7.31 Trentham East land system (TE)

Situated in the higher-rainfall part of the catchment, this gently undulating landscape on basalt near Trentham is highly productive and intensively used. The notable red soils have a high ferric oxide content, a strong structure, a friable consistence and a high clay content, resulting in excellent physical characteristics for plant growth. The depth to the weathering basalt is variable, and in places shallow soils and outcropping rock restrict land use to grazing.

Little remains of the original tall dense forests. *E. viminalis* and *E. obliqua* are the main tree species, often with *E. pauciflora* and occasionally *E. radiata. E. ovata* occurs in the less well-drained sites. Common understorey species are *Acacia melanoxylon* and *A. dealbata.*

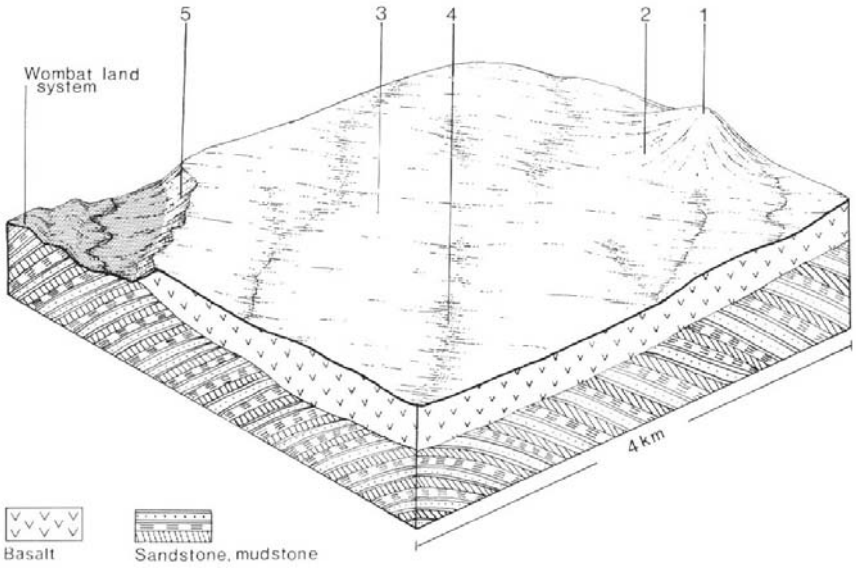
Soil loss occurs on the steeper slopes, particularly where cultivation is not done on the contour. Although inherently well structured, compaction occurs under excessive cultivation and where stock congregate on seasonally wet depressions. Blackberries thrive unless the land is carefully managed, particularly in drainage depressions.

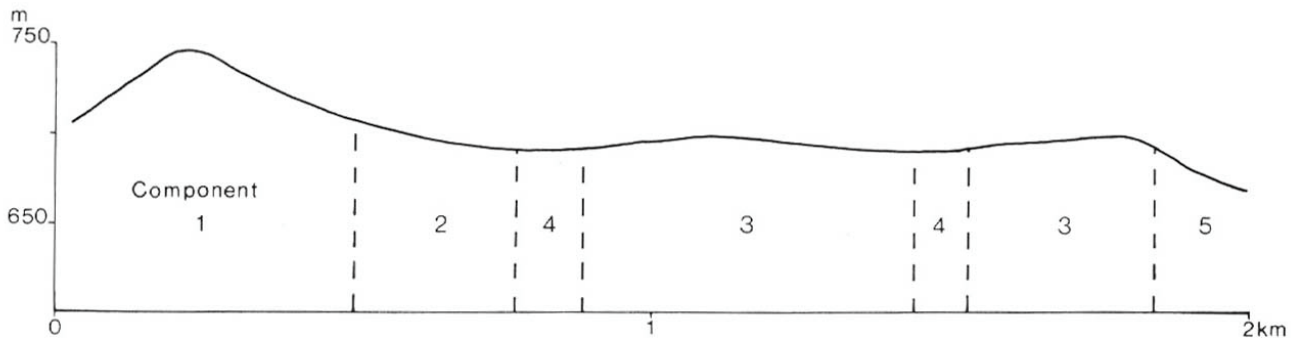
The bulk of the land system is used for grazing on improved pastures in rotation with crops, such as potatoes or summer fodder crops. Growth is severely retarded by low winter temperatures. A small area of the natural vegetation has been retained in the Trentham Falls Reserve.

Blue Mountain on the southern catchment boundary has an annual rainfall of 1250 mm.

Components in the Trentham East land system

The red friable soils are ideal for growing potatoes





TRENTHAM EAST LAND SYSTEM (TE) Area 76 km^2 1.9% of catchment

CLIMATE Rainfall, mean (mm) Temperature, mean (°C) Seasonal growth limitations	Annual, 800-1300; lowest January (50-55), highest June (120-130) Annual, 11.5; lowest July (6), highest February (18) Temperature less than 10°C (av.): April-September Rainfall less than potential evapotranspiration: November-February				
GEOLOGY Age, rock type	Pliocene, olivine basalt				
PHYSIOGRAPHY Landform pattern Elevation range (m) Relative relief (m) Drainage pattern Channel spacing	Gently undulating rises, isolated volcanic cones 560-873 20 Dendritic Sparse				
LAND COMPONENT Number Percentage of land system	1 5	2 5	3 75	4 10	5 5
PHYSIOGRAPHY Landform element Slope; modal, range Site drainage	Volcanic cone 30,20-40 Somewhat excessively drained	Outwash slope flanking volcanic cone 12, 10-18 Somewhat excessively drained	Undulating plain 2,0A Well drained	Drainage depression 1,1-2 Somewhat poorly drained	Scarp Variable, 10-50 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	Basalt Shallow red stony loam soils Um1.2 Silty loam 0.1-0.3 Low to moderate Low to moderate Rapid 60-80 -	Colluvium Deep red gradational soils Gn4.11, Gn3.12 Silty loam > 1.0 Low to moderate High Moderate 0-10 1111	Basalt Red gradational soils, occasionally stony on crests Gn3.14, Gn3.12, Gn3.11 Silty loam, silty clay loam > 1.0 Low to moderate High Moderate 0 1109,1110	Alluvium and colluvium Dark silly gradational soils, often with mottled subsoils Gn3.42; minor Uf6.32 Silly clay loam > 1.5 Low to moderate High Moderate 0 1060	Basalt Shallow red loamy soils and red gradational soils Um, Gn4.1, Gn3.1 Silty loam 0.1-0.5 Moderate Moderate Moderate to rapid 0-10 -
NATIVE VEGETATION Structure Characteristic species (+ indicates predominant species)	Open forest II *E. viminalis, E. obliqua*	Open forest Ill *E. viminalis,* E. *obliqua*	Open forest Ill E. *obliqua+,* E. *radiata+* *E. viminalis+, E. pauciflora*	Open forest II *E .ovata+, E. viminalis*	
PRESENT LAND USE	Grazing on introduced pastures	Grazing on introduced pastures; minor cropping	Grazing on introduced pastures; topping - potatoes, cereals, legumes	Grazing on introduced pastures	Grazing on introduced pastures; reserve (Trentham falls)
OBSERVED SOIL DETERIORATION	Minor sheet erosion	Minor sheet erosion	Minor compaction	Minor compaction	Minor sheet erosion;

SUSCEPTIBILITY OF LAND TO PROCESSES OF SOIL DETERIORATION – Trentham East

Compt.	Process	Susceptibility	Critical land factors	Off-site effects	Comments
1 & 5	sheet and rill erosion	low to moderate	• moderate to steep slopes	• sedimentation • water turbidity	high soil permeability reduces overland water flow and reduces the erosion hazard
	leaching of nutrients	moderate	• high soil permeability • low to moderate cation exchange • capacity and percentage base • saturation	• -	-
	compaction of topsoil	moderate	• silty loam textures • topsoil often moist • high organic matter content	• increased run-on	-
2	sheet and rill erosion	low to moderate	• gentle to moderate slopes • moderate soil permeability	• sedimentation • water turbidity	-
	leaching of nutrients	low to moderate	• moderate soil permeability • low to moderate cation exchange capacity and percentage base saturation	• -	-
	compaction of topsoil	moderate	• silty loam textures • topsoil often moist • high organic matter content	• increased run-on	-
3	leaching of nutrients	low to moderate	• moderate soil permeability • low to moderate cation exchange capacity and percentage base saturation	• increased run-on	-
	compaction of topsoil	moderate	• silty loam textures • topsoil often moist • high organic matter content	• increased run-on	-
4	compaction of topsoil	high	• silty loam textures • topsoil usually moist • high organic matter content	• -	-

A road-metal quarry near Tylden

Blackberries on the well-drained sols and high rainfall.