

## 7.2 *Axe Creek Land System (AC)*

This area to the south-east of Bendigo occurs on alluvial plains associated with Axe, Sweeneys, Emu, Sheepwash and Homebush Creeks.

The red duplex soils on the older alluvial terrace tend to be moderately well drained because of their situation, but permeability decreases markedly between the A and B horizons. The sandy loam topsoils are prone to compaction and to surface sealing when bared. The soils of the young alluvial stream deposits are usually sandy, with little profile development.

Land use is predominantly grazing and cropping on the upper terrace with small irrigated areas. Loss of productivity through compaction is a notable problem under intense cultivation, trampling and trafficking.

Management within the catchments has raised saline groundwater tables, leading to soil salting on the lower components and to increased salinity of the streams.



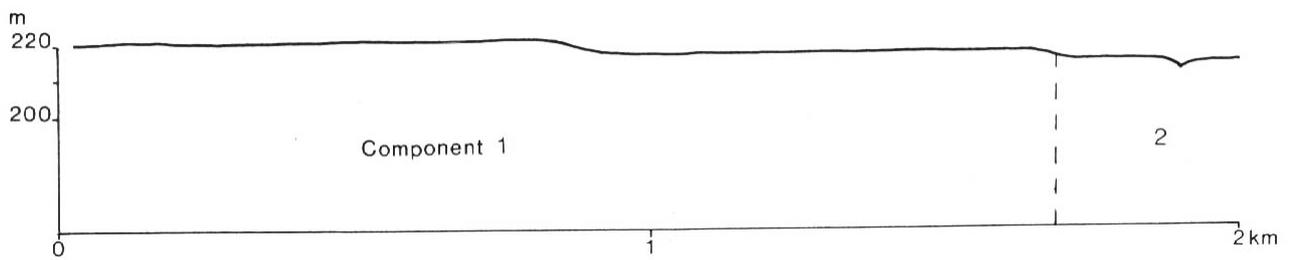
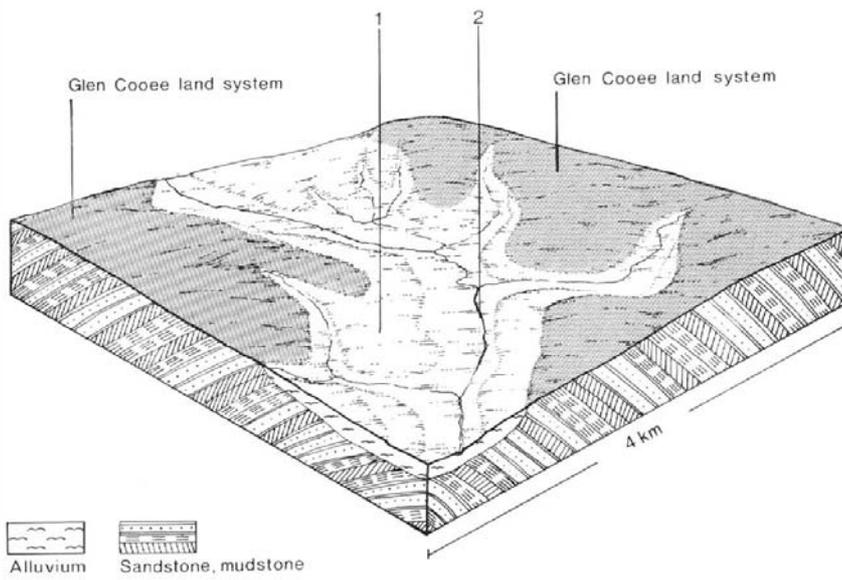
*The tree-lined Axe Creek meanders through the narrow alluvial plains.*



*A gently sloping scarp separates two terrace levels.*



*Grazing, either by cattle or sheep, is a common land use.*



**AXE CREEK LAND SYSTEMS (AC)    Area 41 km<sup>2</sup>    1.0% of catchment**

<b>CLIMATE</b> Rainfall, mean (mm) Temperature, mean (°C) Seasonal growth limitations	Annual, 500-600; lowest December (30-35), highest June (55-60) Annual, 14.5; lowest July (8), highest January (22) Temperate less than 10°C (av.): mid May – mid August Rainfall less than potential evapotranspiration: September – mid April	
<b>GEOLOGY</b> Age, rock type	Quaternary, alluvium	
<b>PHYSIOGRAPHY</b> Landform pattern Elevation range (m) Relative relief (m) Drainage pattern Channel spacing	Gently undulating plains 140-230 5 Dendritic Moderate	
<b>LAND COMPONENT</b> Number Percentage of land system	1 85	2 15
<b>PHYSIOGRAPHY</b> Landform element Slope; modal, range (%) Site drainage	Alluvial terrace 1, 0-2 Well drained	Narrow flood-plain 1, 0-1 Moderate well drained
<b>SOIL</b> Parent material Description  Classification Surface texture Depth to hardpan or bedrock (m) Nutrient status Available water capacity Permeability Exposed rock/stone (%) Sampled site number	Alluvium Red duplex soils, with bleached A <sub>2</sub> horizons. Variants include unbleached A <sub>2</sub> horizons and yellow duplex soils with red mottling in areas of poorer drainage. Dr2.41; minor Dy3.41, Dr2.21, Dy5.42 Sandy loam >2.0  Low surface, moderate soils Low surface, moderate soil Rapid surface, slow subsoil 0 1098,1101	Alluvium Sandy soils  Uc1.43, Uc1.42 Loamy sand >2.0  Low Low Rapid 0 1097
<b>NATIVE VEGETATION</b> Structure Characteristic species (+ indicates predominant species)	Woodland II/open forest II <i>E. microcarpa</i> , <i>E. melliodora</i> , <i>E. camaldulensis</i>	Woodland II, open forest II <i>E. camaldulensis</i>
<b>PRESENT LAND USE</b>	Grazing of sheet and cattle on introduced pastures, including irrigated lucerne; minor cereal-cropping	
<b>OBSERVED SOIL DETERIORATION</b>	Widespread compaction; occasional gully erosion, usually associated with run-on from adjacent lands.	Salting common along the major depressions, leading to sheet, gully and stream-bank erosion.

## SUSCEPTIBILITY OF LANDS TO PROCESSES OF SOIL DETERIORATION – Axe Creek

Compt.	Process	Susceptibility	Critical land factors	Off-site effects	Comments
1	Gully erosion  Compaction of topsoil	Moderate  Moderate	<ul style="list-style-type: none"> <li>• sodic subsoil</li> <li>• deep accumulation of alluvium</li> <li>• channelised run-on</li> <li>• loamy texture</li> <li>• low organic matter content</li> <li>• weak topsoil structure</li> </ul>	<ul style="list-style-type: none"> <li>• sedimentation</li> <li>• increased run-on</li> <li>• water turbidity</li> <li>• increased run-on</li> </ul>	The surrounding cleared areas readily shed water onto this component.  -
2	Stream-bank erosion  Salting  Leaching of nutrients  Compaction of topsoil	Moderate  High  High  Low to moderate	<ul style="list-style-type: none"> <li>• deep accumulations of alluvium</li> <li>• saline groundwater table at shallow depth</li> <li>• stored salts in soil and parent material</li> <li>• moderate to high soil permeability</li> <li>• low cation exchange capacity</li> <li>• low percentage base saturation</li> <li>• sandy or loamy texture</li> <li>• low organic matter content</li> <li>• weak topsoil structure</li> </ul>	<ul style="list-style-type: none"> <li>• sedimentation</li> <li>• saline stream flow</li> <li>• -</li> <li>• increased flash flows</li> </ul>	Trafficability across stream by vehicles and stock is increasingly difficult Loss of the protective cover due to salt toxicity can initiate erosion problems.  -  -



*Clearing the adjacent slopes has contributed to rising saline water tables and salting in the drainage depressions, as indicated by the infestation of spiny rush (*Juncus acutus*).*