

WIR Wirrina Land System

Eroded rises and low hills between Second Valley and Little Gorge

Area: 11.7 km²

Annual rainfall: 575 – 700 mm average

Geology: Apart from several minor basement rock outcrops projecting through the younger sedimentary cover, the characteristic materials of the land system are heavy clays of old glacial valleys. These sediments are dispersive and highly erodible - gully erosion and landslips are features of the landscape. There is minor localized deposition of fine grained alluvial sediments on modern creek flats.

Topography: The landscape comprises irregular undulating rises to rolling low hills. Slopes range from 3% to 25%. The land is dissected by several major watercourses and their tributaries, and this process has been accelerated by poor land management practices in the past, leading to the development of severe erosion gullies. Minor components of the landscape are slopes and rises formed on basement rock, characterized by sporadic rocky outcrop, and creek flats where alluvial sediments have accumulated.

Elevation: 30 m to 190 m

Relief: Up to 80 m

Soils: The characteristic soils of the System are formed on dispersive clayey sediments of old glacial valleys. Sandy loam to clay loam texture contrast soils through to grey cracking clays are common. All have heavy clay subsoils. Minor soils include moderately deep loamy profiles on basement rock, and deep texture contrast or gradational soils on alluvium.

Main soils: *Soils formed on glacial valley sediments*

F2a Sandy loam over poorly structured brown clay

E3 Grey-brown cracking clay

F1 Sandy loamy over brown clay

Minor soils: *Soils formed on glacial valley sediments*

G3 Thick sand over clay

Soils formed on basement rock

B4 Shallow loam over red clay on calcreted rock

K2 Loam over red clay

L1 Shallow stony loam

Soils formed on alluvial sediments

F2b Sandy loam over brown clay

M2 Deep black clay loam

Main features: The Wirrina Land System is characterized by eroded rises and low hills formed on dispersive heavy clay sediments. Most soils are either sandy loam to clay loam over heavy clay, or grey cracking clay. Although the gentler slopes are arable (although prone to waterlogging) and potentially productive, most of the land is too steep for land uses involving cultivation. On these soils, even the gentlest slopes are at risk of erosion. Although many of the eroded watercourses appear stable, re-activation is always a threat, so conservation management is high priority on this land.



Soil Landscape Unit summary: 9 Soil Landscape Units (SLUs) mapped in the Wirrina Land System

SLU	% of area	Main features #
AjC	4.5	Moderately steep upper slopes and crests formed on basement phyllites and metasiltstones. Slopes are 10-30%. There is patchy rock outcrop, up to 20% in places. The soils are loamy, with or without red clayey subsoils. Main soils: <u>Loam over red clay</u> - K2 (E) <u>Shallow stony loam</u> - L1 (E) These soils are fertile and well to moderately well drained but of variable depth. Shallower types tend to occur in association with rocky outcrops, so extensive areas without rock have high productive potential.
DkD	1.2	Lower slope rises formed on calcreted basement calc-siltstones, marbles and limestones. There is sporadic surface stone. The soils are loamy and well structured. Main soil: <u>Shallow loam over red clay on calcreted rock</u> - B4 (D) High calcium status is responsible for the characteristic crumbly consistence of these soils. They are fertile and well drained, although often shallow. They are well suited to viticulture.
HYH HYI HYII HYJJ HYLL	13.5 16.3 42.2 3.0 7.6	Undulating rises to rolling low hills formed on glacial valley clays, calcified by the input of windblown carbonate (lime). Watercourses on the steeper slopes are severely eroded and there are sporadic landslips. HYH Undulating rises with slopes of 3-6%. HYI Undulating low hills with slopes of 6-12%. HYII Gently rolling low hills up to 80 m high with slopes of 12-20%. HYJJ Eroded watercourses. HYLL Moderately steep slopes (15-25%), up to 60 m high with erosion gullies and landslips. The soils fall into two main categories - sandy loam to clay loam over heavy mottled clay, and deep cracking clay. Main soils: <u>Sandy loam over poorly structured brown clay</u> - F2a (E) <u>Grey-brown cracking clay</u> - E3 (C) <u>Sandy loamy over brown clay</u> - F1 (L) These soils are inherently fertile and deep, although prone to waterlogging. The gentler slopes of HYH and HYI are arable, although inadequate surface management is likely to result in serious erosion. The fragility of the other landscapes restricts land use options. Even once stabilized, the severely damaged areas are always vulnerable to renewed erosion.
LNJ	5.6	Creek flats with well defined and commonly eroded watercourses. Underlying materials are medium to fine grained alluvial sediments. The soils fall into two main groups – sandy loam over clay soils and gradational clay loams. Main soils: <u>Sandy loam over brown clay</u> - F2b (E) <u>Deep black clay loam</u> - M2 (E) These soils are deep but frequently imperfectly drained due to their clayey subsoils. However, thick surface soils reduce the severity of this problem. The M2 soils are highly fertile, and the F1 soils are moderately fertile. Waterlogging, stream bank erosion and occasional flooding are common problems. The land has moderately high pasture production potential, but limited scope for horticulture.
PtF	6.1	Upper slopes and crests formed on glacial valley sediments which are sandier than on other slopes in the Land System. Slopes are 10-25%. The soils have thick sandy surfaces sharply overlying clayey subsoils. Main soil: <u>Thick sand over clay</u> - G3 (D) These soils are deep but infertile and prone to wind erosion and water repellence. They are generally strongly acidic. The thick sandy surfaces provide some scope for irrigation, but the land is mostly on high ground, so exposure may be a problem.

PROPORTION codes assigned to soils within Soil Landscape Units (SLU):

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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:*Soils formed on basement rock*

- B4** Shallow loam over red clay on calcreted rock (Petrocalcic, Red Dermosol / Chromosol)
Medium thickness brown loam to clay loam, grading to a reddish brown clay with strong fine polyhedral structure, abruptly overlying semi-hard platy calcrete capping calcareous siltstone, marble or limestone within 100 cm.
- K2** Loam over red clay (Eutrophic, Red Chromosol)
Medium thickness dark brown loam to clay loam with a paler coloured and gravelly A2 horizon, overlying a dark reddish brown to brown medium to heavy clay with strong blocky structure, grading to weathering metamorphosed siltstone or schist, usually deeper than 100 cm.
- L1** Shallow stony loam (Basic, Paralithic, Leptic Tenosol)
Thick dark brown loam with a paler brown clay loam A2 horizon containing up to 50% rock fragments, grading to metamorphosed siltstone or phyllite by 50 cm.

Soils formed on glacial valley sediments

- E3** Grey-brown cracking clay (Episodic-Endocalcareous, Epipedal, Brown Vertosol)
Medium thickness grey clay with coarse subangular blocky structure and surface cracks, overlying a grey to brown heavy clay with strong coarse prismatic structure. Carbonate is usually absent, but minor segregations may occur at depth. The soil is formed on a grey heavy clay with well developed slickensides (Hindmarsh Clay equivalent), usually shallower than 100 cm.
- F2a** Sandy loam over poorly structured brown clay (Hypocalcic, Subnatric, Brown Sodosol)
Medium thickness dark brown firm to hard sandy loam to sandy clay loam with a bleached and hard A2 horizon, overlying a dark grey brown and yellow brown mottled heavy clay with strong prismatic structure, grading to a light grey, yellow and red massive sandy clay to clay with minor soft carbonate segregations from 85 cm.
- F1** Sandy loamy over brown clay (Bleached-Mottled, Eutrophic Brown Kurosol)
Medium thickness grey brown loamy sand to light sandy clay loam with a bleached A2 horizon, overlying a yellow brown, grey and red mottled clay with coarse prismatic structure, grading to grey and yellow mottled sandy clay from 100 cm.
- G3** Thick sand over clay (Bleached, Brown Kurosol)
Thick to very thick soft sand with a bleached A2 layer, over a brown, red and grey mottled acidic sandy to medium clay, continuing below 100 cm.

Soils formed on alluvial sediments

- F2b** Sandy loam over brown clay (Hypocalcic, Brown Sodosol)
Thick loamy sand to sandy clay loam surface soil with a strongly bleached A2 horizon, sharply overlying a yellowish brown, grey and red mottled coarsely structured clay subsoil grading to fine grained alluvium.
- M2** Deep black clay loam (Melanic, Calcic, Black Dermosol)
Medium thickness black clay loam to light clay with strong granular structure, overlying a very dark clay with blocky structure and minor soft calcareous segregations at depth.

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

