

7.14 James Land System (Js)

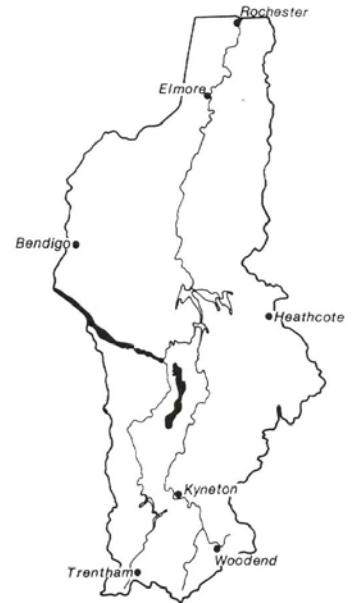
A metamorphic aureole ridge flanks the Harcourt granodiorite intrusion. Within the catchment it extends from Big Hill, near Bendigo, to Metcalfe. The ridge is broken where it is crossed by Myrtle and Axe Creeks and the Coliban River.

Shallow stony loam soils predominate and deeper gradational soils occur on the lower slopes. Dark gradational and duplex soils occupy the drainage depressions, often with a loamy wash layer derived from sheet erosion of the upper slopes.

Most of the ridge has been cleared, the main exceptions being in reserves near Big Hill and Mount Lofty. *E. polyanthemos*, *E. goniocalyx*, *E. microcarpa* and *E. macrorhyncha* predominate, with *E. polyanthemos*, *E. microcarpa* and *E. melliodora* on the gentler lower slopes and upper drainage depressions. *E. albens* is common in the Big Hill area, while *E. camaldulensis* occurs where streams break the ridge.

Prior to clearing there were good stands of native timbers, but the remnants are now largely depauperate. Clearing in the late 1800s and subsequent erosion from overgrazed native pastures has not only reduced *in situ* productivity, but has caused considerable off-site land deterioration.

The slopes and crests with shallow stony soils of high permeability are intake areas for the local or regional water tables. The removal of the higher-water-usage native vegetation from these areas results in increased infiltration of rainwater through the soil into bedrock aquifers, the mobilisation of stored salts and the rise of saline water tables.

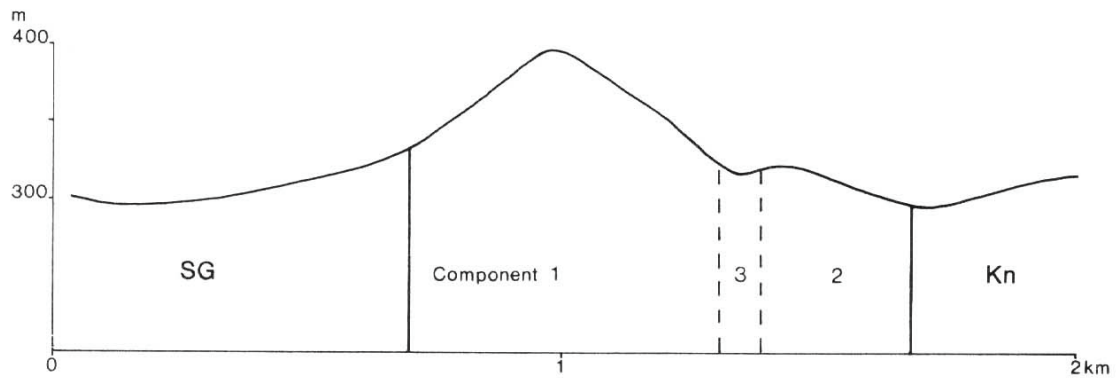
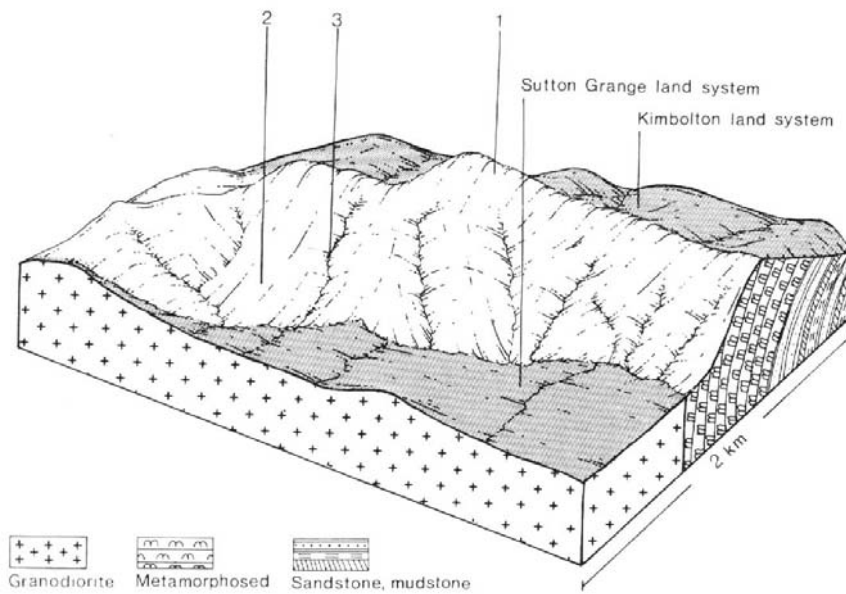


Sections of the steep ridgeline have been totally cleared of trees and now support sparse native pastures.



Increased run-off from the cleared hills results in gully erosion in the main drainage depressions.

The shallow stony loams have a low water-storage capacity, thus restricting native pasture production to a short growing season.



JAMES LAND SYSTEM (Js) Area 43 km² 1.1% of catchment

CLIMATE Rainfall, mean (min) 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 1 O°C (av.): May-August Rainfall less than potential evapotranspiration: October-early April		
GEOLOGY Age, rock type	Ordovician, sandstone and mudstone - variously metamorphosed		
PHYSIOGRAPHY Landform pattern Elevation range (m) Relative relief (m) Drainage pattern Channel spacing	Rolling hills forming prominent ridge 320-520 80-100 Parallel 1 dendritic Close		
LAND COMPONENT Number Percentage of land system	1 75	2 20	3 5
PHYSIOGRAPHY Landform element Slope; modal, range Site drainage	Steep mid to upper slope and crest 25, 5-40 Excessively drained	Less steep lower slope 10, 3-15 Somewhat excessively drained	Drainage depression 5, 1-10 Moderately well 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	Sandstone and mudstone Shallow stony soils of uniform or gradational soils, texture; occasional red duplex soils Urn, Gn3; minor Dr2.41 Loam 0.1-0.5 Low Very low to low Moderate 10-30 1065	Sandstone and mudstone, colluvium Reddish brown or brown gradational usually with pale A2 horizons and stone fragments throughout the profile Gn3, Gn174; minor Dr2 Loam 0.3-1.0 Low Low to moderate Moderate 0 1066	Alluvium and colluvium Upper depressions: Uniform or gradational loamy soils Lower depressions: Brown or black duplex soils, often overlain by a recent wash layer Upper parts: Urn, Gn4, Gn3.04 Lower parts: Urn over Dd, Db Silty loam, loam 0.4->2.0 Low Moderate Moderate; slow subsoil for duplex subsoils 0 1067
NATIVE VEGETATION Structure Characteristic species (+ indicates predominant species)	Woodland I / II, open forest II <i>E. polyanthemos</i> +, <i>E. goniocalyx</i> +, <i>E. microcarpa</i> +, <i>E. macrorhyncha</i> +, <i>E. melliodora</i>	Open forest II <i>E. polyanthemos</i> +, <i>E. melliodora</i> +, <i>E. microcarpa</i> +, <i>E. albens</i>	Open forest II Upper depressions: <i>E. microcarpa</i> +, <i>E. goniocalyx</i> , <i>E. polyanthemos</i> Lower depressions: <i>E. camaldulensis</i>
PRESENT LAND USE	Grazing of sheep on mainly native pastures; nature conservation	Grazing of sheep on mainly native pastures	Grazing of sheep on mainly introduced pastures
OBSERVED SOIL DETERIORATION	Sheet erosion common and locally severe	Sheet erosion common	Gully erosion common

SUSCEPTIBILITY OF LAND TO PROCESSES OF SOIL DETERIORATION – James

Compt.	Process	Susceptibility	Critical land factors	Off-site effects	Comments
1	Sheet and rill erosion wind erosion leaching of nutrients compaction of topsoil	High low to moderate moderate low to moderate	<ul style="list-style-type: none"> steep slopes hydrophobic topsoil summer thunderstorms of high rainfall intensity weakly structured loamy topsoil exposed topographic positions moderate soil permeability loamy texture low organic matter content weak soil structure 	<ul style="list-style-type: none"> sedimentation increased run-on - accession of soluble salts, particularly NaCl, to the ground watertable increased run-on 	<p>-</p> <p>hazard limited by the large number of stones in the topsoil</p> <p>this component is a recharge area for local and regional groundwater tables</p> <p>hazard limited by the large number of stones in the topsoil</p>
2	sheet and rill erosion compaction of topsoil	moderate moderate	<ul style="list-style-type: none"> moderate slopes hydrophobic topsoil summer thunderstorms of high rainfall intensity loamy texture low organic matter content weak soil structure 	<ul style="list-style-type: none"> increased run-on increased run-on 	
3	gully erosion compaction of topsoil	moderate moderate	<ul style="list-style-type: none"> channelised run-on minor accumulations of alluvium subsoils that slake/disperse loamy texture weak topsoil structure low organic matter content 	<ul style="list-style-type: none"> sedimentation water turbidity - 	<p>-</p> <p>-</p> <p>gully erosion is limited by shallow alluvium or rock bars</p>



The visible stones indicate sheet erosion has occurred and the remaining unhealthy/dead trees suggest the local environment has been changed.