

## THE VEGETATION OF TASMAN PENINSULA

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(with one table and three text-figures)

Although its area is less than 1% of Tasmania, Tasman Peninsula possesses more than one-third of the total native vascular plants of the State. The number of species present is close to that predicted by the theories of island biogeography. There are 70 Tasmanian endemic vascular plant species present, representing 13% of the total. This figure is lower than that expected on a proportional basis due to the absence from the peninsula of the distinctively Tasmanian alpine, wet and oligotrophic western environments. There are two vascular plants known only from the peninsula. Nevertheless there is a distinctly local flavour to the flora due to those components held in common with other predominantly lowland dolerite parts of southeastern Tasmania.

The vegetation types present on the peninsula include coastal heaths, dune vegetation and wetlands, dry and wet sclerophyll forests and some small areas of subalpine scrub and rainforests.

The structure and composition of the vegetation on the peninsula reflect climatic, topographic, firing and biotic influences. Thus dry sclerophyll forests grade into wet sclerophyll forests as moisture availability increases. The forests grade into heaths as sites become more exposed to the prevailing salt-laden onshore winds. Within a particular vegetation type, the floristic composition is influenced by local climate and landform but is also attributable to local drainage conditions, geological substrate and fire history.

The plant species and communities present are, with some exceptions, moderately well-conserved, but sensitivity in future management will be required to retain the character conferred on the peninsula by its native vegetation.

**Key Words:** Tasman Peninsula, Tasmania, vascular plants, sclerophyll forest, heath, scrub, coastal vegetation.

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### INTRODUCTION

Until the arrival of Europeans, the vegetation of Tasman Peninsula probably altered little over millennia. Doubtless there were considerable local perturbations associated with shifts in sea levels and with periglacial activity during past glaciations. However, there is good evidence to suggest a long-continued stability in the composition of the vegetation despite the occurrence of such strongly disruptive environments. In his palynological analysis of deposits near Remarkable Cave, Colhoun (1977) found that during the last interglacial the vegetation had a species composition very similar to that found on the peninsula

today. Thus there appears to have been wet sclerophyll communities containing *Dicksonia*, *Tasmannia* and *Pomaderris* in gullies (and possibly in cloud-forest) with dry sclerophyll and/or heath-scrub communities containing *Eucalyptus*, *Casuarina*, *Banksia* and *Leptospermum* on the drier slopes and more exposed areas. The abundance of charcoal in the deposit indicates that then as now, the vegetation was fire-prone.

It is probable that the most extensive alterations to the composition of the Holocene vegetation have occurred in the last two centuries. Approximately 11% of the native vegetation cover has been cleared to crop, pasture, roads and settlements. The new regime of pests, diseases and other pressures on the native

vegetation provide an incentive to document the remaining botanical resource as a baseline for the future.

THE FLORA

To date 566 vascular plant taxa have been recorded from Tasman Peninsula (Appendix). The area of the peninsula is less than 1% of Tasmania but it contains over one-third of the vascular plant species. These overall proportions are in accord with the theories of island biogeography (MacArthur & Wilson 1967), which predict a logarithmic relationship between the area of island and the number of species supported (fig. 1).

The native species are comprised of 45 pteridophytes from 17 families, 2 gymnosperms from 2 families, 336 dicotyledons from 65 families and 183 monocotyledons from 15 families. The relative numbers of species within each of the above groups are not found in the same relative proportions as in Tasmania as a whole. The differences arise because of the presence or absence of particular habitats. Tasman Peninsula lacks alpine environments and has no extensive area of per-humid cool climate and pre-Carboniferous rocks comparable with the extensive areas in western Tasmania. However, there is an abundance of microhabitats afforded by the presence of Jurassic dolerite and the post-Carboniferous sedimentary rocks underlying coasts, lowland plains, wet gullies, hills and scree slopes.

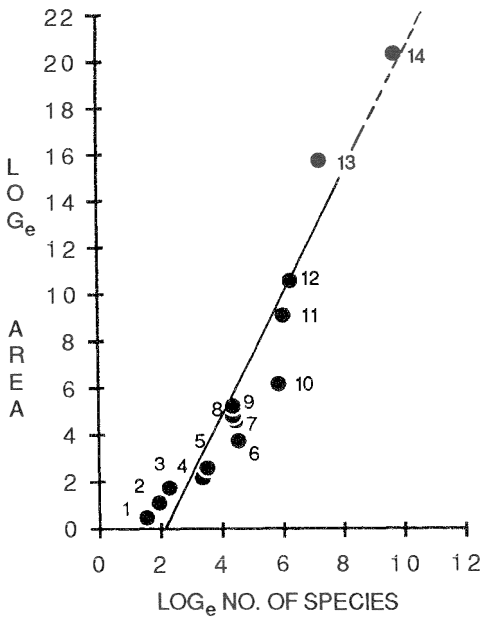


FIG. 1 — The relationship between island size and numbers of species of vascular plants in southeastern Tasmania.

$\ln(\text{species}) = 0.377 \ln(1 + \text{area}) + 2.259$ ,  
 $r = 0.947^{***}$ . (The values for Australia were not included in the analysis.)

- 1 Blanche Rock
- 2 Mewstone
- 3 Hippolyte Rock
- 4 Southport Is.
- 5 Actaeon Is.
- 6 Wedge Is.
- 7 Tasman Is.
- 8 Sloping Is.
- 9 Betsey Is.
- 10 Schouten Is.
- 11 Maria Is.
- 12 Tasman Peninsula
- 13 Tasmania
- 14 Australia.

This diversity of microhabitats on the peninsula has resulted in a substantial fern flora, and about one-half of the Tasmanian ferns and fern allies have been recorded. The two native conifers which occur are the Oyster Bay pine (*Callitris rhomboidea*) and celery top pine (*Phyllocladus aspleniifolius*). *Callitris* is able to survive in relatively xeric conditions and is the only Tasmanian conifer genus having serotinous cones which provide some protection from fire for the seed, thereby allowing for post-fire regeneration (cf. Regal 1979). On the peninsula, *Phyllocladus* is found only in the relatively fire-protected areas offered by the deeper gullies and the cloud-forests of the eastern uplands. The fruits are bird dispersed and thus are probably relatively easily re-introduced into burnt areas following infrequent wildfires.

The largest number of dicotyledons is to be found in those families which are most abundant in Tasmania generally, i.e. Asteraceae (with 61 species on the peninsula), Epacridaceae (31 species), Myrtaceae (25 species) and Fabaceae (22 species). Well represented families of monocotyledons include Orchidaceae (60 species), Poaceae (42 species) and Cyperaceae (34 species). The percentage of Tasmanian endemic plants present on the peninsula is 12.6% of the recorded flora. This figure is lower than that expected on a proportional basis, the corresponding figure for Tasmania as a whole being 20% (Brown 1981, Brown *et al.* 1983). The lower number of Tasmanian endemics reflects the absence of alpine habitats and wet oligotrophic land systems. The latter have high numbers of endemic species in western Tasmania (Kirkpatrick & Brown 1984a).

There are two species of vascular plants known only from Tasman Peninsula: *Euphrasia phragmostoma* and *Euphrasia semipicta*. Together with *Epacris marginata* (a species which is otherwise known only from Maria Island) these species have been taken by Kirkpatrick & Brown (1984b) to infer a centre of local endemism. The occurrence of this centre arises from the distinctive combination of a relatively fertile substrate, a high energy coastal environment and high effective precipitation.

## VEGETATION

The range of physical environments present on the peninsula combines with the local microclimates to support distinctive assemblages of plant species. The broad categories of natural vegetation which occur include some small patches of rainforest together with larger tracts of wet and dry sclerophyll forest, heath and scrub communities and a variety of other coastal vegetation alliances. The distribution of the different

communities is shown in figure 2 (after Kirkpatrick & Dickinson 1984) and their relationships with the physiography of the peninsula are outlined in the profile diagram (fig. 3).

### Rainforest and Mixed Forest

Rainforest as defined by Jarman & Brown (1983) is of fairly limited extent on Tasman Peninsula, but there are larger areas of mixed forests (Gilbert 1959), i.e. of rainforest as understorey to eucalypts. The occurrence of rainforest in Tasmania generally is limited to areas of higher summer rainfall (Jackson 1965, Busby 1986), but its range is extended in topographically protected localities where rainfall is as little as 25 mm per summer month (Jackson 1968).

Most of the rainforest elements found on Tasman Peninsula are confined to the deeper gullies or to areas where effective precipitation is increased through lowered evapo-transpiration and through the stripping of moisture by plants from the orographically formed clouds which frequently clad the upper slopes of the higher coastal ridgelines.

In terms of the vascular plant species, the rainforests of the peninsula are floristically poor, compared with thamnic and implicate rainforest types which occur on the oligotrophic soils of western Tasmania (cf. Jarman *et al.* 1984). However, they contain a greater diversity of spermatophytes than is usually found in the callidendrous rainforests on the basaltic krasnozems of northwestern and northeastern Tasmania.

Two main types of rainforest are found. One occurs mainly as an understorey within *Eucalyptus obliqua* or *E. regnans* tall forest and contains *Atherosperma moschatum* together with *Olearia argophylla*, *Dicksonia antarctica*, *Polystichum proliferum* and a few epiphytic ferns. The rainforest component of this mixed forest community is classified as callidendrous sassafras-musk rainforest (C1C) by Jarman *et al.* (1984), who consider that it is probably a stage transitional between rainforest and wet sclerophyll forest. The second rainforest community is found on the upper slopes of the hills around Balts Spur, and consists of a *Nothofagus-Atherosperma-Phyllocladus* forest (CT1C of Jarman *et al.* 1984). This forest is categorised by a fairly open understorey with occasional shrubs of *Anopterus glandulosus*, *Tasmannia lanceolata* and *Pittosporum bicolor*. The main ferns present are *Dicksonia antarctica* and the ground fern *Blechnum wattsi*.

These forests are developed on pockets of deeper, well drained soils on the upland screes. Elements of them are found also on poorly drained

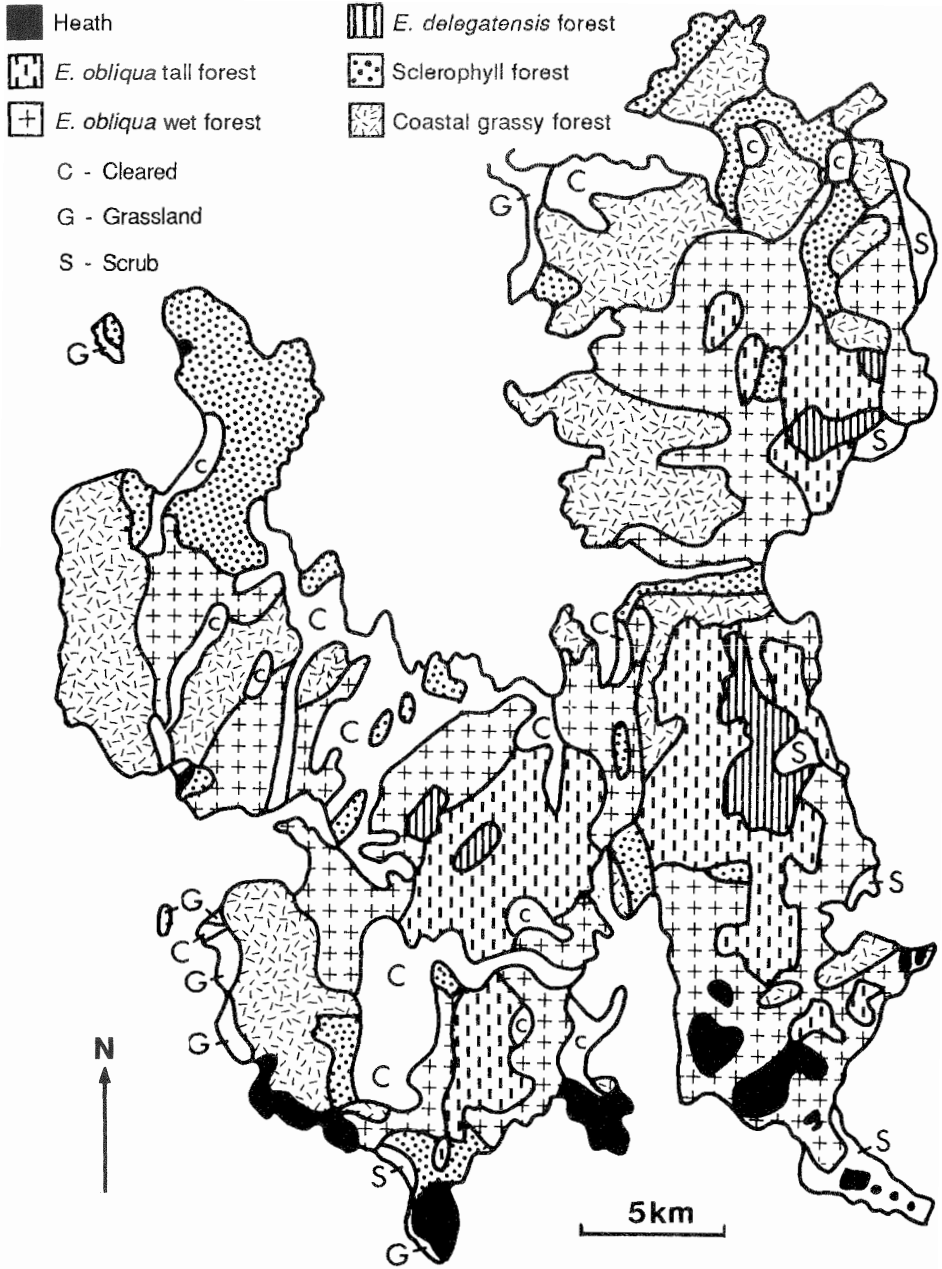


FIG. 2 — The vegetation of Tasman Peninsula (after Kirkpatrick & Dickinson 1984).

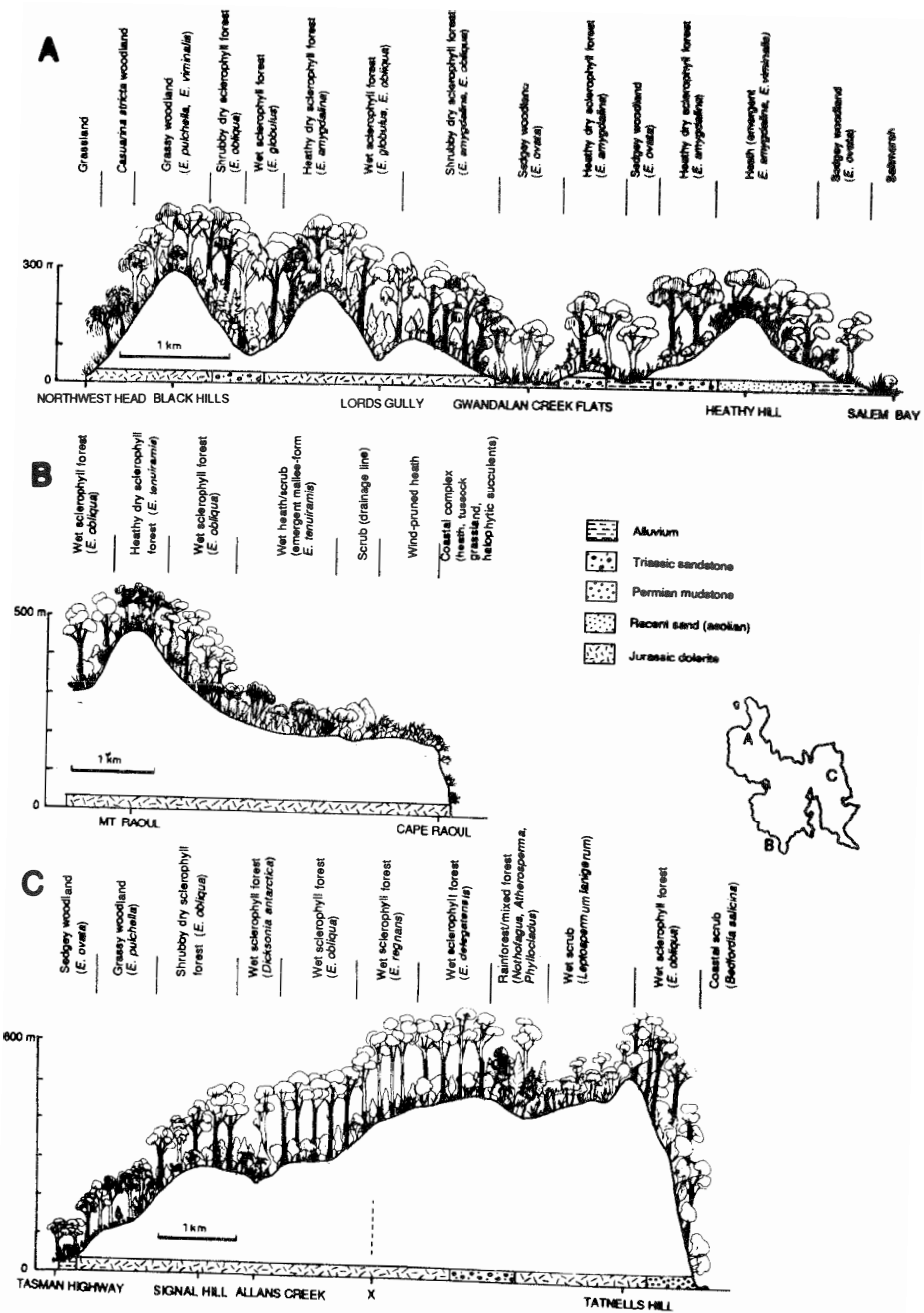


FIG. 3—Vegetation profiles for Tasman Peninsula. (A) North West Head to Salem Bay; (B) Cape Raoul to Mt Raoul; (C) Tattells Hill to Tasman Highway near Signal Hill.

sites in the same area, in long-unburnt scrub communities dominated by *Leptospermum lanigerum*, *Richea dracophylla*, *Eucalyptus johnstonii* and *Bedfordia salicina*.

### Wet Sclerophyll Forest

Wet sclerophyll forests dominated by the ash group of eucalypts (*Eucalyptus regnans*, *E. obliqua*, *E. delegatensis*) constitute the most extensive vegetation type on Tasman Peninsula. On the humid eastern half of the peninsula these forests occupy a broad range of landforms and substrates. In the subhumid north-west of the peninsula, wet sclerophyll is restricted to moist gullies and to southern and eastern aspects where it forms broad ecotones with dry sclerophyll as moisture availability decreases (or fire frequency increases). Similar ecotonal variations have been described elsewhere in eastern Tasmania by Wells *et al.* (1977), Brown & Bayly-Stark (1979) and by Duncan (1983, 1986). The nature of the vegetation varies locally, depending on moisture availability and fire frequency, there being a floristic convergence across substrates on wetter sites (cf. Jackson 1965).

In the most mesic (and fire-protected) wet sclerophyll environments, *Eucalyptus regnans* forms monotypic stands of tall open-forest. The tall shrub or secondary tree layer of these forests is dominated by *Pomaderris apetala*. Other trees or tall shrubs which may be present include *Acacia dealbata*, *A. melanoxylon*, *Atherosperma moschatum*, *Olearia argophylla* and *Leptospermum lanigerum*. Tree ferns (*Dicksonia antarctica*) are common in gullies and on the aerated soils along drainage lines and provide a substrate for such epiphytic ferns as *Hymenophyllum* spp., *Polyphlebium venosum*, *Microsorium diversifolium* and *Rumohra adiantiformis*. The dense secondary layer precludes photosynthetically active light from reaching the forest floor, which is consequently largely devoid of vascular plants, but is clad in a thick litter layer. Canopy gaps are exploited by sedges (*Gahnia grandis*, *Lepidosperma elatius*) and by ground ferns (*Blechnum* spp., *Polystichum proliferum*).

*Eucalyptus obliqua*-dominated wet forests are widespread below 400 m altitude, and are found on both sedimentary rocks and dolerite. The stands are usually even-aged on the moister sites, but several age-classes are present on drier sites. *E. obliqua* frequently forms monotypic stands, but co-occurs with *E. regnans* in very humid places. It also grows in association with *E. globulus* and with *E. viminalis*, and extends into areas occupied by the peppermint group of eucalypts on drier sites.

There is a shift in the understorey composition of *E. obliqua* forests along the gradient from mesic to more xeric conditions. *Pomaderris apetala* and *Olearia argophylla* predominate on the more mesic sites, together with *Bedfordia salicina*, *Prostanthera lasiantha* and *Acacia riceana*. Tree ferns (*Dicksonia antarctica*, *Cyathea australis*) occur in rocky gullies and on drainage lines. Tall thickets of tea trees (*Leptospermum lanigerum*, *Melaleuca squarrosa*) and *Acacia verticillata* are local on alluvial sediments of broader valleys. Drier sites support such shrub species as *Zieria arborescens*, *Beyeria viscosa*, *Acacia verniciflua*, *Cassinia aculeata*, *Helichrysum dendroideum*, *Correa lawrenciana*, *Exocarpos cupressiformis* and *Goodenia ovata*. The ground layer of *E. obliqua* forest on moist sites is similar to that of *E. regnans* forest, but the diversity and density of species is greater in drier areas, and includes a range of ferns (*Blechnum nudum*, *Polystichum proliferum*, *Hypolepis rugosula*, *Histiopteris incisa*, *Pteridium esculentum*), sags (*Dianella tasmanica*) and forbs (*Drymophila cyanocarpa*, *Lagenophora stipitata*). Fire-sere areas typically are clad in tall bracken (*Pteridium esculentum*) and fire-weed (*Senecio linearifolius*).

*Eucalyptus delegatensis* forests are restricted to higher altitudes (above 400 m) on the dolerite plateaux surrounding Tatnells Hill, Mt Koonya, Mt Clark and Mt Arthur. *Eucalyptus delegatensis* may form even-aged and monotypic stands, but more frequently is found growing with other eucalypts (*E. obliqua*, *E. viminalis*, *E. globulus* or *E. johnstonii*) in mixed-age stands. The understorey on moist sites is similar to that of *E. obliqua* forests, but *Bedfordia salicina* is commonly the dominant shrub. *Leptospermum lanigerum* is found on plateaux with impeded drainage. Drier sites also frequently carry *Bedfordia salicina*, and associated shrubs (*Cyathodes* spp., *Pimelea drupacea*, *Notelaea ligustrina*, *Helichrysum antennarium*, *Hakea lissosperma*) form a distinctive community found widely on upland dolerite sites throughout eastern Tasmania.

There are a few occurrences on the peninsula of wet sclerophyll forest dominated by gums (*Eucalyptus globulus* and less frequently *E. viminalis*). They are restricted to dolerite gullies and slopes in the subhumid parts of the peninsula. These forests have an understorey composition similar to that of the *E. obliqua* forests on dry sites.

### Dry Sclerophyll Forest

Dry sclerophyll vegetation dominates the drier and more exposed western areas of the peninsula but is

largely restricted to coastal, infertile or insolated sites in the east. The classification used follows that of Duncan & Brown (1985).

*Casuarina stricta* low forests and woodlands occur in dry coastal environments subject to salt-laden winds and physiological drought. The spectacular sea cliffs, headlands and coastal slopes support sporadic copses of *Casuarina*-dominated vegetation, in which tree heights rarely exceed 5 m. Other species also present in sheltered locations include *Bedfordia salicina*, *Myoporum insulare* and *Beyeria viscosa*. Understorey development is generally sparse in these low forests due to the thick litter of *Casuarina* needles. In the denser forests only a few etiolated saggos (*Lomandra longifolia*, *Dianella revoluta*), grasses (*Stipa* spp., *Poa poiformis*) and occasional succulent scramblers (*Rhagodia baccata*, *Tetragonia implexicoma*) are present.

The understorey is better developed in areas where the canopy is more open and the influence of the prevailing winds is abated, generally on thin cover sands, over dolerite or mudstone on offshore islands and fringing the western coastline. Individual trees of *Eucalyptus globulus*, *E. viminalis*, or *E. tenuiramis* are occasionally emergent in these situations, and the understorey is predominantly grassy (*Poa poiformis*, *Stipa* spp., *Dichelachne crinita*, *Danthonia* spp.) with frequent sedges and saggos such as *Scirpus nodosus*, *Lepidosperma* spp. and *Lomandra longifolia*.

Heathy dry sclerophyll generally occurs on the peninsula on Triassic sediments which crop out extensively in the northwest, and also on sheets of windblown Holocene sands deposited on coastal slopes and plains. *Eucalyptus amygdalina* is the dominant species on the Triassic sediments, usually with *E. viminalis*. *Eucalyptus obliqua* (sheltered slopes) and *E. tenuiramis* (dry ridges) may also be present. Occasionally there are tall shrubs of *Casuarina littoralis* or *Banksia marginata* present but the dominant understorey layer is the distinctive dense heath (*Epacris impressa*, *Amperea xiphoclada*, *Bossiaea cinerea*, *Aotus ericoides*, *Pultenaea juniperina*, *Leucopogon ericoides*) which characterises the siliceous substrates of eastern Tasmania. Bracken (*Pteridium esculentum*) is characteristically the dominant element of the understorey in frequently fired stands.

In exposed coastal environments the *Eucalyptus amygdalina*-*E. viminalis* dominants become more stunted and mallee-form and such species as *Casuarina monilifera*, *Banksia marginata*, *Leptospermum scoparium*, *Leptospermum glaucescens*, *Dillwynia* spp., *Acacia suaveolens* and *Hibbertia* spp. increase the understorey diversity.

Heathy woodlands on mudstones are dominated

by *Eucalyptus tenuiramis*, but *E. obliqua*, *E. ovata* or *E. viminalis* may also be present. Much of the mudstone area of the peninsula is poorly drained; the eucalypts are stunted and the understorey consists of tea trees (*Leptospermum glaucescens*, *L. scoparium*, *Melaleuca squamea*, *M. squarrosa*) and other species typical of waterlogged sites (*Bauera rubioides*, *Lepidosperma filiforme*, *Leptocarpus tenax*).

Shrubby dry sclerophyll communities are widespread on dolerite and less frequent on sandstone. The dominant eucalypts are *E. tenuiramis* and *E. pulchella* (dolerite) and *E. amygdalina* (sandstone), with *E. viminalis* typically present as a sub-dominant species. As moisture availability increases, the trees become taller and of better form. *Eucalyptus obliqua* (lowland sites) and *E. delegatensis* (upland) assume dominance in these areas and *E. globulus* is commonly sub-dominant. The understorey is shrubby, often with an emergent layer of small trees. Common species include *Acacia dealbata*, *Exocarpos cupressiformis*, *Bursaria spinosa*, *Hakea epiglottis*, *Pimelea nivea*, *Epacris tasmanica*, *Gonocarpus teucrioides*, *Lomatia tinctoria*, *Epacris impressa*, *Acacia myrtifolia*, *Astroloma humifusum* and *Lissanthe strigosa*. On sheltered aspects and gully flanks the shrub layer is enriched by such mesophytes as *Zieria arborescens*, *Bedfordia salicina* and *Goodenia ovata*. Shrubby dry sclerophyll forests usually have a depauperate ground layer, except on recently burnt sites where the ubiquitous bracken predominates.

Grassy dry sclerophyll is restricted on Tasman Peninsula to insolated dolerite slopes and ridgelines in dry areas and to cover sands on dolerite coastal areas, including islands. Much of this vegetation has been altered by firing and rough grazing to produce a preponderance of tussock-forming grasses, saggos and sedges at the expense of woody species. The usual eucalypt dominant is *E. pulchella*, but *E. viminalis* or *E. globulus* are often present and may be dominant on some broad ridges on cover sands. The shrub component of the understorey is sparse, with *Astroloma humifusum* and *Lissanthe strigosa* commonly present. Such native grasses as *Danthonia* spp., *Stipa* spp., *Deyeuxia quadriseta* and *Microlaena stipoides* occupy a broad range of substrates, but others appear more selective, e.g. *Themeda australis* (dolerite), *Poa poiformis*, *Dichelachne crinita* (cover sands). The usual understorey dominants of these grassy forests and woodlands are *Lomandra longifolia* and *Lepidosperma laterale*.

Sedgely dry sclerophyll communities were once widespread on the peninsula on valley flats, but have largely been cleared for agriculture. Remnant stands are dominated by *E. ovata* over a mixture of shrubs (*Melaleuca* spp., *Leptospermum* spp., *Sprengelia*

*incarnata*, *Epacris lanuginosa*, *Hakea teretifolia*) and sedges (*Gahnia* spp., *Lepidosperma* spp., *Schoenus* spp.).

### Scrub and Heath

Lowland heath and scrub communities on the peninsula form mosaics on deeply leached sands or skeletal siliceous soils; the infertility interacts with drought, waterlogging, fire and salt spray to determine vegetation composition and structure.

At Lagoon Beach and in places on Sloping Island the open heath is dominated by *Casuarina monilifera* and *Banksia marginata* where salt spray and drought have arrested the progression of the community to scrub and woodland (Kirkpatrick 1975a). Siliceous heaths contain a diversity of shrubs, including *Aotus ericoides*, *Bossiaea cinerea*, *Amperea xiphoclada*, *Epacris impressa*, *Leucopogon* spp., *Hibbertia acicularis* and *Pimelea linifolia*. *Eucalyptus viminalis* is often present as a mallee-form shrub. Other common species include *Pteridium esculentum*, *Lomandra longifolia* and *Lepidosperma concavum*, and an abundance of geophytes (*Drosera* spp., *Wurmbea uniflora* and orchids). *Pteridium* and *Lomandra* replace the shrubs as dominants on frequently fired and/or cultivated sites (Kirkpatrick 1973, 1977; Duncan 1986). On poorly drained siliceous sites, wet heath commonly contains tea trees (*Leptospermum lanigerum*, *L. scoparium*, *Melaleuca squarrosa*, *M. squamea*, *M. gibbosa*), epacrids (*Epacris lanuginosa*, *Sprengelia incarnata*), sedges (*Lepidosperma longitundinale*, *Schoenus* spp.) and cord rushes (*Leptocarpus tenax*, *Empodisma minus*).

Some small patches of heath have also developed on the relatively infertile skeletal and podzolic soils derived from Permian mudstones at Sloping Island and Waterfall Bay (Kirkpatrick 1973, 1977). Characteristic species include *Astroloma humifusum*, *Lissanthe strigosa*, *Hibbertia* spp., *Pultenaea daphnoides*, *Danthonia* spp. and sometimes *Eucalyptus tenuiramis*.

The most extensive heathlands on Tasman Peninsula are those developed on the wind-buffeted plateaux of the southern capes (Cape Pillar, Cape Hauy, Brown Mountain, Cape Raoul, Slaters Point and Shipstern Bluff). In relatively sheltered, well-drained sites mallee-scrubs dominated by *E. tenuiramis* occur in association with *Dianella tasmanica*, *Lomandra longifolia*, *Goodenia ovata*, *Amperea xiphoclada*, *Correa reflexa* and *Pteridium esculentum* (Kirkpatrick 1975b). Shallower soils support *Casuarina monilifera*, *Leucopogon collinus*, *Banksia marginata*, *Pultenaea juniperina*, *Pimelea*

*nivea*, *Daviesia ulicifolia* and *Diplarrena moraea*. Wet heaths, often containing button grass (*Gymnoschoenus sphaerocephalus*), have developed on poorly drained areas. The most exposed coastal environments support *Helichrysum scutellifolium*, *Epacris myrtifolia*, *Helichrysum reticulatum*, *Epacris marginata*, *Leptospermum glaucescens*, *Calytrix tetragona* and *Acacia verticillata* var. *latifolia*.

### Coastal Vegetation

Six broad categories of coastal vegetation can be recognised. These each occupy a distinctive habitat and are best categorised on that basis.

#### Saltmarsh

The range of saltmarsh communities found elsewhere in southeastern Tasmania (Kirkpatrick & Glasby 1981) is not developed on Tasman Peninsula. The limited communities that do occur are similar in their zonation patterns to those described for Maria Island (Brown & Bayly-Stark 1979), and Boomer Marsh (Curtis & Somerville 1947).

The marshes occupy the landward margins of the shallow bays indenting the northern coastline, and are found also in corridors along the brackish reaches of the streams which drain into these bays. Tussock-forming grasses (*Poa poiformis*, *Stipa stipoides*) and rushes and sedges (*Juncus kraussii*, *Gahnia filum*) dominate the saline flats. The inter-tussock flora includes halophytic shrubs (*Suaeda australis*), herbs (*Samolus repens*, *Salicornia quinqueflora*, *Selliera radicans*) and mat-forming grasses (*Distichlis distichophylla*).

#### Wetlands

The northwestern tip of the peninsula is the stronghold of wetlands. There is one large lagoon (Sloping Lagoon) and smaller dune-barred lagoons, intermittent lakes and marginal wetland areas. Kirkpatrick & Harwood (1981) recorded six wetland plant communities. Their occurrence is a function of the salinity, pH and permanence of inundation of the wetlands. The communities are as follows: *Lamprothamnium* aquatic (floating brackish), *Triglochin procera* aquatic (floating fresh), *Eleocharis sphacelata* sedgeland (emergent fresh), *Lepidosperma longitundinale* sedgeland (marginal fresh) and *Selliera radicans* herbfield (marginal brackish). Descriptions of particular wetlands have also been given by



Kirkpatrick (1975a) for Lagoon Beach and for Wedge Island by Duncan (in prep.).

### Halophytic Herbfields

Halophytic herbfields are developed in areas where muttonbirds or fairy penguins have established rookeries on cover sands. Their origin and maintenance are probably due to disturbance by the burrowing seabirds and to the accumulation of nitrate and phosphate (Gillham 1960). The dominant species in these herbfields are succulent scramblers from the families Ficoideae and Chenopodiaceae: *Carpobrotus rossii*, *Disphyma australe*, *Rhagodia baccata* and *Tetragonia implexicoma*.

### Grassland

Grasslands dominated by *Poa poiformis sensu lat.*, and *Lomandra longifolia* tussock sedgeland are widespread on cover sands on the offshore islands and coastal slopes of the western parts of the peninsula. Typical inter-tussock species include *Dichondra repens*, *Acaena novae-zelandiae*, *Scirpus nodosus*, *Dianella revoluta*, *Dichelachne crinita*, *Stipa* spp. and *Pteridium esculentum*. These communities are maintained as a disclimax from woodlands by continued burning and grazing (Kirkpatrick 1973, Brown & Bayly-Stark 1979).

### Beach and Dune Formations

Most of the sandy beaches on the peninsula (e.g. Lagoon Beach, White Beach, Sloping Main) support only strand and foredune vegetation and there is little development of a rear dune complex of shrublands, woodlands and heath. These systems are well developed at Eaglehawk Neck, Roaring Beach and Crescent Bay. The strand vegetation is comprised of halophytic opportunists such as *Cakile edentula* and most foredunes are colonised by the introduced *Ammophila arenaria* although the native colonisers *Spinifex hirsutus* and *Festuca littoralis* are also locally common. The larger dune systems support a complex of *Poa* grassland, *Acacia sophorae* scrub and, in wet swales and drainage lines, scrubby heaths of *Melaleuca squamea*, *Leptospermum scoparium* and *Banksia marginata*. These scrubs are extensive near Stand-Up Point, where the back-dunes also support tall scrub to low open-forests of mallee-form *Eucalyptus obliqua*, *E. viminalis* and *E. tenuiramis* together with *Leptospermum glaucescens* and *Bursaria spinosa* thickets.

### Cliff Vegetation

The variation in structure and floristic composition of cliff vegetation is related to the parent material and morphology of the cliff, to the energy status of the adjacent sea, the regional climate and to faunal activity (Brown & Bayly-Stark 1979, Kirkpatrick 1981). Halophytes such as *Salicornia quinqueflora*, *Disphyma australe* and *Carpobrotus rossii* are sporadic colonisers of boulder beaches and cliff margins above the surge line. Tussock grasses such as *Stipa stipoides*, *Festuca littoralis* and in less saline environments *Poa poiformis*, occupy ledges and gulches from sea level to the cliff tops. The inter-tussock flora contains many halophytic herbs, including *Plantago triantha* and tetraploid plants of *Stylidium graminifolium* as well as the more widespread *Crassula sieberana*, *Apium prostratum*, *Lobelia alata* and the shore spleenwort *Asplenium obtusatum*. Broad ledges and cliff tops in fire-protected but exposed situations support *Casuarina stricta* low forest. Elsewhere, shrubs able to tolerate the wind and salt spray cling to exposed dolerite cliff tops; they include *Correa alba*, *Helichrysum reticulatum*, *H. scutellifolium*, *Calytrix tetragona*, *Leucopogon parviflorus* and *Myoporum insulare*. *Bedfordia salicina* forms a closed scrub on shaded screes and upper cliff crevices on low energy coasts. These locations are generally fire-protected and may support a mesophytic scrub or low forest which includes fire sensitive species such as *Richea dracophylla* and *Callitris rhomboidea*. These communities grade into wet sclerophyll forests.

### CONSERVATION OF THE VEGETATION

The natural vegetation of the peninsula has been subject to the impacts of settlement, with the same problems arising there as elsewhere in Tasmania. Land clearing, logging and recreational pursuits have all led to environmental modifications and problems (Duncan 1985). Problems associated with environmental modifications include fire regimes which are inappropriate for particular plant species and vegetation types, the encouragement of locally intensive grazing (both by native animals and by stock), the accession of weeds and fungal pathogens such as *Phytophthora cinnamomi* (Palzer 1985, Podger, Palzer and Brown unpublished data) and *Chalara australis* (Kile & Walker 1987) and the escalation of soil erosion. Despite these problems, the native vegetation has retained much of its integrity.

The following vascular plant species, recorded from the peninsula, are considered to be rare, poorly

reserved or unreserved in Tasmania using the definitions of Brown *et al.* (1983): *Hakea rostrata*, *Juncus revolutus* and *Thelymitra retecta* (unreserved); *Burnettia cuneata*, *Caladenia caudata*, *Cuscuta tasmanica*, *Cyathea cunninghamii*, *Epacris acuminata*, *Euphrasia phragmostoma*, *E. semipicta*, *Odidia angusta*, *Wilsonia humilis*, *Wurmbea uniflora* (poorly reserved and/or rare); *Cryptandra amara*, *Epacris marginata*, *Eucalyptus cordata*, *Lycopodium serpentinum* and *Spyridium obovatum* var. *velutinum* (rare).

Some of these species are found in reserves which do not offer the full legislative protection of State Reserves. For example, all of the known populations of *Euphrasia phragmostoma* are contained within the Fortescue Forest Reserve.

The land tenure status of the vegetation types recognised by Kirkpatrick & Dickinson (1984) is shown in table 1. There is considerable variation in the reservation status of the different vegetation categories. The *Casuarina stricta* forest, scrub, heath, scrub-heath mosaic, saline wetland and wetland categories have at least 65% of their total areas on the peninsula contained within State Reserves or other conservation reserves. Saltmarshes are generally poorly reserved on the peninsula, but are not directly

threatened by current land use practices. Two wetland communities are unreserved on the peninsula (Kirkpatrick & Harwood 1981): *Lamprothamnium aquaticum* and *Eleocharis acuta* sedge/land. Sclerophyll forest, *E. obliqua* wet forest and coastal grassy forests have 12–40% of their extent contained within reserves. Poorly reserved communities include grassy woodlands and sedge/land woodlands (Duncan & Brown 1985). Wet sclerophyll forests are extensive on private property and in State forest (including the Fortescue Forest Reserve) but only small areas lie within State Reserves. The rainforest occurs predominantly within State forest and some patches of both communities are reserved within the Fortescue Forest Reserve.

At a regional level, the conservation status of most species and communities is satisfactory. However, the retention of the peninsula's present attractive landscape will require sensitivity and conscious management of the native vegetation.

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TABLE 1

#### Areas and Percentage Land Tenure Categories for the Vegetation Types Recognised by Kirkpatrick & Dickinson (1984) for Tasman Peninsula

PL = private land, NA = non-allocated Crown land, SF = State forest, CL = Commonwealth land, OR = other reserve, SR = State Reserve

Vegetation type	Total area (ha)	% occurrence					
		PL	NA	SF	CL	OR	SR
<i>Eucalyptus obliqua</i> wet forest	14 575	57.0	-	24.7	-	6.7	11.6
<i>E. obliqua</i> tall forest	7 666	28.2	-	71.0	-	-	0.8
<i>E. delegatensis</i> forest	1 294	-	-	99.6	-	0.4	-
Coastal grassy forest	8 950	69.1	0.7	18.4	-	5.0	6.8
Dry sclerophyll forest	5 238	59.6	0.4	4.9	-	-	35.1
<i>Casuarina stricta</i> forest	119	-	-	-	-	-	100.0
Scrub	235	-	-	-	-	-	100.0
Heath	1 186	34.2	-	-	-	23.0	42.8
Scrub-heath mosaic	2 472	-	-	2.1	-	-	97.9
Grassland	169	-	26.3	-	73.7	-	-
Saline wetland	41	-	-	-	-	-	100.0
Cleared	5 226	97.5	1.0	0.9	-	0.3	0.2
Major lakes	30	-	-	-	-	-	100.0

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## APPENDIX

## Vascular Plant Taxa Recorded from Tasman Peninsula.

Habitat types of native species are shown as follows: A = aquatic (including saltmarsh), C = coastal, H = heath, S = scrub, D = dry sclerophyll, W = wet sclerophyll, R = rainforest. Introduced (i) and Tasmanian endemic (e) species are indicated. Species nomenclature follows that used by Duncan (1986).

PTERIDOPHYTA		Lycopodiaceae	
Adiantaceae		<i>Lycopodium australianum</i>	H
<i>Adiantum aethiopicum</i>	D	<i>L. deuterodensum</i>	HD
<i>Cheilanthes tenuifolia</i>	D	<i>L. laterale</i>	HD
<i>Pteris tremula</i>	W	<i>L. serpentinum</i>	H
Aspidiaceae		Osmundaceae	
<i>Lastreopsis acuminata</i>	WR	<i>Todea barbara</i>	SW
<i>Polystichum proliferum</i>	DWR	Polypodiaceae	
<i>Rumohra adiantiformis</i>	R	<i>Microsorium diversifolium</i>	CSWR
Aspleniaceae		Psilotaceae	
<i>Asplenium bulbiferum</i>	WR	<i>Tmesipteris billardieri</i>	WR
<i>A. flabellifolium</i>	R	Schizaeaceae	
<i>A. obtusatum</i>	C	<i>Schizaea bifida</i>	H
<i>A. terrestre</i>	WR	<i>Schizaea fistulosa</i>	HD
Blechnaceae		Selaginellaceae	
<i>Blechnum chambersii</i>	WR	<i>Selaginella uliginosa</i>	HD
<i>B. fluviatile</i>	WR		
<i>B. minus</i>	WR	GYMNOSPERMAE	
<i>B. nudum</i>	SDWR	Cupressaceae	
<i>B. patersonii</i>	WR	<i>Callitris rhomboidea</i>	SDW
<i>B. watsii</i>	SWR	<i>Cupressus macrocarpa</i>	i
Cyatheaceae		Pinaceae	
<i>Cyathea australis</i>	W	<i>Pinus radiata</i>	i
<i>C. cunninghamii</i>	W	Podocarpaceae	
Dennstaedtiaceae		<i>Phyllocladus aspleniifolius</i>	eSR
<i>Histiopteris incisa</i>	WR		
<i>Hypolepis rugosula</i>	WR	ANGIOSPERMAE : DICOTYLEDONEAE	
<i>Pteridium esculentum</i>		Apiaceae	
CHSDW		<i>Apium prostratum</i>	AC
Dicksoniaceae		<i>Centella cordifolia</i>	AH
<i>Dicksonia antarctica</i>	WR	<i>Daucus glochidiatus</i>	CHD
Gleicheniaceae		<i>Hydrocotyle javanica</i>	
<i>Gleichenia dicarpa</i>	HS	HSDWR	
<i>G. microphylla</i>	S	<i>H. muscosa</i>	A
<i>Sticherus tener</i>	WR	<i>H. sibthorpioides</i>	DW
Grammitidaceae		<i>Lilaeopsis brownii</i>	eA
<i>Ctenopteris heterophylla</i>	WR	<i>Oreomyrrhis eriopoda</i>	H
<i>Grammitis billardieri</i>	WR	<i>Xanthosia dissecta</i>	HD
<i>G. magellanica</i> ssp. <i>nothofagetii</i>	R	<i>X. pilosa</i>	HD
Hymenophyllaceae		<i>X. pusilla</i>	HD
<i>Hymenophyllum australe</i>	R	Apocynaceae	
<i>H. cupressiforme</i>	R	<i>Parsonsia straminea</i>	WR
<i>H. flabellatum</i>	R	Asteraceae	
<i>H. peltatum</i>	R	<i>Achillea millefolium</i>	i
<i>H. rarum</i>	R	<i>Angianthus preissianus</i>	A
<i>Polyphlebium venosum</i>	WR	<i>Arctotheca calendula</i>	i
Lindsaeaceae		<i>Bedfordia linearis</i>	eCSD
<i>Lindsaea linearis</i>	CHD	<i>B. salicina</i>	eCSDW

<i>Bellis perennis</i>	i	<i>O. viscosa</i>	DW
<i>Brachycome aculeata</i>	CD	<i>Picris</i> sp.	i
<i>B. ciliaris</i>	D	<i>Podolepis jaceoides</i>	CHD
<i>B. spathulata</i> ssp. <i>glabra</i>	eD	<i>Senecio biserratus</i>	CD
<i>Calocephalus brownii</i>	C	<i>S. capillifolius</i>	eC
<i>Carduus</i> sp.	i	<i>S. lautus</i>	C
<i>Cassinia aculeata</i>	CSDW	<i>S. linearifolius</i>	CSDW
<i>Cassinia spectabilis</i>	i	<i>S. quadridentatus</i>	D
<i>Chrysanthemoides monilifera</i>	i	<i>S. minimus</i>	CHD
<i>Cirsium arvense</i>	i	<i>S. velleioides</i>	i
<i>C. vulgare</i>	i	<i>S. vulgaris</i>	i
<i>Cotula australis</i>	AC	<i>Silybum marianum</i>	i
<i>C. coronopifolia</i>	i	<i>Solenogyne dominii</i>	D
<i>C. longipes</i>	A	<i>S. gunnii</i>	D
<i>C. reptans</i>	AD	<i>Sonchus asper</i>	i
<i>Craspedia glauca</i>	D	<i>S. megalocarpus</i>	C
<i>Cymbonotus lawsonianus</i>	D	<i>S. oleraceus</i>	i
<i>Eryngium vesiculosum</i>	CHD	<b>Baueraceae</b>	
<i>Gnaphalium candidissimum</i>	i	<i>Bauera rubioides</i>	CSHD
<i>G. collinum</i>	CHD	<b>Boraginaceae</b>	
<i>G. luteo-album</i>	CHD	<i>Cynoglossum australe</i>	D
<i>Helichrysum antennarium</i>	eS	<i>C. suaveolens</i>	D
<i>H. apiculatum</i>	HD	<b>Brassicaceae</b>	
<i>H. argophyllum</i>	C	<i>Brassica rapa</i>	i
<i>H. bicolor</i>	CH	<i>Cakile edentula</i>	C
<i>H. costatifractum</i>	eCD	<i>Cardamine tenuifolia</i>	D
<i>H. dealbatum</i>	CHD	<i>Lepidium foliosum</i>	C
<i>H. dendroideum</i>	SDW	<i>Rorippa dictyosperma</i>	SD
<i>H. ericeteum</i>	eC	<b>Callitricheae</b>	
<i>H. expansifolium</i>	eC	<i>Callitriche stagnalis</i>	A
<i>H. ledifolium</i>	eCD	<b>Campanulaceae</b>	
<i>H. purpurascens</i>	eCD	<i>Wahlenbergia consimilis</i>	CHD
<i>H. reticulatum</i>	eC	<i>W. gymnoclada</i>	D
<i>H. scorpioides</i>	CHD	<i>W. quadrifida</i>	D
<i>H. scutellifolium</i>	eHD	<i>W. tadgellii</i>	CD
<i>Hypochaeris glabra</i>	i	<b>Caryophyllaceae</b>	
<i>H. radicata</i>	i	<i>Cerastium fontanum</i>	i
<i>Lagenophora huegellii</i>	D	<i>Colobanthus apetalus</i>	D
<i>L. stipitata</i>	HD	<i>Polycarpon tetraphyllum</i>	i
<i>Leontodon leysseri</i>	i	<i>Scleranthus biflorus</i>	CHD
<i>Leptorhynchus linearis</i>	HD	<i>Silene gallica</i>	i
<i>L. squamatus</i>	HD	<i>Spergularia media</i>	AC
<i>Microseris scapigera</i>	D	<i>S. rubra</i>	i
<i>Millotia tenuifolia</i>	HD	<b>Casuarinaceae</b>	
<i>Odixia angusta</i>	eD	<i>Casuarina littoralis</i>	D
<i>Olearia argophylla</i>	SWR	<i>C. monilifera</i>	CHD
<i>O. axillaris</i>	C	<i>C. stricta</i>	CD
<i>O. ciliata</i>	HD	<b>Chenopodiaceae</b>	
<i>O. erubescens</i>	HD	<i>Atriplex hastata</i>	i
<i>O. floribunda</i>	HD	<i>Chenopodium album</i>	i
<i>O. lanceolata</i>	eSD	<i>Rhagodia baccata</i>	C
<i>O. lirata</i>	W	<i>R. nutans</i>	CD
<i>O. persoonioides</i>	eSR	<i>Salicornia blackiana</i>	AC
<i>O. phlogopappa</i>	CHSD	<i>S. quinqueflora</i>	AC
<i>O. ramulosa</i>	CHD	<b>Convolvulaceae</b>	
<i>O. aff. ramulosa</i>	C	<i>Convolvulus erubescens</i>	D
<i>O. stellulata</i>	CHDW	<i>Cuscuta tasmanica</i>	A

<i>Dichondra repens</i>	CHD	<i>Phyllanthus australis</i>	H
<i>Wilsonia humilis</i>	A	<i>Poranthera microphylla</i>	CHD
Crassulaceae		Fabaceae	
<i>Crassula sieberana</i>	CHD	<i>Aotus ericoides</i>	HD
Dilleniaceae		<i>Bossiaea cinerea</i>	HD
<i>Hibbertia acicularis</i>	HD	<i>B. cordigera</i>	CHD
<i>H. empetrifolia</i>	HSD	<i>B. prostrata</i>	HD
<i>H. fasciculata</i>	HD	<i>Chamaecytisus proliferus</i>	i
<i>H. hirsuta</i>	eCHD	<i>Daviesia ulicifolia</i>	HD
<i>H. procumbens</i>	CHD	<i>Dillwynia cinerascens</i>	HD
<i>H. riparia</i>	CHD	<i>D. glaberrima</i>	HD
Droseraceae		<i>D. sericea</i>	HD
<i>Drosera auriculata</i>	HD	<i>Genista monspessulana</i>	i
<i>D. binata</i>	HD	<i>Glycine clandestina</i>	CD
<i>D. pygmaea</i>	HD	<i>Gompholobium huegelii</i>	HD
<i>D. spatulata</i>	H	<i>Goodia lotifolia</i>	DW
Elaeocarpaceae		<i>Hovea heterophylla</i>	HD
<i>Aristoelia peduncularis</i>	eSWR	<i>Indigofera australis</i>	HD
Epacridaceae		<i>Kennedia prostrata</i>	CHD
<i>Acrotiche serrulata</i>	HD	<i>Lupinus arboreus</i>	i
<i>Astroloma humifusum</i>	CHD	<i>Medicago</i> sp.	i
<i>A. pinifolium</i>	HD	<i>Oxylobium ellipticum</i>	CS
<i>Brachyloma ciliatum</i>	HD	<i>Platylobium triangulare</i>	HD
<i>Cyathodes abietina</i>	eC	<i>Psoralea adscendens</i>	i
<i>C. divaricata</i>	eD	<i>Pultenaea daphnoides</i>	HDW
<i>C. glauca</i>	eSDW	<i>P. dentata</i>	HD
<i>C. juniperina</i>	SDW	<i>P. gunnii</i>	HD
<i>C. parvifolia</i>	eS	<i>P. juniperina</i>	CHD
<i>Epacris acuminata</i>	eS	<i>P. pedunculata</i>	HD
<i>E. gunnii</i>	eS	<i>Sphaerolobium vimineum</i>	HD
<i>E. impressa</i>	HD	<i>Trifolium campestre</i>	i
<i>E. lanuginosa</i>	HD	<i>T. glomeratum</i>	i
<i>E. marginata</i>	eCHS	<i>T. repens</i>	i
<i>E. myrtifolia</i>	eCH	<i>T. subterraneum</i>	i
<i>E. obtusifolia</i>	H	<i>Vicia angustifolia</i>	i
<i>E. tasmanica</i>	eHD	Fagaceae	
<i>Leucopogon australis</i>	D	<i>Nothofagus cunninghamii</i>	SR
<i>L. collinus</i>	HD	Ficoideae	
<i>L. ericoides</i>	HD	<i>Arthrocnemum arbuscula</i>	A
<i>L. parviflorus</i>	CD	<i>Carpobrotus rossii</i>	C
<i>L. virgatus</i>	HD	<i>Disphyma australe</i>	AC
<i>Lissanthe strigosa</i>	HD	<i>Suaeda australis</i>	AC
<i>Monotoca elliptica</i>	C	<i>Tetragonia implexicoma</i>	C
<i>M. glauca</i>	eSW	Gentianaceae	
<i>M. scoparia</i>	S	<i>Centaurium erythraea</i>	i
<i>Pentachondra involucrata</i>	eCS	<i>Nymphoides exigua</i>	eA
<i>Richea dracophylla</i>	eSWR	<i>Sebaea albidiflora</i>	AC
<i>R. procera</i>	eS	<i>S. ovata</i>	D
<i>Sprengelia incarnata</i>	HD	<i>Villarsia reniformis</i>	A
<i>Styphelia adscendens</i>	HD	Geraniaceae	
Ericaceae		<i>Erodium moschatum</i>	i
<i>Gaultheria hispida</i>	eSWR	<i>Geranium potentilloides</i>	SD
Escalloniaceae		<i>G. solanderi</i>	HD
<i>Anopterus glandulosus</i>	eSR	<i>Pelargonium australe</i>	CHD
Euphorbiaceae		<i>P. inodorum</i>	D
<i>Amperea xiphioclada</i>	HD	<i>P. x domesticum</i>	i
<i>Beyeria viscosa</i>	CW		

<b>Goodeniaceae</b>		<b>Monimiaceae</b>	
<i>Goodenia lanata</i>	HD	<i>Atherosperma moschatum</i>	SR
<i>G. ovata</i>	CHD	<b>Myoporaceae</b>	
<i>Scaevola hookeri</i>	H	<i>Myoporum insulare</i>	C
<i>Selliera radicans</i>	A	<b>Myrtaceae</b>	
<b>Haloragaceae</b>		<i>Baekia ramosissima</i>	HD
<i>Gonocarpus micranthus</i>	HSD	<i>Callistemon pallidus</i>	SD
<i>G. tetragynus</i>	HD	<i>C. viridiflorus</i>	eHS
<i>G. teucroides</i>	HSDW	<i>Calytrix tetragona</i>	CH
<i>G. serpyllifolius</i>	S	<i>Eucalyptus amygdalina</i>	eHD
<i>Myriophyllum austropygmaeum</i>	eA	<i>E. cordata</i>	eD
<i>M. elatinooides</i>	A	<i>E. delegantensis</i>	DW
<i>M. propinquum</i>	A	<i>E. globulus</i>	HSDW
<b>Hypericaceae</b>		<i>E. johnstonii</i>	eWS
<i>Hypericum gramineum</i>	HD	<i>E. nitida</i>	S
<i>H. japonicum</i>	AHD	<i>E. obliqua</i>	SDW
<b>Lamiaceae</b>		<i>E. ovata</i>	SD
<i>Marrubium vulgare</i>	i	<i>E. pulchella</i>	eD
<i>Prostanthera lasianthos</i>	SW	<i>E. regnans</i>	W
<i>Prunella vulgaris</i>	HD	<i>E. rodwayi</i>	eD
<i>Scutellaria humilis</i>	D	<i>E. tenuiramis</i>	eHSD
<i>Westringia rigida</i>	CS	<i>E. viminalis</i>	HSDW
<i>W. rubiaefolia</i>	eCS	<i>Leptospermum glaucescens</i>	eCSH
<b>Lauraceae</b>		<i>L. grandiflorum</i>	eH
<i>Cassytha glabella</i>	CH	<i>L. lanigerum</i>	HSDW
<i>C. pubescens</i>	SHD	<i>L. scoparium</i>	HSD
<b>Linaceae</b>		<i>L. scoparium</i> var. <i>eximium</i>	eC
<i>Linum marginale</i>	HD	<i>Melaleuca gibbosa</i>	HSD
<b>Lobeliaceae</b>		<i>M. squamea</i>	HSD
<i>Lobelia alata</i>	ACDH	<i>M. squarrosa</i>	HSD
<i>L. gibbosa</i>	D	<b>Oleaceae</b>	
<i>Pratia pedunculata</i>	AD	<i>Notelaea ligustrina</i>	DW
<b>Loganiaceae</b>		<b>Onagraceae</b>	
<i>Mitrasacme pilosa</i>	HD	<i>Epilobium hirtigerum</i>	H
<b>Malvaceae</b>		<i>E. sp.</i>	CD
<i>Asterotrichion discolor</i>	eW	<i>Fuchsia magellanica</i>	i
<i>Lawrenchia spicata</i>	AC	<b>Oxalidaceae</b>	
<i>Malva</i> sp.	i	<i>Oxalis corniculata</i>	CHD
<b>Mimosaceae</b>		<b>Passifloraceae</b>	
<i>Acacia botrycephala</i>	HD	<i>Passiflora cinnabarina</i>	i
<i>A. dealbata</i>	HD	<b>Pittosporaceae</b>	
<i>A. genistifolia</i>	HD	<i>Billardiera longiflora</i>	CSW
<i>A. mearnsii</i>	D	<i>Bursaria spinosa</i>	HSD
<i>A. melanoxylon</i>	SDWR	<i>Marianthus procumbens</i>	HD
<i>A. mucronata</i>	SDWR	<i>Pittosporum bicolor</i>	CSWR
<i>A. myrtifolia</i>	HD	<b>Plantaginaceae</b>	
<i>A. riceana</i>	eSWR	<i>Plantago coronopus</i>	i
<i>A. sophorae</i>	C	<i>P. hispida</i>	C
<i>A. stricta</i>	D	<i>P. lanceolata</i>	i
<i>A. suaveolens</i>	HD	<i>P. major</i>	i
<i>A. ulicifolia</i>	HD	<i>P. triantha</i>	C
<i>A. verniciflua</i>	DW	<i>P. varia</i>	HD
<i>A. verticillata</i> var. <i>latifolia</i>	C	<b>Polygalaceae</b>	
<i>A. v. var. ovoidea</i>	HD	<i>Comesperma calymega</i>	HD
<i>A. v. var. verticillata</i>	SDW	<i>C. retusum</i>	HD
<i>Albizia lophantha</i>	i	<i>C. volubile</i>	HD

Polygonaceae		Santalaceae	
<i>Rumex acetosella</i>	i	<i>Exocarpos cupressiformis</i>	D
<i>R. crispus</i>	i	<i>E. strictus</i>	HD
Primulaceae		<i>E. syrticola</i>	CS
<i>Anagallis arvensis</i>	i	<i>Leptomeria drupacea</i>	HD
<i>Samolus repens</i>	A	Sapindaceae	
Proteaceae		<i>Dodonaea viscosa</i>	CSD
<i>Banksia marginata</i>	CHSD	Scrophulariaceae	
<i>Hakea epiglottis</i>	eHSD	<i>Euphrasia collina</i>	HD
<i>H. lissosperma</i>	SW	<i>E. phragmostoma</i>	eH
<i>H. rostrata</i>	H	<i>E. semipicta</i>	eH
<i>H. rugosa</i>	H	<i>Limosella lineata</i>	A
<i>H. teretifolia</i>	HD	<i>Mazus pumilio</i>	A
<i>Lomatia polymorpha</i>	eHS	<i>Mimulus repens</i>	A
<i>L. tinctoria</i>	eHD	<i>Verbascum virgatum</i>	i
<i>Persoonia juniperina</i> var. <i>juniperina</i>	HD	<i>Veronica calycina</i>	CD
<i>P. j.</i> var. <i>brevifolia</i>	eHD	<i>V. formosa</i>	eSDW
<i>Telopea truncata</i>	eSWR	<i>V. gracilis</i>	CD
Ranunculaceae		Solanaceae	
<i>Clematis aristata</i>	WR	<i>Lycium ferocissimum</i>	i
<i>C. gentianoides</i>	eHD	<i>Solanum laciniatum</i>	CHD
<i>Ranunculus lappaceus</i>	D	Stackhousiaceae	
<i>R. repens</i>	i	<i>Stackhousia monogyna</i>	CD
<i>R. rivularis</i>	A	<i>S. spathulata</i>	C
Rhamnaceae		Stylidiaceae	
<i>Cryptandra amara</i>	HD	<i>Stylidium graminifolium</i>	CHD
<i>Pomaderris apetala</i>	CSW	Thymelaeaceae	
<i>P. elliptica</i>	eHD	<i>Pimelea drupacea</i>	SWR
<i>P. pilifera</i>	HD	<i>P. flava</i>	D
<i>Spyridium gunnii</i>	eH	<i>P. humilis</i>	CHD
<i>Spyridium obovatum</i> var. <i>velutinum</i>	eHD	<i>P. linifolia</i>	HD
Rosaceae		<i>P. nivea</i>	eHD
<i>Acaena echinata</i>	HD	Tremandraceae	
<i>A. novae-zelandiae</i>	CHD	<i>Tetradlea pilosa</i>	HD
<i>A. ovina</i>	D	<i>T. procumbens</i>	H
<i>Rosa rubiginosa</i>	i	Urticaceae	
<i>Rubus fruticosus</i>	i	<i>Urtica urens</i>	i
<i>R. parvifolius</i>	D	Valerianaceae	
Rubiaceae		<i>Centranthus ruber</i>	i
<i>Coprosma hirtella</i>	DW	Violaceae	
<i>C. quadrifida</i>	SW	<i>Viola hederacea</i> ssp. <i>hederacea</i>	HSDW
<i>C. repens</i>	i	<i>V. h.</i> ssp. <i>cleistogamoides</i>	D
<i>Galium albescens</i>	eD	Winteraceae	
<i>G. australe</i>	D	<i>Tasmania lanceolata</i>	SWR
<i>G. ciliare</i>	D	ANGIOSPERMAE : MONOCOTYLEDONEAE	
<i>G. gaudichaudii</i>	D	Centrolepidaceae	
<i>Opercularia varia</i>	CHD	<i>Centrolepis aristata</i>	C
Rutaceae		<i>C. fascicularis</i>	CH
<i>Boronia parviflora</i>	HD	<i>C. strigosa</i>	CHD
<i>B. pilosa</i>	HD	Cyperaceae	
<i>Correa alba</i>	CH	<i>Baumea acuta</i>	HD
<i>C. lawrencianca</i>	SDW	<i>B. arthropphylla</i>	A
<i>C. reflexa</i>	CHD	<i>B. juncea</i>	AC
<i>Phebalium squameum</i>	SW	<i>B. tetragona</i>	A
<i>Zieria arborescens</i>	SW	<i>Carex appressa</i>	ACSW
Salicaceae		<i>C. breviculmis</i>	D
<i>Salix</i> sp.	i		



<i>C. inversa</i>	D	<i>D. tasmanica</i>	HSDW
<i>Eleocharis acuta</i>	A	<i>Drymophila cyanocarpa</i>	SDWR
<i>E. sphacelata</i>	A	<i>Laxmannia sessiliflora</i>	C
<i>Gahnia filum</i>	A	<i>Lomandra longifolia</i>	CHD
<i>G. graminifolia</i>	eD	<i>Thysanotus patersonii</i>	D
<i>G. grandis</i>	HSDW	<i>Wurmbea uniflora</i>	HD
<i>G. radula</i>	HD	Orchidaceae	
<i>G. trifida</i>	AH	<i>Acianthus caudatus</i>	HD
<i>Gymnoschoenus sphaerocephalus</i>	H	<i>A. exsertus</i>	HD
<i>Lepidosperma concavum</i>	CHD	<i>A. reniformis</i>	HD
<i>L. elatius</i>	W	<i>Burnettia cuneata</i>	H
<i>L. filiforme</i>	HD	<i>Caladenia carnea</i>	HD
<i>L. gladiatum</i>	C	<i>C. caudata</i>	eD
<i>L. laterale</i>	HD	<i>C. dilatata</i>	HD
<i>L. lineare</i>	HD	<i>C. filamentosa</i>	HD
<i>L. l. var. inops</i>	eSHD	<i>C. gracilis</i>	eD
<i>L. longitudinale</i>	HD	<i>C. patersonii</i>	HD
<i>Schoenus apogon</i>	HD	<i>C. reticulata</i>	D
<i>S. maschalinus</i>	CH	<i>Caleana major</i>	HD
<i>S. nitens</i>	AC	<i>Calochilus campestris</i>	HD
<i>S. tenuissimus</i>	HD	<i>C. robertsonii</i>	HD
<i>Scirpus cernuus</i>	HD	<i>Chiloglottis cornuta</i>	DW
<i>S. inundatus</i>	A	<i>C. gunnii</i>	HD
<i>S. montivagus</i>	A	<i>C. reflexa</i>	HD
<i>S. nodosus</i>	C	<i>Corybas aconitiflorus</i>	HD
<i>S. platycarpus</i>	A	<i>C. dilatatus</i>	HDW
<i>S. setaceus</i>	H	<i>Cryptostylis subulata</i>	HS
<i>Tetraparia capillaris</i>	HD	<i>Dipodium punctatum</i>	HD
Hypoxidaceae		<i>Diuris maculata</i>	HD
<i>Hypoxis glabella</i>	HD	<i>Eriochilus cucullatus</i>	HD
<i>H. hygrometrica</i>	D	<i>Gastrodia major</i>	D
Iridaceae		<i>Lyperanthus nigricans</i>	H
<i>Diplarrena moraea</i>	HD	<i>L. suaveolens</i>	HD
<i>Patersonia fragilis</i>	HD	<i>Microtis parviflora</i>	HD
Juncaceae		<i>M. rara</i>	H
<i>Juncus australis</i>	AD	<i>M. unifolia</i>	D
<i>J. bufonius</i>	AHD	<i>Prasophyllum album</i>	HD
<i>J. capitatus</i>	i	<i>P. australe</i>	H
<i>J. kraussii</i>	A	<i>P. bufonianum</i>	eH
<i>J. pallidus</i>	AHD	<i>P. elatum</i>	HD
<i>J. pauciflorus</i>	HD	<i>P. fuscum</i>	HD
<i>J. planifolius</i>	AH	<i>P. gracile</i>	HD
<i>J. pusillus</i>	A	<i>P. nigricans</i>	HD
<i>J. revolutus</i>	A	<i>P. odoratum</i>	HD
<i>J. vaginatus</i>	CD	<i>P. rogersii</i>	H
<i>Luzula densiflora</i>	D	<i>P. suttonii</i>	H
<i>L. sp.</i>	HD	<i>P. uroglossum</i>	H
Juncaginaceae		<i>Pterostylis barbata</i>	HD
<i>Triglochin procera</i>	A	<i>P. curta</i>	D
<i>T. striata</i>	A	<i>P. foliata</i>	HD
Lemnaceae		<i>P. furcata</i>	DW
<i>Lemna sp.</i>		<i>P. longifolia</i>	HD
Liliaceae		<i>P. nutans</i>	HD
<i>Arthropodium milleflorum</i>	HD	<i>P. pedunculata</i>	HDW
<i>Bulbine bulbosa</i>	D	<i>P. parviflora</i>	HD
<i>B. semibarbata</i>	C	<i>P. pedoglossa</i>	H
<i>Dianella revoluta</i>	CHD	<i>P. toveyana</i>	HD

<i>Thelymitra aristata</i>	HD	<i>Microlaena stipoides</i>	D
<i>T. canaliculata</i>	C	<i>Nassella trichotoma</i>	i
<i>T. cornea</i>	HD	<i>Pentapogon quadrifidus</i>	D
<i>T. ixioides</i>	HD	<i>Phragmites australis</i>	A
<i>T. megalyptra</i>	HD	<i>Poa annua</i>	i
<i>T. nuda</i>	HD	<i>P. labillardieri</i>	D
<i>T. pauciflora</i>	HD	<i>P. poiiformis</i>	CD
<i>T. resecta</i>	H	<i>P. rodwayi</i>	D
<i>T. rubra</i>	HD	<i>P. sieberana</i>	D
<i>T. venosa</i>	HD	<i>Polypogon monspeliensis</i>	i
Poaceae		<i>Puccinellia stricta</i>	A
<i>Agropyron scabrum</i>	D	<i>Spinifex hirsutus</i>	C
<i>Agrostis aemula</i>	CHD	<i>Stipa aphylla</i>	eD
<i>A. avenacea</i>	HD	<i>S. compacta</i>	D
<i>A. billardieri</i>	AD	<i>S. mollis</i>	D
<i>A. stolonifera</i>	i	<i>S. nervosa</i> var. <i>neutralis</i>	D
<i>Aira caryophylla</i>	i	<i>S. pubinodis</i>	CD
<i>A. elegans</i>	i	<i>S. semibarbata</i>	D
<i>Ammophila arenaria</i>	i	<i>S. stipoides</i>	C
<i>Anthoxanthum odoratum</i>	i	<i>S. stiposa</i>	eD
<i>Briza minor</i>	i	<i>Tetrarrhena acuminata</i>	H
<i>Bromus hordeatus</i>	i	<i>T. distichophylla</i>	HD
<i>B. mollis</i>	i	<i>Themeda australis</i>	D
<i>Dactylis glomeratus</i>	i	<i>Vulpia bromoides</i>	i
<i>Danthonia caespitosa</i>	CD	Restionaceae	
<i>D. dimidiata</i>	eD	<i>Calorophus elongatus</i>	HS
<i>D. geniculata</i>	CD	<i>Empodisma minus</i>	HS
<i>D. laevis</i>	D	<i>Hypolaena fastigiata</i>	H
<i>D. penicillata</i>	D	<i>Leptocarpus brownii</i>	AH
<i>D. pilosa</i>	D	<i>L. tenax</i>	HD
<i>D. racemosa</i>	D	<i>Lepyrodia muelleri</i>	HD
<i>D. semi-annularis</i>	HD	<i>L. tasmanica</i>	HD
<i>D. setacea</i>	HD	<i>Restio complanatus</i>	HD
<i>Deyeuxia contracta</i>	HD	<i>R. tetraphyllus</i>	S
<i>D. quadriseta</i>	HD	Ruppiaceae	
<i>D. rodwayi</i>	HD	<i>Lepilaena cylindrocarpa</i>	A
<i>Dichelachne crinita</i>	CD	<i>Ruppia</i> sp.	A
<i>D. rara</i>	D	Typhaceae	
<i>Distichlis distichophylla</i>	AC	<i>Typha</i> sp.	A
<i>Festuca asperula</i>	C	Xyridaceae	
<i>F. littoralis</i>	C	<i>Xyris gracilis</i> ssp. <i>tasmanica</i>	eH
<i>Hierochloa redolens</i>	D	<i>Xyris muelleri</i>	eHD
<i>Holcus lanatus</i>	i	<i>Xyris operculata</i>	HD
<i>Hordeum leporinum</i>	i	Zosteraceae	
<i>H. marinum</i>	i	<i>Zostera</i> sp.	A
<i>Lolium perenne</i>	i		