

7.29 Sutton Grange land system (SG)

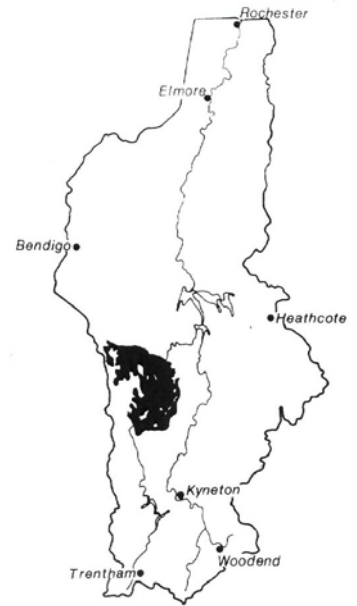
The gentle land on the Harcourt granodiorite features a siliceous hardpan between the soil and relatively fresh rock. Lateral movement of water occurs above the hardpan and is noticeable after prolonged rains. The highly weathered clay subsoils contain appreciable soluble salts, and seepage waters are often saline.

Crests and slopes typically have yellow or yellowish-grey mottled duplex soils with a bleached A2 horizon. The soils of the drainage depressions are variable, but yellow or black duplex soils are common, frequently overlain by a wash of sandy alluvium. Various erosional and depositional sequences are apparent in cuttings.

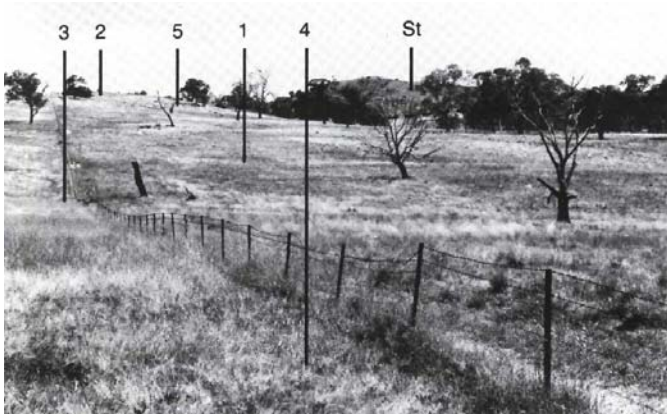
Much of the original vegetation remains, presenting an attractive landscape. *E. camaldulensis* dominates in drainage depressions and on lower slopes, but is replaced by *E. goniocalyx*, *E. microcarpa* and *E. dives* on the upper slopes and crests. *E. melliodora* is also common on the slopes.

Most of the land is used for grazing of sheep on native or introduced pastures, but cropping and orcharding are also practised. Land use is restricted by the droughty nature of the sandy topsoils.

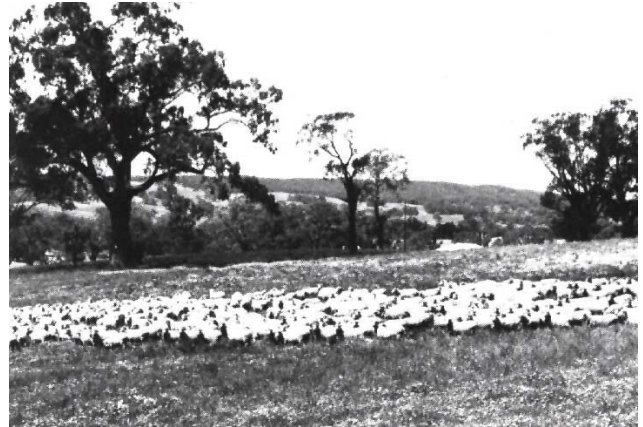
Erosion is not common, although the sandy topsoils are susceptible to wind and water erosion. Gully erosion occurs in many drainage depressions. Minor salting occurs on the lower slopes and drainage depressions, particularly in areas adjacent to the metamorphic aureole ridge to the north and east.



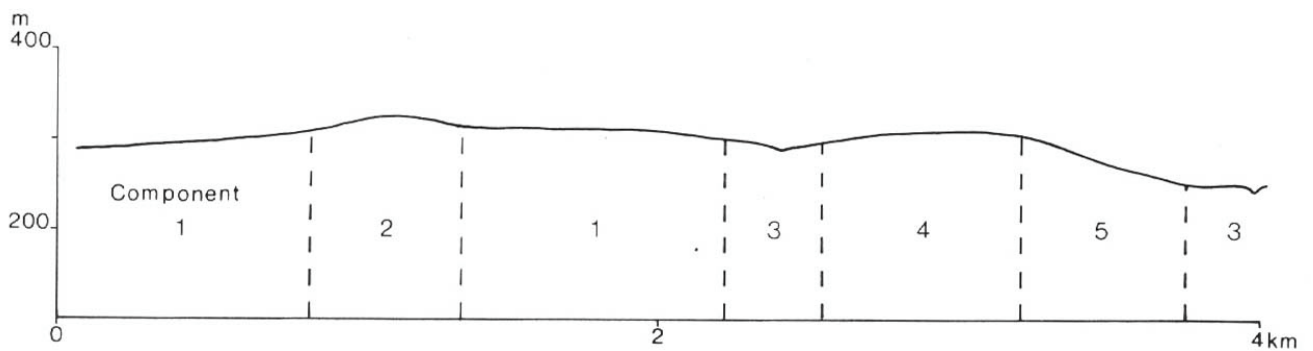
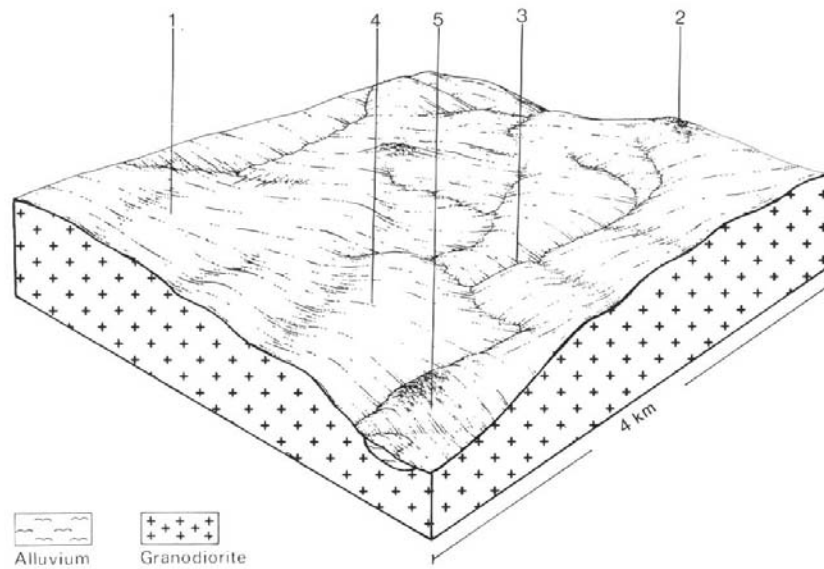
The gently sloping Sutton Grange land system is encircled by the steep ridge of the James land system.



A typical landscape showing the land system components



Improved pastures, an open woodland of E. camaldulensis and a mob of fat sheep present an idyllic grazing scene.



SUTTON GRANGE LAND SYSTEM (SG)
Area 146 km² 3.5% of catchment

CLIMATE Rainfall, mean (nim) Temperature, mean (°C) Seasonal growth limitations	Annual, 550-650; lowest December (35-40), highest August (65-70) Annual, 13.5; lowest July (7), highest February (21) Temperature less than 10°C (av.): May-August Rainfall less than potential evapotranspiration: October-early April				
GEOLOGY Age, rock type	Devonian, granodiorite				
PHYSIOGRAPHY Landform pattern Elevation range (m) Relative relief (tit) Drainage pattern Channel spacing	Undulating low hills 260-400 40 Dendritic Moderate				
LAND COMPONENT Number Percentage of land system	1 50	2 5	3 10	4 15	5 20
PHYSIOGRAPHY Landform, element Slope; modal, range Site drainage	Gentle rock-free slope 4,2-7 Well drained	Rocky crest 8,5-15 Somewhat excessively drained	Drainage depression 1,0-2 Somewhat poorly drained	Rounded rock-free crest 3,0-6 Well drained	Steeper slope, often with rock outcrop 8,6-15 Somewhat excessively drained
SOIL Parent material Description Classification Surface texture Depth to hardpan or bedrock (m) Nutrient status Available water capacity Permeability Exposed rock/stone Sampled site number	Granodiorite Mottled yellow or yellowish grey duplex soils Dy3.41 Coarse sandy loam 0.7-1.2 Low Low surface, moderate subsoil Rapid surface, slow subsoil 0 716,1042,1049	Granodiorite Brown coarse sandy soils; occasional mottled yellow duplex soils Uc3.21; minor Dy3.41 Coarse sandy loam 0.2-0.7 Low Low Rapid; slow for duplex subsoils 10-20 -	Alluvium and colluvium Variable; usually black duplex or mottled yellow duplex soils, often overlying sandy alluvium Dy3.41, Dd1.42; minor Uc1, Dy2.41 Sandy loam > 1.2 Low surface, moderate subsoil Low surface, moderate subsoil Rapid surface, slow subsoil 0 717,1041	Granodiorite Mottled yellow or yellowish grey duplex soils with bleached A2 horizons Dy3.41; minor Dy2.41 Coarse sandy loam 1.0 Low Low surface, moderate subsoil Rapid surface, slow subsoil 0 715,1050,1051	Granodiorite Mottled yellow or yellowish grey duplex soils with bleached A2 horizons Dy3.41; minor Dy2.41 Coarse sandy loam 1.0 Low Low surface, moderate subsoil Rapid surface, slow subsoil 0-10 -
NATIVE VEGETATION Structure Characteristic species (+ indicates predominant species)	Woodland II / Open forest II <i>E. camaldulensis</i> +, <i>E. melliodora</i> , <i>E. goniocalyx</i> , <i>E. microcarpa</i> , <i>E. rubida</i> , <i>Casuarina stricta</i>	Woodland II / Open forest II <i>E. goniocalyx</i> +, <i>E. microcarpa</i> +, <i>E. camaldulensis</i> +, <i>E. dives</i> , <i>E. macrorhyncha</i>	Woodland II / Open forest II <i>E. camaldulensis</i>	Woodland II / Open forest II <i>E. goniocalyx</i> +, <i>E. melliodora</i> +, <i>E. dives</i> , <i>E. camaldulensis</i> +, <i>E. polyanthemos</i> , <i>E. rubida</i> , <i>E. microcarpa</i> , <i>E. macrorhyncha</i>	Woodland II / Open forest II <i>E. camaldulensis</i> , <i>E. melliodora</i> , <i>E. microcarpa</i>
PRESENT LAND USE	Grazing of introduced pastures; minor cropping; and irrigated orchards	Grazing of native pastures	Grazing of native and introduced pastures	Grazing of introduced pastures; cropping	Grazing of native and introduced pastures
OBSERVED SOIL DETERIORATION	Minor sheet erosion; minor wind erosion	Minor sheet erosion; minor wind erosion	Minor gully erosion; also some saline seeps	Minor sheet erosion; minor wind erosion	Minor sheet erosion; minor wind erosion

SUSCEPTIBILITY OF LAND TO PROCESSES OF SOIL DETERIORATION – Sutton Grange

Compt.	Process	Susceptibility	Critical land factors	Off-site effects	Comments
1&4	sheet and rill erosion wind erosion leaching of nutrients (topsoil)	low to moderate moderate high	<ul style="list-style-type: none"> gentle slopes subsoil of low permeability weakly structured sandy topsoil droughty topsoil high topsoil permeability low cation exchange capacity low percentage base saturation 	<ul style="list-style-type: none"> sedimentation increased run-on sedimentation - 	<p>high topsoil permeability generally reduces the overland flow and erosion hazard</p> <p>re-establishment of pastures is slow once the organic matter and seed reserves have been lost</p> <p>added fertilizers readily leached</p>
2	sheet and rill erosion wind erosion leaching of nutrients	low to moderate moderate high	<ul style="list-style-type: none"> soils of high permeability rock outcrop weakly structured sandy topsoil droughty topsoil high soil permeability low cation exchange capacity low percentage base saturation 	<ul style="list-style-type: none"> sedimentation increased run-on sedimentation - 	<p>high soil permeability reduces the overland flow and erosion hazard</p> <p>re-establishment of pastures is slow once the organic matter and seed reserves have been lost</p> <p>Added fertilizers are readily leached</p>
3	gully erosion compaction of topsoil	moderate low to moderate	<ul style="list-style-type: none"> accumulations of alluvium subsoils that slake/disperse sandy loam texture soil often moist low organic matter contents 	<ul style="list-style-type: none"> sedimentation - 	<p>-</p> <p>-</p>
5	sheet and rill erosion wind erosion leaching of nutrients (topsoil)	moderate moderate high	<ul style="list-style-type: none"> moderate slopes subsoils of low permeability weakly structured sandy topsoil droughty topsoil high topsoil permeability low cation exchange capacity low percentage base saturation 	<ul style="list-style-type: none"> sedimentation increased run-on sedimentation - 	<p>-</p> <p>-</p> <p>added fertilizers are readily leached</p>



Hardpans at approximately one metre depth restrict water movement and root penetration to the lower soil profile.



Relatively shallow gullies are common in this granitic landscape.