

7.9 Glen Cooee Land System (GC)

This gently undulating area with few rocky slopes occurs on Ordovician sediments to the south and east of Bendigo, usually between the steeper ridges of the Kimbolton land system and the alluvial plains of the Axe Creek land system. The gentle landscape tends to occur on the softer mudstones; however, both differential erosion and geological structure appear to be involved.

Soil depth overlying the sandstones and mudstones is often shallow, even on the gentler slopes. Shallow stony uniform loams and gradational soils occur on the steeper slopes and crests. Yellow mottled sodic duplex soils predominate on the gentle slopes and in the drainage depressions, where they are often overlain by sandy wash.

The native vegetation is dominated by *E. microcarpa* and *E. leucoxylo*n. *E. melliodora* tends to grow on gentler lower slopes and drainage depressions, and *E. camaldulensis* is restricted to the major drainage depressions. *E. polyanthemos*, *E. macrorhyncha* and *E. goniocalyx* are confined to the steeper, rocky upper slopes and crests.

Land use consists mainly of sheep grazing on native pastures, but crops are often grown on the deeper soils. The upper slopes readily revert to native trees and shrubs.

Numerous small areas of Tertiary river gravels occur within the land system, often as thin layers of ferruginised gravel. Occasional deeper deposits are mined for road construction materials.

Although most slopes are gentle, the land is sensitive to several processes of soil deterioration. The slopes are susceptible to compaction and sheet erosion. The lower slopes and drainage depressions with sodic subsoils are readily affected by gully erosion, which may be aggravated by salting where groundwaters are rising.



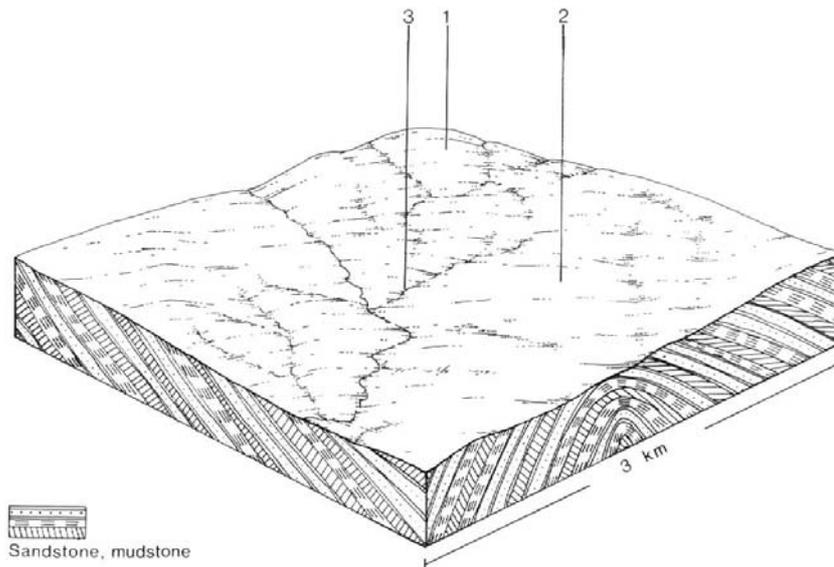
Myrtle Creek approximate the boundary between the Glen Cooee land system in the foreground and the steeper Kimbolton land system in the background.



Cape weed thrives during the spring, competing vigorously for moisture and nutrients, but provides no protection for the shallow topsoils during intense summer rainstorms.

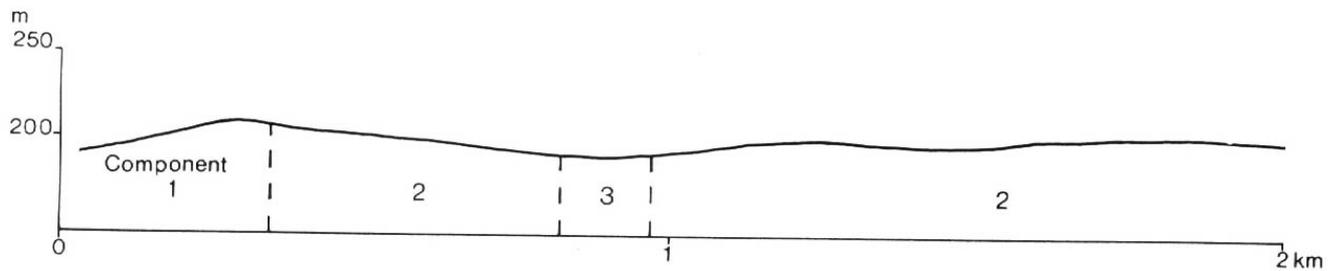


*Spiny rush (*Juncus acutus*) and dead trees in drainage depressions are indicative of a salting problem.*





Sandstone, mudstone



GLEN COOEE LAND SYSTEM (GC) Area 359 km² 8.8% of catchment

CLIMATE Rainfall, mean (mm) Temperature, mean (°C) Seasonal growth limitations	Annual, 500-650; lowest December (35-40), highest June (60-65) Annual, 14.5; lowest July (8), highest January (22) Temperature less than 10°C (av.): mid May – mid August Rainfall less than potential evapotranspiration: September – mid April		
GEOLOGY Age, rock type	Ordovician, sandstone and mudstone		
PHYSIOGRAPHY Landform pattern Elevation range (m) Relative relief (m) Drainage pattern Channel spacing	Undulating rises 160-400 20 Dendritic Moderate		
LAND COMPONENT Number Percentage of land system	1 20	2 70	3 10
PHYSIOGRAPHY Landform element Slope; modal, range (%) Site drainage	Steeper slope and crest with rock outcrop 7, 3-20 Somewhat excessively drained	Gentle slope and low crest, generally free of rock outcrop 3, 1-6 Well drained	Drainage depression 1, 0-3 Somewhat poorly 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 loam soils of uniform texture on the rocky crests; stony brown gradational soils on the slopes Um, Gn3.71, Gn3.84; minor Dr2.41 Loam 0.1-0.5 Very low to low Low Moderate 0-50 1025	Sandstone and mudstone, colluvium Yellow duplex soils comprising loamy topsoils and bleached A ₂ horizons over mottled yellow clays Dy3.41, Dy3.42, Dy3.43; minor Dr2.41 Loam 0.5-1.5 Very low surface, moderate subsoil Low surface, moderate subsoil Moderate surface, low subsoil 0-5 709, 1024	Alluvium Mottled yellow duplex soils with bleached A ₂ horizons Dy3.41, Dy3.42, minor Uc wash layer over Dy3.42 Loam >1.0 Very low to low Low surface, moderate subsoil Rapid surface, slow subsoil 0 1026
NATIVE VEGETATION Structure Characteristic species (+ indicates predominant species)	Woodland I/open forest I <i>E. leucoxylon</i> +, <i>E. microcarpa</i> +, <i>E. polyanthemos</i> , <i>E. macrorhyncha</i> , <i>E. goniocalyx</i> , <i>E. melliadora</i>	Open forest I/open forest II <i>E. leucoxylon</i> +, <i>E. melliadora</i> +, <i>E. microcarpa</i> +, <i>E. albens</i> , <i>E. polyanthemos</i> , <i>E. macrorhyncha</i>	Woodland II/open forest II <i>E. camaldulensis</i> +, <i>E. melliadora</i> (major drainage depressions) <i>E. microcarpa</i> +, <i>E. melliadora</i> , <i>E. leucoxylon</i> (minor drainage depressions)
PRESENT LAND USE	Grazing of predominantly sheep on native pastures and introduced pastures	Grazing on introduced pastures; cereal-cropping	Grazing on native and introduced pastures
OBSERVED SOIL DETERIORATION	Sheet erosion common	Sheet erosion	Salting common; gully erosion often severe

SUSCEPTIBILITY OF LAND TO PROCESSES OF SOIL DETERIORATION – Glen Cocee

Compt.	Process	Susceptibility	Critical land factors	Off-site effects	Comments
1	Sheet & rill erosion Leaching of nutrients Compaction of topsoil	Moderate Moderate Moderate	<ul style="list-style-type: none"> gentle to moderate slopes hydrophobic topsoil moderate soil permeability moderate cation exchange capacity loamy textures low organic matter content weak topsoil structure 	<ul style="list-style-type: none"> sedimentation flash flows - increased run-on 	The hard-setting topsoils resist erosion - -
2	Sheet & rill erosion Compaction of topsoil	Low to moderate Moderate	<ul style="list-style-type: none"> gentle slopes hydrophobic topsoil loamy textures low organic matter content weak topsoil structure 	<ul style="list-style-type: none"> sedimentation flash flows increased run-on 	The hard-setting topsoils resist erosion -
3	Gully erosion Salting	High High	<ul style="list-style-type: none"> subsoils that slake/disperse accumulations of alluvium channelised run-on saline water table at shallow depth stored salts in soil or parent material 	<ul style="list-style-type: none"> sedimentation water turbidity saline stream flows 	- Loss of protective vegetation cover due to salt toxicity can initiate erosion problems
	Compaction of topsoil	High	<ul style="list-style-type: none"> loamy textures low organic matter content weak topsoil structure topsoil frequently moist 	<ul style="list-style-type: none"> - 	The topsoils are prone to compaction when moist, although they become hard and massive when dry.



Increased run-off from adjacent slopes, sodic subsoil and overgrazing by stock and rabbits have all contributed to form this gully.