

5. NATIVE VEGETATION

In general, the vegetation of the upper Ovens and King catchments is similar to that described for the other areas of north-eastern Victoria already reported on (Rowe 1967, 1970, 1972). The classification of the vegetative communities is set out in Appendix IV. The structural forms are based on the classification of Specht (1970), with the open forest and woodland classes further sub-divided on the basis of height of the dominant species, as used in the Land Conservation Council studies (see, for example, L.C.C. 1977b, p.69).

Because of its broad scale, the present study has not sought the detail necessary for precise definition of communities, and the lists of common species in the subordinate strata should not be regarded as exhaustive.

Open forest IV

***Eucalyptus delegatensis* forest**

This is the tallest and densest of the vegetative communities occurring here. The trees in a mature community may reach a height of about 60 m, but actual heights vary with site quality.

The community usually has a tall shrub stratum up to about 10 m, and possibly also a low shrub stratum 2-3 m tall. Its ground cover appears to vary in nature with site quality and past treatment, but always provides complete soil cover. This layer often comprises herbaceous cover, including much grass, although it mainly forms a mosaic of herb cover, low shrubs and abundant forest litter.

E. delegatensis occurs in almost pure stands and only mixes with other tree species along the borders of adjoining communities. *E. dalrympleana* and *E. pauciflora* are the commonly associated species at its upper elevation limit, and *E. dives*, *E. chapmaniana*, *E. rubida* and *E. radiata* may be associated with *E. delegatensis* at the lower margins.

The most common tall shrub is *Acacia dealbata*, while a number of other less-tall species — such as *Pomaderris aspera*, *A. obliquinervia*, *A. melanoxylon*, *Olearia argophylla*, *Prostanthera lasiantha*, *Lomatia ilicifolia* and *Coprosma hirtella* — occur in the variety of micro-environments existing beneath the dominant stratum.



Alpine ash (*E. delegatensis*) regrowth forest with dense silver wattle understorey.

Typical low shrubs are *Daviesia latifolia*, *D. ulicifolia*, *Pultenaea juniperina*, *Cassinia aculeata*, *Tieghemopanax sambucifolius*, *Oxylobium ellipticum* and *Veronica derwentiana*.

Of the numerous ground cover species, *Poa australis* is ubiquitous; others such as *Stellaria pungens*, *Viola betonicifolia*, *Dianella* spp. and ferns are widespread.

[Willis (1970) acknowledged the existence of a *Poa* species aggrate — *P. australis* sp. agg. Revision of the classification of *Poa australis* has now resulted in recognition of a number of distinct species. However, the field work for this report was carried out prior to the revision, and as the author has not re-examined the species in the field the original name is retained throughout the report.]



Open forest of alpine ash (*E. delegatensis*) occurs where snow lies for short periods in winter. A shrub layer may be present, or absent as in this forest.

The community is confined to areas of high rainfall and deep soils at elevations from about 1000 to about 1500 m. It is therefore found in the south of the catchment along the Dividing Range and the main ridges, and on massifs such as Mount Buffalo and the Black Range.

Open forest III

***E. obliqua* forest**

The height of the trees making up the dominant stratum in this community may reach about 50 m but is more commonly about 30-40 m.

E. obliqua is the dominant species and, although it may occur in pure stands, it is usually associated with *E. radiata* and sometimes also *E. viminalis*.

A scattered tall shrub stratum of *A. dealbata* may be present, but low shrubs up to about 3 m are more typical. Ground cover is usually complete: common species are *D. latifolia* and *Pteridium esculentum*; and *Poa australis* is usually present as scattered tussocks, but may also form a more-or-less closed sward.

This community has a relatively restricted distribution within the study area. Its main occurrences are on deep clayey soils on the plateaux between the tributaries of the King River in the south-western corner of the area and, occasionally, along the Great Dividing Range below the level of the *E. delegatensis* forests.

***E. radiata*-*E. rubida* forest**

The form of this forest community varies with site quality, and soil-moisture availability is probably the dominant variable. It commonly exceeds 30 m height, but would rarely exceed 40 m.

Shrubs are commonly present in such a range of heights, up to about 10 m, that it may not be possible to separate distinct strata. Ground cover is usually complete, although it may consist of abundant forest litter with scattered shrubs or herbs.

A number of species may occur together in the community. These include *E. radiata*, as the most abundant, and usually also *E. rubida* and *E. dives*. Others commonly present, although rarely as numerical dominants, are *E. st johnii*, *E. obliqua*, *E. viminalis*, *E. chapmaniana*, *E. dalrympleana* and *E. goniocalyx*.

Species in the shrub stratum vary with the micro-environment: *A. obliquinervia* grows at the upper elevations; *A. dealbata* is usually present in the moister areas; and *A. melanoxylon* is a typical species in sheltered gullies. Others with a more general occurrence are *D. latifolia*, *Platylobium formosum*, *Cassinia aculeata* and occasionally *Bursaria spinosa*. *Pteridium esculentum* often forms a continuous stratum about 1 m tall and, where it is not too dense, *Poa australis*, *Danthonia pallida* and numerous herbs such as *Ajuga australis* and *Acaena anserinifolia* provide more or less continuous ground cover.

This is the most widespread vegetation in the study area. It occurs on most topography and soils where rainfall exceeds about 900 mm. On the plateaux in the south-west it is closely associated with *E. obliqua* forest, which appears to replace it on soils of high available-moisture capacity. At elevations above 1000 m it is replaced by *E. delegatensis* forest. At the drier end of its range in the south-west, it

grades into the drier *E. dives*-*E. rubida* forest, but elsewhere it merges with the *E. macrorhyncha*-*E. dives* forest, with which it has several species in common.

Open forest III of narrow-leaf peppermint (*E. radiata*) and candlebark (*E. rubida*), with a ground layer of austral bracken (*Pteridium esculentum*) — on the right. The open forest II of broad-leaf pepper-mint (*E. dives*) and candlebark (*E. rubida*) with grassy ground layer, below, is a more open vegetation form.



Open forest II

***E. dives*-*E. rubida* forest**

Relative to the *E. radiata*-*E. rubida* open forest III, this forest community is not as tall and has poorer-form trees and a more open canopy, as well as having *E. dives* as the most abundant species instead of *E. radiata*. In places it may approach a woodland. The tallest trees usually grow to about 12 to 15 m. The most common species is *E. dives*, but *E. rubida* is usually also present. *E. goniocalyx*, and in some situations *E. mannifera*, may be present.

Although ground cover usually consists of a more-or-less closed sward of *Poa australis* and *Danthonia pallida* with numerous herbs, scattered low shrubs are common and sometimes form an almost closed stratum about 0.5 m high. Common shrubs are *Platylobium formosum*, *Daviesia ulicifolia*, *D. virgata* and *Brachylooma daphnoides*. *Styliidium graminifolium* is a conspicuous herb of the ground cover.

This vegetation is widespread on the plateaux on. Carboniferous sedimentary rocks in the south-west of the study area. It seems that, although annual rainfall is of the order of 1000 mm, the relatively low available-moisture capacity of the soils may be important here. The vegetation is also typical of the dry ridge-tops and exposed slopes at elevations from about 600 to about 900 m.

The *E. radiata*-*E. rubida* forest replaces this community in situations of higher moisture availability, and *E. macrorhyncha*-*E. dives* forest replaces it at lower elevations.

***E. macrorhyncha*-*E. dives* forest**

In height, this forest community averages about 25 m. It may have a great range in tree diameters because of the presence of many suppressed trees that have very thin trunks, although their crowns may be almost at the level of the dominants.

The most widespread species is *E. macrorhyncha*, although *E. polyanthemos*, *E. goniocalyx* and *E. dives* are also very common. Other tree species whose presence or absence is influenced by differences in micro-environment are *E. bridgesiana*, *E. melliodora*, *E. blakelyi*, *E. rubida*, *E. mannifera* and sometimes *E. radiata*.

A sparse shrub stratum may be present or absent. It may contain *Acacia dealbata* up to about 8 m tall in moister areas and *A. verniciflua* up to about 5 m tall in drier areas. Shrubs less than about 2 m tall — such as *Cassinia aculeata*, *Platylobium formosum* and *Brachyloma daphnoides* — may occur, with a closed or open sward of *Poa australis* and *Danthonia pallida*, and possibly also *Themeda australis* and *Pteridium esculentum*. However, ground cover commonly consists mainly of dry forest litter.

This is a widespread forest community. It occurs mainly on well-drained areas below about 750 m elevation and is thus the dominant vegetation of a large proportion of the foothills and lower mountain slopes in the study area.

Open forest II to woodland

***E. camphora* forest**

Other studies (Rowe 1967, 1972) have referred to this community as a tall woodland. Under the presently used classification (Specht 1970), its tree heights of about 12 to 15 m and projective cover greater than 30% make this an open forest.

The dominant species is *E. camphora*. *E. stellulata* is frequently present and occasionally, in the upper valleys, *E. neglecta* also. On better-drained soils, *E. viminalis* sometimes occurs adjacent to *E. camphora* trees and has been included in this community.

Although tall shrubs such as *Acacia dealbata*, *A. melanoxylon* and *A. pravissima* may be associated with it, this community is better characterised by species more tolerant of poor drainage, such as *Leptospermum scoparium*, *L. lanigerum*, *Callistemon pallidus*, *Epacris breviflora* and even *Phragmites communis* and *Juncus* spp. Large tussocks of *Poa australis* are frequently present and ground cover is complete.

This community occurs along the margins of permanently wet drainage lines and streams. It is characteristic of poorly drained situations, although it may also be present on freely draining soils when a water table is relatively close to the surface. It has a relatively restricted distribution at elevations up to about 1000 m.

***E. goniocalyx* forest**

In form, this community varies from open forest to woodland. The trees are typically 12 to 15 m tall and commonly have a low branching habit, which may be regarded as a woodland form.

A shrub stratum is seldom present, but the community has probably been modified by grazing, and ground cover is typically annual grasses. Native perennial grasses may be present in the climax ground flora.



Fire-damaged mountain gum (*E. dalrympleana*) and snow gum (*E. pauciflora*).

The dominant tree species is *E. goniocalyx*, and associated species are *E. polyanthemos*, *E. melliodora*, *E. dives* and occasionally *E. radiata*.

It is a relatively restricted community confined to areas of basalt soils at elevations about 450 m in the north-west of the study area. The adjoining vegetation is *E. macrorhyncha*-*E. dives* forest.

***E. dalrympleana*-*E. pauciflora* forest**

This community has been described as tall woodland in other studies in north-eastern Victoria (Rowe 1967, 1972). Its form varies somewhat and ranges from woodland to open, forest in the classification now used. *E. dalrympleana* may be present as scattered trees 15 to 20 m tall, with their crowns above the general canopy level of the denser *E. pauciflora* at about 10 to 12 m. In areas where severe fire damage has occurred, the *E. dalrympleana* has usually survived largely unaffected, but the lower-growing *E. pauciflora* has been killed and has regenerated by coppicing so its present form may be that of a closed scrub or open scrub (2 to 8 m) beneath the woodland form of *E. dalrympleana*.

A true shrub stratum, often two-layered, is usually also present. It usually includes shrubs of *Acacia obliquinervia* up to 5 m tall and sometimes low shrubs less than about 2 m — such as *Oxylobium ellipticum*, *Bossiaea foliosa*, *Drimys xerophila*, *Daviesia ulicifolia* and *A. alpina*. A closed or open sward of *Poa australis* is usually present and forest litter is typically abundant.

This community occurs as a relatively narrow band between the *E. delegatensis* forests and the *E. pauciflora* woodlands at higher elevations. It is therefore most commonly found between elevations of about 1400 and 1500 m. In the study area it occurs mainly in the south and on the Black Range and Mount Buffalo massifs.

Woodland II

***E. camaldulensis* woodland**

Large, broad and deep-crowned trees, up to 25 to 30 m tall, characterise this woodland community. Throughout its range, its ground layer has been considerably modified by agricultural development, but in general the form of the trees is probably close to climax condition.

E. camaldulensis is the dominant tree species of this woodland, which is confined to the flood-plains and low terraces of the major valleys. *E. bridgesiana* and *E. melliodora* occur occasionally on slightly higher and better-drained sites, usually sandy natural levee banks, or where alluvial fans from adjacent hills encroach onto the flood-plain.

It is difficult to determine what may have been the natural understorey. *Acacia pravissima* often grows along the streams and may once have been more widespread. *Phragmites communis* forms dense clumps around water-filled depressions and backwaters of the streams.

The community is confined to the riverine landscape in the northern parts of the area, where elevations are up to about 250 m. At higher elevations it is replaced by *E. camphora* forest.

Because it occupies the lowest parts of the landscape, it is subjected to lower minimum temperatures than the adjacent vegetation on higher ground. Under natural conditions it was subjected to periodic flooding in winter or spring. The establishment of water storages on the Buffalo and King Rivers may have altered its hydrologic regime.

***E. blakelyi*-*E. microcarpa* woodland**

While the greater proportion of this community lies to the north, it does extend into the study area along the northern margins. The characteristic form of the vegetation has been altered over much of its occurrence as a result of clearing, or at least selective removal of many trees.

The trees are 20 to 30 m tall and have crowns about as wide as they are deep. Originally, they probably were not as widely spaced as is common now, but it seems likely that projective cover would not have exceeded the upper limit for woodland.

The dominant tree species are *E. blakelyi* and to a lesser extent *E. microcarpa*, with *E. Albens*, *E. melliodora*, *E. bridgesiana* and *E. polyanthemos* occurring throughout the community. The box species other than *E. microcarpa* appear to favour the better-drained sites.

Little of the natural understorey vegetation remains. *Acacia verniciflua* is a common low shrub where the community appears to have escaped alteration, such as along road reserves, but road construction and grazing have probably markedly altered the ground flora. Although *Themeda australis* is usually present, much of the ground cover consists of dry forest litter.

This vegetation occurs only in the north of the study area, and is typically found on duplex soils derived from transported material on gently sloping or flat country at elevations below about 300 m. It is replaced by *E. macrorhyncha*-*E. dives* forest on the better-drained foothills and low mountain slopes.



Snow gum (*E. pauciflora*) grows in woodland formation at the upper limit of tree vegetation. In more severe environments it may be stunted to open scrub.

Woodland I to open scrub

***E. pauciflora* woodland**

The *E. pauciflora* woodland has formerly been referred to as sub-alpine woodland (Rowe 1967, 1972), or wet mallee (Rowe 1970) where it had been burned and had regenerated as a dense coppice. The open scrub form may result from fire, but it also occurs naturally where *E. pauciflora* persists on exposed areas at elevations up to about 1700 m, such as along the Dividing Range between Mount Hotham and Mount St Bernard.

Large-crowned, low-branching trees up to about 10-12 m tall appear to be the climax form in areas of optimum development of the community.

An open or closed low shrub stratum is frequently present. Of a number of species that may occur, the most typical are *Oxylobium ellipticum*, *Bossiaea foliosa*, *Daviesia ulicifolia*, *Acacia alpina* and, at the lower end of its range, *A. obliquinervia*.

A closed sward of *Poa australis* and numerous herb species typifies the ground stratum.

The community occupies the highest zone of tree vegetation in the study area, where snow lies for at least several months during winter, frosts may occur at most times of the year and annual precipitation probably exceeds 1400 mm. It occurs on the highest parts of the Dividing Range and the Mount Buffalo plateau. It extends along the eastern boundary of the catchment to just north of Mount Feathertop and grows sporadically along the western boundary as far north as Burnt Hut Knob.

It is associated with *Hovea-Grevillea-Oxylobium* heathland, *Poa australis* grassland and *Celmisia asteliifolia*-*Poa australis* herbfield at the highest elevations, and at its lower limits it adjoins the *E. dalympleana*-*E. pauciflora* forest or less commonly *E. delegatensis* forest.

Open heath to low shrubland

***Calytrix tetragona* heath**

This heath vegetation consists of shrubs up to about 2 m tall, sometimes with crowns touching but commonly slightly spaced.

The dominant species is *Calytrix tetragona*. Very scattered short trees of *E. mannifera* are often present and may cause the community to be classified as open woodland I. It may be better regarded as an association in the more broadly defined *Leptospermum-Kunzea* heath, but has a quite discrete distribution and is a distinctive community in those limited areas where it occurs.

It is confined to very shallow soils where shelving rock outcrops abundantly at elevations up to about 900 m. Mosses form much of the vegetative ground cover.

***Leptospermum myrtifolium*-*Kunzea parvifolia* heath**

The projective cover of this community varies considerably, because it grows on shallow rocky soils with much bare rock outcrop. The shrubs seldom grow beyond 2 m tall and, where extreme shallowness or lack of soil does not actually pre-vent growth, the community is an open heath. Again, very scattered small trees of *E. mannifera* may be found through the heath, causing it to be classified as a low open woodland.

A number of species, varying in dominance from place to place, characterise this community. These include *Leptospermum myrtifolium*, *Kunzea parvifolia*, *Callistemon pallidus*, *Calytrix tetragona*, *Platysace lanceolata* and, on Mount Buffalo, *A. phlebophylla*. Mosses predominate as ground flora, particularly where the soil is very shallow, and lichens cover much of the exposed rock surfaces.

This community was described in an earlier study of the Mount Buffalo area (Rowe 1970), where it occurs between elevations of about 600 and 1000 m.

Open heath to closed heath

***Hovea longifolia*-*Grevillea australis*-*Oxylobium alpestre* heath**

As with the previous heath community, projective cover varies. However, it has been suggested (Carr 1962) that in places this variation, as well as being caused by variation in micro-environment, represents a temporary stage in the recovery from severe damage; thus the community may be spreading in some areas and retreating in others.

Its shrubs are typically less than 2 m tall and many reach no more than 1 m.

The species present in the community vary in dominance from place to place. On Mount Buffalo, *Bossiaea foliosa* and *Hovea longifolia* dominate, but elsewhere *Oxylobium alpestre* and *Grevillea australis* are generally dominant and other species such as *Acacia alpina*, *Kunzea muelleri*, *Leucopogon suaveolens* and *Prostanthera cuneata* may all share dominance.

Ground flora within the heath is usually dominated by *Poa australis* and a variety of herbs typical of the grassland or herbfield of the high-elevation areas. *Goodenia hederacea*, a common stoloniferous herb, appears to colonise the bare soil.

This heath community occurs at elevations above about 1300 m on the gently sloping high-valley plains on Mount Buffalo, and is also found associated with rocky areas such as on the summit of Mount Cobbler. It forms a mosaic with herb-fields on exposed areas such as Mount Speculation and Mount Stirling. Many of the heath species occur as understorey in the *E. pauciflora* woodlands, and the community commonly forms a zone between the woodland and *Poa australis* grassland or *Celmisia astellifolia*-*Poa australis* herbfield.



Fringe-myrtle (*Calytrix tetragona*) open heath occurs only on very shallow soils on rocky areas.



Alpine vegetation patterns of heaths and grassland with scattered trees or woodland of snow gum (*E. pauciflora*).

Low open shrubland

***Baeckea gunniana*-*Epacris breviflora* heath**

An earlier report on the Mount Buffalo area (Rowe 1970) described this community as a wet heath. It consists of low shrubs, usually about 1 m tall, which grow close together, often with branches interlacing. The dominant species is *Baeckea gunniana*, with *Epacris breviflora* as a less numerous co-dominant. *E. paludosa* is also common.

Ground cover usually consists of a dense mat of *Calorophus lateriflorus* and *Richea continentis*; *Poa australis* is also often present.

The community is characteristic of wet areas at high elevation where temperatures are low. It is the dominant vegetation of most drainage lines of the high-valley plains of Mount Buffalo, where elevations vary from about 1300 to 1500 m. In this situation it may be intimately associated with sphagnum bogs and sometimes fen along the drainage lines, and adjoins *Poa australis* grassland, *Hovea-Grevillea-Oxylobium* heath or *E. pauciflora* woodland on higher, better-drained areas.

***Kunzea muelleri*-*Ewartia nubigena* dwarf heath**

Because this community occurs on exposed ridge-tops and is subjected to the effects of severe wind, it is very easily damaged and slow to recover. Its climax form is therefore difficult to determine. At present it usually consists of scattered prostrate low shrubs, less than 0.3 m tall, of *Kunzea muelleri* and *Epacris microphylla* and mat-forming herbs such as *Ewartia nubigena* and *Scleranthus biflorus*.

It occurs on the highest, most exposed parts of the landscape where soils are extremely stony — possibly the harshest environment to be found in the study area. Its distribution is very restricted.

Closed tussock grassland

***Poa australis* grassland**

In the closed tussock grassland typical of this community, individual tussocks up to 0.3 m high form a dense sward. However, in exposed situations — where subjected to damage by insect attack or grazing — it may have become less dense and spaces between the tussock crowns may, under extreme conditions, occupy up to 50% of the area. In this situation, the intertussock spaces are usually occupied by herbaceous species, many of which are regarded as exotic to this community. It is then actually a herbfield, although not climax.

Poa australis dominates this vegetation and in a healthy community herbs are not common. Such species as *Gentianella diemensis*, *Podolepis robusta* and other daisies and orchids such as *Prasophyllum alpinum* and *P. suttonii* may be scattered throughout the grassland. *Trifolium repens*, *Rumex acetosella* sp. agg. and *Leptorrhynchos squamatus* may occupy intertussock spaces in damaged grassland.

This community occurs on gently sloping areas where minimum temperatures may be extreme, such as in the high-valley plains on Mount Buffalo at about 1300 m.

Herbfield

***Celmisia asteliifolia*-*Poa australis* herbfield**

The climax condition of this community is a completely closed sward, in which both *Celmisia asteliifolia* and *Poa australis* less than about 0.3 m tall share dominance; however, bare ground is often present where insect damage or overgrazing has occurred. Other herbs, such as those found in the *Poa australis* grassland, occur scattered throughout the community. Scattered low shrubs are also common, but these may not be part of the mature community. The shrub species are usually those found in the *Hovea-Grevillea-Oxylobium* heath community.

This herbfield vegetation grows on the higher ridge-tops and slopes along the Dividing Range at elevations above about 1300 m. It is closely associated with the *Hovea-Grevillea-Oxylobium* heath community, but occupies the more exposed areas where soils are deeper and less stony.



Herbfield with low shrubs of rusty pods (*Hovea longifolia*).

Mossland

***Sphagnum cristatum* bog**

The bog community consists of thick masses of *Sphagnum cristatum* in which a limited number of shrub species and sedges grow. These usually comprise the shrubs *Epacris paludosa*, *Baeckea gunniana* and *Callistemon sieberi*, none of which normally exceeds 2 m in height, and the low-growing *Richea continentis* and *Carex gaudichaudiana*.

Bog vegetation was probably never very widespread in the study area, except possibly on Mount Buffalo, where it may have occupied a central strip in most of the high-valley plains and seepage areas on the adjacent slopes.

The community now has a limited distribution and is confined to permanently wet areas at high elevations.

Small bogs still occur on the Mount Buffalo plateau, and depleted bog vegetation may be found along the ridges in the south of the catchment at elevations above about 1300 m. On the steeper-sloping ridges and spurs, where drainage is usually rapid, damage to the bog vegetation causes rapid and possibly irreversible deterioration as the drainage is concentrated in entrenched channels and the local water table becomes lowered.

Sedgeland

***Carex gaudichaudiana* fen**

The fen is a community of herbaceous plants, which grows in saturated soil but lacks hummock-forming mosses.

Carex gaudichaudiana dominates the sedge fen community in the high-elevation areas.

Phragmites communis also forms a fen community in the valleys, where it occurs in water-logged depressions on the flood-plain and quiet backwaters of the streams. This is referred to as the reed fen.