Michael Rabbitt Application to clear native vegetation Lot 3361 on Deposited plan156362, Hill River (Reference CPS6716/1)

Initial flora survey conducted 30-01-2016.

Report prepared for Mr. Michael Rabbitt 164 Lennard Street Herne Hill W.A. 6056 by Donald Williams. Williams & Son. Tootbardi Road Badgingarra 6521

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Looking North showing a combination of environments

Contents.

- 1 Description of area.
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- 3 Priority flora explanation.
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Showing very small area of Banksia menziesii that will be retained in South East corner

1 Description of area

The area surveyed in

the South Western Corner of lot 3361 and excludes a cleared area for accommodation and mechanical plant operation. This the very south western corner of lot 3361 See map in section 4.

The soils are loamy to sandy and located mainly in the palusplains associated with the Hill River.

There does not appear to be any degree of salinization within the survey area.

Vegetation condition quote: Department of Environment Preliminary Assessment Report 2015. Very good (Keighery 1994). This is an accurate assessment using the Keighery scale.

It would appear the wetland effect has increased over the last 30 years as the property to the South and up slope has been cleared. This is based on the number of plant species from the family Proteaceae that are evident in the survey area.

Most of the Kwongan and Woodland species show no signs of regeneration in the survey area. This effect could be caused by either the density of the vegetation or more likely the high soil moisture level that would be present for most of the year. This would discourage the non-riparian species from regeneration.

There appears to be no evidence of Phytophthora infestation. It is important in a susceptible area such as this that this status be maintained using good hygiene practices.



Showing Parkland clearing on the adjoining cattle grazing property upslope to the South.

2 Flora list of native species and weed or introduced non native species

Property Michael Rabbitt Hill River Loc. 3361

Phytophthora evidence. No visual evidence.

Density of species code

L less than 2 plants per 100 x 2 meters M between 2-100 plants per 100 x 2 meters H greater than 100 plants100 x 2 meters

Species Name	Density	Comments
Acacia blakelyi	M	
Acacia pulchella	M	
Anarthria laevis	М	A true wet lands species
Anarthria Sp.	M	Most likely gracilis. A true wet lands species
Alexgeorgea subterranea	M	Only in drier areas
Allocasuarina humilis	М	Only in drier areas
Anigozanthos flava	M	
Banksia laricina	Н	
Banksia litoralis	Н	
Banksia menziesii	M	Only in drier areas
Banksia stenoprion	M	Not normally a wetland species
Beaufortia bracteosa	M	
Callitris arenaria	M	Not normally a wetland species
Cassytha glabella	Н	
Calothamnus quadrifidus	L	
Calytrix aureum	M	
Cassytha glabella	Н	Difficult to estimate
Conospermum wycherleyi	M	
Conostylis Sp.	M	
Calytrix fraseri	M	Flowering January
Eucalyptus todtiana	M	In white sand areas southern quarter
Gompholobium aristatum	M	yellow
Grevillea leucoptera	M	In poor condition, waterlogged
Grevillea vestita	M	
Glischrocaryon aureum	L	
Gyrostemon Sp.	L	Not expected
Hakea erinacea	Н	
Hakea varia	M	
Hibbertia mylnei	M	
Hypocalymma Sp.	М	
Isopogon linearis	М	Only in drier areas
Laxmannia squarrosa	М	

Lepidobolus Preissianus	M	
Lepidosperma longitudinale	Н	A true wet lands species
Macropidia fuliginosa	L	
Macrozamia fraseri	L	Juvenile
Melaleuca brevifolia	Н	
Melaleuca preissiana	M	Healthy large species
Melaleuca viminea	Н	
Nuytsia floribunda	M	In drier sections
Patersonia occidentalis.	M	
Scholtzia. involucrata s. lat.	M	
Stirlingia latifolia	M	Only in drier areas
Synaphea spinulosa	M	
Velia trinervis	M	
Verreauxia reinwardtii		On track surrounding site
Verticordia densiflora	M	
Xanthorrhoea preissii	M	Healthy in drier sections not doing well in wetter areas

Introduced species Non Native.

There appears to be no introduced species within the bushland surveyed.

On the access track adjoining the southern boundary fence the perennial species Paspalum distichum or couch grass occurs in small amounts.



Showing dense sedge and rush population with some dead and dying dryland species Flowering Melaleuca preissiana in background.

3 Priority flora explanation

Rare and Priority Flora with the potential to occur within cps 6716/1

Species name and conservat	ion status	Notes and explanation
Paracaleana dixonii	DRF	Occurs over granite Flowers January not sighted
Thelymitra stellata	DRF	Occurs Lesueur National Park and Cockleshell gully area
Therymitia Stellata	טאר	in locations not as wet as survey area.
Tuestimitus la prophisis	DDE	· · · · · · · · · · · · · · · · · · ·
Eucalyptus leprophloia	DRF	I am familiar with this species as I manage 1 population
Color and a second and a second	205	could not be missed owing to height.
Spirogardnera rubescens	DRF	I am familiar with this species occurs on Tootbardi Road
		and Marchagee Track in gravel only.
Eucalyptus absita	DRF	I am familiar with this species occurs on Badgingarra
		Dandaragan Road and Koonah Road I have conducted a
		count for CALM some 15 years ago.
Grevillea thelemanniana Sub	sp.	Has been recorded to the west on Cantabilling Road. Has
Cooljarloo	P1	been described as Plant Description, Notes: Radially
		spreading prostrate shrub; blue-green foliage, flowers
		red, leaves simple to divided. There do not appear to be
		any prostrate species of grevillea on this site.
Drosera allantostigma	P1	Has been recorded to the East on Cantabilling Road main
		population further upstream on Hill river near Brand
		Highway. Do not appear to be any Species of the genera
		Drosera at this site.
Goodenia xanthotricha	P2	Has only been recorded on well drained sites mainly
		hillsides and hilltops in rocky lateritic areas.
Arnocrinum gracillimum	P2	I am familiar with this species occurs on our Property Hi
-		Vallee occurs in deep white well drained sands.
Synaphea lesueurensis	P2	Has been recorded to the East on Cantabilling Road in
•		deep well drained white sand over laterite. Does appear
		to be only one species of the genera Synaphea on this
		site. Synaphea spinulosa. Main population to the North
		in Lesueur National Park.
Synaphea xela	P2	Has been recorded on Yeramullah Road in well drained
		white sand. Does appear to be only one species of the
		genera Synaphea on this site. Synaphea spinulosa.
Persoonia filiformis	P2	Occurs in well drained sites. Main population well north.
		There does not appear to be any species of the genera
		Persoonia on this site.
Stackhousia Sp. Red blotched	l corolla	Nearest recorded population over 20 Km. North in well-
The state of the s	P3	drained soil main population well south in granitic areas.
		There do not appear to be any species of the Genera
		Stackhousia at this site.
Tetratheca angulata	P3	Has only been recorded in well drained sites' both North
i chatitoca anguiata	. ,	and South in excess of 10 Km. There do not appear to be
		any species of the genera Tetratheca at this site.
		any species of the genera retrathera at this site.

ears to occur in more open sites than the dense tation at this site. There do not appear to be any
ies of the genera Haemodorum at this site.
ecords indicate that this species is a dryland sand
el species. There do not appear to be any species of
Genera Thysanotus this site
very familiar with this species as I manage a
lation on Hi Vallee. Soil type is not suitable for this
ies.
not appear to occur in wet lands prefers white
s and low Kwongan. Some records 7/8 Km distance
very familiar with this species as I manage a
lation on Hi Vallee. Occurs in clay to laterite in
ciation with lateritic Mesas Soil type is not suitable
nis species on the site.
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lation on Hi Vallee. Has a distinctive square stem
e name. Does not occur at site
peen recorded north end of Nylagarda road. The
cordia on site (densiflora) has small pinnate leaves
eas fragrans has medium ovate leaves. Not on site.
peen recorded north end of Nylagarda road. There
not appear to be any species of the genera
rostipa. This may change after fire or land clearing.
est recorded population western end of Cantabilling
. Does not appear to occur on site. Occurs in deeper
r sand.
rs in drier and more upslope areas. There is only
species of Gompholobium on this site. This being the
common Gompholobium aristatum. This may
ge after fire.
very familiar with this species as I have counted
in the Watheroo National Park. This species occurs
ry well drained white to yellow sand. Has different
and leaves to Verticordia densiflora.
not appear to have been recorded south of the
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e Genera Thysanotus this site
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nenotia on this site. This may change after fire.
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er east that this site
species has been recorded Just W of Brand Highway
species has been recorded Just W of Brand Highway antabilling Road. In well drained soil. There does not
antabilling Road. In well drained soil. There does not ar to be any species of the genera Conostephium on
antabilling Road. In well drained soil. There does not

Eucalyptus macrocarpa subs	p.	This species is extremely distinctive with large blue ovate
elachantha	P4	leaves. Does not occur on site
Thelymitra apiculata	P4	Appears to occur in well drained soil not on site
Grevillea rudis	P4	I am very familiar with this species as I manage a
		population on Hi Vallee. It occurs on very well drained
		lateritic soils. Does not occur at site
Desmocladus elongatus	P4	I am very familiar with this species as I manage a
_		population on Hi Vallee. It occurs on very well drained
		deep sandy soils. Does not occur at site.
Thysanotus glaucus	P4	Appears to occur in well drained sand. There do not
_		appear to be any species of the Genera Thysanotus this
		site
Eucalyptus Pendens	P4	I am very familiar with this species as I manage the
		largest single population of this species in Western
		Australia on Hi Vallee, occurs on high lateritic soils. Does
		not occur at site.
Calytrix chrysantha	P4	Appears to occur north of this site in well drained soils
		centred on Eneabba.
Hakea Neurophylla	P4	I am very familiar with this species as I manage a
		population of this species on Hi Vallee, It occurs on clay
		lateritic soils in conjunction with lateritic mesas. It has
		very distinctive nerved leaves hence the name. Does not
		occur at site.

All of the above species were searched for or eliminated owing to the environment at this site being unsuitable or totally contra to that required.



CPS 6716/1 - Palusplain Wetland

Showing area out lined with blue that is required for the proposed Marron Farm.

Note the cleared area to the south west corner referred to in section 1

5 Fauna

The resident fauna noted during daylight hours and notes on the effect of project were.

Western Grey Kangaroo. These appear to be using area as a means of gaining access to more open woodland to the South. Land clearing will not affect this.

Tiger snakes appear to inhabit the area. Tracks, noise and local knowledge indicate this. They would be feeding on frogs and marron. 2 historical ponds have a marron population. The project would increase the number of marron and possibly frogs.

Motor Bike Frog. This species is present as evident by sound. One could presume that other frog species are also present. Marron ponds with associated food will also be a habitat for these species. There is no need to control frog numbers in the Marron farming process.

A Whistling Kite was sited. One could presume that it was hunting frogs. If the frog population increases because of the ponds this will benefit Raptor species.

A number of ant colonies were sighted in the drier area. This is visible on map in section 4 and is in the South East corner. There will be no effect on these areas as the woodland species are to be retained. See notes in section 7. A number of ant colonies will have been lost over years with the rising water table making the habitat unsuitable for these species.

The area would be too wet for small marsupial species like Honey possums, Dunnarts and Ash grey mouse. One would presume that historically these species occurred and utilized the large number of nectar producing flora that is still evident.

6 Phytophthora management

Phytophthora management (Die Back) will be critical in an area as wet as this project. There does not appear to be any evidence of Phytophthora on this or the adjoining properties.

The main excavator to be used in the project has been sourced from the Greenbushes Tin mine. It is now housed at Herne Hill. It will be thoroughly cleaned of all soil debris before being transported to the Hill River.

All other equipment needed on site will be checked before coming on site.

I will be assisting Michael Rabbitt in the matter of Phytophthora management.

I have attended several training courses in this subject. I am the holder of a GREEN CARD trained in Phytophthora Die Back Hygiene No0000176 delivered by the Die Back working group. I am also a member of the Northern Sand Plains Die Back working group.



Showing Grevillea leucopteris dying from waterlogging effect.

Bibliography

Western Weeds, a guide to the weeds of Western Australia.

B.M.J Hussey G.J. Keighery R.D. Cousins J. Dodd S.G.Lloyd

How to know Western Australian Wildflowers. W.E. Blackall and B.J. Grieve

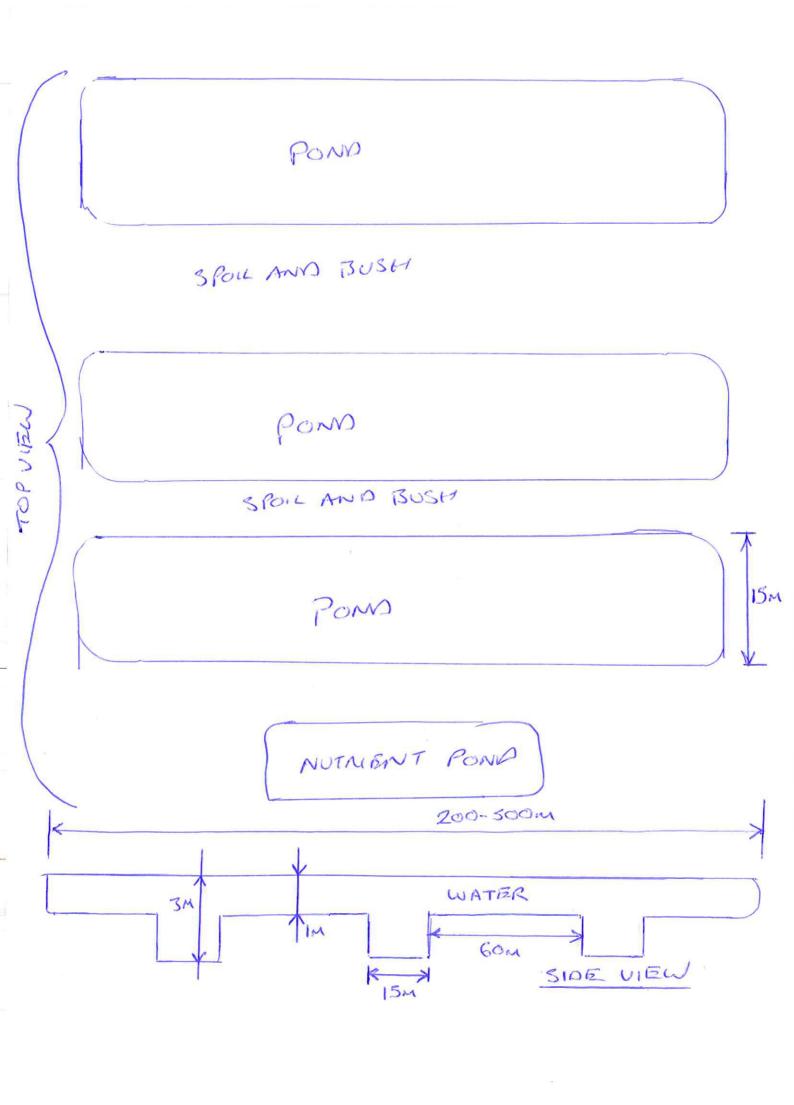
Hakeas of Western Australia. A field Guide and Identification Guide J.A. Young

Wildflowers of Southern Western Australia. Margaret G. Corrick. Bruce A Fuhrer.

and Alexander S George.

Hi-Vallee Farm flora list Donald Williams Joy Williams & Jolanda Keebles

Florabase - the Western Australian Flora



TO WHOM IT MAY CONCERN

I JOHN RABBITT GIVE MICHARE RABBITT AND

DOM WILLIAMS MY CONCENT FOR THEM TO ACT

ON MY BEHALF RECUMNING LAND CLEANING,

APPROVALS.

KIND REGUMNS

Phallett

Michael Rabbitt Application to clear native vegetation Lot 3361 on Deposited plan156362, Hill River (Reference CPS6716/1)

Report prepared for Mr. Michael Rabbitt 164 Lennard Street Herne Hill W.A. 6056 by Donald Williams. Williams & Son. Tootbardi Road Badgingarra 6521

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To address points raised by

Elysia Harradine Clearing Regulation Officer Clearing Regulation Department of Environment Regulation



Looking North showing a combination of environments including dying banksia also sedges and rushes.

To address the concerns listed below

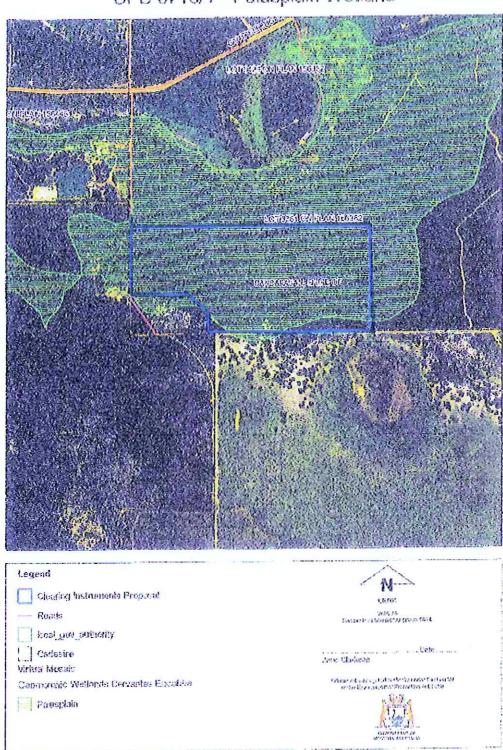
	nber 2015, it was noted that the proposed clearing:
1	□may impact conservation significant flora species;
	□is a significant remnant and ecological linkage within a highly ed area;
wetla	□is likely to deteriorate surface water quality of the palusplain nd and Hill River through the alteration of groundwater flow and ty; and
	□is likely to cause appreciable land degradation in the form of ty and eutrophication.

- It was also noted that the proposed land use of a marron farm has the potential transport nutrients off-site, causing eutrophication and pollution within the adjacent Hill River, and excavation within the application area may expose acid sulphate soils.
 - The flora has been surveyed and priority and DRF species searched for. None were located. It is obvious that the water table has risen in the prosed area over the last 40 years with land clearing. This has resulted in a reduction of the number of species. The more wet area (riparian) tolerant rushes and sedges have increased. The family Proteaceae has remnants in the waterlogged area that will not sustain for future generations. The original Kwongan to Woodland flora has been all but replaced by the sedge and rush species. There fore the original values no longer can apply.
 - 2 There is marginal value as a linkage as to the south is highly cleared cattle grazing land. The frog population should suffer minimal disturbance as the actual area of Ponds is insignificant in comparison to the total wet areas nearby. Once the Ponds are constructed it is accepted

- that a frog population will inhabit them as they do on farm dams. There does not appear to be any evidence of nest sites for water birds. It is accepted that some species of larger water birds will predate the Marron to a small degree.
- 3 No water will be extracted to fill the ponds and none pumped out with the ponds being constructed to make use of the static water level. This system will have a non-measurable effect on the surrounding massive water table. The water quality of the palusplain wetland and Hill River will not be effected as no water will be extracted or contributed to the surrounding area.
- 4 Salinity will not be altered as the evaporation on the area will remain constant as the ponds will be constructed in areas where surface water is currently evident. The problem of eutrophication will be managed by emptying the waste product from the bottom of the pond by pumping out and drying the material. This will be then used away from this site as high quality fertilizer in an area where it will not contribute to local eutrophication.
- The nutrients will be transported of site to an area that does not drain into the Hill River. The use of residue from crustaceans and other forms of aquatic farmed species is considered good agricultural practice as long as the product does not contaminate water ways. All the soil in the general area is acidic. As the construction of the ponds will not involve movement of soils of site. No problem is envisaged with the slightly acidic siols..

My knowledge of the above subject relates to the fact that I have been involved in previous land clearing applications in this area for the purpose of Marron Farming.

I have been involved in the construction of a large Marron Farm on Banovich Road with 14 large ponds. In this project that is part of a dry land farm the waste product was harvested and used to grow pasture for livestock.



CPS 6716/1 - Palusplain Wetland

Showing area out lined with blue that is required for the proposed Marron Farm. Note the cleared area to the south west corner that has contributed to the rising water table in the.

Phytophthora management

Phytophthora management (Die Back) will be critical in an area as wet as this project. There does not appear to be any evidence of Phytophthora on this or the adjoining properties.

The main excavator to be used in the project has been sourced from the Greenbushes Tin mine. It is now housed at Herne Hill. It will be thoroughly cleaned of all soil debris before being transported to the Hill Rive site.

All other equipment needed on site will be checked for cleanliness before coming on site.

I will be assisting Michael Rabbitt in the matter of Phytophthora management.

I have attended several training courses in this subject. I am the holder of a GREEN CARD trained in Phytophthora Die Back Hygiene No0000176 delivered by the Die Back working group. I am also a member of the Northern Sand Plains Die Back working group.

Species name and conserva	tion status	Notes and explanation
Paracaleana dixonii	DRF	Occurs over granite Flowers January not sighted
Thelymitra stellata	DRF	Occurs Lesueur National Park and Cockleshell gully area
		in locations not as wet as survey area.
Eucalyptus leprophloia	DRF	I am familiar with this species as I manage 1 population
		could not be missed owing to height.
Spirogardnera rubescens	DRF	I am familiar with this species occurs on Tootbardi Road
		and Marchagee Track in gravel only.
Eucalyptus absita	DRF	I am familiar with this species occurs on Badgingarra
		Dandaragan Road and Koonah Road I have conducted a
		count for CALM some 15 years ago.
Grevillea thelemanniana Su	bsp.	Has been recorded to the west on Cantabilling Road. Has
Cooljarloo	P1	been described as Plant Description, Notes: Radially
•		spreading prostrate shrub; blue-green foliage, flowers
		red, leaves simple to divided. There do not appear to be
		any prostrate species of grevillea on this site.
Drosera allantostigma	P1	Has been recorded to the East on Cantabilling Road main
		population further upstream on Hill river near Brand
		Highway. Do not appear to be any Species of the genera
		Drosera at this site.
Goodenia xanthotricha	P2	Has only been recorded on well drained sites mainly
		hillsides and hilltops in rocky lateritic areas.
Arnocrinum gracillimum	P2	I am familiar with this species occurs on our Property Hi
		Vallee occurs in deep white well drained sands.
Synaphea lesueurensis	P2	Has been recorded to the East on Cantabilling Road in
		deep well drained white sand over laterite. Does not
		appear to be any species of the genera Synaphea on this
		site. Main population to the North in Lesueur National
		Park.
Synaphea xela	Р2	Has been recorded Yeramullah Road in well drained
		white sand. Does not appear to be any species of the
		genera Synaphea on this site.
Persoonia filiformis	P2	Occurs in well drained sites. Main population well north.
		There does not appear to be any species of the genera
		Persoonia on this site.
Stackhousia Sp. Red blotche		Nearest recorded population over 20 Km. North in well-
	Р3	drained soil main population well south in granitic areas.
		There do not appear to be any species of the Genera
· · · · · · · · · · · · · · · · · ·	na	Stackhousia at this site.
Tetratheca angulata	Р3	Has only been recorded in well drained sites' both North
		and South in excess of 10 Km. There do not appear to be
	D2	any species of the genera Tetratheca at this site.
Haemodorum loratum	Р3	Appears to occur in more open sites than the dense
		vegetation at this site. There do not appear to be any
		species of the genera Haemodorum at this site.

Thysanotus anceps P3	All records indicate that this species is a dryland sand
	gravel species. There do not appear to be any species of
	the Genera Thysanotus this site
Drosera marchantii subsp. Prophylla	I am very familiar with this species as I manage a
Р3	population on Hi Vallee. Soil type is not suitable for this
	species.
Phlebocarya pilosissima subsp.	Does not appear to occur in wet lands prefers white
pilosissima P3	sands and low Kwongan. Some records 7/8 Km distance
Hakea longiflora P3	I am very familiar with this species as I manage a
	population on Hi Vallee. Occurs in clay to laterite in
	association with lateritic Mesas Soil type is not suitable
	for this species on the site.
Lepidobolus quadratus P3	I am very familiar with this species as I manage a
	population on Hi Vallee. Has a distinctive square stem
	hence name. Does not occur at site
Verticordia fragrans P3	Has been recorded north end of Nylagarda road. The
-	Verticordia on site (densiflora) has small pinnate leaves
•	whereas fragrans has medium ovate leaves. Not on site.
Austrostipa Sp. Cairn Hill P3	Has been recorded north end of Nylagarda road. There
•	does not appear to be any species of the genera
	Austrostipa. This may change after fire.
Stylidium torticarpum P3	Nearest recorded population western end of Cantabilling
	Road. Does not appear to occur on site. Occurs in deeper
	dryer sand.
Gompholobium gairdnerianum P3	Occurs in drier and more upslope areas. There does not
	appear to be any species of the genera Gompholobium
	on this site. This may change after fire.
Verticordia insignis Subsp. eomagis P3	I am very familiar with this species as I have counted
• • •	many in the Watheroo National Park. This species occurs
	in very well drained white to yellow sand. Has different
	form and leaves to Verticordia densiflora.
Thysanotus vernalis P3	Does not appear to have been recoded south of the
•	Jurien East Road There do not appear to be any species
	of the Genera Thysanotus this site
Guichenotia alba P3	There does not appear to be any species of the Genera
	Guichenotia on this site. This may change after fire.
Banksia subulata P3	I am very familiar with this species as I have I have
	collected the species for research purposes. Mast A.R.
	Williams D. Coll. No. 629 This species occurs considerably
	further east that this site
Conostephium magnum P4	This species has been recorded Just W of Brand Highway
•	on Cantabilling Road. In well drained soil. There does not
	appear to be any species of the genera Conostephium on
	site.
Banksia elegans P4	Occurs from the North boundary of Dandaragan shire
_	Northwards to Irwin. Would not be at this site
Eucalyptus macrocarpa subsp.	This species is extremely distinctive with large blue ovate
elachantha P4	leaves. Does not occur on site
Thelymitra apiculata P4	Appears to occur in well drained soil not on site

Grevillea rudis	P4	I am very familiar with this species as I manage a population on Hi Vallee. It occurs on very well drained
		lateritic soils. Does not occur at site
Desmocladus elongatus	P4	I am very familiar with this species as I manage a
		population on Hi Vallee. It occurs on very well drained
		deep sandy soils. Does not occur at site.
Thysanotus glaucus	P4	Appears to occur in well drained sand. There do not
		appear to be any species of the Genera Thysanotus this
		site
Eucalyptus Pendens	P4	I am very familiar with this species as I manage the
		largest single population of this species in Western
		Australia on Hi Vallee, occurs on high lateritic soils. Does
		not occur at site.
Calytrix chrysantha	P4	Appears to occur north of this site in well drained soils centred on Eneabba.
Hakea Neurophylla	P4	I am very familiar with this species as I manage a
• •		population of this species on Hi Vallee, It occurs on clay
		lateritic soils in conjunction with lateritic mesas. It has
		very distinctive nerved leaves hence the name. Does not
		occur at site.