

7.15 *Kimbolton land system (Kn)*

This hilly area on Ordovician sandstones and mudstones occurs to the south and east of Bendigo. It consists of mostly timbered ridgelines, which typically trend north-south or north-east-south-west.

The relatively steep terrain is partly the result of faulting and the differential resistance of the rocks to erosion. The more resistant sandstones tend to form rocky spurs along the direction of strike, and drainage depressions form in the intervening softer siltstones.

Red gradational soils predominate, with shallow stony loams among the rocky outcrops. Yellowish brown gradational soils occupy most of the gentler slopes and crests, and yellowish brown to greyish brown gradational or sodic duplex soils occur in the drainage depressions.

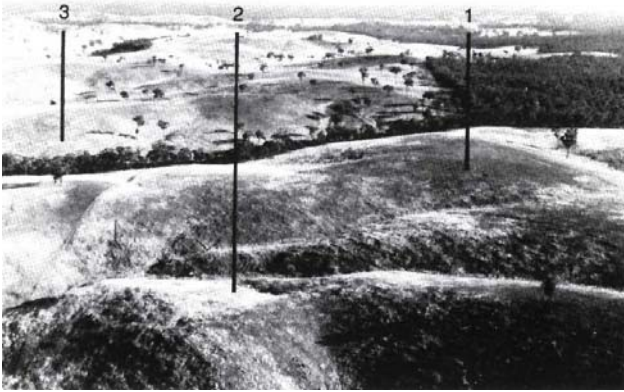
E. microcarpa is the predominant tree species throughout. It is associated with *E. macrorhyncha*, *E. polyanthemos* and *E. sideroxylon* in a woodland or open forest formation on the steeper crests and slopes and with *E. leucoxylon* and *E. melliodora* in an open forest formation on the gentler slopes and drainage depressions.

The shallow stony soils of low fertility, low water-holding capacity and moderate susceptibility to leaching of nutrients have a low potential for agriculture or forestry. Most of the native forests remain, and careful management allows controlled selective logging for posts and firewood as well as providing for nature conservation and recreation.

The steeper slopes are prone to sheet erosion, and the drainage depressions to sheet and gully erosion. Retention of the forests in most areas limits the incidence of erosion and protects the cleared lowlands from erosion and from rising saline water tables. Existing erosion gullies in forested areas probably result from indiscriminate exploitation during earlier gold rush days.



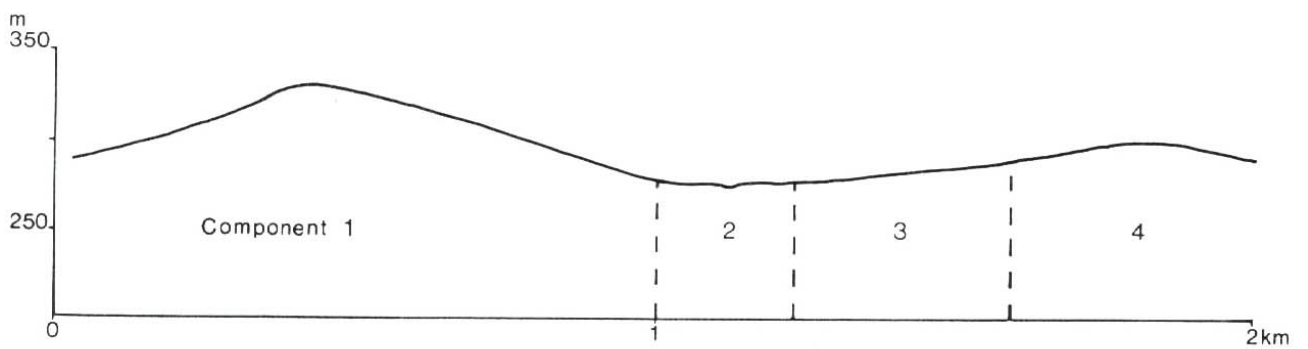
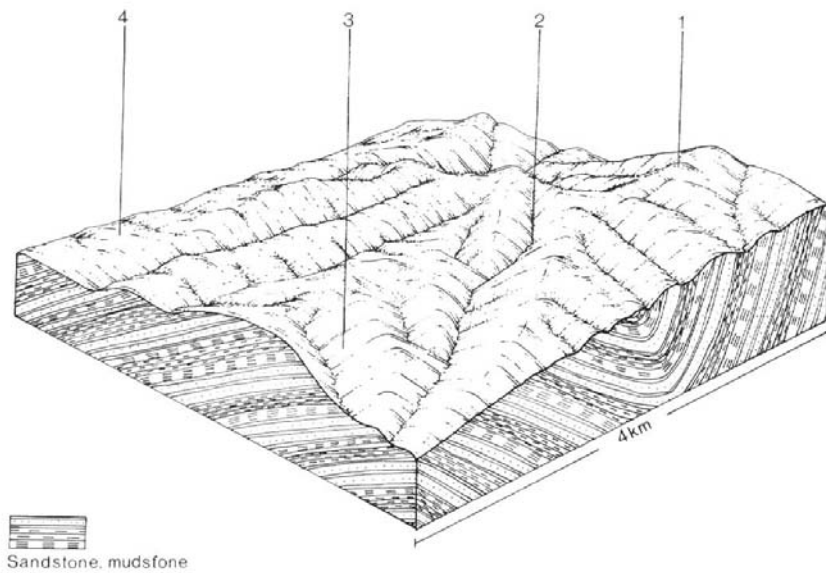
Outcropping bedrock is a common sight on the steeper slopes.



The rolling low hilly landscape supports forestry and grazing



Open channels convey water to private properties



KIMBOLTON LAND SYSTEM (Kn) Area 208 km² 5.1% of catchment

CLIMATE Rainfall, mean (mm) Temperature, mean (°C) Seasonal growth limitations	Annual, 550-650; lowest December (35-40), highest June (60-65) Annual, 14; lowest July (7.5), highest January (21.5) Temperature less than 10°C (av.): May-August Rainfall less than potential evapotranspiration: late September-early April			
GEOLOGY Age, rock type	Ordovician, sandstone and mudstone			
PHYSIOGRAPHY Landform pattern Elevation range (m) Relative relief(m) Drainage pattern Channel spacing	Rolling low hills 180-371 40 Dendritic Moderate to close			
LAND COMPONENT Number Percentage of land system	1 60	2 10	3 15	4 15
PHYSIOGRAPHY Landform element Slope; modal, range Site drainage	Steeper slope and rocky crest 12, 4-25 Somewhat excessively drained	Drainage depression 2, 1-3 Somewhat poorly drained	Gentler mid to lower slope, generally rock free 6, 4-10 Well drained	Gentle crest and adjacent slope (with predominantly <i>E. sideroxylon</i>) 6, 1-10 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 Red gradational soils; occasional shallow brown loam soils of uniform texture Urn 1.43, Gn3.4, Gn3.1 1; minor Dy3.11 Loam 0.1-0.5 Very low Low Moderate 10-60 713, 1046	Alluvium Yellowish to greyish brown gradational or duplex soils, usually with pale or bleached A2 horizons Dy3.42, Gn4.5, Gn4.8 Loam 1.0->2.0 Low Moderate Moderate surface, slow subsoil 0 -	Sandstone and mudstone Yellowish brown gradational soils; occasional yellow duplex soils Gn3.85, Gn3.84; minor Dy3.42 Loam 0.5-4.0 Very low to low Low to moderate Moderate 1-5 714, 1048	Sandstone and mudstone Yellowish brown gradational soils Gn3.75, Gn4.81 Loam, silty loam 0.3-1.0 Very low to low Low to moderate Moderate 5-10 1047
NATIVE VEGETATION Structure Characteristic species (+ indicates predominant species)	Woodland I, open forest I/II <i>E. microcarpa</i> +, <i>E. polyanthemos</i> +, <i>E. macrorhyncha</i> +	Open forest II <i>E. microcarpa</i> +, <i>E. melliodora</i> +, <i>E. leucoxyton</i>	Open forest I/II <i>E. macrorhyncha</i> +, <i>E. microcarpa</i> +, <i>E. polyanthemos</i> +, <i>E. sideroxylon</i> , <i>E. albens</i> , <i>E. goniocalyx</i>	Open forest II <i>E. sideroxylon</i> +, <i>E. macrorhyncha</i> , <i>E. polyanthemos</i> , <i>E. leucoxyton</i> , <i>E. microcarpa</i>
PRESENT LAND USE	Forestry; recreation; minor grazing on native and introduced pastures	Recreation; minor grazing; grazing of native and introduced pastures	Forestry; recreation; grazing of native and introduced pastures	Forestry; recreation;
OBSERVED SOIL DETERIORATION	Sheet erosion common and severe in cleared areas	Gully erosion occurs in many lower drainage depressions; limited salting	Sheet erosion widespread, generally slight to moderate	Sheet erosion widespread, generally slight to moderate

SUSCEPTIBILITY OF LAND TO PROCESSES OF SOIL DETERIORATION – Kimbolton

Compt.	Process	Susceptibility	Critical land factors	Off-site effects	Comments
1	sheet and rill erosion	moderate	<ul style="list-style-type: none"> hydrophobic topsoil moderate slopes summer thunderstorms of high rainfall intensity 	<ul style="list-style-type: none"> sedimentation increased run-on 	<p>numerous rock outcrops imp(overland flow, thereby increasing the infiltration of water; the shallow topsoils have a low tolerance of. sheet erosion</p>
	leaching of nutrients	moderate	<ul style="list-style-type: none"> weakly structured topsoil moderate soil permeability moderate cation exchange capacity low organic matter content 	<ul style="list-style-type: none"> accession of soluble salts, particularly NaCl, to the groundwater table 	<p>the component is a recharge area for local and regional groundwater tables</p>
	compaction of topsoil	low to moderate	<ul style="list-style-type: none"> low organic matter content loamy texture 	<ul style="list-style-type: none"> increased run-on 	-
2	gully erosion	low to moderate	<ul style="list-style-type: none"> small accumulations of alluvium excessive run-on sodic subsoils 	<ul style="list-style-type: none"> sedimentation water turbidity 	<p>gully erosion is limited by shallow alluvium or rock bars</p>
	compaction of topsoil	Moderate to high	<ul style="list-style-type: none"> low organic matter content loamy textures 	<ul style="list-style-type: none"> increased run-on 	<p>the topsoils are prone to compaction when moist, although they become hard a massive when dry</p>
	salting	low to moderate	<ul style="list-style-type: none"> stored salts in soil regolith saline groundwater table at shallow depth 	<ul style="list-style-type: none"> saline stream flows 	<p>the retention of native vegetation within this land system maintains the water table at safe depths</p>
3&4	sheet and rill erosion	moderate	<ul style="list-style-type: none"> gentle-moderate slopes hydrophobic topsoil summer thunderstorms of high rainfall intensity 	<ul style="list-style-type: none"> sedimentation flash flows 	<p>the long, rock-free slopes allow erosive water velocities to develop</p>
	compaction of topsoil	moderate	<ul style="list-style-type: none"> loamy texture low organic matter content 	<ul style="list-style-type: none"> increased run-on 	-



Shallow gullies, once initiated, work their way up the drainage depressions, even in forested areas.