LIVINGSTONE LAND SYSTEM

LIVINGSTONE LAND SYSTEM

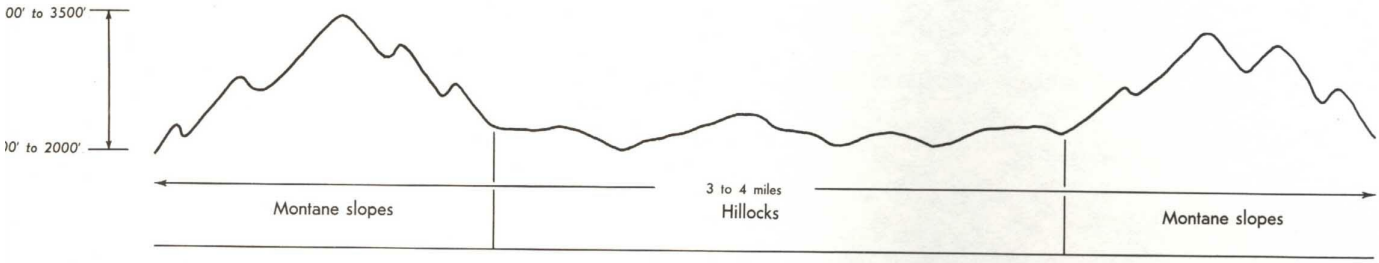
Area: 153 square miles 3·9% of catchment

Comprising two sub-systems

(b) Parslow sub-system

(c) Glen Wills sub-system

a) Distribution of land forms

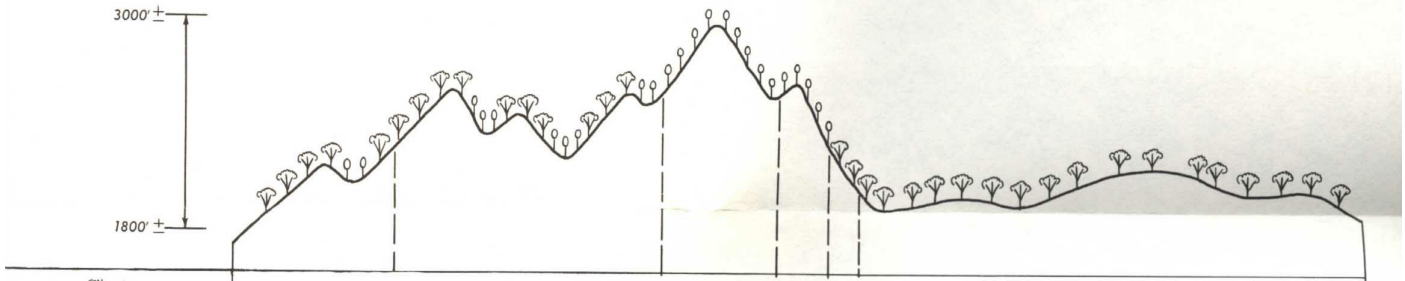


b) Sub-system diagram

PARSLOW SUB-SYSTEM

Area: 121 square miles 3·1% of catchment

north to west ⟵⟶ *south to east*

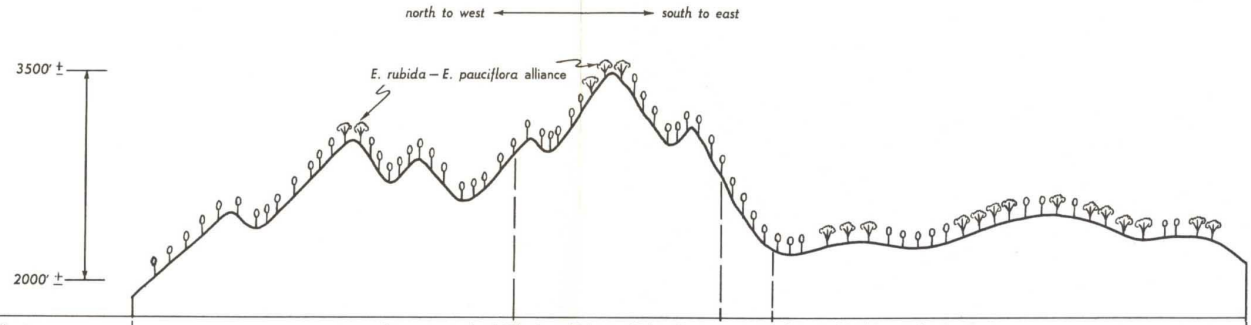


Climate	Average annual rainfall about 25 in. to 35 in. Summers warm, winters cold with occasional snow				
Geology	Mainly gneiss, some Ordovician shales and mudstones				
Topography	Steep to very steep				Rolling to hilly
Land Form	Montane slopes				Hillocks
Soil Groups	Leptopodzols	Cryptopodzols	Acid brown earths	Crypto-podzols	Leptopodzols, occasional red podzolic soils
Vegetation Structure	Savannah woodland tending to tall woodland		Wet sclerophyll forest		Savannah woodland tending to tall woodland
Vegetation Floristics	*E. rubida–E. pauciflora* alliance, to *E. radiata–E. rubida–E. dives* alliance		*E. radiata–E. rubida–E. dives* alliance		*E. rubida–E. pauciflora* alliance
Present Land-use	Forestry—catchment protection. Some utilization for scantling-quality mill-logs, fencing timber, and poles for local use. Licensed cattle grazing on Crown lands				Grazing sheep for wool, and beef cattle on cleared and timbered freehold land. Licensed cattle grazing on Crown lands
Potential Land-use	Present use is probably optimum for these areas. Timber quality and growth rate of *E. radiata–E. rubida–E. dives* forests could be improved by silvicultural techniques. Generally too steep for clearing and pasture development				Safe carrying capacity could be increased by pasture improvement. More subdivisional fencing would lead to better control of grazing. Controlled cattle grazing on Crown lands
Hazards	Sheet erosion would occur if ground cover was damaged. Erosion of roads and roadside drains				Sheet and gully erosion are likely to occur where areas are over-grazed. Erosion of access roads
Problems	Fire protection and access. Control of Crown land grazing Control of road erosion				Economics of pasture improvement in remote areas. Methods of pasture improvement and management. Control of Crown land grazing. Control of road erosion

(c) Sub-system diagram

GLEN WILLS SUB-SYSTEM

Area: 32 square miles 0·8% of catchment



Climate	Average annual rainfall about 40 in. to 45 in. Summers warm, winters cold with occasional snow		
Geology	Mainly schists, some gneiss		
Topography	Steep to very steep		Rolling to hilly
Land Form	Montane slopes		Hillocks
Soil Groups	Cryptopodzols with occasional leptopodzols on drier slopes	Acid brown earths	Leptpodzols and red podzolic soils
Vegetation Structure	Wet sclerophyll forest		Wet sclerophyll forest tending to tall woodland
Vegetation Floristics	*E. radiata–E. rubida–E. dives* alliance to *E. rubida–E. pauciflora* alliance		*E. radiata–E. rubida–E. dives* alliance to *E. rubida–E. pauciflora* alliance
Present Land-use	Forestry—catchment protection with some utilization for scantling-quality mill-logs, fencing timbers, and poles for local use. Licensed cattle grazing on Crown lands		Grazing sheep for wool, and beef cattle on cleared and timbered freehold land. Licensed cattle grazing on Crown lands
Potential Land-use	Present use is probably optimum for these areas. Timber quality and growth rate could be improved by silvicultural techniques		Safe carrying capacity could be increased by pasture improvement. More subdivisional fencing would lead to better control of grazing. Controlled cattle grazing on Crown lands
Hazards	Sheet erosion would occur if the ground cover was damaged. Erosion of access roads		Sheet and gully erosion are likely to occur where areas are over-grazed. Erosion of access roads
Problems	Fire protection and access. Erosion of access roads. Control of grazing on Crown lands		Economics of pasture improvement in remote areas. Methods of pasture improvement and management. Control of Crown land grazing. Control of road erosion

Fig. 27 – Livingstone Land System

This is another land system which has been subdivided into two sub-systems and again the main differences are in climate and indigenous vegetation. The land system as a whole occupies 153 square miles, which is a little under 4 per cent of the catchment.

Parslow Sub-System

This sub-system occupies a fairly large area at the southern end of the catchment. Bingo Munjie Creek, Jim and Jack Creek and the lower part of the Victoria River and its tributaries are included in the sub-system. Mt Parslow and Mt Livingstone are prominent peaks in the area.

A large part of the southern end of the sub-system is Permanent Forest, and a smaller area of Timber Reserve is located to the north-west of Mt Livingstone. Freehold land and Crown land in about equal proportions, make up the remainder of the area. The area of the Parslow sub-system is 121 square miles, which is about three per cent of the total catchment.

About 40 percent of the sub-system is classed as hillocks land form, and the remainder is montane slopes (Figure 27). The topography of the hillocks area is usually rolling to hilly but some areas, such as Cobungra Station, are mainly rolling country. The elevations of this sub-system range from about 2,000 feet to 2,500 feet along the Livingstone Creek and up to about 4,000 feet on some of the prominent peaks.

Gneiss is the main rock of the sub-system, although there are some small areas of grey granite and schist.

The area is of interest climatically because it has a low rainfall, although it has moderate elevation. This is because it is within the rain shadow caused by Mt. Hotham and the associated high country to the west and north-west. Average annual rainfall is about 25 inches to 35 inches, and several light falls of snow may occur during winter. The rainfall distribution is fairly uniform throughout the year, although the rain in winter is moe reliable than in the other sasons. The evelevation influences temperatures, so that the summer maxima are rarely very high, and in winter they are lower than in the northern valleys which have similar rainfall. The temperature records of Omeo may be applicable to much of the lower-elevation country in this sub-system.

Over most of the sub-system, the soils are leptopodzols. Where soil-moisture availability is higher than is general for this sub-system, the accumulation of organic matter in the soil may be pronounced. In such localities, the soils are cruptopodzols or even acid brown earths. Some red clay relic horizons may be found beneath the leptopodzol soils, and occasionally red podzolic soils occur on flatter topography.

The vegetation over most of the Parslow sub-system is savannah woodland tending to tall woodland of the E. *rubida-E. pauciflora* alliance. Native grasses such as *Themeda australis* and *Poa australis* grow beneath the woodland, together with low shrubs of *Platylobium formosum* and sometimes *Pultenaea juniperina* and *Daviesia latifolia.* Dry forest litter forms a valuable part of the soil cover. Where soil moisture availability is higher, either because of higher rainfall or protected aspect, and temperatures are not limiting, a wet sclerophyll forest of the *E. radiata-E. rubida-E. dives* alliance occurs. Ground cover is less dependent on forest litter is such areas.

Mild, but at times extensive, sheet erosion occurs where native pastures are over-grazed by concentration of stock on favoured sites. Small slumps occur on some steep cleared land on southern aspects. Because of the hazard of erosion from roads, particularly those on coarse-textured soils, careful design and construction is necessary, and maintenance of established roads must be thorough.

The freehold land in this sub-system is used for grazing of both sheep for wool, and beef cattle. Very little or no pasture improvement is carried out, and top-dressing of the native pastures is not common. The forested Crown lands and Reserved Forest areas are sometimes used for grazing under an annual licence system. The bulk of the forests do not produce any worthwhile timber; both the species and the form of the trees make them unsuitable for most forms of utilization. However, small quantities of scantling-quality mill-logs have been cut in the Mt. Phipps area. The local demand for posts and firewood from these areas is small.

The productivity of the freehold land could be raised by pasture improvement. Experimental work would be needed to decide the best species, fertilizer treatments and management practices for the area. An economic study should be carried out to determine whether improvements are worthwhile in the area, which is far from a rail-head and markets. Closer settlement of some larger holdings may be desirable. Fire protection is of major importance.

Glen Wills Sub-System

The Glen Wills sub-system is the smaller of the two sub-systems in the Livingstone land system. It consists of three small areas. One occupies the lower part of the Bundarrah River valley, another is the area around Glen Valley and Shannonvale on Middle Creek, and the third is in the headwaters of the Four Mile Creek, a tributary of the Mitta Mitta River.

The areas in the Bundarrah River and the Glen Valley-Shannonvale localities are mostly freehold with a small proportion of Crown land. The Four Mile Creek area is entirely Crown land. The area of the sub-system is about 32 square miles, or less than one per cent of the whole catchment.

As in the Parslow sub-system, the Glen Wills sub-system consists of about 60 per cent. montane slopes and 40 per cent. hillocks (Figure 27). The Glen Wills sub-system differs geologically, however, in being mainly on schists, except for the Middle Creek area where gneiss is the dominant rock.

Rainfall is the main basis for separation of the two sub-systems. The Glen Wills sub-system has an average annual rainfall of about 40 inches, although the Four Mile Creek area may be drier. Snow is less common in this sub-system as elevations are somewhat lower and the country is not as open as the Parslow sub-system. The higher rainfall in the Glen Wills sub-system results in soils with a great accumulation of organic matter in the surface. The drier parts of the sub-system have leptopodzols, some of which are the red type, but most are brown. Cryptopodzols occur in moister areas, and these merge into acid brown earths in areas of higher elevation and higher rainfall.

The vegetation also reflects the generally moister conditions. Some savannah woodland to tall woodland of the *E. rubida-E. pauciflora* alliance occurs in the drier parts, but this is replaced over most of the area by wet sclerophyll forest of the *E. radiata-E. rubida-E. dives* alliance in which *E. pauciflora* may also occur. On ridge tops, soil-moisture availability is often lower because of excessive drainage and exposure. The alliances of the drier part of the wet sclerophyll forest or the savannah woodland formations may occur in these situations.

Incipient sheet erosion may occur on drier areas in droughty years. Generally, there is little erosion from these areas. Sheet erosion would occur in the drier forested areas if the protective litter were burnt. Roads, particularly those on coarse-textured soils, are inclined to erode unless constantly maintained.

Grazing of sheep for wool, and of beef cattle is the only land-use practised on freehold land. There is little pasture improvement. Parts of the lower slopes of the Middle Creek freehold are irrigated from a race line which taps the creek higher up. The forested areas produce little timber of value at present. The better-quality forest may be logged for mill-logs in the future but such areas are not of very great extent.

Isolation is a major problem of this sub-system. The Omeo Highway which passes by the Middle Creek-Glen Wills area is a narrow tortuous road for a great deal of its distance from Omeo, the nearest town, although this road has been considerably improved in recent years. The Four Mile Creek is not yet accessible by vehicle. Economic considerations may prevent any further development of these areas at present.