

BRC Bruce Land System

Area:	219.5 km ²
Landscape:	Grey calcareous and red clayey plains and pediments east of the Willochra creek. Named from the hamlet of Bruce.
Annual rainfall:	270 – 335 mm
Geology:	Pleistocene and Holocene calcareous pediment and slope deposits including Telford Gravel and Pooraka Formation.
Topography:	Level to gently inclined pediments which lie to the east of the Willochra Creek alluvial plain land system. Slopes are generally 1 - 2%. The land system is bisected by the incised Bellaratta-Coonatto creek system, but mostly drainage lines are broad, not deeply incised, and occur regularly along the pediment. In some areas, south of Hammond, drainage channels are poorly defined.
Elevation:	240 - 250 m in the north, and 300 - 320 m in the south
Relief:	Mostly less than 10 metres and frequently less than 1 - 2m, particularly in the south
Typical soils:	<p>There is a gradual change in the dominance of soils from more highly calcareous loams with rubbly subsoils on pediments in the north and closer to the ranges; to extensive red clay plains in the south and west.</p> <p>Calcareous loam/clay loam grading to rubbly highly calcareous clay loam or clay (Calcarosols) on gently sloping to undulating pediments and plains, formed as outwash from ranges of calcareous rocks to the east</p> <p>Thin crusty loam over very friable red clay (Sodosols) occur on lower slopes of pediments and adjacent to the alluvial soils of the floodplain. They are gravelly at depth where gypsum is often present below the carbonate layer.</p> <p>Friable red clay (pedaric Dermosols or Vertosols) on pediments and plains, mostly with carbonate and gypsum at depth.</p>
Main soils:	<p>C3 (32%) Friable gradational clay loam (Calcic-Hypercalcic Red Dermosol-Calcarosol)</p> <p>A5 (15%) Rubbly calcareous loam on clay (Supracalcic-Lithocalcic Calcarosol on clay)</p> <p>C1 (15%) Gradational sandy loam (Calcic-Hypercalcic Kandosol-Calcarosol)</p>
Minor soils:	<p>A3 (9%) Deep moderately calcareous loam (Calcic Calcarosol)</p> <p>D4 (8%) Loam over pedaric red clay (Pedaric Red Sodosol-Dermosol)</p> <p>A4 (5%) Deep (rubbly) calcareous loam (Hypercalcic-Lithocalcic Calcarosol)</p> <p>D2 (4%) Loam over red clay (Calcic-Hypercalcic Red Chromosol-Sodosol)</p>
Summary:	The Bruce Land System is comprised of a series of pediments, plains and fans with associated drainage lines which join the Willochra Creek to the west. Red gradational and rubbly calcareous soils are dominant, but red duplex soils are also common. Some ironstone gravelly and red clay soils occur on plateau remnants in places.



Soil Landscape Unit summary: Bruce Land System (BRU)

SLU	% of area	Component	Main soils	Prop#	Notes
DGB	0.4	Gently sloping pediments	D2D1	D	Gently sloping pediments with shallow red duplex soils over Brachina formation shale. The soils have sandy clay loam surface textures. Relief is less than 9m, slopes are 1-3%. Main soils: <u>Sandy Clay Loam over red clay - D2</u> and <u>Sandy Clay loam over pedaric red clay on rock - D1</u> .
EHV	0.1	Gently undulating pediments	A2	V	Gently undulating pediments and rocky rises on calcareous siltstones and limestones such as those of the Tapley Hill Formation, Wonoka Formation and the ABC Range Quartzite of the Wilpena Group. The soil landscape units are also associated with Bunyeroo Formation shales with some outwash contribution from calcareous Wonoka Formation calc-siltstones. Gently sloping Plains: Slopes are 1-3%, relief is less than 9m. Rocky rises: Slopes are 3-10%, relief is 9-30m. Main soils: Rocky rises: Shallow stony soils on rock - L1 and Bare rock - RR. Plains and Pediments: <u>Calcareous loam on rock - A2</u> , <u>Loam over poorly structured clay on rock - D7</u> and <u>Shallow stony soils on rock - L1</u> .
		Rocky rises	A2L1	C	
HEI	0.6	Gently undulating rises	J1D4 A5	D	Gently undulating rises with ironstone gravelly red texture contrast soils underlain by deeply weathered basement. 5-10% of land is scalded and 5-10% is gullied. Slopes are 1-3%, relief is less than 30m. Main soils: <u>Ironstone gravelly soil with calcareous lower subsoil - J1</u> , <u>Loam over pedaric red clay - D4</u> and <u>Rubblly calcareous loam on clay - A5</u> .
HFB	0.1	Gently undulating rises	D4D6 C3	D	Rises with red texture contrast soils developed over deeply weathered basement or sediments. HFB Gently undulating rises
HFG	2.4	Gently undulating rises	D4D6 C3	D	HFG Gently undulating rises; with 5-10% gullied land and 0-5% scalded. Main soils: <u>Loam over pedaric red clay - D4</u> , <u>Ironstone-gravelly sandy loam over red clay - D6</u> and <u>Friable gradational clay loam - C3</u> . <u>Rubblly calcareous loam on clay - A5</u> soils also occur as a minor component.
JAE	0.5	Creek line	D4E2 C3	D	Pediments with clay loam surface textures on texture contrast and gradational soils. Red clays are also common. JAE Creek line. Main soils: <u>Loam over pedaric red clay - D4</u> , <u>Red cracking clay - E2</u> and <u>Friable gradational clay loam - C3</u> . D4 and C3 soils have surfaces which are highly susceptible to water erosion.
JFA	0.7	Plains	D2D4 C1	D	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%. JFA Level plains. Slopes: less than 1%, relief is less than 9m. JFJ Creek flat with more than 20% unstable gullied land.
JFJ	2.1	Creek flat	D2D4 C1	D	Main soils: <u>Loam over red clay - D2</u> , <u>Loam over pedaric red clay - D4</u> and <u>Gradational sandy loam - C1</u> .
JMV	0.3	Gently sloping plain	D2D4 A6	D	Pediment plains with stony, pedaric, red, texture contrast soils with quartz gravel on the surface. JMV Gently sloping plains with 10-50% scalded. Slopes are 1-3%, relief is less than 9m. Main soils: <u>Loam over red clay - D2</u> , <u>Loam over pedaric red</u>



					<u>clay - D4</u> and <u>Gradational calcareous clay - A6</u> .
JNA	0.2	Plains	D4D2 A5	D	<p>Pediments with non-stony pedaric, texture contrast soils with calcareous subsoils. Surface textures are clay loamy most commonly.</p> <p>JNA Plains. Slopes are less than 1%, relief is less than 9m.</p> <p>JNk Plain; 10-20% affected by gullyng and 40-50% scalded. Scalding may be more than 50% locally.</p> <p>JNI Gently sloping pediment plain; gullyng affects up to 50% of land, most severe along watercourses. Scalding affects nearly 50% of land. Slopes are 1-3%, relief is less than 9m.</p> <p>JNo Creek flat 10-20% affected by gullyng and 40-50% scalded. Scalding may be more than 50% locally.</p> <p>JNU Level plain; 5-10% scalded. Slopes are less than 1%, relief is less than 9m.</p> <p>JNV Gently sloping pediments. Scalding affects 10-50% of land. Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils: <u>Loam over red clay - D2</u>, <u>Loam over pedaric red clay - D4</u> and <u>Rubbly calcareous loam on clay - A5</u>. Red clay soils occur in minor association.</p>
JNk	0.2	Plains	D4D2 A5	D	
JNI	0.7	Gently undulating pediments	D4D2 A5	D	
JNo	3.4	Creek flats	D4D2 A5	D	
JNU	2.1	Plains	D4D2 A5	D	
JNV	0.6	Gently undulating pediments	D4D2 A5	D	
KCA	13.3	Plains	C3A3	D	<p>Plains and pediments of outwash sediments with gradational soils with sandy clay loam surface textures. Soils are mostly not calcareous throughout.</p> <p>KCA Flat plains. Slopes less than 1%.</p> <p>KCB Gently undulating pediments. Slopes are 1-3%, relief is less than 9m.</p> <p>KCE Creek line.</p> <p>KCI Gently undulating pediments, 10% is gullied and up to 50% is scalded. Slopes are 1-3%, relief is less than 9m.</p> <p>KCm Undulating pediments, 10-20% is gullied and up to 50% is scalded.</p> <p>KCy Creek line with extreme scalding (over 50%) and gullyng (over 50%)</p> <p>KCV Gently undulating pediments with 10-50% scalded and 5-10% gullied. Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils: <u>Friable gradational sandy clay loam - C3</u> and <u>Deep moderately calcareous sandy loam - A3</u>. Additionally, <u>Deep gravelly soil - M3</u> is found associated with creek flats.</p> <p>Plains with mixed red gradational soils with calcareous subsoils and calcareous rubbly soils. Slopes are 0-1%, relief is less than 9m.</p> <p>Main soils: <u>Friable gradational clay loam - C3</u> and <u>Rubbly calcareous loam on clay - A5</u>.</p> <p>Pediments and plains with sandy surface-textured red gradational soils with calcareous subsoils.</p> <p>KGA Plains. Slopes are 0-1%, relief is less than 9m.</p> <p>KGB Gently undulating pediments, with minor scalding and gullyng. Slopes are 1-3%, relief is less than 9m.</p> <p>KGE Creek flat with stable banks.</p> <p>KGJ Creek flat with more than 20% gullied banks.</p> <p>KGI Gently undulating pediments with slight scalding (less than 5%) and minor gullyng which is locally more severe along drainage lines. Slopes are 1-3%, relief is less than 9m.</p> <p>KGy Creek flat with more than 20% gullied banks and 5-10% scalded land.</p> <p>KGV Gently undulating pediments with 5-10% scalding and minor gullyng. Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils: <u>Friable gradational sandy clay loam - C3</u> and <u>Gradational sandy loam - C1</u>.</p>
KCB	1.9	Gently undulating pediments	C3A3	D	
KCE	2.2	Creek line	C3A3 M3	D	
KCI	1.9	Gently undulating pediments	C3A3	D	
KCm	1.7	Undulating pediments	C3A3	D	
KCy	0.3	Creek line	C3A3 M3	D	
KCV	4.1	Gently undulating pediments	C3A3	D	
KDA	5.9	Plains	C3A5	D	
KGA	9.3	Plains	C3C1	D	
KGB	18.8	Gently undulating pediments	C3C1	D	
KGE	0.9	Creek flat	C3C1	D	
KGJ	0.3	Creek flat	C3C1	D	
KGy	0.2	Creek flat	C3C1	D	
KGV	0.2	Gently undulating pediments	C3C1	D	
KLA	1.0	Plains	A5	D	Pediments and plains with clay loamy calcareous soils.



KLB	12.7	Gently undulating pediment	A5	D	<p>KLA Plains. Slopes are 0-1%, relief is less than 9m.</p> <p>KLB Gently undulating pediment. Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils: <u>Rubbly calcareous clay loam on clay</u> - A5. Minor soils include: <u>Calcareous clay loam on rock</u> - A2, <u>Gradational red-brown clay loam over rock</u>-C2 and <u>Shallow calcareous loam on calcrete</u> - B2.</p>
KME	0.4	Creek flat	A5D4	D	<p>Creek flat on which gradational calcareous soils are dominant, and in combination with red texture contrast soils occupy over 90% of the land.</p> <p>Main soils: <u>Rubbly calcareous clay loam on clay</u> - A5 and <u>Loam over pedaric red clay</u> - D4.</p>
KNA	0.4	Plains	A5D4	D	<p>Plains and pediments with more than 50% loamy surface-textured, rubbly calcareous gradational soils and more than 20% texture contrast soils with reddish subsoils.</p> <p>KNA Plains Slopes are 0-1%, relief is less than 9m.</p> <p>KNB Gently undulating pediments. Slopes are 13%, relief is less than 9m.</p> <p>KNU Plains with 5-10% scalded land. Slopes are 0-1%, relief is less than 9m.</p> <p>KNV Gently undulating pediments, with 5-10% scalded land. Slopes are 13%, relief is less than 9m.</p> <p>Main soils: <u>Rubbly calcareous clay loam on clay</u> - A5 and <u>Loam over pedaric red clay</u> - D4.</p>
KNB	1.1	Gently undulating pediment	A5D4	D	
KNU	0.8	Plains	A5D4	D	
KNV	2.7	Gently undulating pediment	A5D4	D	
KQI	0.4	Gently undulating pediment	A5	V	
KQm	0.5	Shallow rises	A2	C	<p>Pediment and basement rise complexes with mostly calcareous gradational soils.</p> <p>KQI Gently undulating pediments with shallow rises. Up to 50% of land on pediments is scalded and up to 10% is gullied. Rises have little or no scalds and gullies. Slopes are 1-3%, relief is less than 9m.</p> <p>KQm Undulating pediments with shallow rises. 10- 50% of land on pediments is scalded and over 20% is gullied. Rises have little or no scalds and gullies.</p> <p>KQV Gently undulating pediments with shallow rises. Up to 10% of pediment land is scalded, and around 5% is gullied. Rises generally do not exhibit gullying and scalding occurs on less than 5%. Slopes are 1-3%, relief is less than 9m.</p> <p>Main soils: <u>Rubbly calcareous loam on clay</u> - A5 on pediments and <u>Calcareous loam on rock</u> - A2 on rises.</p>
		Pediment	A5	V	
KQV	0.2	Shallow rises	A2	C	
		Pediment	A5	V	
XHS	1.6	Drainage line	M1C1 C3	D	
XJS	0.6	Floodplain	M3M1	D	<p>Floodplains with deep, gravelly, medium-textured (loam) alluvial soils.</p> <p>XJS Floodplain</p> <p>XJT Floodplain with eroded watercourse.</p> <p>Main soils: <u>Deep gravelly soil</u> -M3 and <u>Deep alluvial loam</u> - M1.</p>
XJT	2.4	Floodplain	M3M1	D	

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

D Dominant in extent (>90% of SLU)

V Very extensive in extent (60–90% of SLU)

E Extensive in extent (30–60% of SLU)

C Common in extent (20–30% of SLU)

L Limited in extent (10–20% of SLU)

M Minor in extent (<10% of SLU)



Detailed soil profile descriptions:

- A2/L1** Shallow calcareous loam (Paralithic, Hypercalcic / Lithocalcic Calcarosol) (A2) OR Shallow stony loam (Calcareous, Paralithic, Leptic Tenosol) (L1)
- 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.
- A5** Rubby 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.
- C1** Gradational sandy loam (Calcic-Hypercalcic Kandosol-Calcarosol)
Friable sandy to loamy topsoil grading into massive red-brown alkaline loamy to clay loamy subsoil.
- C3** Gradational clay loam (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to a 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 red clay, friable and finely structured, calcareous with depth, grading to weathering basement rock within 100 cm.
- D2** Hard loam over red clay (Calcic / Hypercalcic, Red Chromosol)
Hard setting sandy loam to clay loam (with variable quartzite stones) abruptly overlying a well structured red clay with soft Class I carbonate at depth.
- D4** Loam over red friable clay (Calcic, Pedaric, Red Sodosol)
Thin to medium thickness fine sandy loam to loam over a finely structured friable red clay, calcareous from about 50 cm, grading to fine or medium grained alluvium.
- D6** Ironstone gravelly sandy loam over red clay (Ferric (?) Red Chromosol)
Loamy texture contrast soil with some ironstone gravel and a red alkaline clayey subsoil.
- E2** Red cracking clay (Epicalcareous, Epipedal, Red Vertosol)
Dark strongly structured clay grading to a well structured red calcareous medium to heavy clay continuing below 100 cm. Often containing gypsum segregations in subsoil.
- L1** Shallow stony loam (Paralithic, Leptic Tenosol)
Shallow stony loam, often calcareous throughout or with depth, overlying weathering rock shallower than 50 cm.
- J1** Ironstone soil with calcareous lower subsoil (Ferric Calcic Brown Sodosol-Chromosol-Dermosol)
Ironstone gravelly soil with a brown alkaline clayey subsoil which has a calcareous layer within the profile.
- M1** Alluvial loam (Orthic Tenosol)
Very thick loam with variable gritty or more-clayey lenses, formed over recent alluvium.
- M3** Deep gravelly soil (Gravelly Kandosol-Tenosol)
Deep uniform loamy alluvial soils with at least 50% gravel in the major part of the profile.

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

