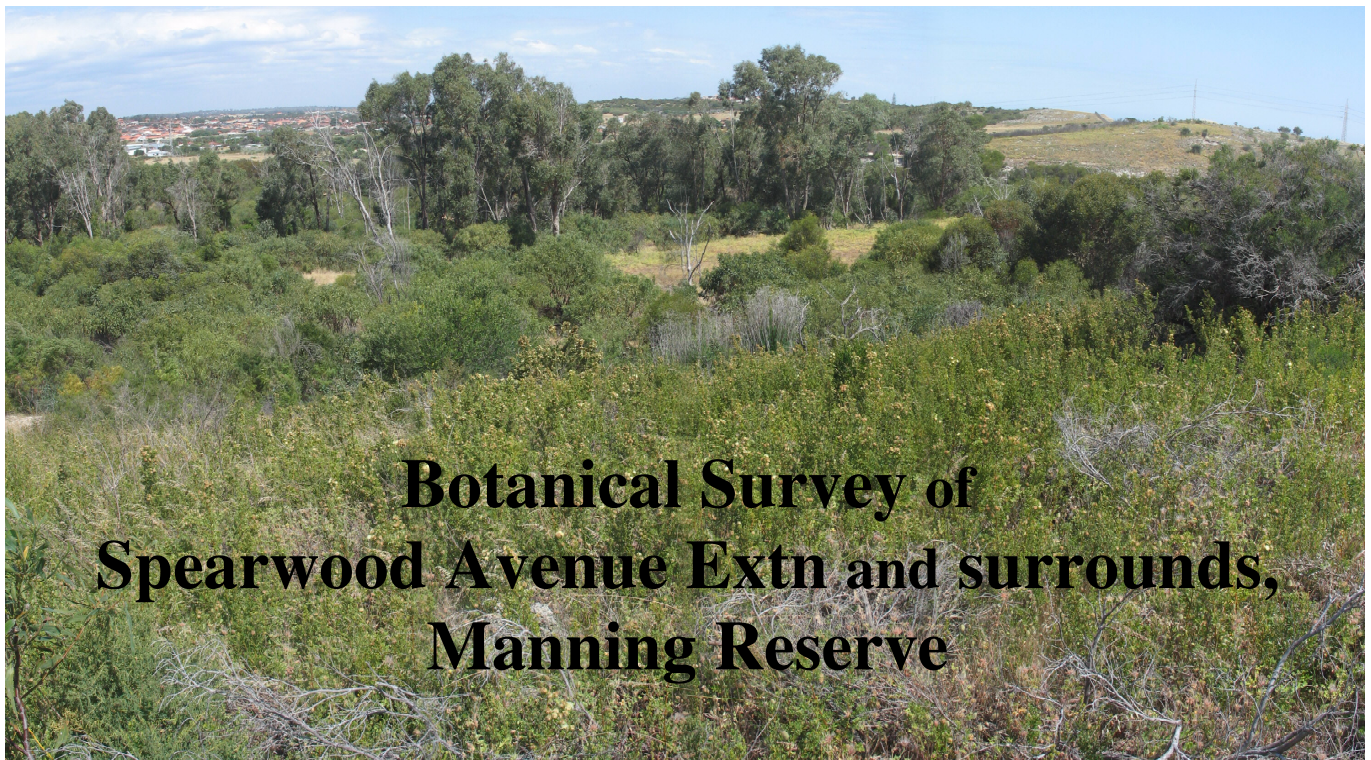


# Preliminary Report

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## Botanical Survey of Spearwood Avenue Extn and surrounds, Manning Reserve

View looking south-east from quadrat H  
across the old quarry site

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## **Introduction**

Regen4 Environmental Consultants were commissioned by the City of Cockburn to conduct a botanical survey along a part of the Spearwood Avenue extension that passes through the southern portion of Manning Reserve. At the same time to also survey the flora to the south between Spearwood Avenue extension and the railway. The purpose of this survey was to determine the vegetation communities, to assess the bushland condition and to document all flora with particular respect to any priority taxa.

## **Methodology**

The site was traversed on foot and both the vegetation type and structure, using the 'Classification System Used to Describe Vegetation Structure' (Keighery 1994), and the vegetation condition, using a combination of 'Keighery Condition Scale' (Keighery 1994) and 'Kaeshagen Condition Scale' (Kaeshagen 1994), were recorded.

Aerial photos were also studied to identify areas of past disturbance.

Best practice methodology was utilized to sample the vegetation which involved the establishment of a series of standard ten by ten metre (100 square metre) quadrats followed by a systematic and thorough collection of every taxon within each quadrat.

Quadrats were located to ensure that each vegetation type, or each separate occurrence of vegetation type, both within the proposed Spearwood Road extension and between the road extension and the railway would be sampled at least once. Specifically, quadrats were located to ensure that they:

were representative of the vegetation type

did not straddle the boundary to a different vegetation type

were in areas of the best condition bushland

had the highest possible diversity

Wooden jarrah stakes were used to mark the corners of each quadrat. The GPS co-ordinates of the north-west picket were taken. After the survey was completed, this stake was left in place as a permanent marker. Whenever possible, the north-west picket was also used as the photo point. A photo record of each quadrat was taken.

Taxa have been initially identified by D. Bright. Specimens of all taxa found have been submitted to the Herbarium for confirmation of Id.



## **Results**

23 different taxa have been identified within the eight quadrats and 33 voucher specimens submitted to the herbarium for confirmation of identification.

The current species list, obtained from the City of Cockburn, shows 50 taxa (plus 1 possibly introduced taxon) occurring on the Spearwood Sand and Spearwood Limestone, which together constitute the Spearwood Unit, (refer Appendix1) plus an additional 15 taxa on the Herdsman Unit (refer Appendix 2). None of these are priority taxa.

No priority taxa have been found.

## Site Details

### Quadrat A



Vegetation type is *Acacia rostellifera* tall open shrubland  
Vegetation condition is 'Fair'

Species identified were:

*Acacia rostellifera*

*Austrostipa elegantissima*

*Clematis linearifolia*

*Dianella revoluta*

*Spyridium globulosum*

*Xanthorrhoea preissii*

50% of the *Acacia rostellifera* is showing signs of senescence. However, there is considerable regrowth from suckers.

The understorey is weedy with wild oats, geraldton carnation, veldt grass and bridal creeper



## Quadrat B



Vegetation type is *Acacia rostellifera* closed tall scrub  
Vegetation condition is 'Fair'

Species identified were:

*Acacia rostellifera*

*Austrostipa flavescens*

*Dianella revoluta*

*Dryandra sessilis*

*Spyridium globulosum*

There is almost no understorey. 70% of the surface is covered with a layer of leaf litter.



## Quadrat C



Vegetation type is *Dryandra sessilis* closed heath with *Acacia pulchella*  
Vegetation condition is 'Good'

Species identified were:

*Acacia pulchella*

*Austrostipa flavescens*

*Dryandra sessilis*

*Olearia axillaries*

*Xanthorrhoea preissii*

This site was burnt during summer 02/03. *Dryandra sessilis* is killed by fire and there are numerous 4m tall skeletonized specimens. Subsequent to the fire, there has been extensive germination and there are currently in excess of 10 *Dryandra sessilis* juveniles/seedling stems per m<sup>2</sup>.



## Quadrat D



Vegetation type is *Dryandra sessilis* closed heath with *Acacia rostellifera* on a south facing slope.

Vegetation condition is 'Good'

Species identified were:

*Acacia cyclops*

*Acacia rostellifera*

*Acanthocarpus preissii*

*Dryandra sessilis*

*Santalum acuminatum*

This site was also burnt during summer 02/03. 75% of the quadrat is covered by 2m tall *Dryandra sessilis* juveniles.

## Quadrat E



Vegetation type is *Melaleuca huegelii*, *Dryandra sessilis*, *Acacia rostellifera*, *Spyridium globulosum* mixed tall open scrub on a north facing slope.

Vegetation condition is 'Good'

Species identified were:

*Acacia rostellifera*

*Austrostipa flavescens*

*Clematis linearifolia*

*Dianella revoluta*

*Dryandra sessilis*

*Leucopogon parviflorus*

*Melaleuca huegelii*

This site was also burnt during summer 02/03, however the *Melaleuca huegelii* at the highest point of the quadrat (limestone outcrop) survived the fire.



## Quadrat F



Vegetation type is *Dryandra sessilis* and *Templetonia retusa* tall shrubland on a south facing slope.

Vegetation condition is 'Fair'

Species identified were:

*Acacia cyclops*

*Acacia saligna*

*Austrostipa flavescens*

*Dianella revoluta*

*Dryandra sessilis*

*Leucopogon parviflorus*

*Olearia axillaris*

*Scaevola crassifolia*

*Templetonia retusa*

Not only was this site burnt during summer 02/03, aerial photos indicate that it was cleared or partly cleared during the early 1980,s



## Quadrat G



Vegetation type is *Xanthorrhoea preissii* open heath with *Dryandra sessilis*. Site is flat.  
Vegetation condition is 'Good'

Species identified were:

*Dryandra sessilis*

*Hovea pungens*

*Xanthorrhoea preissii*

All adult *Dryandra sessilis* were killed by the summer 02/03 fire. The ground surface is bare yellow sand with 20% limestone outcrop. Apart from a few minor weeds and the single specimen of *Hovea pungens*, there is almost a total absence of an understorey or herb layer.

## Quadrat H



Vegetation type is *Acacia rostellifera* mixed tall open scrub with *Acacia cyclops*, *Agonis flexuosa*, *Dryandra sessilis*, *Olearia axillaris* and *Spyridium globulosum*  
Vegetation condition is 'Good'

Species identified were:

*Acacia cyclops*  
*Acacia rostellifera*  
*Acacia saligna*  
*Agonis flexuosa*  
*Austrostipa flavescens*  
*Clematis linearifolia*  
*Dianella revoluta*  
*Dryandra sessilis*  
*Lepidosperma* sp (possibly *L. angustatum*)  
*Leucopogon parviflorus*  
*Melaleuca lanceolata* (?)  
*Olearia axillaris*  
*Spyridium globulosum*  
*Templetonia retusa*  
*Tricoryne elatior*

This is the most diverse of all the quadrats sampled with fifteen separate taxa being identified. The quadrat occurs at the edge of the area that was quarried during the early 1980's. It is possible that the *Agonis flexuosa* and *Melaleuca lanceolata*(?) are not natural but have recruited from revegetation work done at the end of the quarrying.



## **Discussion**

An additional two taxa have been identified in this survey that are not on the current City of Cockburn species list; namely *Agonis flexuosa*, Peppermint and *Santalum acuminatum*, Quandong. The occurrence of *Agonis flexuosa* is somewhat problematical. Whilst it naturally occurs on the Swan Coastal Plain, it is likely that this is not indigenous to Manning Reserve and is as a result of past plantings. (Bronwen Kheighery has made a similar comment about the *Melaleuca lanceolata*, Rottnest Island Teatree, growing in Manning Reserve)

The herb layer is poorly represented in the CoC species list but also particularly in the list of species from this current survey. The forb layer is totally absent, the only annuals being found were grasses and these were identified from dried desiccated specimens that would have been in flower in September. The evidence of rabbit activity is very high. It is possible that additional taxa would have been found in the herb layer if the survey was conducted in August/September but any such specimens have subsequently have been predated by rabbits or desiccated and disappeared.

The species diversity is low and this is probably as a result of the 02/03 fire. The species diversity immediately to the north of the survey area (an area that wasn't burnt), whilst not assessed in detail, is significantly higher and particularly where there is no competition from Bridal Creeper.

# Quadrat Species lists

## Manning Reserve Vegetation Survey - November/December 2006

<u>Vegetation Community</u>	Acacia rostellifera tall open shrubland	Acacia rostellifera closed tall scrub	Dryandra sessilis closed heath with Acacia pulchella	Dryandra sessilis closed heath with Acacia rostellifera	Melaleuca huegelii, Dryandra sessilis, Acacia rostellifera, Spyridium globulosum mixed tall open scrub	Dryandra sessilis and Templetonia retusa tall shrubland	Xanthorrhoea preissii open heath with Dryandra sessilis	Acacia rostellifera mixed tall open scrub with Acacia cyclops, Agonis flexuosa, Dryandra sessilis, Olearia axillaris and Spyridium globulosum
<u>Vegetation Condition</u>	Fair	Fair	Good	Good	Good	Fair	Good	Good
<u>quadrat no</u>	a	b	c	d	e	f	g	h
<u>Taxon name</u>								
1	Acacia cyclops			Acacia cyclops		Acacia cyclops		Acacia cyclops
2	Acacia pulchella		Acacia pulchella					
3	Acacia rostellifera	Acacia rostellifera		Acacia rostellifera	Acacia rostellifera			Acacia rostellifera
4	Acacia saligna					Acacia saligna		Acacia saligna
5	Acanthocarpus preissii			Acanthocarpus preissii				
6	Agonis flexuosa							Agonis flexuosa
7	Austrostipa elegantissima	Austrostipa elegantissima						
8	Austrostipa flavescens		Austrostipa flavescens	Austrostipa flavescens	Austrostipa flavescens	Austrostipa flavescens		Austrostipa flavescens
9	Clematis linearifolia	Clematis linearifolia			Clematis linearifolia			Clematis linearifolia
10	Dianella revoluta	Dianella revoluta	Dianella revoluta		Dianella revoluta	Dianella revoluta		Dianella revoluta
11	Dryandra sessilis		Dryandra sessilis	Dryandra sessilis	Dryandra sessilis	Dryandra sessilis	Dryandra sessilis	Dryandra sessilis
15	Hovea pungens						Hovea pungens	
16	Lepidosperma sp (poss. angustatum)							Lepidosperma sp
17	Leucopogon parviflorus				Leucopogon parviflorus	Leucopogon parviflorus		Leucopogon parviflorus
18	Melaleuca huegelii				Melaleuca huegelii			
19	Melaleuca lanceolata							Melaleuca lanceolata (?)
20	Olearia axillaris		Olearia axillaris			Olearia axillaris		Olearia axillaris
23	Santalum acuminatum			Santalum acuminatum				
24	Scaevola crassifolia					Scaevola crassifolia		
25	Spyridium globulosum	Spyridium globulosum	Spyridium globulosum					Spyridium globulosum
26	Templetonia retusa					Templetonia retusa		Templetonia retusa
27	Tricoryne elatior							Tricoryne elatior
28	Xanthorrhoea preissii	Xanthorrhoea preissii	Xanthorrhoea preissii				Xanthorrhoea preissii	

## **References**

Bronwen Keighery 1994: "Bushland Plant Survey", published by the Wildflower Society of WA (Inc.).



## Appendix 1: Manning Lake Species List – Spearwood Unit

	<u>GENUS</u>	<u>SPECIES</u>	<u>FAMILY</u>	<u>COMMON NAME</u>
1	Acacia	cyclops	Mimosaceae	Red-Eyed Wattle/Coastal Wattle
2	Acacia	lasiocarpa	Mimosaceae	
3	Acacia	rostellifera	Mimosaceae	
4	Acacia	saligna	Mimosaceae	Orange Wattle/Golden Wreath Wattle
5	Acacia	truncata	Mimosaceae	
6	Acanthocarpus	preissii	Dasypogonaceae	Prickle Lily
7	Adenanthos	cygnorum	Proteaceae	Woolly Bush
8	Alyogyne	huegelii (var. glabrescens)	Malvaceae	Lilac Hibiscus
9	Austrostipa (prev. Stipa)	elegantissima	Poaceae	Feather Speargrass
10	Calothamnus	quadrifidus	Myrtaceae	Crimson Cluster Netbrush
11	Cassytha	racemosa	Lauraceae	Dodder Laurel
12	Clematis	linearifolia (prev. microphylla)	Ranunculaceae	Small Leaved Clematis
13	Conostylis	candicans	Haemodoraceae	Cottonhead/White Conostylis
14	Dianella	revoluta (prev. divaricata)	Phormiaceae	Native Flax/ Flax Lily
15	Drosera	erythrorhiza	Droseraceae	Red Ink Sundew
16	Drosera	pallida	Droseraceae	Pale Rainbow Sundew
17	Dryandra	lindleyana	Proteaceae	Couch Honeygot
18	Dryandra	sessilis	Proteaceae	Parrot Bush
19	Eucalyptus	decipiens	Myrtaceae	Redheart/Marlock
20	Eucalyptus	gomphocephala	Myrtaceae	Tuart
21	Ficinia (prev. Isolepis)	nodosa	Cyperaceae	Knotted Club Rush
22	Grevillea	preissii (prev. thelemanniana)	Proteaceae	Spider Net Grevillea
23	Hakea	prostrata	Proteaceae	Harsh Hakea
24	Hardenbergia	comptoniana	Papilionaceae	Native Wisteria
25	Hibbertia	hypericoides	Dilleniaceae	Yellow Buttercups
26	Hovea	pungens	Papilionaceae	Devils pin
27	Lepidosperma	squamatum (prev. angustatum)	Cyperaceae	
28	Lepidosperma	angustatum (prev. pubisquamatum)	Cyperaceae	
29	Leucopogon	parviflorus	Epacridaceae	Coast Beard Heath
30	Lomandra	maritima	Dasypogonaceae	
31	Macrozamia	riedlei	Zamiaceae	Zamia Palm
32	Melaleuca	cuticularis	Myrtaceae	Saltwater Paperbark
33	Melaleuca	huegelii	Myrtaceae	Chenille Honeymyrtle
34	Melaleuca	lanceolata	Myrtaceae	Rottnest Island Tea Tree
35	Melaleuca	systema (prev. acerosa)	Myrtaceae	Coastal Honeymytle
36	Mesomelaena	pseudostygia	Cyperaceae	
37	Olearia	axillaris	Asteraceae	Coast Daisy Bush
38	Opercularia	vaginata	Rubiaceae	Dog Weed
39	Phyllanthus	calycinus	Euphorbiaceae	False Boronia
40	Ptilotus	drummondii	Armaranthaceae	Narrow Leafed Mulla Mulla
41	Ptilotus	polystachyus	Amaranthaceae	Prince of Wales Feather
42	Scaevola	anchusifolia	Goodeniaceae	
43	Scaevola	crassifolia	Goodeniaceae	Thick Leaved Fan Flower
44	Spyridium	globulosum	Rhamnaceae	Basket Bush
45	Stylidium	bulbiferum	Stylidiaceae	Circus Triggerplant
46	Templetonia	retusa	Papilionaceae	Cockies Tongues
47	Thomasia	cognata	Sterculiaceae	
48	Thysanotus	manglesianus	Anthericaceae	
49	Tricoryne	elatior	Anthericaceae	Yellow Autumn lily
50	Trymalium	ledifolium	Rhamnaceae	
51	Xanthorrhoea	preissii	Xanthorrhoeaceae	Grasstree

Source = City Of Cockburn (Authors = Bronwen Kheighery and various City of Cockburn employees)

## Appendix 2: Manning Lake Species List – Herdsman Unit

	<u>GENUS</u>	<u>SPECIES</u>	<u>FAMILY</u>	<u>COMMON NAME</u>
1	Atriplex	hypoleuca	Chenopodiaceae	
2	Baumea	juncea	Cyperaceae	Bare Twig Rush
3	Centella	asiatica (prev. cordifolia)	Umbelliferae	Indian Pennywort
4	Comesperma	integerrimum	Polygalaceae	
5	Cotula	coronopifolia	Asteraceae	Waterbuttons
6	Eucalyptus	gomphocephala	Myrtaceae	Tuart
7	Gahnia	trifida	Cyperaceae	Coast Saw-sedge
8	Gompholobium	tomentosum	Papilionaceae	Hairy Yellow Pea
9	Juncus	kraussii	Juncaceae	Sea Rush
10	Melaleuca	rhaphiophylla	Myrtaceae	Swamp or Freshwater Paperbark
11	Myoporum	caprarioides	Myoporaceae	Slender Myoporum
12	Samolus	repens	Primulaceae	
13	Sarcocornia	quinqueflora	Chenopodiaceae	Bearded Samphire
14	Solanum	symonii	Solonaceae	
15	Suaeda	australis	Chenopodiaceae	Suaeda, Seablite

Source = City Of Cockburn (Authors = Bronwen Kheighery and various City of Cockburn employees)

