100 cm.
- C3** Gradational clay loam (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to friable red clay with soft Class I carbonate within 50 cm, grading to alluvium within 100 cm.
- D1** Loam over red clay on rock (Hypercalcic / Calcic, Red Chromosol / Sodosol)
Medium thickness hard gravelly loam over a red clay, friable and finely structured (D1), to hard, coarsely structured and dispersive (D7), calcareous with depth, grading to weathering basement rock within 100 cm.
- D4** Loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness fine sandy loam to loam over finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.
- L1** Shallow stony loam (Paralithic, Leptic Tenosol)
Shallow stony loam, often calcareous throughout or with depth, overlying weathering rock shallower than 50 cm.
- M1** Alluvial loam (Orthic Tenosol)
Very thick loam with variable gritty or more-clayey lenses, formed over recent alluvium.
- M4** Gradational loamy sand (Hypocalcic, Red / Brown Kandosol)
Medium to thick massive (often powdery) loamy sand to sandy loam grading to a red or brown sandy clay loam becoming more clayey and weakly calcareous with depth.

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

