ITA Itali Itali Land System

Area: 141.6 km^2

Landscape: Arable and non-arable rises and low hills with clayey and calcareous soils over siltstone, shales, sandstone and calc-siltstones, mostly of the Willochra Subgroup. Named from Itali Itali historic site.

Annual rainfall: 285 – 465 mm average

Geology: Willochra Subgroup fine grained rocks, viz. siltstones, shales and calc-siltstones of the Wilmington Formation, Nhw (upper) and the Angepina Formation, Nha (lower).

Topography: Moderately gentle to steep slopes on rises with mostly rounded crests and narrow drainage lines. Rises with linear quartzite ridges are common.

Elevation: Elevations of the rises range from around 300m asl near the eastern edge where the land system meets the pediments and plains of the Yapoona land system, to 450m on the western side.

Relief: Up to 50m on the western side, but mostly around 30m or less, along the eastern edge.

Typical soils:

- Shallow friable, strongly structured red clay over fine grained rock (Dermosols) occur on slopes and broad crests of rises, especially in the northern part.
- Shallow calcareous clay loam to loam over calc-siltstone (Tenosols/Rudosols) are common on rises on calc-siltstone.
- Calcareous clay loam to loam over calcareous clay over calc-siltstone (Calcarosols/Tenosols) occur on more gently undulating rises.
- Loam over red clay on fine grained rock. (Chromosols/Dermosols) occur on pediments and gently undulating rises, mostly in the south and western parts of the land system.
- Silcrete gravelly loam over red clay on Tertiary clayey alluvium.
- Calcareous clay loam to loam over calcareous clay over calcareous clayey alluvium associated with Tertiary silcreted fan remnants.
- Thin loam/clay loam over red friable clay on fine calcareous alluvium.

Main soils:

L1	(36%)	Shallow soil on rock	(Rocky Rudosol-Tenosol)
A2	(20%)	Calcareous loam on rock	(Paralithic Calcarosol)
RR	(13%)	Bare rock	

Minor soils:

D1	(9%)	Loam over clay on rock	(Shallow Calcic-Hypercalcic Red Chromosol)
D2	(6%)	Loam over red clay	(Calcic-Hypercalcic Red Chromosol-Sodosol)
C2	(4%)	Gradational loam on rock	(Shallow Red Dermosol-Kandosol-Calcarosol)

Summary: The Itali Itali Land System is a low range with associated rises, elongated along its North-South axis. The greater elevations occur on the western side and relief grades lower to the east where the landscape is dominated by pediments and outwash deposits. Soils are mostly shallow, but commonly have clay subsoils overlying weathered siltstones and shales. They are commonly calcareous as well. Some deep weathering effects are evident in places with silcrete gravels as surface lags.

Soil Landscape Unit summary: Itali Itali Land System (ITA)

SLU	% of area	Component	Main soils	Prop#	Notes
AAD	4.4	Steep low hills	L1	D	Rises and hills with shallow rocky calcareous soils formed on Tapley Hill Formation calc-siltstones. **AAD** Steep low hills. Relief: 30-90m, slopes: 30-50%. **AAI** Rolling low hills with eroded watercourses; over 20% of land affected by gullying. Relief is 30-90m, slopes are 3-10%. Main soils: calcareous loamy, Shallow stony soils on rock **- L1.**
AAI	5.6	Rolling low hills	L1	D	
ABB	3.5	Rolling rises	L1RR	D	Rises with linear rocky quartzite outcrops and shallow rocky soils on interbedded fine-grained rocks. **ABB** Rolling rises**.** Relief is 9-30m, slopes are 10-30%. **ABD** Steep low hills. Relief: 30-90m, slopes: 30-50%. **ABH** Rolling rises with eroded watercourses. Relief is 9-30m, slopes are 10-30%. **ABI** Rolling low hills with eroded watercourses. Relief is 30-90m, slopes are 3-10%. **ABJ** Steep low hills with eroded watercourses. Relief is 30-90m, slopes are 30-50%. Main soils: Shallow stony soils on rock **- L1**. Rock outcrop - **RR** is common.
ABD	4.8	Steep low hills	L1RR	D	
ABH	12.0	Rolling rises	L1RR	D	
ABI	0.9	Rolling low hills	L1RR	D	
ABJ	4.0	Steep low hills	L1RR	D	
ADj	2.6	Steep low hills	L1RR	D	Steep low hills with very shallow stony calcareous soils formed on Skillagollee Dolomite and calcareous fine-grained rock, with eroded watercourses and sheet erosion. Relief is 30-90m, slopes are 30-50%. Main soils: Shallow stony soils on rock **- L1** and Calcareous clay loam on rock – **A2**. Bare rock – **RR** is common. Non-arable.
AKB	1.0	Rolling rises	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 Skillagollee Dolomite. **AKB** Rolling rises. Relief is 9-30m, slopes are 10-30%. **AKC** Rolling low hills. Relief >30m, slopes: 10-30%. Main soils: Shallow stony soils on rock **- L1**. Minor soils: Gradational loam on rock - **C2** and Loam over clay on rock - **D1**.
AKC	0.9	Rolling low hills	L1	D	
API	1.5	Rolling low hills	L1D1	D	Rolling low hills with shallow red texture contrast and rocky soils formed on coarse-grained basement rocks particularly Appilla Tillite Formation. Watercourses are eroded. Gullying affects more than 20% of land. Non arable. Relief is 30-90m, slopes are 10-30%. Main soils: Shallow stony soils on rock **- L1** and Loam over pedaric red clay on rock - **D1**.
DGC	2.3	Undulating pediments	D2D1	D	Rises and pediments with shallow red duplex soils over Brachina formation shale. The soils have sandy clay loam surface textures. **DGC** Undulating pediments. Relief: < 9m, slopes: 3-10%. **DGI** Rolling rises with 10-20% of land gullied. Relief is 9-30m, slopes are 10-30%. **DGn** Rolling rises with 5-10% of land gullied and 5-10% scalded. Relief is 9-30m, slopes are 10-30%. Main soils: Sandy Clay Loam over red clay - **D2** and Sandy Clay loam over pedaric red clay on rock - **D1**.
DGI	2.6	Rolling rises	D2D1	D	
DGn	0.7	Rolling rises	D2D1	D	
DHH	2.4	Undulating rises	D1	D	Undulating rises with shallow red texture contrast soils over Cambrian limestone. Relief is 9-30m, slopes are 10-30%. Main soils: Loam over clay on rock - **D1**, with associated Loam over poorly structured clay on rock - **D7** and Shallow stony soils on rock **- L1**.
DJD	0.4	Rolling rises	D4D6	D	Rises with shallow red duplex soils associated with deeply

			C3		weathered kaolinised and ferruginised rocks.
DJm	0.9	Undulating rises	D4D6 C3	D	**DJD** Rolling rises. Relief is 9-30m, slopes are 10-30%. **DJm** Undulating rises. 5-10% of land is scalded and 10-20% is gullied. Relief is 9-30m, slopes are 3-10%. **DJZ** Plateau surface with surface lag of iron-stone and silcrete or quartz rocks. Main soils: Loam over pedaric red clay - **D4**, Ironstone-gravelly sandy loam over red clay- **D6** and Friable gradational sandy clay loam - **C3**.
DJZ	0.5	Plateau surface	D4D6 C3	D	
DXC	7.0	Undulating rises	D1L1	V	Undulating rises and pediment slopes with red duplex soils over basement rock or saprolite within one metre of the surface. More than 20% of soils are formed on outwash sediments. Soils formed on basement rock in complex with soils formed in outwash materials. Surface textures are loamy. Relief is 9-30m, slopes are 3-10%. ***Rises:*** Rocky rises have shallow red duplex soils on rock. ***Pediments:*** Pediment slopes have red duplex and gradational soils. Main soils: Clay loam over pedaric red clay on rock **- D1,** Loam over red clay - **D2,** Loam over pedaric red clay - **D4** and Friable gradational clay loam - **C3.**
		Pediments	D2D4 C3	C	
EAH	1.1	Undulating rises	A2C2 D1	D	Undulating rises with gradational calcareous soils over hard rock with more than 20% red texture contrast and/or non-calcareous red gradational soils. More than 20% of land is gullied. Relief is 9-30m, slopes are 3-10%. Main soils: Calcareous loam on rock **-A2**, Gradational loam on rock -**C2** and Clay loam over pedaric red clay on rock - **D1**.
EFC	2.6	Undulating rises	A2D7 L1	D	Rises with shallow, mainly calcareous loamy soils formed on calc-siltstones of the Wonoka or Tapley Hill Formations typically. **EFC** Undulating rises. Relief: < 30m, slopes: <10%. **EFH** Undulating rises with gullies affecting 5-10% of land. Relief is 9-30m, slopes are 3-10%. **EFI** Rolling rises. Gully erosion affects 5-20% of land, reflecting the erodible nature of the silty, calcareous soils. Slopes: 10-30%, relief: <30m. Main soils: Calcareous loam on rock – **A2**, Loam over poorly structured clay on rock - **D7,** Shallow stony soils on rock **- L1**.
EFH	5.9	Undulating rises	A2D7 L1	D	
EFI	8.1	Rolling rises	A2L1	D	
EHl	1.3	Gently undulating pediments	A2	V	Gently undulating pediments with 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. Severely scalded (40-50% of land affected) and gullied (20% of land affected). Slopes are 1-3%, relief is less than 30m. Main soils: ***Plains and Pediments:*** Calcareous loam on rock – **A2** with minor Shallow calcareous loam on calcrete - **B2**. ***Rocky rises:*** Shallow stony soils on rock **- L1** and Bare rock - **RR**.
		Rocky rises	A2L1	C	
ELD	2.1	Rolling rises	L1C2 B2	D	Rises with shallow soils formed on Appila Tillite Formation and alluvium. **ELD** Rolling rises. Slopes: 10-30%, relief: <30m. **ELI** Rolling rises; gullying affects 5-10% of land, scalding affects around 5%. Slopes are 10-30%, relief is less than 30m. Main soils: Shallow stony soils on rock **- L1**, gradational red clay-loam over clay (Red clayey pedaric Dermosols **- C2)** and Shallow calcareous loam on calcrete - **B2**.
ELI	4.0	Rolling rises	L1C2 B2	D	

ERB	0.2	Gently undulating rises	A2L1 RR	D	Rises with shallow dark brown clay loamy calcareous soils on calc-siltstones and shales typically Willochra Formation. **ERB** Gently undulating rises. Slopes: 1-3%, relief: 9-30m. **ERC** Undulating rises. Relief: 9-30m, slopes: 3-10%. **ERH** Undulating rises with more than 20% of land gullied. Relief is 9-30m, slopes are 3-10%. **ERI** Rolling rises with more than 20% of land gullied. Slopes are 10-30%, relief is less than 30m. **ERj** Drainage line with 10-20% of land gullied, and 10-50% of land is saline. Main soils: Calcareous clay loam on rock – **A2** and Shallow stony soils on rock **- L1**. Bare rock – **RR** is common.
ERC	2.6	Undulating rises	A2L1 RR	D	
ERH	3.3	Undulating rises	A2L1 RR	D	
ERI	1.2	Rolling rises	A2L1 RR	D	
ERj	2.7	Drainage line	A2L1 RR	D	
JAH	0.7	Undulating pediments	D4E2 C3	D	Undulating pediments and outwash plains with clay loam surface textures on texture contrast and gradational soils. Red clays are also common. Slopes are 3-10%. Gullying affects 5-10% of land. Main soils: Loam over pedaric red clay - **D4**, Red cracking clay - **E2** and Friable gradational clay loam - **C3**. **D4** and **C3** soils have surfaces which are highly susceptible to water erosion
JFl	1.6	Gently undulating pediments	D2D4 C1	D	Pediments with mostly red texture contrast soils with clay loam surfaces, calcareous soils occupy more than 20% and other gradational soils occupy more than 10%. **JFl** Gently undulating pediments. Slopes: 1-3%, relief: < 9m. **JFm** Undulating pediments; 5-10% of land is gullied, 5-10% is scalded. Slopes are 3-10%, relief is less than 9m. **JFo** Creek flat with more than 20% with unstable gullies and 5-10% is scalded. Main soils: Loam over red clay - **D2**, Loam over pedaric red clay - **D4** and Gradational sandy loam - **C1**.
JFm	1.4	Undulating pediments	D2D4 C1	D	
JFo	0.4	Undulating pediments	D2D4 C1	D	
JXl	0.8	Gently undulating pediments	D2	V	Pediments with texture contrast soils in complex with rocky rises. Most soils have clay loam surfaces. **JXl** Gently undulating pediments in complex with rocky rises. Gullying affects 10-20% of land on pediments, and less than 5% on rises. Scalding affects around 10% of pediments and up to 50% in places. Rocky rises have less than 5% scalded land. Slopes are 1-3%. **JXm** Undulating pediments in complex with rocky rises. Gullying affects over 20% of land on pediments, and 5-10% on rises. Scalding affects around 10% of pediments and up to 50% in places. Rocky rises have less than 5% scalded land. Slopes are 3-10%. **JXW** Undulating pediments in complex with rocky rises, scalding affects 10-50% of land, around 10% is gullied. Slopes are 3-10%, relief is less than 9m on pediments and 9-30m on rises. Main soils on pediments: Loam over red clay - **D2**; with Loam over clay on rock- **D1** soils associated with rocky rises.
		Rocky rises	D1	C	
JXm	0.3	Undulating pediments	D2	V	
		Rocky rises	D1	C	
JXW	0.9	Undulating pediments	D2	V	
		Rocky rises	D1	C	
KLG	0.7	Gently undulating pediment	A5	D	Gently undulating pediments with predominantly calcareous gradational soils. 10-20% of land is gullied and less than 5% scalded. Slopes are 1-3%, relief is less than 9m. Main soils: Rubbly calcareous loam on clay - **A5**.

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)

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.

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.

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.

D7 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.

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