

**A FLORA SURVEY OF THE PROPOSED
BEACONSFIELD REFUSE SITE**

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**QUEEN VICTORIA MUSEUM AND ART GALLERY
LAUNCESTON**

Summary and Recommendations

One hundred and nine species were recorded from 74 genera in 42 families.

The vegetation was found to be essentially homogeneous shrubby *Eucalyptus amygdalina* woodland and open forest, except for small areas of treeless heaths and very localized wet scrub. The shrubs are those species typical of low nutrient sites, being essentially heaths.

Degradation of the ecosystem by evident repeated fires has probably resulted in the increased representation of sedges and bracken fern throughout the area.

Large areas degraded by gravel removal appear to be recovering very slowly, as may be expected on a low nutrient site.

All of the communities described are considered to be well reserved within the states secure conservation reserves.

Two species of conservation significance were recorded.

Brunonia australis is recorded as unreserved and vulnerable (Kirkpatrick *et al.* 1990), however, the species may be more widespread than previously thought (F. Duncan, pers. comm.)

Xanthorrhoea bracteata is recorded in Kirkpatrick *et al.* (1990) as occurring in less than 20 10 X 10 km mapping grids, and as such is considered rare. The type specimen was recorded at Port Dalrymple and the species is found in heaths in north and eastern Tasmania, notably Waterhouse Protected Area. This area is not considered as secure tenure for conservation purposes. The species extends south to Hobart but is of limited abundance. Most quadrats containing the species in this survey occur in the 500 m buffer along the western edge in the *Eucalyptus obliqua* forest but also at site 23 in the south-east of the surveyed area.

State wide, all remnant vegetation has conservation value. In the case of some vegetation types that are not considered to be economically productive they are often targeted for use as refuse tips, or attempts are made to transform them into more productive land by draining, filling or fertilizing. These types of vegetation are usually swampy or heathy and are similar to the vegetation in the present study. However, as this site has been chosen by a selection process ultimately excluding several others, and is quite severely degraded, it is not considered to be of high conservation value and as such is appropriate for a refuse site. It is recommended, however, that the moorland sites in the north are protected from regular intentional burning and that ground water quality is maintained to avoid both direct toxic effects on the vegetation and indirect toxic effects due to nitrification of the ground water from refuse leachates.

Introduction

It is proposed that the Beaconsfield council will apply to the State Government for tenure of part of a gravel reserve between Town Road, West Arm Road and the Tamar Highway near Beaconsfield (figure 1). The council intends to use a site of 65 ha within this reserve as a refuse tip. The site was surveyed for its botanical and conservation values to ascertain whether or not any such values clashed with the proposed use of the site.

The geology of the study site has been determined by the Beaconsfield council's geologist (J. Farrell pers. comm.). In general terms, it is predominantly Tertiary partially consolidated conglomerate. There are limited areas of Quaternary alluvial deposits in low lying areas and a small area of Permian mudstone and pebbly siltstone in the north-east of the study area.

The climate is warm humid (Gentilli 1972).

Methods

The vegetation in the area was sampled along walking transects across the site at approximately 200 m intervals. Species were recorded from a quadrat of approximately 400 m² every 200 m along each transect. Additional quadrats were sampled where community changes would otherwise have been missed. All additional species noticed along the transects were recorded.

The quadrat data were classified by reference to existing community classifications, in this case Duncan and Brown (1985) and Jarman *et al.* (1988).

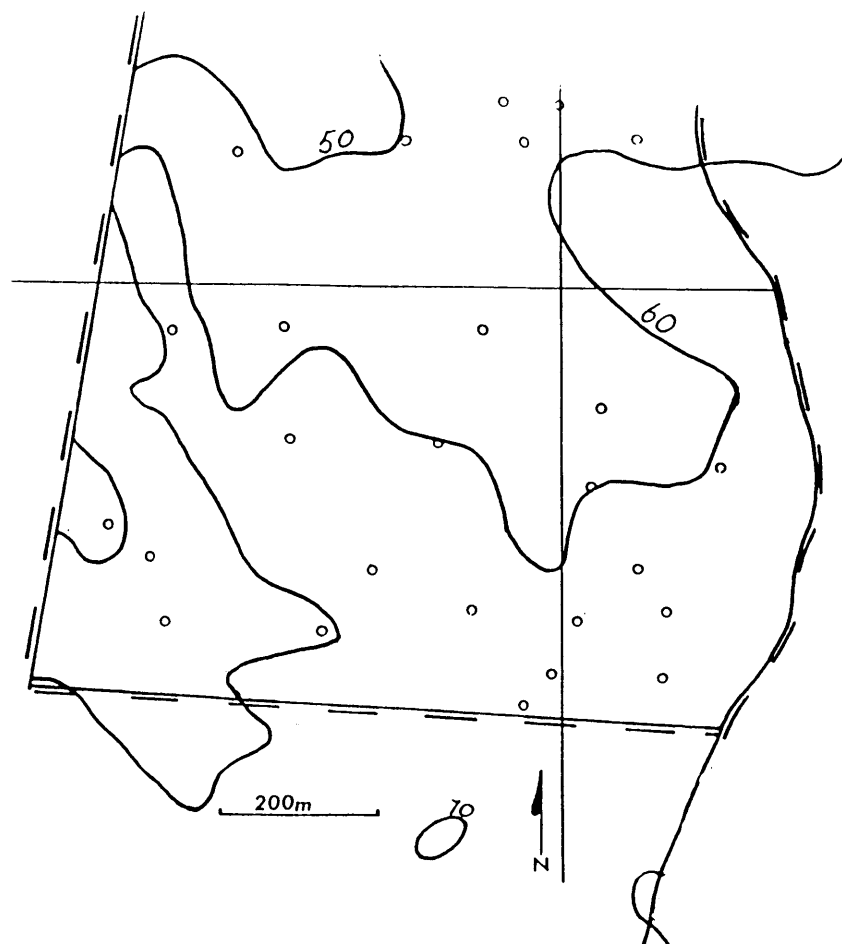
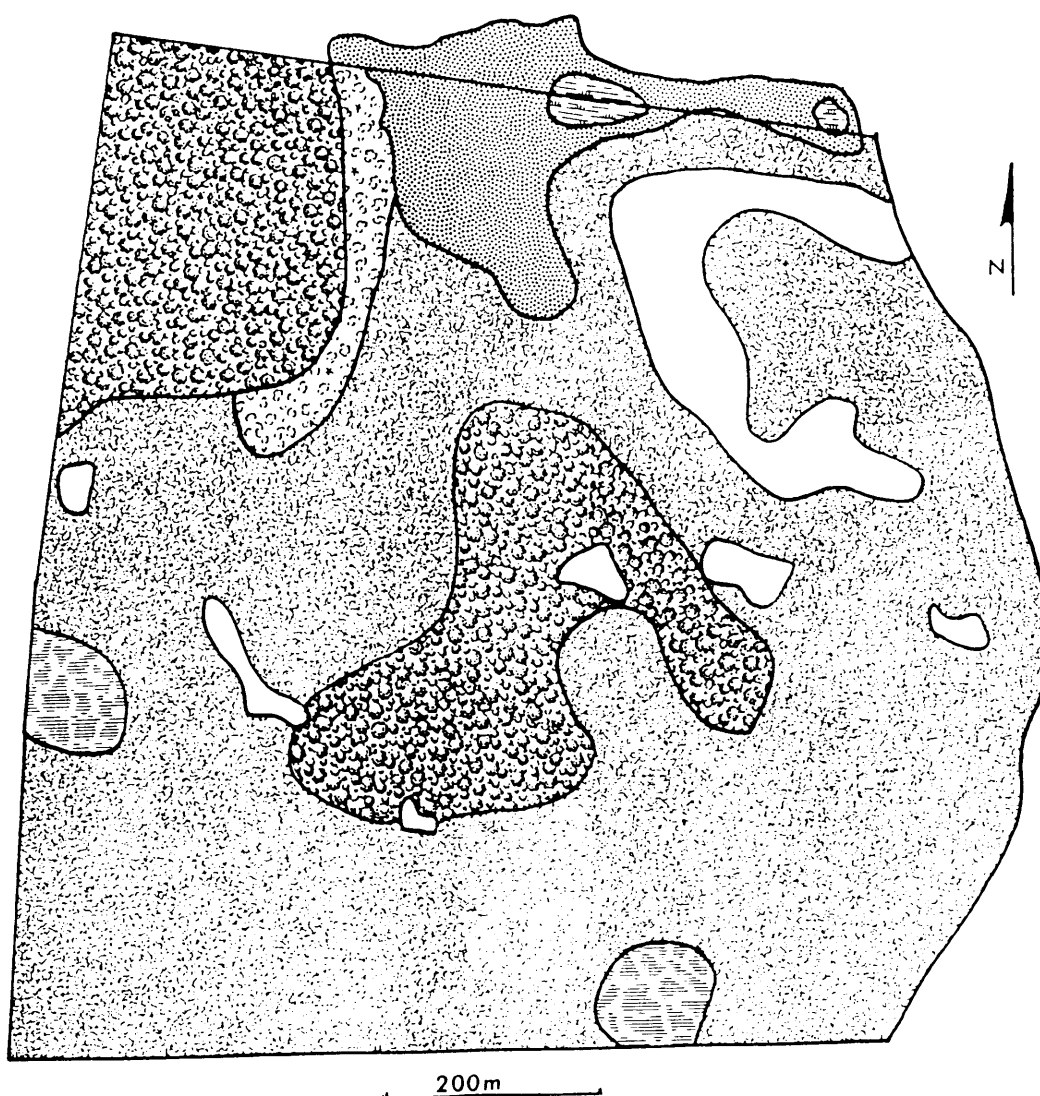


Figure 2. A contour map of the proposed 65 ha tip site, and the distribution of the survey quadrats.



Key to vegetation map.

Sclerophyll forest/woodland

Shrubby *Eucalyptus amygdalina* dry sclerophyll forest/woodland



Shrubby *Eucalyptus obliqua* dry sclerophyll forest



Sedgey *Eucalyptus obliqua* damp forest



Moorland/heath

Eastern Woolly Tea-Tree



Lowland eastern sedgey



Melaleuca squarrosa tall heath



Gravel pits



Figure 3. A vegetation map of the 65 ha tip site.

Community descriptions

1. Shrubby/sedgey *Eucalyptus amygdalina* open forest and woodland

This community covers the largest area of any community in the study area. There is variation within the community due to differences in drainage attributable to slope position. The differences do not warrant separate classification. In the main, the community is dominated by *Eucalyptus amygdalina*, with *Allocasuarina littoralis* subdominant. Occasionally *Eucalyptus obliqua* and or *E. viminalis* are co-dominant where drainage has enriched the nutrient status of lower slope positions.

Small trees include sparse *Exocarpus cupressiformis* and more commonly *Banksia marginata*. Shrub species include sparsely scattered *Leucopogon australis* and *Leptomeria drupacea* dominating smaller shrubs such as *Leucopogon collinus*, *L. ericoides*, *Epacris impressa*, *Bossiaea cinerea*, *Hibbertia riparia* and *Xanthosia pilosa*. Less common species include *Amperea xiphoclada*, *Lomatia tinctoria*, *Persoonia juniperina* and *Pimelea humilis*.

On the drier sites the prostrate species are more frequent and cover greater than 20 % of the ground area. The prostrate species include *Astroloma humifusum*, *Acrotriche serrulata*, *Hibbertia serpyllifolia* and *Platylobium obtusangulum*. On mid slope and lower slope positions the small shrubs are more important. Herbs are rare with only *Goodenia lanata* and *Gonocarpus humilis* occurring with any regularity.

Lepidosperma concavum is the most abundant taxon but is lower than the predominant shrub height. Other monocots are conspicuous throughout the community. Other than *Lepidosperma*, which is ubiquitous, the distribution of other genera is patchy. *Dianella* spp., *Gahnia radula*, *Ehrharta distichophylla*, *Lomandra longifolia* and *Xanthorrhoea* spp. are each important in different parts of the landscape.

The effects of frequent burning may be evident in a number of features of the vegetation. The rarity of herbs in this community may be such an indication. *Pteridium esculentum*, a species often favoured by burning, is abundant in some areas and shrub diversity declines in association with it. In other areas, the eucalypt canopy diminishes to an emergent woodland cover over a low mid-dense cover of *Allocasuarina littoralis*. This species is also favoured by repeated fires.

2. Shrubby *Eucalyptus obliqua* open forest

This is the second most extensive community in the study area. It differs from the first community in greater abundance of *E. obliqua* over *E. amygdalina*. This community does not have as many prostrate shrubs. The position of the community seems to indicate a preference for slightly enriched areas due to catena influences, and the community also occurs on the siltstone gravels in the west of the study area. The siltstone gravels are also likely to be richer than the quartz gravels. Much of this community has been recently burnt but resprouting plants that were recorded indicated a similar small shrub flora to the *E. amygdalina* forest. *Xanthorrhoea bracteata* was conspicuous along the low ridges.

3. *Eucalyptus obliqua* damp forest

In occasional and limited areas of restricted drainage, narrow ecotones support *Gahnia grandis*, *Notelaea ligustrina*, *Melaleuca ericifolia*, *Leptospermum scoparium*, *Acacia melanoxylon*, *Blechnum watsii* and *Lepidosperma elatius*. These areas may also be dominated by *Eucalyptus obliqua* and *E. viminalis* but are generally too small to escape the influence of the surrounding shrubby *E. obliqua* community. In some areas *Leptospermum scoparium* forms a scrub with large tussocks of *Gahnia* but in others the cover is open and the ground layer is dominated by the sedges.

Moorland

4. Eastern Woolly Tea-Tree heath (Jarman *et al.* 1988)

This community is very restricted in the study area (Figure 3). The community occupies depressions in the landscape where ground water is near or at the surface during late winter and spring (J. Farrell, pers. comm.). *Leptospermum lanigerum* is the dominant species at up to 2 m tall although *Hakea teretifolia* and *Melaleuca squarrosa* are less frequent co-dominants. The shrubs *Epacris lanuginosa* and *Sprengelia incarnata* are distributed in limited gaps in between low tussocks of *Gymnoschoenus sphaerocephalus* which have a crown diameter greater than 1 m. Other monocots include *Leptocarpus tenax*, *Empodisma minus*, *Restio complanatus*, *Patersonia fragilis* and *Gahnia grandis*. *Gleichenia dicarpa* is common between the tussocks of *Gymnoschoenus sphaerocephalus*.

5. Lowland eastern sedgey moorland (Jarman *et al.* 1988)

This community surrounds the woolly tea-tree community as an ecotone to the dry sclerophyll forest. *Eucalyptus amygdalina* is a sparse dominant and may be adventive from the surrounding community. *Hakea teretifolia* and *Banksia marginata* are more regular in an emergent shrub layer. *Lepidosperma filiforme* and *L. concavum* are abundant in the same stratum as *Leptocarpus tenax*, *Xyris operculata*, *Empodisma minus*, *Restio complanatus* and *Schoenus tenuissimus* which are present in roughly equal proportions. The Iris *Patersonia fragilis*, and the lily, *Thelionema caespitosum* are more sparsely scattered. *Pultenaea stricta*, *Hibbertia riparia* and *Epacris lanuginosa* are the most common small shrubs. Others which are sparsely scattered throughout are *Acacia myrtifolia*, *Epacris impressa*, *Dillwynia glabberima*, *D. sericea* and *Styphelia adscendens*. The less sclerophyllous species *Xanthosia pusilla*, *Aotus ericoides*, *Pimelea linifolia* and *Boronia parviflora* are also present. *Xanthorrhoea australis* is present but rare.

Gleichenia dicarpa, *Lindsaea linearis* and *Selaginella uliginosa* are common pteridophytes.

Jarman *et al.* (1988) suggest that the community's high abundance of sedges is attributable to either a greater frequency of fire or to edaphic control. In this study both of these attributes differentiate the community from the woolly tea-tree community.

6. *Melaleuca squarrosa* tall heath

This community may have been induced by the frequent burning of the lowland eastern sedgey community. The community is very restricted and frequent fire is evident as the community forms a closed heath dominated by *Melaleuca squarrosa* and *Pteridium esculentum* about 1.5 m tall. A similar suite of species to the previously described community persist but are reduced in abundance by the complete dominance of the *Melaleuca* and *Pteridium*. The suite includes *Hakea teretifolia* and *Banksia marginata* as part of the dominant canopy. *Lepidosperma filiforme* and *L. concavum* are abundant in the same stratum as *Leptocarpus tenax*, *Xyris operculata*, *Empodisma minus*, *Restio complanatus*, *Schoenus tenuissimus* and *Patersonia fragilis*. The latter are present in roughly equal proportions but are most abundant on a narrow ecotone between the heath and the surrounding forest. *Pultenaea stricta*, *Hibbertia riparia* and *Epacris lanuginosa* are the most common small shrubs. Others, which are sparsely scattered throughout are *Acacia myrtifolia*, *Epacris impressa*, *Dillwynia glabberima*, *D. sericea* and *Styphelia adscendens*. Again, the less sclerophyllous species *Xanthosia pusilla*, *Aotus ericoides*, *Pimelea linifolia* and *Boronia parviflora* are present.

Gleichenia dicarpa, *Lindsaea linearis* and *Selaginella uliginosa* are common pteridophytes.

List of species by community.

	1	2	3	4	5	6
Apiaceae						
<i>Xanthosia pilosa</i>	*	*			*	*
<i>Xanthosia pusilla</i>				*		*
Asteraceae						
<i>Helichrysum dealbatum</i>	*	*				
<i>Helichrysum scorpioides</i>	*	*				
<i>Lagenifera stipitata</i>	*	*	*			
Brassicaceae						
<i>Cardamine</i> sp.				*		
Brunoniaceae						
<i>Brunonia australis</i> uv	*					
Campanulaceae						
<i>Wahlenbergia</i> sp.	*	*			*	
Casuarinaceae						
<i>Allocasuarina littoralis</i>	*	*			*	
<i>Allocasuarina monilifera</i>	*					
Dilleniaceae						
<i>Hibbertia riparia</i>	*	*	*		*	*
<i>Hibbertia serpyllifolia</i>	*	*				
Epacridaceae						
<i>Acrotriche serrulata</i>	*	*				
<i>Astroloma humifusum</i>	*					
<i>Brachyloma serrulata</i>	*					
<i>Epacris impressa</i>	*	*				
<i>Epacris lanuginosa</i>				*	*	*
<i>Leucopogon collinus</i>	*			*		*
<i>Leucopogon ericoides</i>	*	*				
<i>Leucopogon australis</i>	*	*	*			
<i>Monotoca glauca</i>	*	*	*			
<i>Sprengelia incarnata</i>				*	*	*
<i>Styphelia adscendens</i>					*	
Euphorbiaceae						
<i>Amperea xiphoclada</i>	*	*				
Fabaceae						
<i>Acacia melanoxydon</i>	*	*	*		*	
<i>Acacia myrtifolia</i>	*	*			*	
<i>Acacia suaveolens</i>	*	*				
<i>Acacia stricta</i>	*					
<i>Acacia terminalis</i>	*	*	*		*	*
<i>Acacia verticillata</i>			*			
<i>Aotus ericoides</i>				*	*	*
<i>Bossiaea cinerea</i>	*	*				
<i>Bossiaea prostrata</i>	*	*			*	*
<i>Dillwynia glaberrima</i>	*	*			*	*

	1	2	3	4	5	6
<i>Dillwynia sericea</i>					*	
<i>Kennedia prostrata</i>	*	*				
<i>Platylobium obtusangulum</i>	*	*	*		*	
<i>Pultenaea daphnoides</i>						
var. <i>obcordata</i>		*				
<i>Pultenaea gunnii</i>		*				
<i>Pultenaea stricta</i>					*	*
Gentianaceae						
<i>Centaurium</i> sp.	*	*				
Goodeniaceae						
<i>Goodenia lanata</i>	*	*	*		*	
Haloragaceae						
<i>Gonocarpus tetragynus</i>	*	*			*	
<i>Gonocarpus humilis</i>	*	*			*	*
<i>Gonocarpus micranthus</i>				*	*	
Lauraceae						
<i>Cassytha glabella</i>	*	*	*		*	*
Loganiaceae						
<i>Mitrasacme pilosa</i>	*					
Myrtaceae						
<i>Eucalyptus amygdalina</i>	*	*			*	
<i>Eucalyptus obliqua</i>	*	*	*			
<i>Eucalyptus viminalis</i>	*	*	*			
<i>Leptospermum lanigerum</i>				*	*	
<i>Leptospermum scoparium</i>	*	*	*		*	*
<i>Melaleuca squarrosa</i>			*	*	*	*
<i>Melaleuca ericifolia</i>			*			
Oleaceae						
<i>Notelaea ligustrina</i>			*			
Oxalidaceae						
<i>Oxalis corniculata</i>			*		*	
Pittosporaceae						
<i>Billardiera scandens</i>	*	*				
Proteaceae						
<i>Banksia marginata</i>	*	*	*	*	*	*
<i>Hakea teretifolia</i>				*	*	*
<i>Lomatia tinctoria</i>	*	*				
<i>Persoonia juniperina</i>	*	*			*	
Rhamnaceae						
<i>Pomaderris pilifera</i>	*	*				
Rubiaceae						
<i>Opercularia ovata</i>	*					
Rutaceae						
<i>Boronia parviflora</i>					*	*

	1	2	3	4	5	6
<i>Boronia nana</i>	*					
Santalaceae						
<i>Exocarpus cupressiformis</i>	*	*				
<i>Leptomeria drupacea</i>	*	*	*			
Stylidiaceae						
<i>Stylidium graminifolium</i>	*	*			*	
Tremandaceae						
<i>Tetratheca pilosa</i>		*				
Thymelaeaceae						
<i>Pimelea humilis</i>	*	*			*	*
<i>Pimelea linifolia</i>					*	
Violaceae						
<i>Viola hederaceae</i>	*		*			
<i>Viola betonicifolia</i>		*			*	
Monocotyledonae						
Cyperaceae						
<i>Gahnia grandis</i>			*	*	*	*
<i>Gahnia radula</i>	*	*				
<i>Lepidosperma concavum</i>	*	*		*	*	*
<i>Lepidosperma elatius</i>			*			
<i>Lepidosperma filiforme</i>					*	*
<i>Lepidosperma gladiatum</i>	*					
<i>Gymnoschoenus sphaerocephalus</i>				*		
<i>Schoenus tenuissimus</i>	*			*	*	*
Iridaceae						
<i>Diplarrena moraea</i>	*	*	*			
<i>Patersonia fragilis</i>	*			*	*	*
Juncaceae						
<i>Juncus subsecundus</i>	*					
<i>Juncus pallidus</i>			*			
Liliaceae						
<i>Dianella tasmanica</i>	*	*	*			
<i>Dianella revoluta</i>	*					
<i>Thelionema caespitosum</i>					*	
Orchidaceae						
<i>Thelymitra</i> sp.	*					
Poaceae						
<i>Agrostis</i> sp.	*	*				
<i>Ehrharta distichophylla</i>	*	*	*		*	
<i>Danthonia pilosa</i>	*	*				
<i>Poa tenera</i>	*	*			*	
<i>Festuca plebeia</i>	*	*				
<i>Stipa</i> sp.	*	*			*	*

	1	2	3	4	5	6
Restionaceae						
<i>Empodisma minus</i>				*	*	*
<i>Hypolaena fastigiata</i>	*			*	*	*
<i>Restio complanatus</i>				*	*	*
<i>Leptocarpus tenax</i>				*	*	*
Xanthorrhoeaceae						
<i>Lomandra longifolia</i>	*					
<i>Xanthorrhoea australis</i>	*				*	
<i>Xanthorrhoea bracteata</i> r2u	*	*		*		
Xyridaceae						
<i>Xyris operculata</i>				*	*	*
Pteridophyta						
Blechnaceae						
<i>Blechnum wattsii</i>			*			
Dennstaedtiaceae						
<i>Pteridium esculentum</i>	*	*	*		*	*
Lindsaeaceae						
<i>Lindsaea linearis</i>				*	*	*
Gleicheniaceae						
<i>Gleichenia dicarpa</i>				*	*	*
Selaginellaceae						
<i>Selaginella uliginosa</i>				*	*	*

Quadrat locations. Map. 1: 20 000

1	4829 54422
2	830 422
3	831 415
4	831 416
5	830.5 416
6	828.5 416
7	827.5 417
8	826 417
9	824.5 418
10	827 418
11	828.5 418
12	830.5 417
13	831 417
14	832 417.5
15	830.5 418.5
16	829 419.5
17	827 419.5
18	825 419.5
19	831 422
20	829.5 422
21	828 422
22	825.5 422
23	825 416
24	827.5 416
25	829 415

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