PIT Pitcairn Land System

Area: 158.5 km^2

Landscape: Rocky rises and low hills east of Porcupine Range and northeast of Pitcairn station homestead. Pediments and alluvial plains flank the rises, with drainage directed to the northeast and east, into Paratoo Creek.

Annual rainfall: 220 – 255 mm average

Geology: Adelaide Geosyncline Proterozoic rocks including Tapley Hill Formation, Tarcowie Siltstone and Enorama Shale outcrop extensively in low, linear hills and rises in the centre of the land system. Less extensive outcrops of Proterozoic shales and siltstones occur in the surrounding undulating land, which is largely mantled by pediments and outwash sediments. Deeply weathered substrates are evident in the southeast of the land system.

Main soils:

D4 (21%) Loam over pedaric red clay (Pedaric Red Sodosol-Dermosol)
A2 (20%) Calcareous loam on rock (Paralithic Calcarosol)
RR (12%) Bare rock
A5 (11%) Rubbly calcareous loam on clay (Supracalcic-Lithocalcic Calcarosol on clay)

Minor soils:

L1 (9%) Shallow soil on rock (Rocky Rudosol-Tenosol)
D1 (8%) Loam over clay on rock (Shallow Calcic-Hypercalcic Red Chromosol)
A3 (5%) Deep moderately calcareous loam (Calcic Calcarosol)
A6 (4%) Gradational calcareous clay loam (Pedal Hypercalcic-Lithocalcic Calcarosol on clayey subsoil)
B2 (4%) Shallow calcareous loam on calcrete (Petrocalcic Calcarosol-Rudosol)

Summary: The Pitcairn Land System consists of low linear hills trending northeast to southwest. Pediments and undulating land surround these hard rock areas. Some deeply weathered substrates are found in the southeast. Soils are red crumbly texture contrast soils and calcareous gradational soils, with significant areas of bare rock or very shallow soils on the ranges.

Soil Landscape Unit summary: Pitcairn Land System (PIT)

SLU	% of area	Component	Main soils	Prop#	Notes
ADH	0.3	Rolling rises	L1RRD1	D	Non-arable rocky rolling rises formed on limestones and calc-siltstones such as Tapley Hill Formation with very shallow, loamy, rocky soils, bare rock outcrop or shallow texture contrast loam over red clay on rock. 10-30% calcareous loam on rock. Relief is 9-30m, slopes are 10-30%. Main soils: calcareous loamy, Shallow stony soils on rock - **L1**, Bare rock – **RR** and Clay loam over pedaric red clay on rock - **D1** Non-arable, limited pastoral use.
AEA	0.9	Undulating rises	L1RR	D	Non-arable rocky rises and low hills formed on mostly fine-

AEB	0.3	Rolling rises	L1RR	D	grained rocks. Soils are very shallow and more than 20% are petrocalcic (contain a calcrete layer). **AEA** Gently undulating rises with mostly very shallow loam on fine-grained rock or bare rock, not or slightly calcareous. Relief is less than 30m, slopes are 1-3%. **AEB** Rolling rises with soils as above. Relief is 9-30m, slopes are 10-30%. Main soils: Shallow stony soils on rock - **L1** and Bare rock - **RR**.
AYA	0.4	Undulating rises	A2L1RR	D	Hills and rises on fine-grained rocks, especially siltstones of the Tapley Hill Formation. **AYA** Undulating rises with shallow calcareous loam on calcareous siltstone or other fine grained rocks; or bare rock. Relief is less than 30m, slopes are 3-10%. **AYB** Rolling rises as above. Relief is less than 30m, slopes are 10-30%. **AYD** Very steep low hills as above. Relief is 30-90m; slopes are 50-100%. **AYI** Rolling low hills as above. Eroded watercourses occur over 10-20% of land. Slopes are 10-30%, relief is 30-90m. **AYg** Undulating rises as above, with 10-20% eroded watercourses and 5-10% scalding. Relief is less than 30m, slopes are 3-10%. Main soils: Calcareous loam on rock – **A2** and Shallow stony soils on rock **- L1** and Bare rock – **RR**.
AYB	1.2	Rolling rises	A2L1RR	D	
AYD	0.3	Very steep low hills	A2L1RR	D	
AYI	1.1	Rolling low hills	A2L1RR	D	
AYg	15.9	Undulating rises	A2L1RR	D	
DDy	1.4	Valley plain	D3D4D7	V	Texture-contrast soils (Chromosols) with rock or weathered rock within 1 metre depth are dominant. More than 20% of soils are gradational calcareous soils. Valley plain with texture contrast sandy clay loam over poorly structured red clay, or over crumbly red clay, often on rock; 10-30% shallow calcareous loam on siltstone. 20-30% rocky rises with very shallow soils or rock outcrop and shallow calcareous loam over siltstone. Main soils on plains: Loam over poorly structured red clay - **D3**, Loam over pedaric red clay - **D4** and Loam over poorly structured clay on rock -**D7**. Main soils on rocky rises: Shallow stony soils on rock **- L1**, Bare rock – **RR** and Calcareous loam on rock – **A2**.
		Rocky rises	L1RRA2	C	
DSv	0.5	Shallow pediment	D1C2D7	V	Pediments and rises complexes with shallow, clay-loamy surfaced, duplex soils over rock with more than 20% outcropping rock. **DSv** Gently undulating pediment with shallow sandy loam over red clay on rock. 20-30% bare rock. Severely scalded (over 50%), moderately gullied (10-20%). Slopes are 1-3%, relief is less than 30m. **DSy** Lower slopes drainage depression with soils as above. Severely scalded (over 50%), moderately gullied (10-20%). Main soils on pediments: Clay loam over pedaric red clay on rock - **D1**, Gradational red-brown clay loam over rock-**C2**, Loam over poorly structured clay on rock -**D7** Main soils on rocky rises: Shallow stony soils on rock **- L1**, Bare rock – **RR**.
		Rock outcrop	L1RR	C	
DSy	1.0	Drainage depression	D1C2D7	V	
		Rock outcrop	L1RR	C	

EEH	2.7	Undulating rises	A2	D	Rises with mostly gradational calcareous soils, containing carbonate concretions or hard calcrete fragments. **EEH** Undulating rises with shallow calcareous loam on calc-siltstone. 10-30% very shallow soils or deep rubbly calcareous loam. Moderately gullied. Relief is less than 30m, slopes are 3-10%. **EEV** Gently undulating rises as above. Moderately scalded. Slopes are 1-3%, relief is less than 30m. Main soils: Calcareous loam on rock – **A2**.
EEV	1.3	Gently undulating rises	A2	D	
EHQ	6.3	Gently sloping plain	A2	V	Rises and pediments 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. **EHQ** Gently undulating pediments with gradational calcareous sandy loam over clay loam on weathered rock; 10-20% shallow rocky outcrop. High salinity occurs throughout soil profiles. Gently sloping Plains: Slopes are 1-3%, relief is less than 9m. Rocky rises: Slopes are 3-10%, relief is 9-30m. Main soils: *Plains and Pediments:* Calcareous loam on rock – **A2**. Rocky rises: Bare rock – **RR**, Shallow stony soils on rock **- L1**.
		Rocky outcrops	RR	L	
EVB	1.4	Gently undulating rises	A2	V	Rises with rock outcrops and shallow calcareous soils formed on fine-grained calcareous rocks. **EVB** Gently undulating rises. Slopes are 1-3%, relief is less than 30m. **EVC** Undulating rises Slopes are 3-10%, relief is less than 9-30m. **EVV** Gently undulating rises. Moderately scalded (5-10%). Slopes are 1-3%, relief is less than 30m. Main soils: Calcareous loam on rock – **A2** and Bare rock – **RR**.
		Rocky outcrops	RR	C	
EVC	0.5	Undulating rises	A2	V	
		Rocky outcrops	RR	C	
EVV	7.7	Gently undulating rises	A2	V	
		Rocky outcrops	RR	C	
EZl	4.1	Gently undulating rises	A2A5B2	V	Rises with mostly shallow calcareous soils on weathered siltstones of the Tapley Hill Formation and the Tarcowie Siltstone **EZl** Gently undulating rises with shallow calcareous sandy loam over rock, or deep rubbly calcareous sandy loam over clay. Rocky outcrops. Moderately gullied (5-10%) and scalded (5-10%). Slopes are 1-3%, relief is less than 30m. **EZm** Undulating rises as above. Moderately gullied (10-20%) and scalded (5-10%). Slopes are 3-10%, relief < 30m. Main soils: *Rises:* Calcareous loam on rock **– A2**, Rubbly calcareous loam on clay - **A5** and Shallow calcareous loam on calcrete - **B2**. ***Rocky outcrops:*** Bare rock – **RR**. ***Pediments:*** Calcareous loam on rock **– A2**, Rubbly calcareous loam on clay - **A5** and Shallow calcareous loam on calcrete - **B2**.
		Rocky outcrops	RR	C	
EZm	1.0	Undulating rises	A2A5B2	V	
		Rocky outcrops	RR	C	

H5p	2.8	Plains	D4	D	Dissected plains underlain by deeply weathered materials with texture contrast loam over crumbly red clay soils; 10-30% gradational calcareous loam over clay. Severely scalded (over 50%) Subsoils are highly saline. Main soils: Loam over pedaric red clay - **D4**. Subdominant soils are mainly Gradational calcareous clay loam - **A6**.
HJp	0.3	Plains	D4	D	Plains underlain by deeply weathered parent materials with texture contrast loam over crumbly red clay soils; 10-30% deep gradational moderately calcareous loam, or deep gravelly loam, or gradational calcareous loam. Severely scalded (over 50%) and subsoils are saline. Main soils: Loam over pedaric red clay - **D4**. Subdom. soils mainly Deep moderately calcareous sandy loam - **A3**, Deep gravelly soil -**M3** and Gradational calcareous clay loam - **A6**.
IuU	0.5	Plains	C1	D	Plains underlain by deeply weathered parent materials with gradational loam over clay; 10-30% loam, often ironstone gravelly, over crumbly red clay. Main soils: Gradational sandy loam - **C1**. Subdominant soils are mainly Loam over pedaric red clay - **D4** and Ironstone-gravelly sandy loam over red clay- **D6**.
JLoo	20.7	Creek flat	D4D1	D	Plains and pediments with more than 20% pedaric, texture contrast (loam over crumbly red clay) soils, but less than 20% calcareous gradational soils. **JLoo** Creek flats with loam over crumbly red clay; 10-30% deep moderately calcareous loam over clay. Severely gullied (over 20%), moderately scalded (10-50%). **JLuu** Plains with soils as above. Severely gullied (over 20%) and scalded (over 50%). **JLyy** Creek flats with soils as above. Severely gullied (over 20%) and scalded (over 50%). Main soils: Clay loam over pedaric red clay - **D4** and Loam over pedaric red clay on rock - **D1**, with minor occurrences of Deep moderately calcareous loam – **A3**.
JLuu	0.5	Plains	D4D1	D	
JLyy	0.9	Creek flat	D4D1	D	
JNv	5.3	Gently sloping plain	D4A6E2	D	Gently sloping plains with non-stony pedaric (crumbly), texture contrast soils with calcareous subsoils, gradational calcareous clay loam over clay, or red cracking clay. 10-20% of land is gullied and over 50% is scalded (severe). Subsoils are moderately saline and there are 10-50% magnesia patches. Slopes are 1-3%, relief is less than 9m. Main soils: Loam over pedaric red clay - **D4**, Gradational calcareous clay - **A6** and Red cracking clay - **E2**.
JPPz	1.9	Plains	D4A5	D	Pediments and plains with texture contrast soils formed on outwash sediments derived from basement rocks. Calcareous in some part of the profile. More than 20% of soils are pedaric (fine crumbly structure in subsoils). **JPPz** Plains with clay loam over crumbly red clay, or deep calcareous rubbly clay loam over clay. Moderately gullied (10-20%) and saline (saline throughout soil profiles), severely scalded (over 50%). **JPQz** Gently sloping pediment plains with soils as above. Moderately gullied (10-20%) and saline (saline throughout soil profiles), severely scalded (over 50%). Slopes are 1-3%, relief is less than 9m. **JPU** Plains as above. Moderately scalded (5-10%). **JPp** Plains as above. Severely scalded (over 50%).
JPQz	1.0	Gently sloping plain	D4A5	D	
JPU	0.7	Plains	D4A5	D	
JPp	2.5	Plains	D4A5	D	
JPu	0.6	Plains	D4A5	D	

					JPu Plains as above. Severely scalded (over 50%) and moderately gullied (10-20%). Main soils: Loam over pedaric red clay - **D4** and Rubbly calcareous loam on clay - **A5**.
JZl	2.1	Pediment Rocky outcrops	D4A5 RR	V C	Pediment-basement rock complex with gently sloping pediments with red texture contrast soils and 20-30% rocky rises with shallow texture contrast soils. 20-30% rocky outcrops. Moderately gullied and scalded. Pediments have 10-20% of gullied land, with 10-50% scalded. Rises not affected. Slopes 1-3% on pediments and 3-10% on rises. Main soils: ***Pediments and plains:*** Loam over pedaric red clay - **D4** and Rubbly calcareous loam on clay - **A5**. ***Rocky rises:*** 10-30% bare rock or Shallow stony soils on rock **- L1**.
KFV	3.9	Pediment	A5	D	Gently sloping pediments with deep rubbly calcareous gradational soils and more than 20% red pedaric texture contrast soils. Moderately scalded (10-50%). Slopes are 1-3%, relief is less than 9m. Main soils: Rubbly calcareous loam on clay - **A5** with 10-30% of Loam over pedaric red clay - **D4**
KLV	0.5	Pediment	A5	D	Gently sloping pediments with deep rubbly gradational calcareous loam over clay soils. 10-30% shallow calcareous loam over rock or calcrete. Slopes are 1-3%, relief is less than 9m. Moderately scalded (10-50%). Main soils: Rubbly calcareous loam on clay - **A5** Minor soils include: Calcareous clay loam on rock – **A2**, Gradational red-brown clay loam over rock-**C2** and Shallow calcareous loam on calcrete – **B2**.
KOH	1.0	Undulating plain	A6A5	D	Pediments with calcareous soils occupying > 80% of land. **KOH** Undulating pediment plain with gradational calcareous clay loam or deep rubbly calcareous loam over clay; 10-30% clay loam over crumbly red clay or deep gradational rubbly calcareous loam over clay. Moderately gullied (10-20%). Slopes are 3-10%, relief is less than 9m.
KOv	5.4	Gently sloping pediment	A6A5	D	**KOv** Gently sloping pediment as above. Moderately gullied (10-20%), severely scalded (>50%). Slopes 1-3%, relief <9m. Main soils: Gradational calcareous clay - **A6** and Rubbly calcareous loam on clay - **A5**.
KXV	1.0	Pediment	C1	D	Gently sloping pediments with gradational sandy loam over red clay on rock; 10-30% deep calcareous sandy loam over, often rubbly, clay. Moderately scalded. Slopes are 1-3%, relief is less than 9m. Main soils: Gradational sandy loam - **C1**. Minor soils include: Rubbly calcareous loam on clay - **A5** and Deep moderately calcareous sandy loam - **A3**.

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

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**) **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 CO_3 buildup in the subsoil (<20% CO_3 in subsoil). Pediment type Calcarosols.

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.

B2 Shallow calcareous loam on calcrete (Petrocalcic Calcarosol-Rudosol)
Shallow, grey to reddish calcareous sandy to clay loamy soil on calcrete. This includes calcareous Petrocalcic Rudosols.

C1 Gradational sandy loam (Calcic-Hypercalcic Kandosol-Calcarosol)
Friable sandy to loamy topsoil grading into massive red-brown alkaline loamy to clay loamy subsoil.

C2 Gradational loam on rock (Calcic / Hypercalcic Red Dermosol)
Loam to clay loam grading to a friable red clay with soft Class I carbonate within 50 cm, grading to weathering rock 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.

D3 Loam over poorly structured red clay (Calcic-Hypercalcic Red Sodosol-Chromosol)
Topsoil <30 cm over poorly structured subsoil. Hard-setting loamy to clay loamy texture-contrast soil with a prismatic/poorly structured red alkaline clayey subsoil. Often with a thin topsoil. Can have slightly to moderately calcareous surface soil.

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.

D7 Loam over dispersive red clay on rock (Calcic / Hypercalcic, Red Sodosol)
Medium to thick hard sandy loam to clay loam sharply overlying a coarsely structured dispersive red clay, calcareous with depth, grading to highly weathered kaolinized siltstone.

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.

RR Bare rock.

Further information: DEWNR Soil and Land Program