

## 20. DUNKELD LAND-SYSTEM

The Dunkeld land-system is the second mapping unit on the basalt area of the survey. Like the Willaura land system it is an undulating plain but differs in having stony rises and no swamps. Further differences are the predominance of heavy clay soils and the presence of red gum woodlands in some parts of the land-system.

The stony rises are few and are minor features of the landscape. They are two or three chains long and no more than about ten feet high. The undulating plain has long gentle slopes, with basalt boulders outcropping on the surface in some areas, and it lacks a clearly defined creek system although the regional drainage is not as weakly developed as in Willaura land-system. The land-forms and their features of environment and land-use are shown in Figure 24.

Three areas are included in the Dunkeld land-system. The largest lies south of the Wannon River in the southern and south-western parts of the survey. The Wannon forms the boundary of this section of the land-system because it was forced to move around the edge of the original lava flows which blocked its former southward course and diverted it to the west (Hills 1959). The second area is near to the first in the Victoria Valley within the Grampians and the third is further east in the parish of Kalymna, south of Moyston.

Further description of the land-system is best given by reference to the land-units of which there are two, Karabeal and Dunkeld land-units. The important difference between the land-units is their soils.

### *Land-Units*

**Karabeal land-unit** has gilgaied acidic brown clays. These acidic clays are poorly structured and very hard when dry. The puff has a slightly better structure than the shelf because it cracks more intensively when it is dry whereas the shelf is massive or only weakly cracked. The top one or two inches of the shelf is often a clay loam with some aggregation because of the accumulation of organic matter from the grass cover. Small nodules of ironstone buckshot lie on the ground and in the soil although usually they are not in large amounts. A feature of many parts of the land-unit is the basalt boulders which protrude above the surface of the ground or lie just under it.

At some sites there are definite tendencies toward the features of solodic soils particularly in the shelves of the gilgais and where the gilgais are not very noticeable. These tendencies include a change of texture at the surface to a loam and also a deepening of the surface horizon which is accompanied by an increase in the quantity of buckshot and a slight bleaching above a clay horizon in the subsoil.

A shallow red to reddish brown loam has developed on the stony rises. This is a skeletal soil (lithosol) and was first described and named Corangamite stony loam by Leeper et al (1936). It is one of the most fertile soils in the survey because of its proximity to an abundant source of primary minerals in the weathering basalt. However, it cannot be used intensively because there is so little of it and the stony rises are a barrier to cultivation.



*Plate 32 – Karabeal land-unit is a naturally treeless basalt plain with heavy clay soils. Wind breaks of sugar gums and pines have been planted.*

Some parts of Karabeal land-unit are covered with a red gum savannah woodland, for example, in the parish of Kalymna, in the Victoria Valley and along the western boundary near Kyup and Mokanger. The central section around Karabeal, the landscape is treeless although a few isolated swamp gums suggest that there may have been a woodland of this species when white men settled in the area. Sugar gums and pines have been planted as wind breaks and shelter belts.

The main primary industry is fine-wool growing on native pastures with beef production on most properties as a sideline. Although there is some pasture improvement, many areas in the land-unit are still under native pastures because there are difficulties in the way of cultivation. One of these is the basalt boulders which make cultivation impossible wherever they are in large numbers. Where the boulders are few, spring-tined implements can be used to break the ground prior to broadcasting seed and fertilizer. The second difficulty arises from the physical properties of the clays. These soils are very hard when dry, and very sticky when wet, and are therefore difficult to cultivate. The

only time cultivation is not a problem is when the soil is at the correct intermediate level of soil moisture and this condition may not last for very long. Landholders are assisted greatly by powerful tractors and ploughs now available to finish the task quickly before the soil becomes too wet or too dry.

The native pastures are thin and provide a limited amount of feed for the grazing animals particularly during summer when the grasses dry-off. The overall carrying capacity is about a half dry sheep per acre. The provision of supplementary feed is therefore a necessity but it cannot be produced readily on the farms because the native pastures do not make sufficient spring growth for hay making, and the difficulties of cultivation reduce the possibility of growing cereal hay or grain.

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

***Dunkeld land-unit*** is located along the southern boundary of the survey area from Strathkellar eastwards nearly to Glenthompson. It is distinguished from the Karabeal land-unit by its solodic soils which have loams and sandy loams in their A horizons with considerable quantities of fine buckshot. A clay subsoil is at depths of between 8 and 24 inches below the surface. In some places there are weakly developed gilgais.

Around Dunkeld township, the land-unit has a red gum savannah woodland but in the western parts between Moutajup and Strathkellar it has a swamp gum woodland.

In contrast to Karabeal land-unit, introduced pastures are common because the absence of basalt boulders in many areas and the coarser textures of the topsoils offer no difficulties to cultivation. Under an average annual rainfall of 25 to 27 inches, Mt. Barker subterranean clover and perennial ryegrass have lifted the carrying capacity to three dry sheep per acre. Superphosphate is the only fertilizer in common use and, encourages a quick response by the pastures. Deficiencies of potassium and molybdenum may be limiting factors in some localities and should be considered if the pastures do not respond as they should to superphosphate.

The land-unit has a higher rainfall than most of the other agricultural areas and perennial pastures should find a ready place in the farm economy. Local farming experience has shown that white clover does not thrive, however perennial ryegrass is widespread and phalaris is successful when sown in the spring. On the lower positions of the landscape, Yarloop subterranean clover and Palestine strawberry clover should be useful in seasonally-waterlogged paddocks.

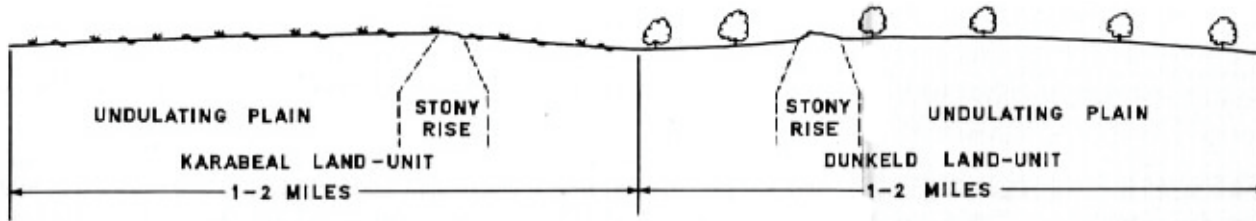


***Plate 33 – The Dunkeld land-unit is a gently undulating plain with solodic soils and woodlands of red gum and swamp gum.***

Both land-units of the land-system have a moderate to low erosion hazard and few serious examples of erosion. The low slopes, and in the case of Karabeal land-unit the clay soils, help to give this favourable situation. A few drainage lines in Dunkeld land-unit have scoured in places to form shallow gullies but the introduced pastures have since reduced the volume of run-off and the gullies are no longer very active. In Karabeal land-unit, sheet erosion does occur to some extent on the steepest slopes under native pastures.

## DUNKELD LAND-SYSTEM

(i) Distribution of land-forms



(ii) Land-system diagram

Land Unit		Karabeal		Dunkeld	Karabeal and Dunkeld
Climate	Average annual rainfall 23-27 inches : growing season April to October				
Land Form	Undulating plain				Stony rise
Geology	Pleistocene basalt				
Topography	Long, gentle slopes 1-2%				Very short, steep slopes up to 10%
Soil	Acid brown clays		Brown solodic soils		
Land Class	Mainly 2A and 2B without basalt boulders, 3 with basalt boulders				
Land Use	Present	Fine wool grown on native and introduced pastures, some beef production			
	Problems	Difficulty of cultivation for pasture improvement and hay making			
Water Erosion	Hazard	Low		Low	
	Actual	Moderate sheet erosion on steepest slopes		Shallow gullies in some drainage lines	
Native Vegetation	Structure	Grassland	Savannah woodland	Savannah woodland	Grassland
	Species	Wallaby, brome, spear grasses	Red gum	Red gum	Swamp gum

**Figure 24 – Dunkeld Land System**