

SIMPSON LAND SYSTEM

This gently undulating surface is the remnant of a former lateritic plateau which used to extend over a large part of what is now the Tomahawk Creek Catchment and the Scotts Creek Catchment. Small remnants found through these areas are evidence of the former extent of this surface. Where these remnants are continuous and wide enough to be mapped at this scale of survey they have been included in the Simpson land system.

The plateau surface dates from the late Tertiary period when the climate over Victoria is thought to have been vastly different from what is at present experienced. The typical lateritic profile forming in tropical rainforest environments today consists of a thin mineral horizon of sandy material overlying deep horizons of lateritic ironstone. Below this is found a mottled zone of haematite and kaolinite clays which gradually changes to a pallid zone of kaolinite clay. These profiles are several metres deep and are considered to be the end product of deep extensive weathering of soil in tropical environments.

The soil profiles on the Simpson plateau are somewhat unlike this. Instead of a thin mineral layer being present above the laterite, a full soil horizon overlies the ironstone which is encountered at between 1.5 and 2.0 meters below the surface. This could be due to a redistribution of material over the lateritic landscape, or to reweathering and pedological reorganisation of the lateritic material in subsequent drier temperate climates. Whatever the cause of these atypical lateritic soil profiles, the only places where lateritic ironstone is found close to the surface is on the scarps of the plateau in the neighbouring Tomahawk Creek land system.

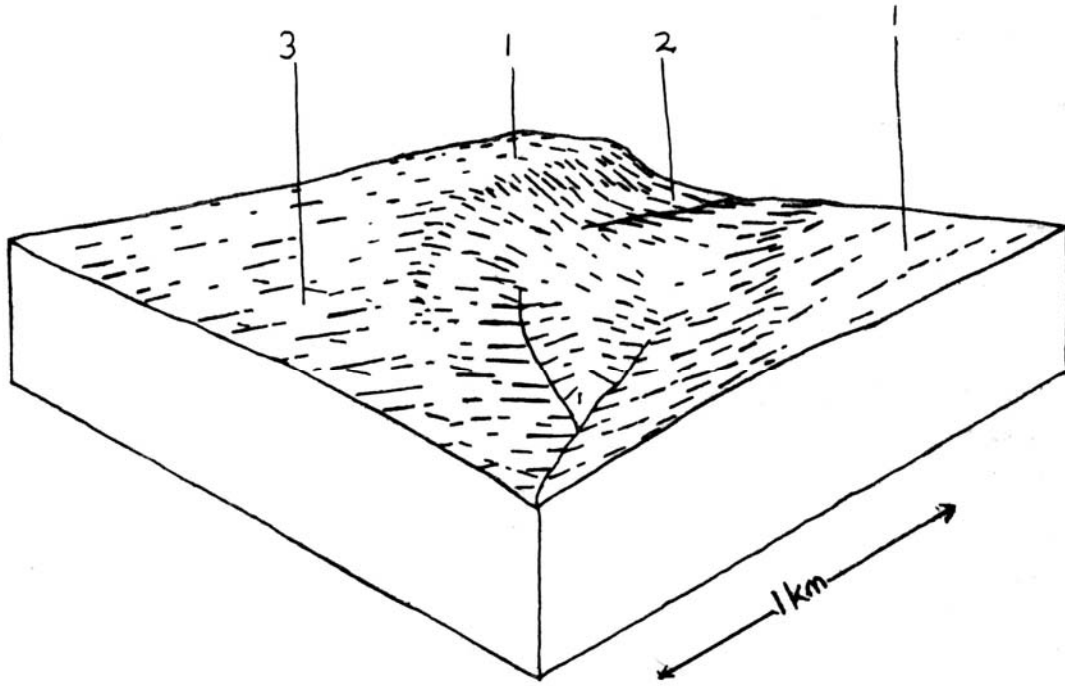
Component 1 includes the most widespread soils found overlying the lateritic ironstone. The soils are acid and are low in most plant nutrients. They are found on such gentle slopes as to appear almost flat. Drainage of the soils is often impeded by the presence of the ironstone at about 1.7 meters below the surface. Almost all of these soils have been cleared as part of the Heytesbury Settlement Scheme but they formerly supported open forests of messmate and brown stringybark with widespread hybridisation between these two species.

Before deep dissection of the Simpson surface took place, wandering creeks and streams deposited layers of sand over the top of these soils described above. Due to weathering of this sand, a thin hardpan frequently develops due to iron cementation between the sand deposit and the older clay subsoil underneath giving rise to the soils of component 2. This phenomenon is quite common in the Tertiary sediments surrounding the Otways and is described in detail in the chapter on soils. The presence of the hardpan and the rapid decrease in permeability below the sand horizons of these soils leads to frequent perched water tables in winter and generally waterlogged conditions conducive to the growth of heathlands or scrublands in place of open forests. Numerous treeless plains used to delineate the presence of these areas of poorly drained soils but have now all been cleared and sown to pastures.

Closer to the minor depressions of the present drainage system are found coarse structured soils with heavy clay subsoils somewhat similar to the soils of component 4 in the Tomahawk Creek land system. They are underlain by lateritic ironstone in some places but often alluvial sand, clay and lateritic detritus continue indefinitely below the solum. It seems probable that these soils were formed during the same climatic period responsible for the formation of their counterparts in the Tomahawk Creek land system. The subsoils are slowly permeable, highly dispersible and often contain up to thirty percent colluvial ironstone gravel. The vegetation is normally an open forest of messmate and brown stringybark but occasionally on badly drained sites it may be restricted to a low woodland or closed scrub with black sheoak dominating the association.

The drainage pattern of this landscape is unusual – the drainage lines are parallel and straight and orientated in a NW/SE direction with little or no branching. Furthermore this pattern has in turn determined the pattern of secondary drainage lines in the neighbouring Tomahawk Creek land system being similarly straight and parallel with the primary drainage coming down the slopes and intersecting them at right angles. The reason for this pattern is obscure. It has been suggested that it may be due to successive stages in the retreat of the Tertiary area with parallel sand dunes and accompanying swamps being left behind. The swamp subsequently became the drainage lines of the lateritic landscape and also became instrumental during the rejuvenation which formed the Tomahawk Creek land system. Little evidence of former sand dunes on this landscape remains however, although it is possible that they become the source of the sand for component 2 soils.

The main problems associated with use of this land for agriculture are the low nutrient status of the soils, and the exposure of the landscape to severe wind storms. These problems can be overcome by applying fertilisers and planting shelter belts – productivity from these areas should be quite high. At present, most agricultural land is used for dairying. Some conflicts are likely to arise due to the use of the area as a water supply catchment to supplement the domestic supply for Warnambool and other population centres. However, with proper management the conflicts between these uses and dairy farming should be resolved.



1:25000

Simpson Land System

AREA: 78 Km²

Component		1	2	3
Proportion %		65	25	10
Climate	Rainfall mm	Annual: 800 – 950 Monthly Range: 35 (Jan) – 110 (Aug)		
	Temperature °C	Annual: 13.0 Monthly Range: 8.0 – 18.5		
Seasonal Growth Factors		Period when average monthly temperature < 10°C June → August Period when precipitation < Potential evapotranspiration: Late October → Early April		
Geology	Age	Lateritised Sands and clays of Pliocene Age		
	Lithology		Veneer of Quaternary Sands	
Topography	Landscape	Very gently undulating plateau with arms extending N.W. and S.E.		
	Elevation M	150 – 170		
	Local Relief M	10		
	Drainage Pattern	Parallel		
	Drainage Density Km/Km ²	1.0		
	Landform	Undulating plain		
	Position	Most slopes, crests	Slopes	Swales
	Average Slope (Range)	4% (0% - 14%)	0% (0% - 3%)	5% (0% - 9%)
	Slope Shape	Straight (some convex)	Straight	Concave
Native Vegetation	Structure	Open forest	Closed scrub	Open Forest
	Dominant Stratum			
	Species	Messmate, Brown Stringy-Bark Occas, Manna Gum	Prickly Tea Tree, Scented Paperbark Shining Peppermint Black Sheoak	Brown Stringybark, Swamp Gum
	Other Common Species	Large Leaf Bush Pea, Dusty Miller, Prickly Tea Tree, Silver Banksia, Mountain Correa, Myrtle Wattle	Pink Swamp Heath, Swamp Clubmoss, Coral Fern, Slender Rice Flower	Narrow Leaved Wattle, Dusty Miller Silver Banksia, Furze Hakea
Soil	Parent Material	Weathering lateritic remnants	Lateritic remnants covered by varying depths of sand	Sandy Clay Alluvium
	Group	Mottled Yellow Red Gradational Soils with Ironstone	Grey sand soils compact clay underlay	Yellowish Brown Coarse Structured Gradational Soils
	Surface Texture	Sandy loam	Peaty sandy loam	Sandy Loam
	Permeability	Moderate	Slow	Slow
	Av. Depth m	1.70	> 2	> 2
	Northcote Class	Gn 3.94		
Land Use		Cleared Areas: Mainly Dairy Farming some Beef Cattle Grazing Domestic Water Supply Protection. Minor Uncleared Areas: Hardwood Forestry Production Domestic Water Supply Protection		
Hazards of Soil Deterioration		Low hazard of sheet erosion on steepest slopes	Some waterlogging and hazard of soil plugging on poorly drained sites	
Management Practices for Soil Conservation		Wintering of stock away from waterlogged areas		