Proposed Jandakot Botanical Park; Overview of Botanical Communities and their Significance I Anstey Road Wetlands

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Background

The Jandakot Botanical Park was proposed to conserve the *Banksia* woodlands of the Bassendean Dunes, and their associated wetlands (Bassendean Complex - Central and South).

However, the eastern margin of the study area delineated by the Department of Planning and Urban Development, impinges on on the Pinjarra Plain (Southern River Complex). Lots 65/66 and Reserve 32926 Anstey Road is the only uncleared remnant of this complex in the region.

Because of the significance of this area, and the land use conflicts which have arisen over the location(s), a separate report has been prepared. Other reports will deal in detail with Forrestdale Lake, the Banksia woodlands, Bassendean (Jandakot) Wetlands and significant flora of the proposed park.

Geomorphological Setting

Van Gool (1990) has mapped the geomorphology of the study area up to Forrest Road, at a scale of 1:50 000. Most of the study area lies within the Bassendean Dune Systems, whereas the wetlands around Forrestdale Lake are placed in the Pinjarra Plain. Anstey Road, directly north of this lake, is on the boundary of the Bassendean Dunes and the Pinjarra Plain.

Semeniuk (1987) and Le Provost, Semeniuk and Chalmer (1989) place the Anstey Road Wetlands in their Bennett Brooke Suite (B/P.4 - Bassendean - Pinjarra Interface) and not in the Jandakot Suite which contains all other wetlands of the study area (Bowman, Bishaw and Gorham 1990).

On geomorphological grounds the Anstey Road wetlands do not belong to the Bassendean Dunes, and their relationships must be sought in wetlands occurring on the fluviatile soils on the eastern side of the Swan Coastal Plain (Keysbrook, Mungala, Muchea and Bennett Brook wetland suites).

Hence, the wetlands of this area are unique for the region on geomorphic grounds, belonging to a region that on air photo interpretation by CALM in 1990 (Burbidge and Hopper, 1990, Burbidge pers. comm.) was found to be 97% cleared (the wheatbelt, an area traditionally considered to be overcleared is 93% cleared, Beard 1990).

Because of the amount of clearing that has taken place all remnant vegetation of this area must be considered of conservation significance.

Size of the area in a regional setting

The Anstey Road Wetlands have a combined are of about 150 ha. Keighery and Trudgen (1992) listed the remnant bushland of conservation value on the eastern side of the coastal plain (Pinjarra to Gingin). They located 22 remnants that were considered to have conservation significance. These are detailed below in size classes:

Area (ha)	No of Recommendations: contained in Keighery Trudgen (1992).
0-5	4
6-20	5
21-40	3 total <400 ha
41-90	3
>100	3

The larger areas are mainly composite areas of several distinct blocks - e.g.

A. Canning Wetlands (Recommendation 17, Keighery and Trudgen 1992)

Brixton Street - Yule Brook (4 blocks of 19, 38, 28 and 34 ha : 119 ha).

B. Dandaragan Plateau and Pinjarra Plain (Recommendation 10, Keighery and Trudgen, 1992)

(At least 9 separate blocks; largest M14 119 ha).

C. Forrestdale Lake Wetlands (one block 123 ha)

Anstey Road, comprising 150 ha, is the largest single vegetated remnant left in this region.

If one considers areas which are already in the reserve network; to compare to the remnant at Anstey Road.

Cardup Nature Reserve	46 ha	Woodlands - 1 very small wetland
Twin Swamps Nature Reserve	143 ha	Wetlands and *Banksia* woodlands

Ellen Brook Nature Reserve	58 ha	Wetlands and Marri woodlands
Forrestdale Lake Nature Reserve	243 ha	Wetlands and Woodlands

Since almost all of Forrestdale Lake Nature Reserve is a lake bed, only Twin Swamps Nature Reserve contains a significant area of wetland vegetation.

Hence, on size alone, the Anstey Road Wetlands appear to be the largest intact remnant of the wetlands of the eastern side of the Swan Coastal Plain. With Forrestdale Lake it is the only large remnant of the Bennett Brook Wetland Suite.

Vegetation of the area in a regional setting

Weston (1989) identified 8 vegetational units, and 7 interdigitating units on Lots 65/66. Most of these are repeated on Reserve 32926 except that *Regelia ciliata/Melaleuca* heath is more prominent. A small claypan is covered by a diverse *Melaleuca* shrubland over herbs (Table 2), this appears to be an outlyer of a Pinjarra Plain wetland.

All areas identified in the report of remnant vegetation on the eastern side of the Coastal Plain have been inspected to compare these to Anstey Road (Table 2). No other areas of *Evandra pauciflora* sedgeland have been located, nor have any been noted on the comprehensive aerial photography examined. The shallow sandy seasonal pools under a low open *Melaleuca* woodland appear also to be a unique vegetation type.

Table 1: Wetland Vegetation types of the Pinjarra Plain

Type	Soil	Reserve Status:
Casuarina obesa woodland	Clay	Not reserved
**Pericalymma* heath	Sand/clay	Local Govt Reserve 27165; Brickwood Townsite; M53.
**Regelia ciliata* heath	Sand/Clay	Twin Swamps NR
Melaleuca preissiana Woodland	Sand/Clay	Not reserved
Viminaria high shrubland	Clay/ ironstone	Ellen Brook NR; Brixton St
*Melaleuca open heath - shrubland	Sand/clay	Local Govt Reserve 27165; Brickwood; Ellen Brook NR; Yule Brook; M14; Twin Swamps
*Mixed Low Open Heath	Sand/Clay	Brixton Street; Yule Brook; M53; Ellen Brook NR; Twin Swamps NR; M14.
*Samphire Low Shrubland	Sand/clay	Yule Brook; M14; Lake Chandala NR
*Sedgelands	Sand/clay	Reserve 27615; Brickwood; Brixton St; Yule Brook, Ellen Brook NR; Twin Swamps NR; M14; Lake Chandala

		NR
*Herblands (includes seasonal ponds)	Clay	As above

Table 2: Melaleuca Claypan of Reserve 32926

Shrubs 1-2 m, cc = 60% *Melaleuca teretifolia, M. viminea, M. polygaloides, M. uncinata, M. lateriflora, M. laterita.*

Herbs/Sedges, to 30 cm, cc = 30 *Podolepis* sp. aff. *gracilis, Agrostis preissii, Pilularia novae-hollandiae, Calandrinia compsita, Stylidium ecorne, Isolepis oldfieldii, Isolepis cernnua, Calandrinia granulifera, Stylidium utricularioides, Stylidium longitubum, Stylidium mimeticum, Conosperma? calymega, Villarsia capitata, Grattiola peruviana, Microtis ?unifolia, Isoetes drummondii, Triglochin stowardii.*

There are ten major vegetation formations present in the wetlands of the Eastern Swan Coastal Plain (Table 1), seven of these are present at Anstey Road. Two (*Pericalymma* heath and *Regelia ciliata* heath) are rarely represented in conservation reserves, but are well represented at Anstey Road.

Two vegetation types (*Evandra* sedgelands, Melaleuca seasonal pools) appear unique to the Anstey Road Wetlands.

Samphire low shrubland only occupies a very small area at Anstey Road and has not been mapped as a separate unit.

The common vegetation types of these wetlands are the *Melaleuca* open heath - shrubland and mixed low open heath. These are floristically diverse and form complex mosaics depending on small changes in topography and soils (ratio of sand to clay). We have established a series of quadrats within these vegetation complexes at Reserve 27165, Brickwood, Yule Brook, Brixton Street, Ellen Brook Nature Reserve and M14

to analyse these differences. However, the severe fire at Anstey Road in the summer of 1990/91 has meant that these quadrats will not be able to be compared until regeneration has occurred. Instead I have compared the entire floras of each of these areas as a single "quadrat". Data for these areas were obtained for Brixton Street from Keighery and Keighery (1991) and Speck and Baird (1984).

From these four wetland complexes, five hundred and fifty three taxa of vascular plants have been recorded (222 Monocotyledons and Ferns; 321 Dicotyledons). This represents 35% of the recorded native flora of the Perth region (Marchant *et al.* 1987), in an area less than one tenth of one percent of the total. Again this illustrates the richness of these seasonal wetlands.

Each wetland contains a rich assemblage of species (Table 3), some widespread across the region, but with numerous unique occurrences as shown in the comparison in Table 4. Hence each wetland complex contains a unique assemblage of species, with differences ranging.

Table 4 - Presence/Absence Records of the Four Wetlands Compared

Monocotyledons

Anstey Road	Forrestdale Reserve 27165
Present: 157	Present: 129
Absent: 65	Absent: 93
Brixton Street	Yule Brook
Present: 123	Present: 139
Absent: 99	Absent: 83

Dicotyledons

Anstey Road		Forrestdale Reserve 27165	
Present:	210	Present:	186
Absent:	111	Absent:	135

Brixton Street		Yule Brook	
Present:	123	Present:	222
Absent:	198	Absent:	99

from 30-60% compared to the other wetlands.

Rapid turnover of species between areas is a characteristic of South Western Australia's Flora in the heathlands and it is apparently also true for the heathlands and herbfields of these ephemeral wetlands.

There are a series of interrelated underlying causal agents for this diversity. These are the areas geomorphology, location of the remnant, size of the remnant and some still unknown factors.

Considering the first agent, only Brixton Street is lsocated entirely on outcropping Guildford Clays. The species listed below only occur on this formation in winter wet claypans and can define wetlands like Brixton Street.

Claypan Species Defining Brixton Street

Ottelia ovalifolia
Aponogeton hexatepalus
Eleocharis acuta
E. sp. (GK5180)
Hydatella dioica
Pimelea imbricata var. *gracillima*
Calandrinia composita (complex)
Kunzea sp. (GK6830)
Eryngium pinnatifidum ssp. *palustris*

E. subdecumbens
Hydrocotyle lemnoides
Stylidium calcaratum (rose)
Helipterum pyrethrum
Myriocephalus helichrysoides

Compared to this all the other wetlands have varying degrees of sand overlying the clay and tend to lack these species, or only contain a few, but not the entire suite. The influence of the overlying sand is especially noticeable in the Anstey Road Wetlands (and to a lesser degree the Forrestdale Wetlands). The Anstey Road Wetlands are defined by the large number of Bassendean sand elements present, which is perhaps not surprising as they are classified as intermediate by Semeniuk (1987) and Le Provost *et al.* (1989).

Western Coastal Plain Species (Bassendean Sands) Defining Anstey Road and Forrestdale Lake

Phlebocarya filifolia
Diuris purdiei
Adenanthos obovatus
Caesia occidentalis
Olax benthamiana
Polygonum prostratum
Dysphania glomulifera
Clematis pubescens
?*Rannunculus sessiliflorus*
Jacksonia ?*sericea*
Tripterococcus sp.
Plathytheca galioides
Boronia ramosa
B. spathulata
Hybanthus calycinus
H. floribundus
Pimelea lanata
P. leucantha
Waitzia panniculata

Location of the wetland also appears to be a major factor in defining the wetlands floristically. Brixton Street and Yule Brook are close to the Darling Range Escarpment and contain numerous species with affinities to the scarp flora or which normally do not occur on the coastal plain. These species define Brixton Street and Yule Brook as a unit, but the presence of a large sand swale at Yule Brook enables numerous taxa not recorded from Brixton Street to be present here and at Forrestdale Lake and Anstey Road. The sand and sandy swamp species separate Brixton Street from Yule Brook, whereas the presence of these scarp related species defines Yule Brook from Anstey Road and Forrestdale Lake.

Heavy Soil Scarp Species of Brixton Street and Yule Brook

Schoenus andrewsii
S. asperocarpus
S. benthamii
S. bifidus
Acanthocarpus canaliculatus
Calectasia grandiflora
Lomandra odora
L. micrantha
Xanthorrhoea brunonis
Thysanotus arbuscular
T. thyrsoideus
T. scaber
Tricoryne humilis
Anigozanthos bicolor
Tribonanthes brachypetala
Paracaleana nigrita
Conospermum huegelii
Grevillea bipinnatifida
Hakea auriculata
H. candolleana
H. erinacea
H. incrassata
Isopogon asper
Isopogon asper
I. dubius
Stirlingia simplex
Synaphaea acutiloba
S. petiolaris
S. spinulosa
Daviesia physodes
Boronia cymosa
Hibbertia aurea
Verticordia acerosa
V. huegelii
V. pennigera
Andersonia aristata
A. sprengelioides
Stylidium bulbiferum
S. carnosum
S. obtusatum
S. perpusillum
Senecio gilbertiii
Trichocline sp. (GK6382)

H. lissocarpha

The size of the remnants also contributes to the species list obtained for a remnant. Usually the larger the remnant the greater the range of habitats, hence the larger the species list. This appears true for the small Brixton Street remnant, but the other ranging in size from 35 ha to 150 ha have similar sized floras, and a similar range of habitats. This helps increase the validity of the comparisons.

Table 3: Species Richness and Area of the Sites

Location	Area	Survey Period	No Species
Yule Brook	35 ha	20 seasons	355*
Brixton Road	19 ha	10 seasons	256**
Anstey Road	150 ha	2 seasons	381
Forrestdale Reserve 27165	123 ha	1 season	312

*Uncertain records (e.g. *Johnsonia lupulina*, *Lepidosperma resinosum*) and weeds (*Juncus capitatus, Cyperus tenellus*) deleted from original list. Figure probably around 360/370.

**Two weeds deleted from list -

However, despite the obvious effects of geomorphology, location and size there are still differences between the sites which cannot be readily ascribed to convenient causal agents.

Both the Anstey Road wetlands and the Forrestdale Lake Wetlands contain a rich and varied assemblage of shrubland *Melaleuca* species (*M. cuticularis, M. incana, M. preissiana, M. teretifolia, M. thymoides* and the more widespread *M. hamulosa, M. uncinata* and *M. viminea*). This variety has also

been noted at Twin Swamps Nature Reserve and it may prove to be characteristic of these wetlands on the edge of the Bassendean sands, but data are lacking to confirm this observation at present.

Finally the wetlands of the eastern side of the coastal plain, contain numerous unusual outlying populations and range ends. These rarely recorded species add greatly to the disparity between the wetlands and they are listed below. Under each major wetland complex they occur in:

Yule Brook	Anstey Road
(S) *Byblis gigantea*	(N) *Leptocarpus tenellus*
(S) *Calytrix aurea*	(N) *Johnsonia acaulis*
(S) *Andersonia gracilis*	(N) *Tricoryne tenella*
(S) *Needhamiella pumillo*	(N) *Aotus gracillima*
	(N) *Latrobea tenella*
	(N) *Comesperma flavum*
	(N) *Actinotus glomeratus*

Key:
(S) Near southern margin of range
(N) Near northern margin of range

If the bushland containing these remnants was still intact, the species comprising this area would form a continuum. However, we are noeft with an assortment of remnants of these once widespread wetland complexes. Each remnant contains a unique species assemblage from this bushland due to their differing locations, geomorphology, size and aspects of this unknown past history.

Each deserves to be conserved based on their floristics and plant communities.

Significant Flora

The preliminary report gave details of the single species of declared rare flora present on site, the seven priority species present and the ten other species of significance. It is not intended to repeat that information here.

Since that report two other taxa of note have been subsequently recorded from Anstey Road.

Dysphania glomulifera ssp *glomulifera*

This rarely collected species was recorded in early summer on the dried mud of the seasonal pools under *Melaleuca cuticularis*. Previous records of this taxon were made by Andrews at Guildford in 1902 and a subsequent collection from Leederville in 1967. I have collected this species under *Eucalytpus rudis* edging the Blackwood River in 1987, suggesting the species may be more widespread. Currently the Anstey Road population is the only extant population the Metropolitan Region.

Stylidium longitubum

A poorly known species with scattered records from the Coastal Plain near Busselton to Muchea, and one outlying possible record from Beaufort River Nature Reserve.

The population at Anstey Road is very large (>1 000). The reserve status of this species is not known.

Conclusion

The site contains a cross section of wetlands lying on the margin of the Bassendean Sands and Pinjarra Plain, giving it some unique communities and unusual combinations of species not normally found in either area. Nearly all of these

wetlands have been converted to agricultural uses or housing on the northern coastal plain.

The site is large and with a simple boundary, making management of the area somewhat simpler than a complex boundary.

Preservation of the area within the Jandakot Botanical Park will greatly add to the variety of plant communities encompassed in this reserve. It will also conserve two unique vegetation types, a species of declared rare flora, seven priority flora species and ten other significant species of flora.

The data presented here suggests that the site has extremely high regional significance for flora conservation and should be preserved for future Australians.

References

Burbidge, A.H. (Department of Conservation and Land Management). Data on the Conservation of Vegetation Associations on the Swan Coastal Plain. Unpublished Report.

Keighery, G.J. and Keighery, B.J. 1991. Floristics of Reserves and Bushland Areas of System 6 Region Part II: Brixton Street Wetlands, Kenwick. In Floristics of Reserves and Bushland Areas of the Perth Region (System 6), Parts II-IV, Wildflower Society of W.A. In., Nedlands.

Keighery, B.J. and Trudge, M.E. 1992. Remnant Vegetation on the Alluvial Soils of the Eastern Side of the Swan Coastal Plain. Report to Department of Conservation and Land Management and the National Estate Program.

LeProvost, Semeniuk and Chalmer 1989. Environmental Significance of Wetlands in the Perth to Bunbury Region. Vol 1. Report to the Western Australian Water Resources Council, Perth Western Australia.

Marchant, N.G., Wheeler, J.R., Rye, B.L., Bennett, Lander, N.S. and MacFarlane, T.D. 1987. Flora of the Perth Region. Parts 1 & 2. Western Australian Herbarium, Perth.

Semeniuk, C.A. 1987. Consanguineous wetlands and their distribution in the Darling System, South Western Australia. Journal Royal Society, Western Australia.

Speck, N.H. and Baird, A.M. 1984. Vegetation of Yule Brook Reserve near Perth, Western Australia. Journal of the Royal Society of Western Australia, Vol 66, Part 4, p147-162.

Van Gool, D. 1990. Land Resources of the Peel-Harvey Catchment, Swan Coastal Plain, Western Australia. Northern and southern maps. Western Australian Department of Agriculture, Perth.

Weston, A.S. 1989. Vegetation and Significant Flora of Lots 65 and 66 Anstey Road, Forrestdale, City of Armadale. Unpublished Report for G.R. Crimp and Partners.

	Anstey	Forrestdale	Brixton	Yule Brook
FERNS				
Azollaceae				
Azolla fillicoides	x			
Lycopodiaceae				
Phylloglossum drummondii	x	x		x
Selaginellaceae				
Selaginella gracillima	x	x	x	x
Isoetaceae				
Isoetes drummondii	x	x		x
Pilularia novae-hollandiae	x	x	x	
GYMNOSPERMS				
Zamiaceae				
Macrozamia riedlei	x	x		x
Cupressaceae				
Actinostrobus pyramidalis	x	x		x
ANGIOSPERMS				
Juncaginaceae				
Triglochin calcitrapa				x
T. centrocarpa	x	x		x
T. mucronata	x			x
T. procera	x	x	x	x
T. stowardii	x	x	x	x
T. minutissima	x	x		x
Poaceae				
Agrostis aemula	x		x	
A. preissii	x	x	x	
Amphibromus neesii	x	x	x	
Amphipogon amphipogonoides			x	
A. debilis	x	x		
A. turbinatus	x	x	x	x
Danthonia ?caespitosa	x	x	x	x
Neurachne alopecuroidea	x	x	x	x
Sporobolus virginicus	x			x
Stipa compressa	x	x	x	x
S. semibarbata			x	x
S. trichophylla			x	x
Microlaena stipoidea		x		
Polypogon tenellus	x	x		x
Hydrocharitaceae				
Lepilaena australis			x	
Ottelia ovalifolia			x	
Aponogetonaceae				
Aponogeton hexatepalus			x	

	Anstey	Forrestdale	Brixton	Yule Brook
Cyperaceae				
Baumea acuta	x	x	x	
B. juncea	x	x	x	
B. preissii			x	
Chorizandra enodis	x	x	x	
Evandra pauciflora	x			
Cyathochaeta avenacea	x	x	x	x
Eleocharis acuta		x	x	
E. sp. (GK5180)			x	
Gahnia trifida	x	x		x
Isolepis cernua	x	x		
I. marginata	x	x	x	x
I. stellata	x	x	x	
I. fluitans	x	x	x	
I. oldfieldiana	x			
I. tenellus	x	x	x	
Lepidosperma angustatum	x	x	x	x
L. leptostachyum			x	
L. longitudinale	x	x	x	
L. tenue	x	x	x	
[*L. resinosum*]				x
Mesomelaena graciliceps	x			
M. stygia	x	x		x
M. tetragona	x	x	x	x
Schoenus andrewsii			x	x
S. asperocarpus			x	x
S. benthamii			x	x
S. bifidus			x	
S. caespititicus	x	x		
S. brevifolius				x
S. clandestinus	x	x		
S. curvifolius	x	x		x
S. grandiflorus	x	x	x	
S. nanus		x		x
S. pedicellatus	x			x
S. rigens	x	x		x
S. rodwayanus	x			x
S. odontocarpus	x		x	x
S. subflavus	x	x	x	
S. unispiculatus	x	x		
S. trachycarpus	x	x	x	
S. sp. (GK10906)			x	
Tetraria octandra	x	x	x	x
Retionaceae				
Alexgeorgea nitens	x			x
Anarthria laevis	x	x	x	x
Hypolaena exsulca	x	x		x
Lepidobolus preissianus				x
Leptocarpus aristatus	x	x		x
L. canus	x	x	x	x
L. co-angustatus	x	x	x	x
L. tenellus	x			
Lepyrodia macra	x	x		x
L. muirii		x	x	
Lyginia barbata	x	x		x
Loxocarya cinerea	x	x		x

	Anstey	Forrestdale	Brixton	Yule Brook
L. fasicularis	x	x	x	x
L. pubescens	x	x		x
Restio stenostachyus	x			
R. sphacelatus	x			
R. tremulus				x
Centrolepidaceae				
Aphelia cyperoides	x	x	x	x
Brizula drummondii	x	x	x	x
B. muelleri		x	x	
Centrolepis aristata	x	x	x	x
C. glabra	x	x	x	x
C. drummondiana	x	x	x	x
C. hummillima			x	x
C. polygyna	x	x	x	x
Hydatellaceae				
Hydatella dioica			x	
Trithuria bibracteata			x	
T. submersa	x	x	x	
Philydraceae				
Philydrella drummondii			x	
P. pygmaea	x	x	x	x
Juncaceae				
Juncus bufonius	x	x	x	x
J. holoschoenus	x		x	
J. pallidus	x	x		x
Dasypogonaceae				
Acanthocarpus canaliculatus			x	x
Calectasia cyanea			x	x
C. grandiflora			x	
Kingia australis		x	x	
Lomandra caespitosa	x	x	x	x
L. hermaphrodita	x			x
L. micrantha			x	x
L. odora			x	x
L. nigricans	x	x		x
L. preissii	x			x
L. sericea	x			
L. suaveolens	x			
Dasypogon bromeliifolius	x	x		x
Xanthorrhoeaceae				
X. brunonis			x	
X. preissii	x	x	x	x
[*X. gracilis*] ?*brunonis*				x
Phormiaceae				
Dianella revoluta	x		x	
Agrostocrinum scabrum	x	x	x	x
Anthericaceae				
Arnocrinum preissii	x			x
Arthropodium capillipes		x	x	
A. preissii		x	x	x

	Anstey	Forrestdale	Brixton	Yule Brook
Borya scirpioidea			x	x
B. sphaerocephala			x	
Caesia occidentalis	x	x		
Chaemascilla corymbosa	x	x	x	x
Corynotheca micrantha	x	x		
Johnsonia acaulis	x	x		
J. pubescens				x
[*J. lupulina* - error]				x
Laxmannia ramosa	x	x		x
L. sessiliflora		x	x	x
L. squarrosa			x	x
Sowerbaea laxiflora	x	x	x	x
Thysanotus arbuscular			x	
T. dichotomus				x
T. manglesianus	x	x	x	x
T. patersonii	x	x	x	x
T. scaber				x
T. sparteus	x	x	x	x
T. thyrsoideus	x		x	x
T. triandrus			x	x
T. multiflorus	x	x		x
Tricoryne elatior	x	x	x	x
T. tenella	x			
T. humilis			x	
Hypoxidaceae				
Hypoxis occidentalis	x	x	x	x
Colchicaceae				
Burchardia bairdiae	x			x
B. multiflora	x	x	x	x
B. umbellata	x	x	x	x
W. dioica ssp. *alba*	x	x	x	x
Haemodoraceae				
Anigozanthos humilis	x	x		x
A. manglesii	x	x	x	x
A. viridis	x	x	x	x
A. bicolor			x	x
Conostylis aculeata			x	x
[*C. candicans* - error]				x
C. festucacea	x	x	x	
C. juncea	x	x	x	x
C. setigera			x	
C. aurea				x
Haemodorum brevisepalum	x			x
H. laxum	x	x	x	
H. panniculatum			x	x
H. sparsiflorum	x	x	x	
H. simplex	x	x	x	x
H. spicatum	x	x	x	x
Phlebocarya ciliata	x	x		x
P. filifolia	x	x		
Tribonathes australis	x	x	x	x
T. brachypetala			x	x
T. longipetala			x	
T. uniflora	x	x	x	
T. violacea	x	x		x

	Anstey	Forrestdale	Brixton	Yule Brook
Iridaceae				
Orthrosanthus laxus	x	x		x
Patersonia juncea			x	x
P. occidentalis	x	x	x	x
P. umbrosa		x		x
Orchidaceae				
Caladenia deformis			x	x
C. discoidea		x		x
C. flava	x	x	x	x
C. ferruginea	x	x	x	
C. longicauda	x	x	x	x
C. marginata				x
C. menziesii	x	x		x
C. macrostylis				x
C. huegelii	x	x	x	
C. pectinata			x	
C. nana	x			
C. sericea	x	x		x
Diuris carinata	x	x	x	x
D. longifolia	x	x	x	x
D. purdiei	x	x		x
Elythranthera brunonis	x			
Eriochilus dilatatus	x	x	x	
Leporella fimbriata	x	x		x
Lyperanthus nigricans	x	x		x
L. serratus			x	
Microtis atrata		x		x
M. orbifolia	x	x		
M. unifolia	x	x	x	
Prasophyllum brownii	x			x
P. cyphochilum	x			x
P. drummondii	x	x	x	x
P. elatum	x			
P. gibbosum	x	x		
P. hians	x			x
P. macrostachyum	x	x		x
Paracaleana nigrita				x
Pterostylis nana	x	x		x
P. ?sanguinea	x			
P. vittata	x			x
Thelymitra antennifera	x	x	x	x
T. campanulata	x			
T. crinita			x	
T. flexuosa	x		x	x
T. fusco-lutea	x			
T. mucida	x	x		
T. nuda	x			
T. pauciflora	x	x		
T. villosa	x	x	x	
DICOTYLEDONS				
Casuarinaceae				
Allocasuarina fraseriana	x	x		x
A. humilis	x	x		x

	Anstey	Forrestdale	Brixton	Yule Brook
Proteaceae				
Adenanthos cygnorum	x	x		x
A. obovatus	x	x		
Banksia attenuata	x	x		x
B. grandis	x	x		x
B. illicifolia	x	x		x
B. littoralis	x	x		x
B. menziesii	x	x		x
B. telmatiaea	x	x		x
Conospermum huegelii			x	x
C. stoechadis				x
C. triplinervum	x	x		x
Dryandra nivea	x	x	x	x
Grevillea bipinnatifida			x	
Grevillea thelemanniana ssp. *thelemanniana*	x	x		x
Hakea auriculata			x	
H. candolleana			x	x
H. ceratophylla				x
H. erinacea			x	
H. incrassata			x	
H. lissocarpha			x	
H. prostrata	x	x	x	x
H. sulcata	x	x	x	x
H. trifurcata	x	x	x	
H. varia	x	x	x	x
Isopogon asper			x	
I. dubius			x	
Persoonia angustiflora				x
P. saccata				x
Petrophile linearis	x	x		x
P. macrostachya				x
P. media var. *media*	x			x
P. media var. *juncifolia*	x	x	x	x
P. seminuda	x	x	x	x
Stirlingia latifolia	x	x		x
S. simplex			x	x
Synaphea acutiloba			x	
S. petiolaris			x	x
S. spinulosa				x
Aizoaceae				
Macarthuria australis				x
Olacaceae				
Olax benthamiana	x			
Santalaceae				
Leptomeria empetriformis				x
Loranthaceae				
Nuytsia floribunda	x	x	x	x
Polygonaceae				
Polygonum prostratum	x			
Chenopodiaceae				
Atriplex sp.	x			

	Anstey	Forrestdale	Brixton	Yule Brook
Dysphania glomulifera ssp. *glomulifera*	x			
Halosarcia lepidosperma	x	x		x
Amaranthaceae				
Ptilotus drummondii	x	x	x	x
P. declinatus	x	x	x	
P. manglesii	x	x	x	
P. stirlingii		x	x	
Portulacaceae				
Calandrinia composita	x	x	x	
C. corrigioloides	x	x		x
C. granulifera	x	x		x
Rannunculaceae				
Clematis pubescens	x			
Rannunclus sessiliflorus	x	x		
Lauraceae				
Cassytha flava				x
C. glabella	x	x	x	
C. racemosa	x	x		x
Droseraceae				
Drosera erythrorhiza	x	x	x	x
D. bulbosa				x
D. heterophylla			x	x
D. bulbigena			x	
D. gigantea	x	x	x	x
D. glanduligera	x	x	x	x
D. leucoblasta				x
D. macrantha	x	x		x
D. menziesii ssp. *menziesii*	x	x	x	
D. neesii ssp. nov.	x	x		x
D. occidentalis			x	x
D. nitidula ssp. *nitidula*	x	x		
D. palacea				x
D. pallida	x	x		x
D. platystigma	x			
D. rostulata				
D. stolonifera ssp. *stolonifera*	x	x	x	x
D. tubaestylus			x	
D. zonaria		x		x
Crassulaceae				
Crassula colorata	x	x	x	x
C. exserta	x	x		x
Mimosaceae				
Acacia lasiocarpha	x	x	x	x
A. huegelii	x	x		x
A. pulchella	x	x	x	x
A. saligna	x	x	x	x
A. stenoptera	x	x		x
A. willdenowiana	x	x		

	Anstey	Forrestdale	Brixton	Yule Brook
Fabaceae				
Aotus gracillima	x	x		
Bossiaea eriocarpa	x	x		x
Daevisia decurrens	x	x		x
D. physodes			x	
Dillwynia cinerascens			x	x
Euchilopsis linearis	x	x		x
Eutaxia virgata	x	x	x	x
Gompholobium aristatum	x	x	x	
G. confertum				x
G. knightianum	x			
G. tomentosum				x
Hardenbergia comptoniana	x			
Hovea trisperma	x	x		x
Isotropis cuenifolia	x	x		x
Jacksonia floribunda				x
J. furcellata	x	x		
J. lehmannii				x
J. ?sericea	x	x		
J. sternbergiana	x	x		x
Kennedia prostrata	x	x	x	x
Nemcia capitata	x	x	x	x
Pultenaea reticulata	x			
Latrobea tenella	x	x		
Sphaerolobium linophyllum			x	
S. ?medium	x			x
Viminaria juncea	x		x	x
Rutaceae				
Boronia crenulata	x	x		x
B. cymosa			x	
B. ramosa	x			
B. spathulata	x			
Eriostemon spicatus	x	x	x	x
Tremandraceae				
Platytheca galioides	x			
Polygalaceae				
Comesperma calymega	x	x		
C. ciliatum			x	
C. confertum	x	x		x
C. flavum	x			
Euphorbiaceae				
Monotaxis grandiflora	x	x	x	
Ampera ericoides		x		
Phyllanthus calycinus	x	x		x
Poranthera microphylla	x	x		x
Stackhousiaceae				
Stackhousia pubescens	x	x	x	x
Tripterococcus brunonis			x	x
T. sp.	x			
Byblidaceae				
Byblis gigantea				x

	Anstey	Forrestdale	Brixton	Yule Brook
Rhamnaceae				
Spyridium tridentatum	x	x		
Sapindaceae				
Dodonaea ceratocarpa		x		x
Malvaceae				
Lawrencia squamata	x			x
Dilleniaceae				
Hibbertia aurea			x	x
H. huegelii				x
H. hypericoides	x	x	x	x
H. stellaris	x	x		x
H. subvaginata	x	x		x
Violaceae				
Hybanthus calycinus	x			
H. floribundus	x			
Thymeleaceae				
Pimelea lanata	x	x		
P. leucantha	x	x		
P. imbricata var. *gracillima*			x	x
P. rosea		x		
P. sulphurea				x
Myrtaceae				
Astartea fasicularis	x	x	x	x
Baeckea camphorosmae	x	x	x	x
Beaufortia squarrosa	x			x
Calothamnus lateralis	x	x		x
C. sanguineus	x	x		
C. quadrifidus	x	x		
C. villosus	x	x		x
Calytrix aurea			x	x
C. flavescens	x	x		x
C. fraseri	x			x
Eremaea pauciflora	x			x
Eucalyptus calophylla		x	x	x
E. marginata	x	x		
E. rudis	x			x
E. todtiana	x			
Hypocalymma angustifolium	x	x	x	x
H. robustum	x	x	x	x
Kunzea ericifolia	x	x		x
K. micrantha	x	x	x	x
K. ?recurva (GK6830)			x	
Melaleuca cuticularis	x	x		
M. bracteosa				x
M. incana (polygaloides)	x	x		
M. hamulosa	x			x
M. lateriflora	x	x		x
M. laterita	x	x	x	x
M. preissiana	x			x
M. rhaphiophylla	x	x	x	x

	Anstey	Forrestdale	Brixton	Yule Brook
M. scabra				x
M. seriata				x
M. teretifolia	x	x		
M. thymoides	x	x		
M. uncinata	x	x		x
M. viminea	x	x		x
Pericalymma elliptica	x	x	x	x
Regelia ciliata	x	x		x
Scholtzia involucrata	x	x		x
Verticordia densiflora	x	x	x	x
V. acerosa			x	x
V. drummondii				x
V. lindleyi ssp. *lindleyi*	x	x		x
V. huegelii var. *huegelii*			x	x
V. pennigera			x	
V. plumosa		x		x
Onagraceae				
Epilobium billardierianum	x	x		
Haloragaceae				
Gonocarpus nodulosus			x	
G. pithyoides	x	x	x	x
Myriophyllum crispatum				x
M. integrifolium	x	x		
Apiaceae				
Actinotus glomeratus	x			
A. leucocephalus	x			x
Centella cordifolia	x			
Eryngium pinnatifidum ssp. *palustris*		x	x?	
Eryngium subdecumbens			x	
Homalosciadium homalocarpum	x	x	x	x
Hydrocotyle alata	x			
H. callicarpa	x			x
H. diantha			x	
H. lemnoides			x	
Schoenolaena juncea		x	x	x
Trachymene pilosa	x	x		x
Xanthosia huegelii	x		x	x
Epacridaceae				
Andersonia aristata			x	x
A. gracilis				x
A. sprengelioides				x
Astroloma ciliatum	x			
A. pallidum	x	x	x	x
A. stomarrhena				x
Conostephium pendulum	x			x
C. preissii	x			
Leucopogon conostephioides	x	x		x
L. polymorphus				x
L. propinquus	x	x		x
L. pulchellus				x
Lysinema ciliatum	x	x		x
Needhamiella pumillo				x
L. racemulosus	x	x		x

	Anstey	Forrestdale	Brixton	Yule Brook
L. squarrosus				x
L. ?oxycedrus				x
Primulaceae				
Samolus junceus	x	x		
Loganiaceae				
Mitrasacme paradoxa	x	x		x
Convolvulaceae				
Wilsonia backhousei				x
Cuscutaceae				
Cuscuta australis	x	x	x	x
Menyanthaceae				
Villarsia albiflora	x	x		x
V. capitata	x	x		
V. submersa	x		x	
Chloanthaceae				
Pityrodia uncinata	x			x
Lamiaceae				
Hemiandra pungens				x
Scrophulariaceae				
Grattiola peruviana	x	x		
Glossostigma drummondii	x	x	x	
Orobanchaceae				
Orobanche minor	x	x		
Lentibulariaceae				
Polypomphlyx multifida	x	x	x	x
P. tenella	x	x	x	x
Utricularia hookeri	x	x		x
U. menziesii	x	x	x	x
U. violaceae	x	x	x	x
Myoporaceae				
Eremophila glabra	x	x		
Rubiaceae				
Opercularia vaginata	x	x	x	x
Campanulaceae				
Wahlenbergia preissii	x	x	x	x
Lobeliaceae				
Isotoma hypocratiformis	x	x	x	x
I. scapigera	x	x	x	
I. pusilla	x	x	x	x
Lobelia alata	x			x
L. gibbosa	x	x		x
L. tenuior	x	x		x

	Anstey	Forrestdale	Brixton	Yule Brook
Goodeniaceae				
Anthotium junciforme		x	x	x
Dampiera linearis	x	x	x	x
Goodenia caerulea				x
G. filiformis var. *filiformis*	x	x	x	x
G. filiformis var. *minutiflora*			x	x
Lechenaultia expansa	x	x		x
Scaevola canescens				x
S. lanceolata	x	x	x	x
S. paludosa	x	x		x
Velleia ?trinervis	x	x	x	x
Stylidiaceae				
Levenhookia preissii				x
L. pusilla	x	x	x	
L. stipitata	x	x		
Stylidium amoenum				x
S. brunonianum		x	x	x
S. bulbiferum			x	x
S. calcaratum	x	x		x
S. calcaratum (rose form)			x	
S. canaliculatum			x	x
S. carnosum			x	x
S. dichotomum	x	x	x	x
S. divaricatum	x	x	x	x
S. diuroides		x		x
S. ecorne	x	x	x	x
S. guttatum	x	x		x
S. innundatum	x	x	x	x
S. obtusatum				x
S. perpusillum			x	x
S. mimeticum	x	x		
S. longitubum	x			
S. petiolare			x	x
S. pulchellum	x	x	x	x
S. piliferum	x	x		x
S. repens	x	x		x
S. roseo-alatum	x	x	x	x
S. schoenoides	x	x		x
S. striatum				x
S. utricularioides	x	x	x	x
Asteraceae				
Angianthus pygmaeus	x	x		x
A. strictus	x	x		x
A. tenellus	x	x		x
Brachycome pusilla	x	x		x
Centipedia minima			x	
Cotula australis	x	x		x
C. coronopifolia	x	x		x
Craspedia pleiocephala	x	x	x	x
Helichrysum ?bracteatum				x
Hyalospermum cotula	x	x	x	x
H. pyrethrum			x	
Ixiolaena viscosa	x	x	x	
Lagenifera huegelii	x	x		x

	Anstey	Forrestdale	Brixton	Yule Brook
Myriocephalus isoetes	x	x	x	x
M. helichrysoides			x	
Olearia sp.				x
Pithocarpa ?corymbulosa	x	x		
Podolepis canescens			x	
P. gracilis	x	x	x	x
[*P. nutans*]				x
Podotheca angustifolia	x			x
P. chrysantha	x			x
P. gnaphaloides	x			x
Quinetia urvillei	x	x		x
Senecio gilbertii			x	
S. hispidulus	x			
S. minimus		x	x	
Siloxerus humifusus	x	x	x	x
Gnephosis drummondii				x
Siloxerus filifolius		x		x
Trichocline sp. (GK6382)			x	x
Waitzia panniculata	x	x		
	381	312	256	355