BINDAREE AND TAPONGA LAND SYSTEMS

Plate 26 – Forests of alpine ash with mountain gum are found in the Bindaree and Taponga land systems. They are snow covered during winter.

The tall, dense forests of the upper mountain tract make up the Bindaree and Taponga land systems. They are characterised by average annual precipitation in excess of 1350 millimetres. Topography is usually very steep at the headwaters of the main streams, but the broad gentler valleys of the plateau residuals have been included.

Both land systems embrace the whole of the altitudinal and associated vegetational range between 900 metres and 1350 metres. In the Taponga land system, the proportion of higher land is small but the precipitation is high art all altitudes.

There are four distinct vegetative communities:

(i) ***Messmate-Peppermint-Gum Forest***: With increasing elevation, messmate first appears in gullies on southern aspects, to fringe the lower boundary of alpine ash. On steep slopes, the messmate zone is narrow, sometimes forming only a band, one hundred metres or less in width, of almost pure messmate. On more gentle slopes, particularly where the rainfall is high, the altitude not exceeding 1050 metres and the district is beyond the northerly limit of mountain ash, extensive areas of messmate-peppermint-gum forest are found. Examples can be found in the Golden Mount area in the Strathbogie Ranges, the Rocky Peak area north-east of Mount Torbreck, and the long, flat saddle on the Goulburn-Big River divide west of Gaffneys Creek. Mountain grey gum may also be present, but it rarely constitutes a major portion of the community. In gullies, there is usually a dense understorey of musk daisy bush (*Olearia argophylla*), blanket leaf (*Bedfordia salicina*) and hazel (*Pomaderis aspera*), with tree ferns (*Dicksonia antarctica*). In the wettest sites, the understorey includes these species, plus the common Cassinia (*Cassinia aculeata*) under silver wattle and blackwood. On the drier northern and western slopes, messmate and narrow-leaved peppermint, with a few tall candelabras, form a more open forest, with a less dense understorey and a more open floor. This floor has a closed cover of *Poa spp.*, with other grasses and herbs. Under the shrub and bush understorey in gullies where shade is dense, there is little or no living ground cover, and the surface consists of twigs and leaf mould.

With increasing precipitation, messmate forests give way to either alpine ash or mountain ash forest, depending on altitude.

(ii) ***Mountain Ash Forest*:-** At altitudes below 1050 metres but where precipitation exceeds 1400 millimetres, mountain ash (*E. regnans*) forests are found. These appear to have similar water requirements to alpine ash forests but in these places, temperatures are higher and snow does not lie on the ground for long periods. The forest is usually even-aged, of tall, straight, closely spaced trees with high, dense crowns forming a tight canopy. Suitable conditions for mountain ash are also found in

gullies as low as 450 metres altitude, as shown by the small stands in the upper Goulburn-Snake River area, and the southernmost tributaries of the Big River. However, the most extensive areas of the mountain ash lie in the belt a few kilometres wide under the eastern less of the Cerbean massif, where the heavy orographic rainfall persists at low altitudes. The mountain ash forest persists up to the lower boundary of the alpine ash zone, at about 1050 metres, where snow becomes a decisive factor. The lower, drier fringes of the mountain ash forests, particularly at their northern extremity east of Mount Torbreck, grades into messmate-peppermint-gum forests. There both mountain ash and messmate are found together in wet sites. Narrow-leaved peppermint and mountain grey gum are present on the intervening ridges.

The mountain ash forest usually has a dense understorey, similar to that found in wet areas under messmate. It consists of silver wattle, musk daisy bush, hazel, blanket leaf and common cassina and other daisy bushes.

(iii) ***Alpine Ash Forest***:- Adjacent to and above the messmate, where snow is persistent, are extensive areas of almost pure alpine ash. It is not common below 1050 metres but is usually found above 1150 metres, depending on aspect.

Most of the alpine ash forest now consists of even-aged, dense stands of tall, straight trees with high crows. At lower altitudes, there is usually a dense shrub layer of hop scrub (*Davesia latifolia*), below which the ground floor is closed with *Poa spp.*, with other grasses and herbs such as trigger plant (*Stylidium graminifolium*) and speedwell *(Veronica derwntiana*). At higher altitudes, hickory wattle (*a. penninervis*) may replace the hop scrub and, at the uppermost fringe of the zone, a lower shrubby layer of *Oxylobiumalpestre* is typical. In gullies, the dense shrub layer typical of similar sites in the messmate-peppermint gum and mountain ash forests is not developed. Instead, there are small ferns and a dense growth of grass and bog plants, including the *Spaghnum cristatum* of the alpine bogs. Because of excessive wetness, the gullies are often more free of scrub growth than the side slopes. In less wet gullies, a coarse and tall clumped variety of tussock grass, locally referred to as ledgegrass, is found.

(iv) ***Beech Forest***:- In wetter gullies of the mountain ash zone, particularly those facing south and east, the antarctic beech forms a temperate rain forest community with epiphytes, lichens, and liverworts. The creek line is occupied by ferns, dominated by tree ferns. Under beech, the floor is clear of vegetation but is covered with a leaf mould and litter.

In the Bindaree and Taponga land systems a range of rock types is found, including Silurian and Ordovician sediments, granite and porphyries. The soils are mostly acid brown earths namely, deep, friable brown loams, merging at the upper fringe of the alpine ash zone to transitional alpine humus soils. Some soil properties, particularly texture and depth, can be seen to vary with rock type.

The acid brown earths have an accumulation of nutrients in the upper layers of decomposing litter. Much of this can be released but burning or by sheet erosion. However, under undisturbed forest conditions and in spite of the steep slopes and high rainfall, the erosion hazard is slight. This is because the porous nature of the soils favours rapid infiltration of rain water. Where the forest is disturbed, quick recolonisation of the floor by plants occurs.

It is estimated that more than half the precipitation falling as rain or snow on these two land systems ultimately flows into Lake Eildon, constituting production, as large areas are covered with immature regrowth following earlier extensive logging and the 1939 fires.

The Taponga and Bindaree land systems have high values for both water and timber production, giving rise to conflicts in management . The constant supply of high quality water depends on the dense vegetative cover, rapid rate of recolonisation after disturbance and deep, permeable soils. These features result in a high storage capacity. This in turn, strictly limits the amount of surface runoff and provides the constant seepage flow which regulates the streams. Thus not only do these land systems supply most of the water, but their regulating action is most important to the maintenance of summer stream flows. The importance of this regulating function is highlighted by the fact that the travel time of water tot he main river may be measured in months, if it has to move through the soil, but it is a matter of days only if it enters a watercourse as surface runoff. A significant proportion of the water

falling on the land systems originates as snow, which at this altitude melts rapidly in spring. This releases a large volume of water over a short time.

The regulating capabilities of these land systems may be damaged by logging and roading unless precautions are taken. Most of the logging involves wither clear felling or an intensive harvest of even-aged trees, which results in much soil disturbance. Revegetation is usually rapid and the logging scars generally heal with little erosion. On the other hand, snigging tracks and roads may permanently alter runoff characteristics if correct measures are not applied.

Thus, even though there may be ample surface cover, these imposed drainage systems may tap and channel off potential summer water and deliver it to the stream early in spring, when Lake Eildon may be already full.

The influence of fire on erosion in these areas is less than in the drier forests. The organic litter layer is deep and a poor conductor of heat. Only the surface litter burns, even when sufficient oxygen is available. Fire may however, detrimental by releasing nutrients and causing their loss from the topsoil. If it results in scrub regrowth in the alpine ash zone and other snow-melt areas, the regulatory function of the soil for water supply will be impaired. Such effects are more probable with regular controlled burning than with wildfire. Controlled burning however is not usually feasible in these particular land systems.

Except in the beech community, the forest originally carried a dense grass cover with little scrub and was much used for forest grazing. Light grazing, once young tree regrowth is well established, does little damage, and may even be beneficial in reducing scrub growth. The catchment forests occupy about eight times the area of the alpine country which has now come to carry practically all bush grazing but the dense regrowth following fires and logging has made the area unattractive to cattle. The difficulty of mustering cattle in dense scrub is another deterrent to grazing.

The recreational capabilities of these land systems are significant. The area fringes the popular snow country, and it contains impressive stands of timber. Scrub regrowth and debris from logging detract from its bushwalking appeal. Specific area could well be set aside and carefully managed for recreational purposes.

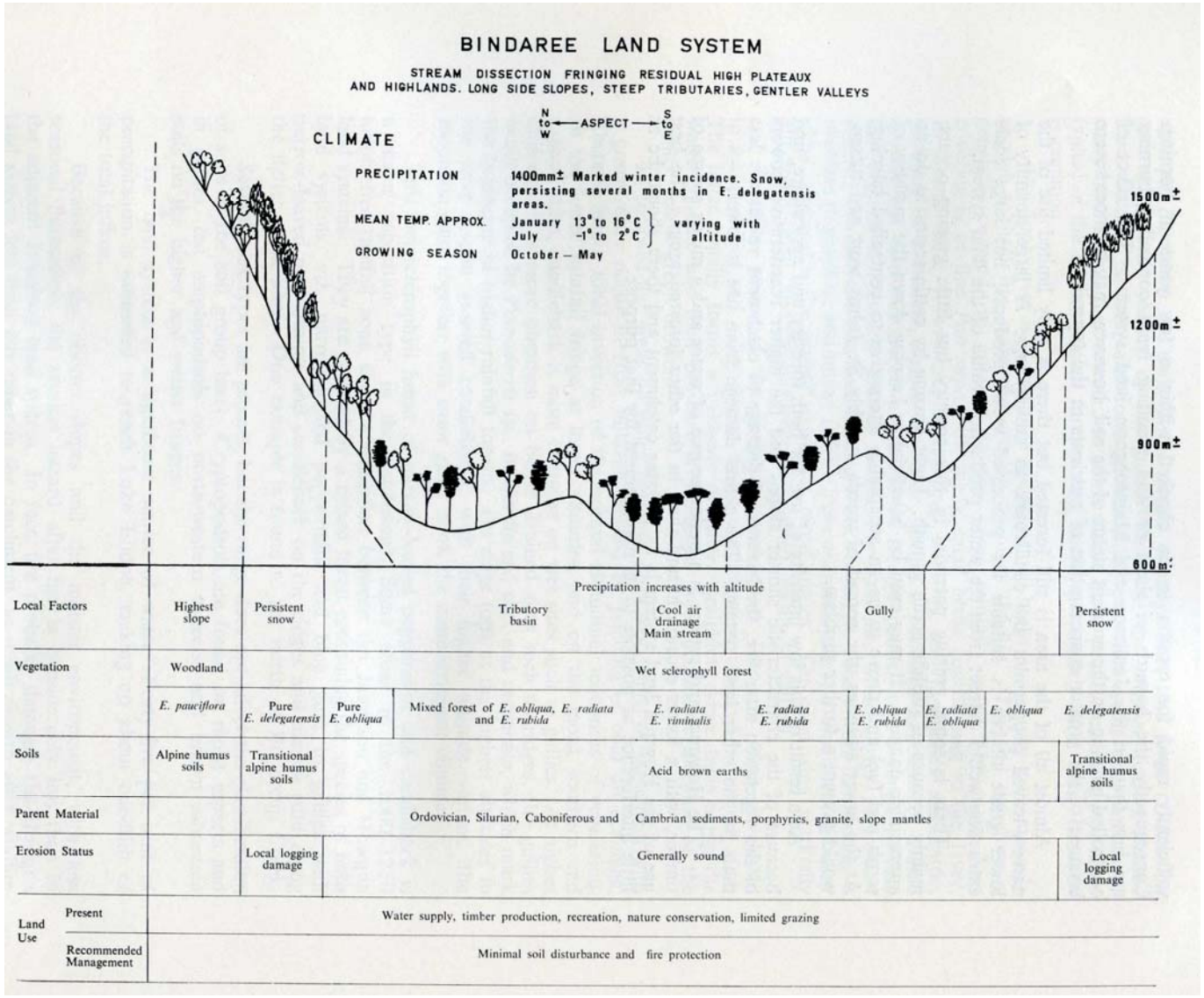

Figure 21 – Bindaree land system

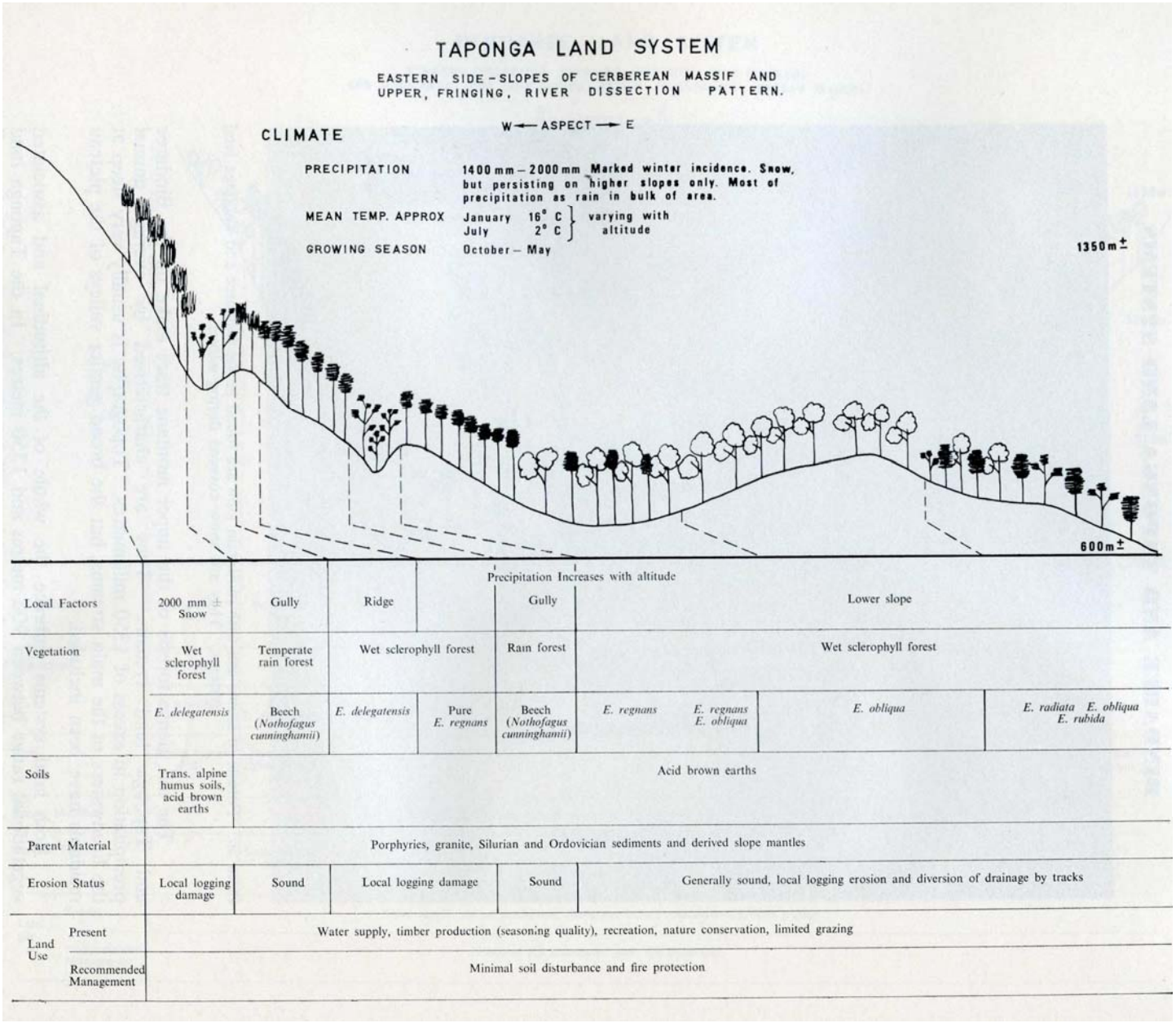

Figure 22 – Taponga land system