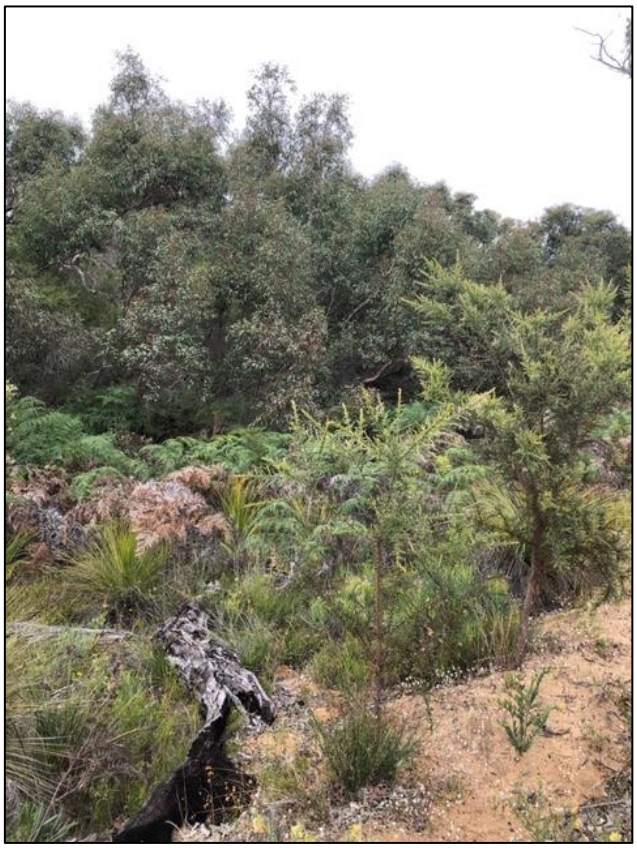
Yalyal Brook Riparian Vegetation Report



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For

Department of Biodiversity, Conservation and Attractions

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MUNDARING

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Data Sets used for the Assessment of Vegetation within the study area

Dataset	Source	Comments
Remnant Vegetation Data	DPIRD	
Digital Aerial Photographs	Nearmap	Various runs and dates

DPIRD Department of Primary Industry and Regional Development.

Summary

The Yalyal Brook that is now within the Ioppolo Nature Reserve is 2.2 Km in length with riparian vegetation on the northern side varying between 20 m and 70 m wide. The southern riparian area borders privately owned land and has a riparian area that varies between 10 and 30m wide.

The vegetation complexes represented along the Yalyal Brook include the Moondah Complex on the eastern portion of the brook with a low closed to low open forest of *Banksia attenuata*, *Banksia menziesii, Banksia grandis*, *Eucalyptus marginata ssp thalassica*. Reagan Complex along the central section comprising low open-woodland of *B. attenuata-B. menziesii-Eucalyptus todtiana.* Other species present were *Alexgeorgea nitens*, *Mesomelaena pseudostygia, Allocasuarina humilis*, *Macrozamia reidlei* and *Calothamnus sp*. A small section at the western end of the brook within the nature reserve flows through Coonambidgee Complex with vegetation of a low open forest and low woodland of *Eucalyptus todtiana*, *Banksia attenuata*, *Banksia menziesii*, *Banksia ilicifolia* and a dense understory of *Kunzea glabrescens* close to the brook.

The western half of the brook is designated Banksia Woodland of the Swan Coastal Plain, a Threatened Ecological Community. (Figure 1)

The banks of the Yalyal Brook are predominantly an overstory of *Melaleuca rhaphiophylla* and *Eucalyptus rudis* with an understory of Bracken, *Pteridium esculentum* and grasses (*Paspalum* sp. and Kikuyu *Cenchrus clandestinus*) with some *Juncus pallidus* and *Juncus pauciflorus(?).* The mid to understory of the brook is mainly *Kunzea glabrescens.*

In the disturb areas adjacent to Reserve Road, Muchea, and the cross over at the western end, woody weeds such as Brazilian Peppers (*Schinus terebinthifolia)* and figs (*Ficus carica)* are present (Appendix 1. Tables 1 and 2). The surveys were undertaken in the summer months and it would be prudent to revisit the brook during the spring to ascertain the full extent of native species and introduced species occurring in the riparian area.

The soil type varies from orange/yellow sand to deep white Bassendean sands towards the western section of the brook.

Two surveys were carried out, one on 25th November 2022 followed by a second survey on the 24th January 2023. Photographs were taken at approximately 100m intervals from the northern side fire break that was used to define the riparian area. Difficulty in accessing the southern side of the brook resulted in only sections being photographed.

The degraded areas tended to be the first section adjacent to Reserve Road where there is easy access to people walking into the brook and the crossover at the western end which was well used and caused some degradation and greater weed incursion to the banks of the brook. There was evidence of an area of Dieback along the northern central length where there were Jarrah trees *(Eucalyptus marginata ssp thalassica*), *Banksia attenuata, Banksia menziesii, Banksia ilicifolia* and *Xanthorrhoea priessii* affected. There was a number of weedy grasses along the southern riparian area and a large patch of an unknown sedge species.

The Yalyal Brook is well shaded with a dense canopy of *Melaleuca rhaphiophylla* and *Eucalyptus rudis* with a good structure of other overstory species including *Banksia* species. The understory was particularly dense along most of the length of the brook surveyed, with bracken *Pteridium esculentum,* and *Kunzea glabrescens* which formed dense thickets in places. The banks of the Yalyal Brook itself was thickly covered with Kikuyu (Appendix 2).

Overall the riparian vegetation is in good to very good condition along the 2.2 kilometre length and the foreshore assessment would be A3,

> **"A3. Slightly Degraded** - Native vegetation dominates. Some areas of human disturbance where soil may be exposed and weeds are relatively dense (ie. along tracks). Native vegetation would quickly recolonise if human disturbance declined."

Vegetation in the northern side riparian area between the firebreak and the brook is mostly very good to good. Small areas near roadways are degraded and an area of possible Dieback.

> **"Very good:** Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure covers repeated fire, aggressive weeds, dieback, logging, grazing.
>
> **Good:** Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires; the presence of some very aggressive weeds at high density; partial clearing; dieback; grazing."

1. Introduction

The Yalyal Brook west of Reserve Road is in the Ioppolo Road Nature Reserve and is now protected. Water quality of the brook has been monitored since 2006 and remains fresh with a constant flow all year round. The brook contains a healthy population of rare Carter's Freshwater Mussels, some of considerable size, and evidence of a Rakali midden which makes this an important area in need of protection.

It is the riparian vegetation that makes the Yalyal Brook important for the survival of the mussels and maintenance of the water quality.

A vegetation study was carried out in 2022 to assess the condition of the riparian area of the Yalyal Brook. This would help in maintaining and improving the ecological integrity of the brook for the future.

2. Description of the study area

The Yalyal Brook is a perennial freshwater stream that flows from the Dandaragan Plateau to the Swan Coastal Plain, Muchea, WA. It is thought to be an expression of the Leederville aquifer at the surface. The upper reaches of the brook flow through farming properties before reaching Reserve Road and the Ioppolo Nature Reserve which may influence the quantity of water flowing to the reserve, particularly in years of low rainfall. Yalyal Brook flows across the nature reserve east to west at the southern end before again flowing through agricultural properties to the Ellen Brook and, during wet years, Chandala Lake.

The condition of this section of the Yalyal Brook is thought to be good to very good. The brook has been monitored annually at Reserve Road since 2006 and has shown to maintain a steady flow and good water quality.

TABLE 1: SUMMARY OF THE VEGETATION COMPLEXES OF THE LOWER YALYAL BROOK.

Vegetation complex	Summary Description
Coonambidgee Complex	Vegetation ranges from a low open forest and low woodland of *Eucalyptus todtiana* (Pricklybark) - *Banksia attenuata* (Slender Banksia) - *Banksia menziesii* (Firewood Banksia) - *Banksia ilicifolia* (Holly-leaved Banksia) with localised admixtures of *Banksia prionotes* (Acorn Banksia) to an open woodland of *Corymbia calophylla* (Marri) - *Banksia species*.
Moondah Complex	Low closed to low open forest of *Banksia attenuata* (Slender Banksia) - *Banksia menziesii* (Firewood Banksia) - *Eucalyptus todtiana* (Pricklybark) - *Banksia prionotes* (Acorn Banksia) on slopes, open woodland of *Corymbia calophylla* (Marri) - *Banksia species* in valley.
Reagan Complex	Vegetation ranges from low open woodland of *Banksia species* - *Eucalyptus todtiana* (Pricklybark) to closed heath depending on the depth of soil.

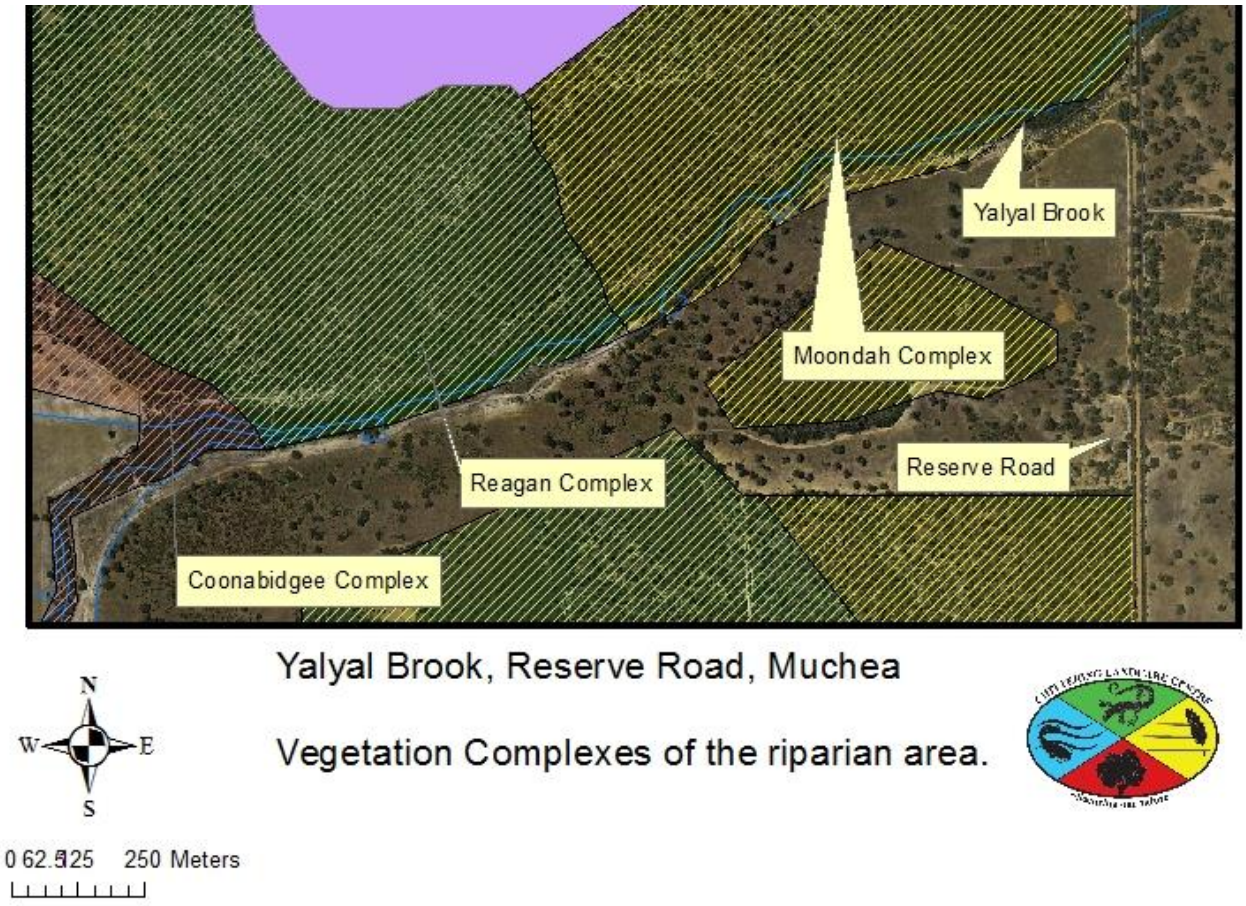

Figure 1: Map of the Yalyal Brook Reserve vegetation complexes.

The Riparian area to be assessed lies between the access track to the north and the southern cadastral boundary. A length of 2.2 kilometres.

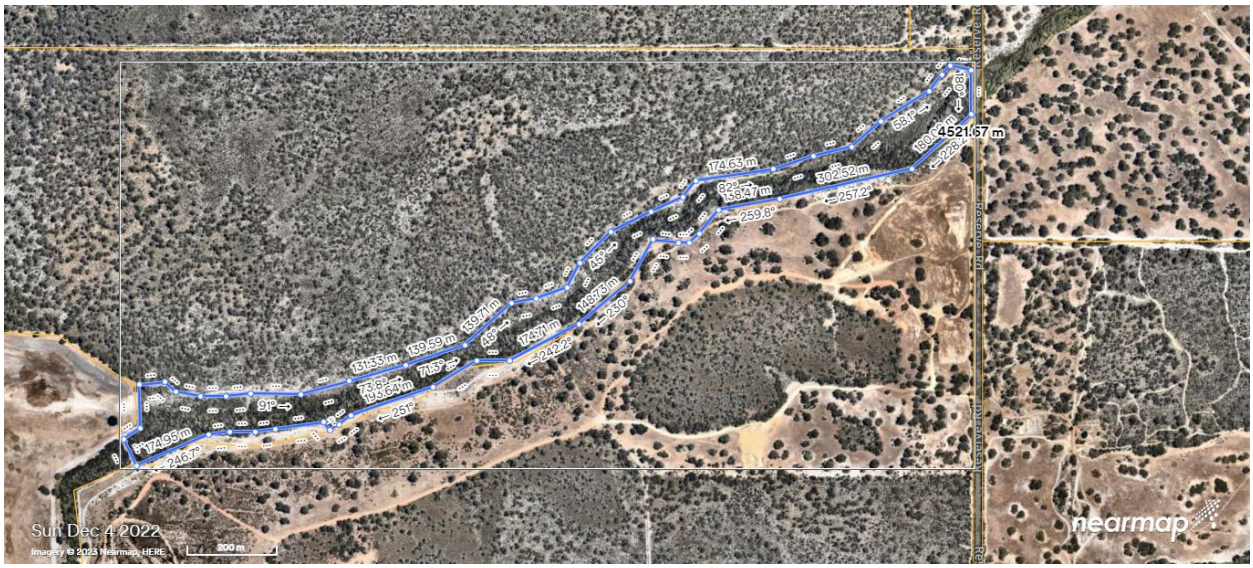

Figure 2. The area of riparian vegetation assessed along the Yalyal Brook Reserve.

3. Methods

A reconnaissance study was carried out along the track on the north side of the Brook on 23rd November 2022 followed by a more detailed inspection on the 8th February 2023. Photographs were taken at 100 metre intervals or when a change in the vegetation or soil type or condition was observed.

Some photographs were taken of the south side of the brook but boundary issues and difficult vehicle access prevented complete assessment of southern riparian area. However, a subsequent visit during which the Carter's Mussel monitoring occurred allowed for further assessment of the southern portion.

A survey of the vegetation was carried out every 100m and the species that could be identified were recorded.

A variation on the rapid assessment method as outlined by Luke Pen and Margaret Scott (1999) was used to record the condition of the brook at present.

The foreshore survey of Ellen Brook was carried out in April - May 2007 at the paddock scale with the foreshore condition, stream health and fencing status recorded. Not only did this provide baseline information, it enabled priorities to be set for long-term protection of the Ellen Brook and its tributaries and help to target areas that require rehabilitation. The Yalyal Brook is considered a major fresh water perennial tributary and a major target for protection and, if necessary, rehabilitation.

A number of characteristics were assessed including a general foreshore condition rating, a detailed condition rating, and the environmental rating indicating stream health.

4. Assessment

A visual assessment of the riparian vegetation was undertaken where the condition of the vegetation was recorded. This included photographic evidence provided of the structure, type and condition of the vegetation.

TABLE 2: PARAMETERS OF FORESHORE CONDITION

Foreshore Condition	Bank Vegetation	Verge Vegetation	Stream Cover	Bank Stability & sediment	Habitat Diversity	Erosion/ Siltation	Bank Steepness	Fencing
A. Pristine	Excellent	Excellent	Excellent	Excellent	Excellent	None	Very Steep	Yes
B. Degraded	Good	Good	Good	Good	Good	Points of cutting	Steep	No
C. Eroding or Erosion Prone	Moderate	Moderate	Moderate	Moderate	Moderate	Washouts	Moderate	
D. Ditch or Drain	Poor	Poor	Poor	Poor	Poor	Subsidence	Slight	
	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	Large deposits		

TABLE 3: CONDITION RATING SCALE FROM BUSH FOREVER (DEPARTMENT OF ENVIRONMENTAL PROTECTION, 2000)

Rating	Description	Explanation
1	Pristine	Pristine or nearly so, no obvious signs of disturbance.
2	Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
3	Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure covers repeated fire, aggressive weeds, dieback, logging, grazing.
4	Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure covers frequent fires, aggressive weeds at high density, partial clearing, dieback and grazing.
5	Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure includes frequent fires, presence of very aggressive weeds, partial clearing, dieback and grazing.
6	Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas often described as "parkland cleared" with the flora comprising weed or crop species with isolated native trees or shrubs.

5. Conclusion

The foreshore assessment would be categorised as A3.

> **"A3. Slightly Degraded** - Native vegetation dominates. Some areas of human disturbance where soil is exposed and weeds are relatively dense (ie. along tracks). Native vegetation would quickly recolonise if human disturbance declined."

Overall the riparian vegetation is in good to very good condition along the 2.2 kilometre length

Vegetation in the northern riparian area between the firebreak and Yalyal brook is mostly very good to good. Small areas near roadways are degraded and there is a patch midway on te northern portion that shows evidence of Dieback.

The assessment is considered on the following criteria:

> **"Very good:** Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure covers repeated fire, aggressive weeds, dieback, logging, historic grazing.
>
> **Good:** Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires; the presence of some very aggressive weeds at high density; partial clearing; dieback; grazing."

The banks of the brook were covered in Kikuyu (*Cenchrus clandestinus)* and in some places, *Paspalum sp* and *Lotus angustissimus?* However, this covering of Kikuyu does prevent the excessive erosion of the banks. Any rehabilitation and species replacement would need to be undertaken carefully and in short sections over a period of years to prevent erosion occurring.

An area of Dieback was apparent on the northern side of the brook with the loss and/or deterioration of some *Banksia species*, *Eucalyptus marginata ssp thalassica* and *Xanthorrhoea* sp.

6. References

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Keighery, B. (1994). *Bushland Plant Survey – A guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc.)

Pen, L.J. and Scott, M (1995). *Stream foreshore assessment in farming areas.* Blackwood Catchment Coordinating Group, Western Australia.

7. Appendix 1

TABLE 1: Species list recorded for the Yalyal Brook Riparian area in Ioppolo Road Reserve at the time of the study.

Genus	species	weed	common name
Acacia	*saligna*		
Alexgeorgea	*nitens*		
Allocasuarina	*humilis*		
Arctotheca	*calendula*	*	Capeweed
Avena	*barbata/fatua*	*	Wild Oats
Babingtonia	*?camphorosmae*		
Babingtonia	*?pelloeae*		
Banksia	*attenuata*		
Banksia	*dallanneyi*		
Banksia	*grandis*		
Banksia	*ilicifolia*		
Banksia	*menziesii*		
Baumea	*articulata*		
Baumea	*sp at crossing*		
Beaufortia	*elegans?*		
Billardiera	*fraseri*		
Briza	*minor*	*	
Briza	*maxima*	*	Blowfly grass
Calothamnus	*sanguineus*		
Cassytha	*sp*		
Cenchrus	*clandestinus*	*	Kikuyu
Conostephium	*pendulum*		
Conostephium	*preissii*		
Conostylis	*aculeata*		
Conostylis	*juncea*		
Conostylis	*setigera*		
Conyza		*	Fleabane
Corymbia	*calophylla*		
Cynodon	*dactylon*	*	Couch
Dampiera	*linearis*		
Dasypogon	*bromeliifolius*		
Daviesia	*angulata? hakeoides?*		
Desmocladus	*sp*		
Dielsia	*stenostachya*		
Drosera	*sp*		
Ehrharta	*calycina*	*	Perennial Veldt Grass
Eremaea	*pauciflora*		
Eucalyptus	*marginata ssp thalassica*		
Eucalyptus	*rudis*		
Ficus	*carica*	*	Fig

Gladiolus	*caryophyllaceus*	*	Pink gladiolus
Gompholobium	*knightianum*		
Grevillea??	*white flower*		
Haemodorum	*spicatum*		
Hakea	*lissocarpha*		
Hakea	*prostrata*		
Hemiandra	*linearis*		
Hibbertia	*sericosepala?*		
Hibbertia	*hypericoides*		
Hibbertia	*huegelii*		
Hovea	*pungens*		
Hovea	*trisperma*		
Hyalosperma	*cotula*		
Hypocalymma	*angustifolium*		
Hypochaeris	*sp*	*	Flatweed
Isolepis	*prolifera*	*	
Jacksonia	*floribunda*		
Jacksonia	*furcellata*		
Jacksonia	*sternbergiana*		
Juncus	*pallidus*		
Juncus	*pauciflorus?*		
Kennedia	*prostrata*		
Kunzea	*glabrescens*		
Lagenophora	*huegelii*		
Lechenaultia	*biloba*		
Lechenaultia	*floribunda*		
Lepidosperma	*longitudinale?*		
Leucopogon	*sp*		
Lobelia	*alata*		
Lomandra?			
Lyginia	*barbata*		
Lyginia	*imberbis*		
Macrozamia	*sp*		
Medicago	*sp*	*	Medic
Meeboldina	*scariosus*		
Melaleuca	*rhaphiophylla*		
Mesomelaena	*pseudostygia*		
Mesomelaena	*tetragona*		
Neurachne	*alopecuroidea*		
Paraserianthes	*lophantha*		
Paspalum	*sp*	*	
Petrophile	*linearis*		
Petrophile	*macrostachya*		
Petrophile	*striata*		
Phyllanthus	*calycinus*		

Pimelea	*floribunda*		
Pimelea	*imbricata*		
Podotheca	*gnaphalioides*		
Pteridium	*esculentum*		Bracken
Ptilotus	*drummondii?*		
Ptilotus	*stirlingii?*		
Rytidosperma	*sp*		Wallaby Grass
Scaevola	*repens*		
Schinus	*terebinthifolia*	*	Brazilian or Japanese Pepper
Solanum	*nigricans*	*	Blackberry Nightshade
Solanum	*americanum?*	*	
Stirlingia	*latifolia*		
Stylidium	*adpressum?*		
Stylidium	*neurophyllum*		
Styphelia	*pallida?*		
Synaphea	*spinulosa*		
Taxandria	*linearifolia*		
Tetraria (Morelotia)	*octandra*		
Tetratheca	*nuda*		
Thysanotus	*leafless fls Nov*		
Thysanotus	*manglesianus? patersonii?*		
Thysanotus	*sp*		
Trichocline	*spathulatum?*		
Tricoryne	*elatior*		
Tripterococcus	*brunonis*		
Urospermum	*picroides*	*	False Hawkbit
Ursinia	*anthemoides*	*	
Verticordia	*densiflora*		
Vicia	*sp*	*	Vetch?
Wahlenbergia	*capensis*	*	Cape Bluebell
Xanthorrhoea	*preissii*		
Xanthosia	*huegelii? ciliata?*		
Zantedeschia	*aethiopica*	*	Arum Lily
Lotus	*angustissimus?*	*	Lotus