

## 18. MOORA VALLEY LAND-SYSTEM

Three of the streams flowing out of the Grampians pass through areas of restricted drainage where stream flow is sluggish and the main channel divides into numerous diffuse drainage lines. The streams concerned are the Glenelg and Wannon Rivers and Tea-Tree Creek and the areas of restricted drainage through which they flow are collectively called the Moora Valley land-system, which has an area of 102 square miles.

The Moora Valley land-system is made up of the flat plain, sand sheet and swamp land-forms. The first two land-forms originated from alluvial deposits of three different ages laid down by the streams in 'flat, poorly-drained sections of their upper tracts. The oldest deposits are Plio-Pleistocene sands and clays and the youngest deposits are Late Holocene sands and clays (Spencer-Jones 1965). Both groups of sediments form flat plains. The sand sheets are of intermediate age and are composed of a deep mantle of Early Holocene siliceous sands. The relationships of the land-forms to each other and their features of environment and land-use are shown in Figure 22.



*Plate 30 – In the Moora Valley land-system there are treeless heaths, as shown here, which indicate a clay subsoil close to the surface. The timber in the background is an apple box woodland growing in the deep, sandy podzols of a sand sheet.*

The flat plain of Plio-Pleistocene age is identified by a tall woodland of red gum and also by a shrub woodland of red gum, yellow box, black wattle, silver banksia and prickly tea-tree. Its soils are deep solonchic soils in which the clay subsoil is usually between two and three feet below the surface under the shrub woodland, and one to two feet under the tall woodland. The flat plain of Late Holocene age takes the form of treeless heaths which have short plant communities generally less than two feet in height. The soils are shallow sands which are underlain by clay or coffee rock at depths usually between 18 and 30 inches below the surface.

Characteristic features of the sand sheets are the heath woodlands of apple box and peppermint and the short dry sclerophyll forests of brown stringybark which grow in nomopodzols. Both sub-formations have a continuous and dense heath understorey.



*Plate 31 – From the air the three important components of Moora Valley land-system are readily identified. Areas marked A are red gum and yellow box woodlands growing in the oldest deposits of Plio-Pleistocene sands and clays. Areas marked B are the sand sheets of intermediate age covered with a heath woodland of apple box. Areas marked C are the youngest deposits and are recognised as treeless heaths.*

The A horizons of all soils in the land-system are sands and here the familiar problems associated with the use of sands for agriculture confront agriculturists once again. These problems are a deficiency of pasture nutrients and a low capacity to store soil moisture.

Moora Valley land-system has a greater potential for pasture development than Kowree and Grampians Plains land-systems even though these three mapping units have the same kinds of soil with the same problem of nutrient deficiency. This is because Moora Valley land-system has a higher average annual rainfall (28-35 inches) and many of its soils have a clay subsoil comparatively close to the surface. For these reasons, the soils are more capable of maintaining a supply of water to the pastures.

However, within the land-system some variations in the capacity of the soils store water do occur, particularly between the soils of the sand sheets and the fi, plains ins The podzols on the sand sheets are well drained because of their depth, and they rely solely on rainfall to maintain the supply of soil moisture to the roots of the pastures. By contrast, soils on the flat plain have comparatively shallow A horizons and their clay subsoils hold up water to the pastures. For this reason the heaths are the best pasture sites except in years of excessive rainfall when they would become waterlogged. During such a season the sand sheets may allow more pasture growth because the podzols would remain freely drained.

Another factor favouring the development of the land-system for agriculture is the comparatively low clearing costs of the extensive areas of treeless heath.

### ***Land-Units***

The three areas of restricted drainage associated with the Glenelg River, Wannon River and Tea-Tree Creek can be regarded as land-units within the land-system.

***Moora Valley land-unit***, covering 60 square miles, is the largest land-unit. It contains the headwaters of the Glenelg River and is surrounded on all sides by sandstone ranges and granite hills. Its only outlet is at Victoria Gap where the Glenelg leaves the confines of the mountains and begins its passage across the plains to the sea.

Moora Valley land-unit is entirely within the Grampians Reserved Forest and at present is being used for timber cutting and water conservation. A limited supply of firewood and good quality milling timber is provided by the red gum and yellow box woodlands which are logged under the supervision of the Forests

Commission. Water from the Glenelg River is diverted and stored in the Moora Moora Reservoir, formerly the largest swamp in the land-unit, and then channelled into the distributary system of the Wimmera and Mallee Stock and Domestic Water Supply Scheme.

Although the land-unit has a potential for pastoral development, it is considered that the present utilization for timber and especially water conservation should be retained. The demand for domestic and stock water throughout the Wimmera and Mallee is continuous and the present facilities for storage and distribution need to be safeguarded.

The importance of the Moora Valley as a source of water for the regions to the north has received further emphasis from the suggestion by Gloe (1947) that the valley may be an intake area for aquifers feeding the Murray Artesian Basin.

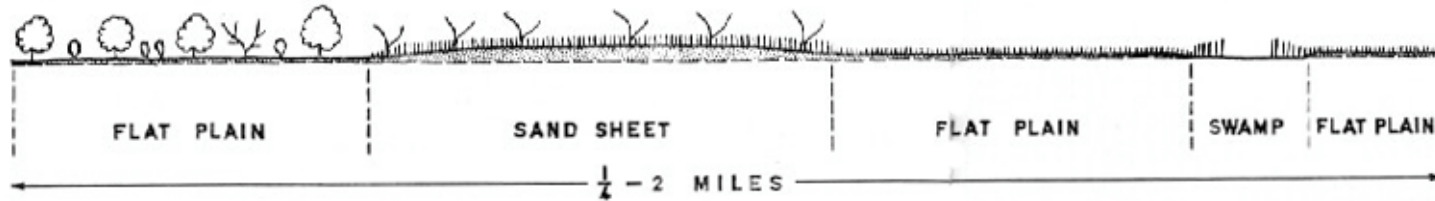
***Tea-Tree Creek land-unit*** is the area of sluggish stream flow associated with Tea-Tree Creek and its tributaries. These streams flow down the western side of the Victoria Range and after a short distance of about five miles enter Rocklands Reservoir. The land-unit is very similar to the Moora Valley with extensive heaths interspersed with forests of brown stringybark. There are, however, no woodlands of red gum and yellow box and no heath woodlands of apple box.

Because the land-unit is essentially a network of drainage lines flowing into Rocklands Reservoir it is considered that it should remain unalienated.

***Burrah Burrah land-unit*** is the third area of the land-system. It is associated with the Wannon River where this stream is blocked and diverted by the edge of the basalt plain. This blockage has given rise to an area of sluggish stream flow where the main channel divides into numerous diffuse drainage lines filled with tall heath vegetation. Between these drainage lines there are woodlands of red gum and yellow box. There are no swamps or large heaths but in other respects it corresponds with the Moora Valley. Its woodlands of red gum and yellow box are alienated and used for sheep grazing but the surrounding areas of stringybark and heath vegetation are uncleared and unused.

## MOORA VALLEY LAND-SYSTEM

(i) Distribution of land-forms



(ii) Land-system diagram

Climate		Average annual rainfall 27-35 inches : growing season April to October			
Land-Form		Flat plain	Sand sheet	Flat plain	Swamp
Geology		Plio-Pleistocene sediments	Early Holocene siliceous sands	Late Holocene sands and clays	
Topography		Flat			
Soil		Deep solonetzic soils (Warratong series)	Organo and iron nomopodzols	Shallow solonetzic (dominant) Shallow organo nomopodzols (minor)	
Land Class		2A	3 (low carrying capacity because of infertility and dryness of soil)	2A	6
Land Use	Present	Some timber cutting and rough grazing for sheep	Unused	Unused	Unused
	Problems	Establishing improved pastures	Finding a suitable form of land-use	Establishing improved pastures	
Water Erosion	Hazard	Low			
	Actual	None			
Native Vegetation	Structure	Tall and shrub woodlands	Heath woodland	Dry sclerophyll forest	Heath
	Species	Red gum (dominant) Yellow box (minor), black wattle, tall Banksia, grasses	Apple box (dominant) Peppermint (minor) Heath understorey	Brown stringybark with heath understorey	Many heath species including silver banksia, yacca, various tea-tree, slaty oak

*Figure 22 – Moora Valley Land System*