



THE TASMANIAN NATURALIST

REGISTERED BY AUSTRALIA POST PUBLICATION No. TBH0495 ISSN 0819-6826
POSTAL ADDRESS: G.P.O. BOX 68A, HOBART 7001
ANNUAL SUBSCRIPTION: \$10.00
EDITOR: D.G. HIRD

WAVERLEY PARK NATURE RESERVE: A GRASSY GEM ON HOBART'S EASTERN SHORE

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Introduction

Economics aside, there are at least three good reasons why Tasmania's grassy bush is exceptionally important. The first reason is that these vegetation types are beautiful. The early settlers who were fortunate enough to see their expanse likened their beauty to an English park and indeed they would have been a colourful park, as during the flowering season from September to May the grassland wildflowers provide a blaze of colour and a variety of form.

The second reasons is because there is so little of these environments left and if something is not done soon to preserve them future generations will have no idea of how these parts of Tasmania once looked. Hobart residents get a distorted impression of the nationwide tenure of these ecosystems because this city is built on and surrounded by grassy hills, and a healthy network of city parks has preserved some of their former range. Elsewhere in the state most grassy vegetation has been converted to improved pasture. Those residents that enjoy walking in these grassy bushlands are familiar with the characteristic red heads of kangaroo grass (*Themeda triandra*), that dominates most of these areas. Few people would appreciate the significance of these landscapes nor realise that these grassy remnants provide a haven for some of Tasmania's rarest plant species. A recently published book; Kirkpatrick *et al.* (1988), *Cemeteries and City Parks: a guide to Tasmanian grassy ecosystems*, provides details of the dramatic decline of this vegetation type since the arrival of Europeans.

Finally, they are important because the ecological processes that intertwine the species, environment and conditions to which they are subjected are of excep-

tional interest. Research reported in *Cemeteries and City Parks* has provided a rudimentary knowledge of these processes, but the more we discover, the more the dynamism and sensitivity of these communities become apparent. Species that are not evident one year profuse the next, and fire and or grazing seem to be an urgent requirement for many species. Some rare species are only known where very specific small scale disturbance, such as a cloven hoof print, has provided the necessary niche. However it is the sensitivity of the grassland species that has contributed to their perilous standing and much of the mechanical disturbance imposed by Europeans has been a death knell for our native grasslands. Introduced species have had a 10,000 year headstart in evolving mechanisms to exploit the disturbances of sedentary people, and given the chance are very successful at replacing native plants. Further understanding of this finely tuned ecology and especially the specific requirements of the rare plant species is critical for the preservation of grassy environments.

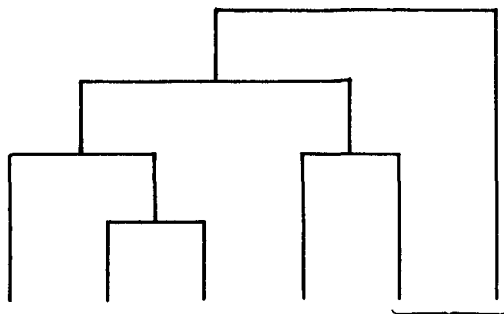
The conservation of these environments also depends on the preparedness of governing agencies to retain areas to be managed as nature reserves. The Clarence City Council has made an admirable decision to do this with Mornington Hill. This hill, known as Waverley Park, provides a backdrop to the eastern shore suburbs of Bellerive and Mornington and is a superb example of our grassy heritage.

This paper seeks to describe the botany of the park, discuss its conservation significance in the context of the rest of the state, and provide some management recommendations in the light of what was previously known about native plant species requirements and the voraciousness of the exotic species present. It also seeks to provide a guide to some aspects of the ecology of our grassy ecosystems that could be used in conjunction with a watchful eye and an exceedingly pleasant Sunday afternoon stroll in Waverley Park Nature Reserve.

THE VEGETATION

As a means of searching for species and in order to understand the vegetation patterns we spaced 47, 10 x 1 m quadrats around the park. For each of these we noted their position, slope, aspect and geology and made lists of all vascular plant species occurring in quadrats. The site lists, excluding exotic species were then classified by a computer program, TWINSPAN, which orders the lists using an index of similarity, so that the lists at either ends of this ordering are most dissimilar. It then splits this ordered sequence of sites, and then reorders and resplits the halves. It continues this process until hierarchy of site groups is formed. While vegetation usually varies continuously, the classification does produce groupings of plant species that are common associates. We begin to understand why these associations occur when we realise that they segregate into distinct environments.

Figure 1. The TWINSpan classification and description of communities.



Community no.	1	2	3	4	5
No. of quadrats	2	10	16	16	3
Mean species richness (10m ⁻²)	16.5	19.6	20.7	19.6	11.7

1. This is an open community dominated by scattered black gums (*Eucalyptus ovata*). Many grasses share dominance in the ground layer, including *Poa hookeri*, *P. labillardieri*, *Themeda triandra*, *Danthonia laevis* and *D. semianularis*.
2. She-oaks (*Allocasuarina verticillata*) and white gums (*E. viminalis*) comprise the overstorey of this community and the understorey is always dominated by a healthy sward of kangaroo grass (*Themeda triandra*).
3. This community is mostly dominated by black peppermint (*E. amygdalina*) with white gum (*E. viminalis*) as a sub-dominant. Bulloak (*Allocasuarina littoralis*) and silver and black wattles (*Acacia dealbata* and *A. mearnsii*) are the main mid-storey trees. All of these trees can dominate in patches. *Themeda triandra*, *Poa rodwayi* and *P. sieberiana* cover most of the ground layer but a host of other grass species are obvious.
4. The overstorey of this group is the same as community 3, but the most common dominants of the ground layer are *Poa sieberiana*, *Stipa mollis* and *Ehrharta disticophylla*.
5. This community has black peppermint as the dominant over a healthy understorey. The most obvious shrubs are the common heath (*Epacris impressa*) and the peas, *Aotus ericoides* and *Bossiaea cinerea*.

The park encompasses the 3 common geological types of the region and accommodates 172 native vascular plant species. The soils these rock types form and the influence of aspect and topographic position result in a complex of vegetation types and a rich native flora. Fig. 1 presents the classification and provides a description of these communities, Appendix 1 shows the community associations of the native plant species and Fig. 2 is a map of the communities. A discussion of the classification reveals some of the underlying environmental influences.

Group 1 forms one extreme of the scaling and can be identified by the presence of the herbaceous species *Haloragis heterophylla*, *Asperula conferta*, and buzzy bur (*Acaena novae-zelandiae*) that is a weed in certain situations but naturally occurs in poorly drained lowland grassland and in the park on the heavy mudstone soils of a gully flat.

Group 2 can be identified by the presence of the native bindweed (*Convolvulus erubescens*) and the absence of two grasses *Poa sieberana* and *Stipa mollis* and occurs on the relatively rich doleritic substrates.

Group 3 and 4 comprise a large block of continuously varying quadrats that occur on the sandstone. Species defining the former group are the grasses *Themeda triandra*, *Poa rodwayi*, *Agrostis aemula* and *Dichelachne rara* and the sedge *Schoenus apogon*. These are all species that most commonly occur on more fertile substrates. However, this region is one of the driest in the state and is significantly drier than the western shore of the Derwent. The fact that sandy soils support oligophobic (intolerant of infertility) grassy vegetation suggests an interplay between rainfall and leaching of nutrients which is affecting the nature of the vegetation on the siliceous substrates. As rainfall increases, soils are less fertile through leaching and heathy species prevail over those more commonly found in grassland. Fire and aspect also interplay and can tip the balance between grassy and heathy understories. Examination of a recent fire boundary (Fig. 2) reveals that the conversion from heathy to grassy vegetation can be precipitated by fire. The grassy side of the boundary presently supports most of the heath species as well as a host of grassy species. However, with continued burning the shift to a grassy understorey could be made more permanent and those heath species neither able to regenerate from lignotuber nor rapidly set seed may be eliminated. Thus the mapping units on the sandstone are impermanent though the probability of shifting the understorey dominance from shrub to grass varies with the sites' moisture status. The driest sandy sites such as those at the top of the hill on the northerly aspects would require a long and improbable fire free period in order to lose their grassiness, while some of the wetter positions would need to be subjected to extremely persistent firing in order to lose their heathy character. Group 5, which forms the other extreme of the axis of variation, are those heathy communities that are more likely to resist conversion to grassiness and have few or no

Table 1

Twinspan Community Code	Community Description
Evp	<i>Eucalyptus viminalis</i> — <i>Poa sieberana</i> grassy woodland
Evd	<i>E. viminalis</i> / <i>E. amygdalina</i> — <i>Dianella revoluta</i> grassy woodland
Ead	<i>E. amygdalina</i> / <i>E. viminalis</i> / <i>Acacia dealbata</i> — <i>Dichopogon strictus</i> grassy woodland
Eva	<i>E. viminalis</i> — <i>Acaena ovina</i> grassy woodland
Eoh	<i>E. ovata</i> — <i>Hypoxis hygrometrica</i> grassy woodland
Evpv	<i>E. viminalis</i> — <i>Plantago varia</i> grassy woodland

grasses in them. Important indicator species for this group are the bush pea *Aotus ericoides*, the rice flower *Pimelea linifolia* and the broom spurge *Amperea xiphioclada*.

These heathy communities are more common on the southern aspects of the hill. In these situations radiation is less, consequently soils are moister and the probability of fires is less, and it may be that some grassland species such as kangaroo grass cannot survive on sites without adequate summer warmth.

CONSERVATION SIGNIFICANCE

Waverley Park includes six (Evp, Evd, Ead, Eva, Eoh, Evpv: see Table 1) of the 31 Tasmanian grassy communities (derived using TWINSPAN) defined in *City Parks and Cemeteries*. Of these only Evp occurs in the state reserve network in the East Risdon Nature Reserve. Evd, Eva and Evpv are represented in other City Parks around Hobart, Ead and Eoh occur mostly on private land and Waverley Park provides an excellent opportunity for their security. The latter of these communities is represented in the park by community 1 and is particularly endangered in the state because it occupies the deep soiled flats that on private land have long since been ploughed.

There are ten plant species in the park that are unreserved in Tasmania. Most are uncommon in the state and the following is a brief discussion of their status in the park. *Haloragis heterophylla* is frequent in community 1 which also houses small populations of the grass *Amphibromus archeri* and the rush *Juncus amabilis*. The grasses *Danthonia procera* and *Poa hookeri* are more widespread and can be found scattered throughout the sandstone country. The chocolate lily (*Dichopogon strictus*) has its stronghold on the mudstone while the daisy *Vit-tadinia cuneata* and pussy-tails (*Ptilotus spathulatus*) are confined to the dolerite where their populations are precarious. As will be discussed below they, like many other grassland species, only survive in open spaces between tussocks. These spaces have not been open in the recent past and most of the individuals of these species can only be found on the edges of a track. The beautiful herb *Velleia paradoxa* is endangered in Tasmania and the populations in the park represent

more than twice the number of individuals of this species known from the rest of the state. The populations straddle both the sandstone and dolerite though most of the plants on the latter substrate are about to be subsumed by new houses and backyards. The peppergrass *Lepidium pseudotasmanicum* only occurs where competition from other plants is negligible. Consequently it has a recently assumed habitat under the canopies of planted conifers. It grows under some old Monterey pine (*Pinus radiata*) trees in the park but also on the shallow soils above the old quarry, to which its annual habit is well suited.

MANAGEMENT

The tenure of public parks is suitable, though not ideal, for the conservation of natural areas. However, this is only so if land managers within the governing institutions understand and take their role as custodians of a precious natural heritage seriously. Fig. 3 shows the attrition of the natural landscape around Bellerive in the few decades from 1946-89. There are four separate developments currently eroding bush on the parks edge. Further attrition by one or two future generations and this place will join most other naturally grassy environments as a part of history. Thus, if grassy areas are to be preserved, there can be no compromise with development. The Domain's jogging track and the Bellerive housing estate are recent examples of overzealous "development" that contribute to the demise of an imperilled ecosystem.

Native vegetation

The natural health (as measured by the native species richness) of the grassy vegetation on doleritic substrates requires the regular depletion of the grass sward. Otherwise the multitude of species that occupy the inter-tussock spaces disappear. This is never more evident than in Waverley Park where a small track provides a fire break (Fig. 3). On one side the grass hasn't been burnt for more than five years and is choked by mats of kangaroo grass with few other species, and contrasts with the other side of the track which was burnt in 1987 and has a rich complement of community 3 native species. Regular firing at 1-3 yearly intervals is required in this community. Alternatively, and probably ideally, a combination of light to moderate grazing and regular firing would most successfully mimic the pre-European conditions of this landscape. The feasibility of reintroducing native herbivores could be examined for the park.

The past fire regimes on the non-dolerite areas seem to have resulted in a healthy mosaic of vegetation types by providing a niche for a range of species. It seems this has been provided for by the *ad hoc* activities of local children and other arsonists. Under this regime some areas are regularly burnt for a succession of years while others may escape burning for ten or more years. This desired affect could be achieved in the future with a *c'est la vie* policy or the patchy mosaic could be maintained by almost randomised burning of the blocks created by the track mosaic.

Exotic species

The Clarence City Council is extremely fortunate in that their decision to manage Waverley Park as a nature reserve presents relatively few management problems. However some specific initiatives are required if the long viability and integrity of the park is to be maintained. The park has a particularly healthy complement of exotic species many of which have never been recorded as naturalised in the state. Banana passionfruit climbs over a wattle tree and jasmine turned up in one of our quadrats. However, most of the 94 exotic species recorded in the park (Appendix 1) are only very local garden escapes and probably pose no real threat as displacers of native vegetation. However all exotic species do particularly well from mechanical disturbance. This is evident wherever such disturbance has occurred. The quarries, the areas abutting backyards, the edges of the many tracks and the places where people have claimed soil all immediately become dominated by exotic species and once these plants have a hold the native species are permanently prevented from reestablishing. There is a suite of particularly voracious disturbance invaders, whose success seems to be rather habitat specific (Fensham and Kirkpatrick 1989). The quaking grass (*Briza maxima*) has a propensity in this state to succeed on sandy substrates and has overtaken the disturbed areas on this substrate in the park. The shivery grass *Briza minor* and rat's tail fescue *Vulpia bromoides* similarly succeed on disturbed areas on richer substrates. Other species such as hair grass *Aira caryophyllaea* and flatweed *Hypochaeris radicata* are more ubiquitous in their taste of disturbed ground. In poorly drained situations on heavy soils, such as those occupied by community 2, the disturbance invader is browntop (*Agrostis stolonifera*) while on the disturbed semi-aquatic facies of this environment the rush *Juncus articulatus* dominates. Needless to say, all mechanical disturbance should be avoided. The developers currently constructing housing estate in the peripheries of the park should be discouraged from driving machinery in the park, and the existing track network should be rationalised and most tracks closed. All public vehicle access to the park should be prohibited.

All of the disturbance colonizers mentioned above co-exist with native species in most undisturbed lowland native grassland throughout the state, although some areas of this park are exceptional for their complete absence of exotic species. In undisturbed situations these species do not seem to become dominant, nor replace native species, which is fortunate, as it is difficult to imagine a management procedure that could possibly limit their existence.

Many of the Hobart City Council's parks are particularly badly infested by gorse (*Ulex europaeus*). This species is particularly vigorous on sandstone, and its stranglehold in the Knocklofty Reserve makes its eradication impossible without the expenditure of vast sums of money and energy. Given that its spread can occur with fire as the only expedite it is surprising that gorse is not more prolific. It

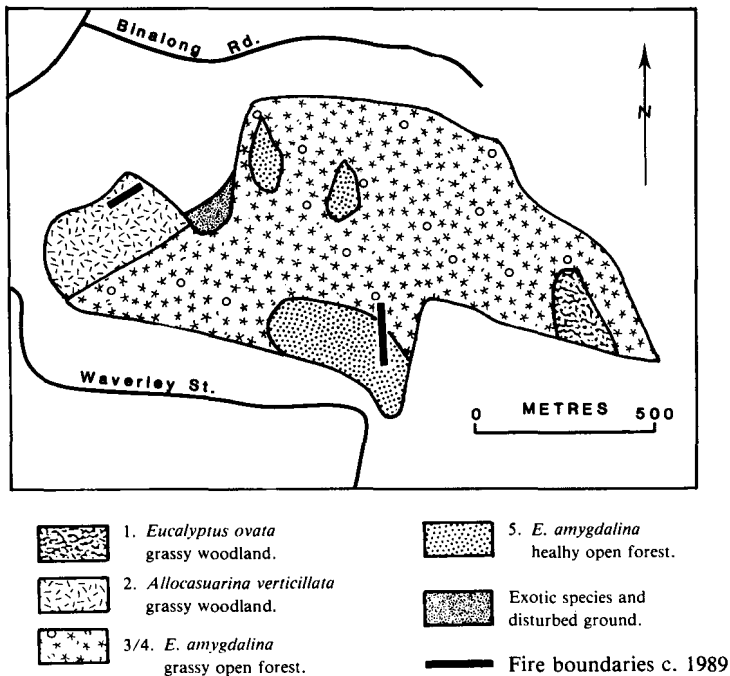
is presently in profusion in a limited area around the old quarry but the plant should be regarded as an extremely noxious weed and removed from the park. This action would be a wise use of the old adage 'a stitch in time saves nine'.

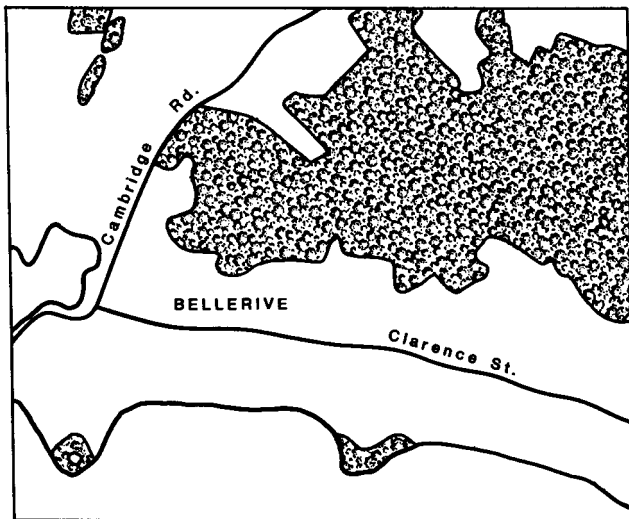
The other woody species that can proliferate without much encouragement is boneseed (*Chrysanthemoides monolifera*). Like gorse, its profusion in some Hobart parks poses a severe management problem. Its numbers in Waverley Park are significantly less than on The Domain where its potential to spread has been documented (Paterson and Volframs 1976). Its control by the manual pulling of plants could be achieved with considerably less effort than has been expended on The Domain. The species can also be checked by regular burning as fire kills the plant and cohorts of seedlings can be killed by a succeeding fire.

CONCLUSION

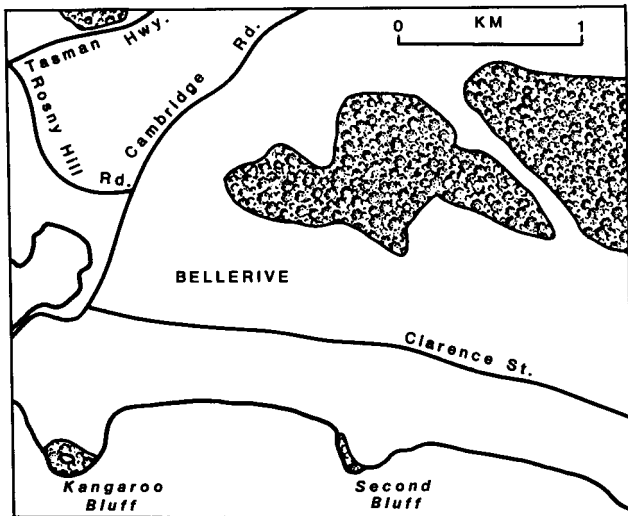
Waverley Park Nature Reserve is indeed a grassy gem and the Clarence City

Figure 2. Vegetation map, Waverley Park Nature Reserve.





c. 1946



c. 1989

Figure 3. The decline of native vegetation around Bellerive, 1946-89.

Council should be congratulated for their commitment to maintaining this area for future generations. It is a gem, not only because of its spectacular natural attributes, but also because with judicious management its long term viability can be maintained. Naturalists and other people who value the bush should use and enjoy it, and perhaps spare a thought for the preciousness of our grassy heritage.

ACKNOWLEDGEMENTS

We thank Jamie Kirkpatrick who provided the impetus and infrastructure for the recent discoveries of grassy Tasmania. Jerry de Gryse organised the contract under which this work was carried out. Jennie Whinam did the data entry and all of these people and Neil Gibson commented on an earlier draft of this manuscript.

FURTHER READING

- Fensham, R.J. and Kirkpatrick, J.B. (1989) The conservation of original vegetation remnants in the Midlands, Tasmania. *Proc. Roy. Soc. Tas.* (in press).
- Kirkpatrick, J.B., Gilfedder, L. and Fensham, R.J. (1988) *City parks and cemeteries: Tasmania's remnant grasslands and grassy woodlands*. Tasmanian Conservation Trust.
- Paterson, I.G. and Volfram, A. (1976) *Boneseed: a threat to native plant communities — a study on The Queen's Domain, Hobart*. University of Tasmania. Environmental Studies Occasional Paper, No. 3. 22pp.

BOOK REVIEW

Wildflowers of Mt Wellington

By Phil Collier

Published by the Society of Growing Australian Plants,
Tasmanian Region, Hobart. RRP \$4.00
Reviewed by Marjorie Wall

This pocket sized booklet in the Plant Identikit series, produced by members of the Tasmanian Region of the Society for Growing Australian Plants (SGAP), is an ideal aid for getting to know the common plants of Mt Wellington—and indeed many highland, dolerite-soil areas in Tasmania.

The introduction to plant communities of Mt Wellington and directions for using the identikit are well thought out and non-technical. For each of the fifty-four plants in the booklet, species and common names, distinguishing features, description, flowering period, distribution, cultivation notes and related species are given, as well as a clear illustration in colour. Plants are ordered according to flower colour and the illustrations are the primary method of identification of any plant in flower.

I recommend this booklet to all who love 'The Mountain' and congratulate all SGAP members who worked to produce this introduction to further study of our native plants.

APPENDIX 1. Species List Waverley Park Nature Reserve

Species nomenclature follows Buchanan, A.M., McGeary-Brown, A. and Orchard, A.E. (1989) *A Census of the Vascular Plants of Tasmania*. Tasmanian Herbarium Occasional Publication No. 2.

e = endemic species
i = introduced species

r = rare species
u = unreserved species

	common name	community number
PTERIDOPHYTA		
Dennstaedtiaceae		
	<i>Pteridium esculentum</i>	bracken 4,5
Sinopteridaceae		
	<i>Cheilanthes austrotenuifolia</i>	1
MONOCOTYLEDONEAE		
Cyperaceae		
	<i>Carex breviculmis</i>	1,3
	<i>Gahnia radula</i>	thatch saw-sedge 1,2,3,4,5
	<i>Isolepis nodosus</i>	knobby club-rush 3
	<i>I. platycarpa</i>	1
	<i>Lepidosperma concavum</i>	2,5
	<i>L. laterale</i>	3,4
	<i>L. lineare</i>	2
	<i>Schoenus apogon</i>	common bog-rush 1,2,3,4
Hypoxidaceae		
	<i>Hypoxis hygrometrica</i>	1
Juncaceae		
u	<i>Juncus amabilis</i>	rush 1
i	<i>J. articulatus</i>	rush
	<i>J. bufonius</i>	rush 1
i	<i>J. effusus</i>	rush
	<i>J. holoschoenus</i>	rush 1
	<i>J. pallidus</i>	rush 1
	<i>Luzula densiflora</i>	woodrush 3,4
	<i>L. meridionalis</i>	woodrush 3,4
Liliaceae		
	<i>Arthropodium milleflorum</i>	vanilla lily 2,3,4
	<i>Bulbine glauca</i>	bulbine lily 3,4
	<i>Chaemescilla corymbosa</i>	blue sky lily 3
	<i>Dianella revoluta</i> var. <i>revoluta</i>	fax lily 2,3,4,5
	<i>D. revoluta</i> var. <i>breviculmis</i>	flax lily 2
	<i>D. tasmanica</i>	flax lily 4
u	<i>Dichopogon strictus</i>	chocolate lily 2,3
	<i>Diplarrhena morea</i>	flag iris 3
	<i>Laxmannia orientalis</i>	4
	<i>Thysanotus patersonii</i>	twining fringe lily 3,4
Orchidaceae		
	<i>Caladenia dilatata</i>	spider orchid 3
	<i>C. pattersonii</i>	spider orchid 3
	<i>Corybas</i> sp.	helmet orchid 3
	<i>Diuris sulphurea</i>	tiger orchid 3,4
	<i>Microtis unifolia</i>	onion orchid 2,3,4
	<i>Thelymitra pauciflora</i>	sun orchid 2,3,4
	<i>Thelymitra</i> sp.	sun orchid 2

Poaceae

	<i>Agrostis aemula</i>	blown grass	2,3
i	<i>A. tenuis</i>	browntop	
i	<i>A. stolonifera</i>	browntop	
i	<i>Aira caryophylla</i>	silvery hair grass	
u	<i>Amphibromus archeri</i>	swamp wallaby grass	
i	<i>Arrhenatherum elatius</i>	oatgrass	
i	<i>Avena fatua</i>	wild oat	
i	<i>Briza maxima</i>	quaking grass	
i	<i>B. minor</i>	shivery grass	
i	<i>Bromus hordeaceus</i>	soft brome	
i	<i>B. catharticus</i>	brome	
i	<i>B. sterilis</i>	sterile brome	
i	<i>Cortaderia sellanoa</i>	pampas grass	
i	<i>Cynosurus echinatus</i>	dog's tail	
i	<i>Dactylis glomerata</i>	cocksfoot	
	<i>Danthonia caespitosa</i>	ringed wallaby grass	2,3,4
	<i>D. geniculata</i>	wallaby grass	3
	<i>D. laevis</i>	wallaby grass	1,2,3,4
	<i>D. pilosa</i>	wallaby grass	2,3,4
u	<i>D. procera</i>	tall wallaby grass	3
	<i>D. racemosa</i>	wallaby grass	2
	<i>D. semianularis</i>	wallaby grass	1
	<i>D. setacea</i>	wallaby grass	4
	<i>Deyeuxia quadriseta</i>	bent grass	1,2,3,4,5
	<i>Dichelachne crinita</i>	longhair plume grass	2,3,4
	<i>D. rara</i>	shorthair plume grass	2,3,4
	<i>Ehrharta distichophylla</i>	hairy ricegrass	3,4,5
	<i>E. stipoides</i>	weeping grass	1,2,3,4
	<i>Elymus scabrus</i>	common wheatgrass	2,3,4
i	<i>Festuca arundinacea</i>	tall fescue	
	<i>F. plebeia</i>	graceful fescue	3
i	<i>Gastridium ventricosum</i>	nit grass	
i	<i>Hordeum murinum</i>	barley grass	
i	<i>Lolium perenne</i>	perennial ryegrass	
	<i>Pentapogon quadrifidus</i>	five-awn spear grass	2,3,4
	<i>Poa hookeri</i>	tussock grass	1,4
	<i>P. labillardieri</i>	tussock grass	1
	<i>P. rodwayi</i>	tussock grass	2,3,4
	<i>P. sieberiana</i>	tussock grass	1,3,4,5
i	<i>Paspalum dilatatum</i>	caterpillar grass	
i	<i>Phalaris</i> sp.	canary grass	
i	<i>Piptatherum miliaceum</i>	rice millet	
	<i>Stipa flavescens</i>	speargrass	1,2,3,4
	<i>S. mollis</i>	speargrass	3,4,5
	<i>S. rudis</i> ssp. <i>australis</i>	speargrass	3,4
	<i>S. semibarbata</i>	speargrass	2,3,4
	<i>S. stuposa</i>	speargrass	2,3
	<i>S. variabilis</i>	speargrass	2
	<i>Themeda triandra</i>	kangaroo grass	1,2,3,4
i	<i>Vulpia bromoides</i>	rat's tail fescue	
Typhaceae			
	<i>Typha</i> sp.	bullrush	aquatic
Xanthorrhoeaceae			
	<i>Lomandra longifolia</i>	sagg	2,3,4,5

DICOTYLEDONEAE

Aizoaceae		
	<i>Carpobrotus rossii</i>	native pigface 3
Amaranthaceae		
u	<i>Ptilotus spathulatus</i>	pussytails 2
Apiaceae		
i	<i>Foeniculum vulgare</i>	fennel
Asteraceae		
i	<i>Arctotheca calendula</i>	capeweed
i	<i>Bellis perennis</i>	English daisy
	<i>Brachycome aculeata</i>	daisy 4
	<i>B. spathulata</i> ssp. <i>glabra</i>	daisy 3,4
i	<i>Carduus tenuiflorus</i>	winged slender thistle
i	<i>Calendula officinalis</i>	marigold
	<i>Cassinia aculeata</i>	dolly bush 4
i	<i>Cirsium vulgare</i>	spear thistle
i	<i>Conyza floribunda</i>	fleabane
	<i>Craspedia glauca</i>	billy buttons 4
i	<i>Chrysanthemoides monilifera</i>	boneseed
i	<i>Gazania</i> sp.	gazania
	<i>G. collinum</i>	cudweed 2,3
	<i>Helichrysum apiculatum</i>	common everlasting 2,3,4
	<i>H. obcordatum</i>	3
e	<i>H. purpurascens</i>	4
	<i>H. scorpioides</i>	4
	<i>H. semipapposum</i>	clustered everlasting 2
i	<i>Hypochaeris glabra</i>	smooth cat's ear
i	<i>H. radicata</i>	flatweed, cat's ear
r	<i>Lagenifera huegelii</i>	2
	<i>L. stipitata</i>	3
i	<i>Leontodon taraxocoides</i>	hawkbit
	<i>Leptorhynchos lineare</i>	buttons 2
	<i>L. squamatus</i>	scaly buttons 3,4
i	<i>Leucanthemum vulgare</i>	ox-eye daisy
	<i>Microseris scapigera</i>	native dandelion 3
	<i>Olearia myrsinoides</i>	4
	<i>O. ramulosa</i>	twiggy daisy-bush 2
i	<i>Picris echioides</i>	bristly ox-tongue
	<i>Podolepis jaceoides</i>	showy podolepis 4
	<i>Solenogyne gunnii</i>	2
	<i>Senecio glomeratus</i>	1,2,3,4
	<i>S. hispidulus</i>	1,4
	<i>S. linearifolius</i>	
	<i>S. quadridentatus</i>	2,3
i	<i>Sonchus asper</i>	prickly sow-thistle
i	<i>S. oleraceus</i>	sow-thistle
i	<i>Taraxacum officinale</i>	common dandelion
i	<i>Tragopogon porrifolius</i>	salsify
i	<i>Urospermum dalechampii</i>	
i	<i>Vellereophyton dealbatum</i>	
u	<i>Vittadinia cuneata</i>	New Holland daisy 2
Boraginaceae		
	<i>Cynoglossum suaveolens</i>	sweet hound's tongue 2,3
i	<i>Echium vulgare</i>	viper's bugloss

Brassicaceae			
i	<i>Brassica rapa</i>	turnip	
i	<i>Cardaria draba</i>	white weed	
i	<i>Coronopus didymus</i>	lesser swine-cress	
	<i>Lepidium pseudotasmanicum</i>	peppercress	3
i	<i>Lobularia maritima</i>	sweet alyssum	
i	<i>Rapistrum regulosum</i>	turnip weed	
Campanulaceae			
	<i>Wahlenbergia consimilis</i>	bluebell	2,3,4
	<i>W. gymnoclada</i>	bluebell	3
	<i>W. quadrifida</i>	bluebell	3
	<i>W. tadgellii</i>	bluebell	3,4
Caryophyllaceae			
i	<i>Arenaria serpyllifolia</i>	thyme-leaf sandwort	
i	<i>Cerastium glomeratum</i>	sticky mouse-ear chickweed	
i	<i>Petrorhagia proliferum</i>	childing pink	
	<i>Scleranthus biflorus</i>	knawel	3,4
i	<i>Silene gallica</i>	French catchfly	
i	<i>S. gallica</i> var. <i>quenquevulnera</i>	French catchfly	
i	<i>Spergularia rubra</i>	sand spurrey	
Casuarinaceae			
	<i>Alloasurina littoralis</i>	bulloak	3,4,5
	<i>A. verticillata</i>	she-oak	2,3
Chenopodiaceae			
	<i>Einadia nutans</i>	climbing saltbush	3
	<i>Rhagodia candollena</i>	coastal saltbush	3
Clusiaceae			
	<i>Hypericum gramineum</i>	small St. John's wort	3,4
Convolvulaceae			
i	<i>Calystegia silvatica</i>	great bindweed	
	<i>Convolvulus erubescens</i>	native bindweed	2
	<i>Dichondra repens</i>	kidney weed	1,2,3,4
Crassulaceae			
	<i>Crassula sieberana</i>		3
i	<i>Echeveria</i> sp.		
i	<i>Sedum</i> sp.	stonecrop	
Dilleniaceae			
e	<i>Hibbertia hirsuta</i>	guinea flower	3,4
	<i>H. riparia</i>	guinea flower	3,4
Droseraceae			
	<i>Drosera peltata</i> ssp. <i>auriculata</i>	sundew	3,4
Epacridaceae			
	<i>Acrotiche serrulata</i>	ant's delight	3,4
	<i>Astroloma humifusum</i>	native cranberry	3,4
	<i>Brachyloma caliatum</i>		4,5
	<i>Epacris impressa</i>	common heath	5
	<i>Leucopogon collinus</i>	beard heath	5
	<i>L. ericoides</i>	beard heath	5
	<i>L. virgatus</i>	beard heath	3,4
	<i>Lissanthe strigosa</i>	peach berry	3
Ericaceae			
i	<i>Erica lusitanica</i>	Portuguese heath	
Euphorbiaceae			
	<i>Amperea xiphioclada</i>		5
	<i>Poranthera microphylla</i>		3,4
Fabaceae			
	<i>Acacia dealbata</i>	silver wattle	3,4,5
	<i>A. genistifolia</i>		3
i	<i>A. longifolia</i>	sallow wattle	
	<i>A. mearnsii</i>	black wattle	2,4
	<i>A. stricta</i>		3

	<i>A. verticillata</i>	prickly moses	1
	<i>Aotus ericoides</i>		5
	<i>Bossiaea prostrata</i>		1,2,3,4
	<i>B. cinerea</i>		4,5
i	<i>Cytisus prolifer</i>	tree lucerne	
	<i>Daviesia latifolia</i>		4
	<i>Dillwynia cinerascens</i>	grey parrot pea	3,4
	<i>D. sericea</i>	parrot pea	4
i	<i>Dolichos lignosus</i>	Australian pea	
i	<i>Genista monspessulana</i>	canary island broom	
	<i>Hovea linearis</i>	common hovea	4
	<i>Kennedia prostrata</i>	running postman	2,4
i	<i>Lupinus arboreus</i>	tree lupin	
i	<i>Sarothamnus scoparius</i>	broom	
i	<i>Trifolium dubium</i>	yellow suckling cover	
i	<i>T. glomeratus</i>		
i	<i>T. repens</i>	gorse	
i	<i>Ulex europaeus</i>	gorse	
i	<i>Vicia angustifolia</i>	narrow-leaf vetch	
i	<i>V. sativa</i>	common vetch	
	Fumariaceae		
i	<i>Fumaria</i> sp.	fumitory	
	Gentiaraceae		
i	<i>Centaurium erythraea</i>	centauria	
	Geraniaceae		
	<i>Geranium solanderi</i>	native geranium	2,3,4
	<i>Pelargonium australe</i>	austral stork's bill	2,3
	Goodeniaceae		
	<i>Goodenia lanata</i>		2,4
r	<i>G. elongata</i>		1
	<i>G. ovata</i>	parrot food	4
ru	<i>Velleia paradoxa</i>	spur velleia	2,3
	Haloragaceae		
	<i>Gonocarpus tetragynus</i>	raspwort	2,3,4,5
	<i>Haloragis heterophylla</i>		1
	Lauraceae		
	<i>Cassytha pubescens</i>	dodder laurel	5
	Linaceae		
	<i>Linum marginale</i>	native flax	2,3
i	<i>L. trigynum</i>	French flax	
	Myrtaceae		
	<i>Eucalyptus amygdalina</i>	black peppermint	3,4,5
	<i>E. globulus</i>	blue gum	4
	<i>E. ovata</i>	swamp gum, black gum	1
	<i>E. pulchella</i>	white peppermint	3
	<i>E. tenuiramis</i>	silver peppermint	3
	<i>E. viminalis</i>	white gum	2,3,4
	<i>Leptospermum scoparium</i>		5
	Oleaceae		
i	<i>Jasminum</i> sp.	jasmine	
	Oxalidaceae		
	<i>Oxalis corniculata</i>	yellow wood sorrel	1,2,3,4
i	<i>O. articulata</i>		
	Papaveraceae		
i	<i>Papaver rhoeas</i>	field poppy	
	Passifloraceae		
i	<i>Passiflora mollissima</i>	banana passion fruit	
	Pinaceae		
i	<i>Pinus radiata</i>	Monterey pine	
	Pittosporaceae		
	<i>Bursaria spinosa</i>	prickly box	2,3,4

Plantaginaceae		
i	<i>Plantago coronopus</i>	plantain
i	<i>P. lanceolata</i>	plantain
i	<i>P. major</i>	plantain
	<i>P. varia</i>	native plantain
		2,3,4
Polygalaceae		
	<i>Comesperma volubile</i>	love creeper
		4
Polygonaceae		
i	<i>Rumex acetosella</i>	sheep's sorrel
i	<i>R. crispus</i>	curled dock
Primulaceae		
i	<i>Anagallis arvensis</i>	scarlet pimpernel
i	<i>A. arvensis</i> ssp. <i>arvensis</i>	scarlet pimpernel
Proteaceae		
	<i>Banksia marginata</i>	silver banksia
		3,4
Ranunculaceae		
e	<i>Clematis gentianoides</i>	
		2
	<i>Ranunculus lappaceus</i>	common buttercup
		1,3,4
Rosaceae		
	<i>Acaena echinata</i>	
		2,3,4
	<i>A. novae-zelandiae</i>	buzzy
		1
i	<i>Cotoneaster glaucophyllus</i>	
i	<i>Prunus</i> sp.	plum
i	<i>Rosa rubiginosa</i>	sweet briar rose
i	<i>Rubus fruticosus</i>	blackberry
Rubiaceae		
	<i>Asperula conferta</i>	woodruff
		1
i	<i>Galium aparine</i>	goosegrass
	<i>Galium gaudicaudii</i>	
		4
	<i>Opercularia varia</i>	
		2,3
Rutaceae		
	<i>Eriostemon verrucosus</i>	wax flower
		4
Santalaceae		
	<i>Exocarpos cupressiformis</i>	native cherry
		3,4
	<i>E. strictus</i>	dwarf cherry
		5
Saliceaceae		
i	<i>Salix babylonica</i>	willow
Sapindaceae		
	<i>Dodonaea viscosa</i>	native hop
		2,3,4
Scrophulariaceae		
i	<i>Parentucellia viscosa</i>	
	<i>Veronica gracilis</i>	splender speedwell
		3
Solanaceae		
i	<i>Lycium ferocissimum</i>	African box-thorn
	<i>Solanum laciniatum</i>	kangaroo apple
		4
i	<i>S. tuberosum</i>	potato
Stackhousiaceae		
	<i>Stackhousia monogyna</i>	creamy stackhousia
		2
Stylidiaceae		
	<i>Stylidium graminifolium</i>	grass trigger plant
		3,4,5
Thymelaceae		
	<i>Pimelea humilis</i>	rice flower
		2,3,4
	<i>P. linifolia</i>	rice flower
		5
Tremandraceae		
	<i>Tetratheca glandulosa</i>	pinke bells
		4,5
Tropaeoaceae		
i	<i>Tropaeolum majus</i>	nasturtium
Valerianaceae		
i	<i>Centranthus ruber</i>	kiss-me-quick
Violaceae		
	<i>Viola hederacea</i>	ivy-leaf violet
		3,4