Flora and Vegetation Survey of Remnant Vegetation (Southwest of M74/57)

Prepared for Western Areas NL

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Draft

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1 Introduction

Western Areas NL (WSA) tenements at the Forrestania Nickel Project are located approximately 170 km south of Southern Cross, 80km east of Hyden and stretch 80km along the Forrestania Nickel Province.

WSA recently purchased farmland which they propose to utilise for infrastructure. Botanica Consulting (BC) was commissioned by WSA to conduct a flora and vegetation survey of the remnant vegetation within this farmland. A map of the area is included in Appendix 1.

1.1 Topography

WSA tenements are located in the Forrestania system within the Mallee Botanical District of the South-West Botanical Province (Beard, 1990). The Forrestania system is developed on the greenstone belt, which extends from Mt Holland in the north to Hatters Hill in the south. This system encompasses a variety of communities related to the underlying geology and occurs in a mosaic form (Beard 1990).

1.2 Vegetation

In this system, eucalypt woodlands and small salt lakes on the heavy soils and mallees on the elevated lateritic soils inhabit weathered greenstones. The North, Middle and South Ironcap hills break up the relatively featureless topography and comprise ridges of banded ironstone supporting distinctive heath and thicket associations (Beard 1990). A large watershed extends along the ironcap hills, with expansive *Banksia, Grevillea* and *Hakea* sandplain mallee heaths occurring west to the Rabbit Proof Fence and Eucalypt woodlands and mallee mosaics to the east. Encompassed within the sandplain heaths, eucalypt woodlands and mallee heaths inhabit the drainage lines trending south and west (Aquila, 1989). The South-West Botanical Province is characterised by plants from the *Myrtaceae, Proteaceae, Mimosaceae, Papilionaceae, Epacridaceae, Dilleniaceae, Rutaceae, Asteraceae,* and *Cyperaceae* families.

1.3 Objectives

The objectives of this report were to:

- To survey the proposed area for Priority Flora
- Identify and collect the vascular plant taxa in the survey area.
- Provide a description of the vegetation groups occurring within the survey area.
- Assess the vegetation condition according to Keighery (1994).
- Assess the survey area with regard to the relevant clearing principles related to clearing native vegetation as outlined in Schedule 5 attached to the *Environmental Protection Act 1986.*

2 Methods

BC was commissioned on the 13th of December 2007 by WSA, to conduct a flora and vegetation survey within remnant vegetation of recently purchased farmland. An approximate total area of 378ha was traversed using the random meandering technique. The survey was carried out in accordance with BC's Safety and Environmental Management Plans.

This flora survey of the study area was planned and implemented as far as practicable according to the Environmental Protection Authority (EPA) Guidance Statement No. 51 *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*, (EPA 2005).

Prior to the field survey, the results of the combined search of the Department of Environment and Conservation's (DEC) Declared Rare and Priority Flora databases (DEC, 2007) was examined for species recorded within the known coordinates shown in Appendix 2. Significant species noted in this search were then examined on the Western Australian Herbarium's web page (WAHERB, 2007). Descriptions outlining the typical vegetation and landscape features associated with the DRF and Priority Flora were noted from this webpage.

Table 1 represents the definitions of Declared Rare and Priority ratings as extracted from DEC (DEC, 2007).

Table 1: Definitions of Rare and Priority Flora Species (DEC, 2007).

R: Declared Rare Flora - Extant Taxa (= Threatened Flora = Endangered + Vulnerable)
Taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
X: Declared Rare Flora - Presumed Extinct Taxa
Taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
P1: Priority One - Poorly Known Taxa
Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2: Priority Two - Poorly Known Taxa
Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3: Priority Three - Poorly Known Taxa
Taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
P4: Priority Four - Rare Taxa
Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.

Initial sample points were chosen prior to field work via aerial photography. Obvious differences in the vegetation assemblages were identified, and differences in vegetation associations were then ground truthed during the survey.

When in the field BC used a method of combining both a random meander technique (Cropper, 1993) and a quantitative technique. The random meander technique was used generally across the survey area. This technique can allow for greater coverage than a plot based survey and is less time consuming (NPWS, 2001). As the name suggests, the random meander technique involves traversing areas of suitable habitat in no set pattern, but roughly back and forth, whilst recording the different species present. Quantitative vegetation analysis was achieved (although quadrats were not setup) via utilizing sample points that were marked with a GPS unit.

The sample locations and GPS coordinates recorded during the survey are outlined in Appendix 3.

At each sample point, information recorded comprised of the following:

- GPS location
-Photograph of representative vegetation
-Visual identification of plants within a 50m radius (where applicable)
-Dominant species
-Collection and documentation of unknown plant specimens
- GPS location, photograph and collection of Threatened Flora if encountered

Presence/absence data of species from sample sites of similar vegetation was then compiled forming the best representative vegetation groups. Similar vegetation groups were recognised visually in the field.

2.1 Limitations to the Survey

The main limitations to this survey are as follows:

- The vegetation groups for this study were based on visual descriptions of locations in the field. The distribution of these vegetation groups outside the study area is not known, however vegetation groups identified in the field were categorized via comparison to the best representative vegetation distributions throughout WA given on Australian Natural Resources Atlas (ANRA, 2008).

- Field work was not completed at the EPA's recommended time period for detecting most ephemeral flora for the survey. However most but not all species were in the later flowering stage. Rainfall was above average for the months of October and December 2007 (Figure 1).

- In the opinion of BC the survey area was covered extensively but not exhaustively. BC estimate that approximately 90% of the flora species in the survey area were recorded. This estimation takes into account the intensity of the survey work, the experience of the Botanist undertaking the work and the rainfall recorded.

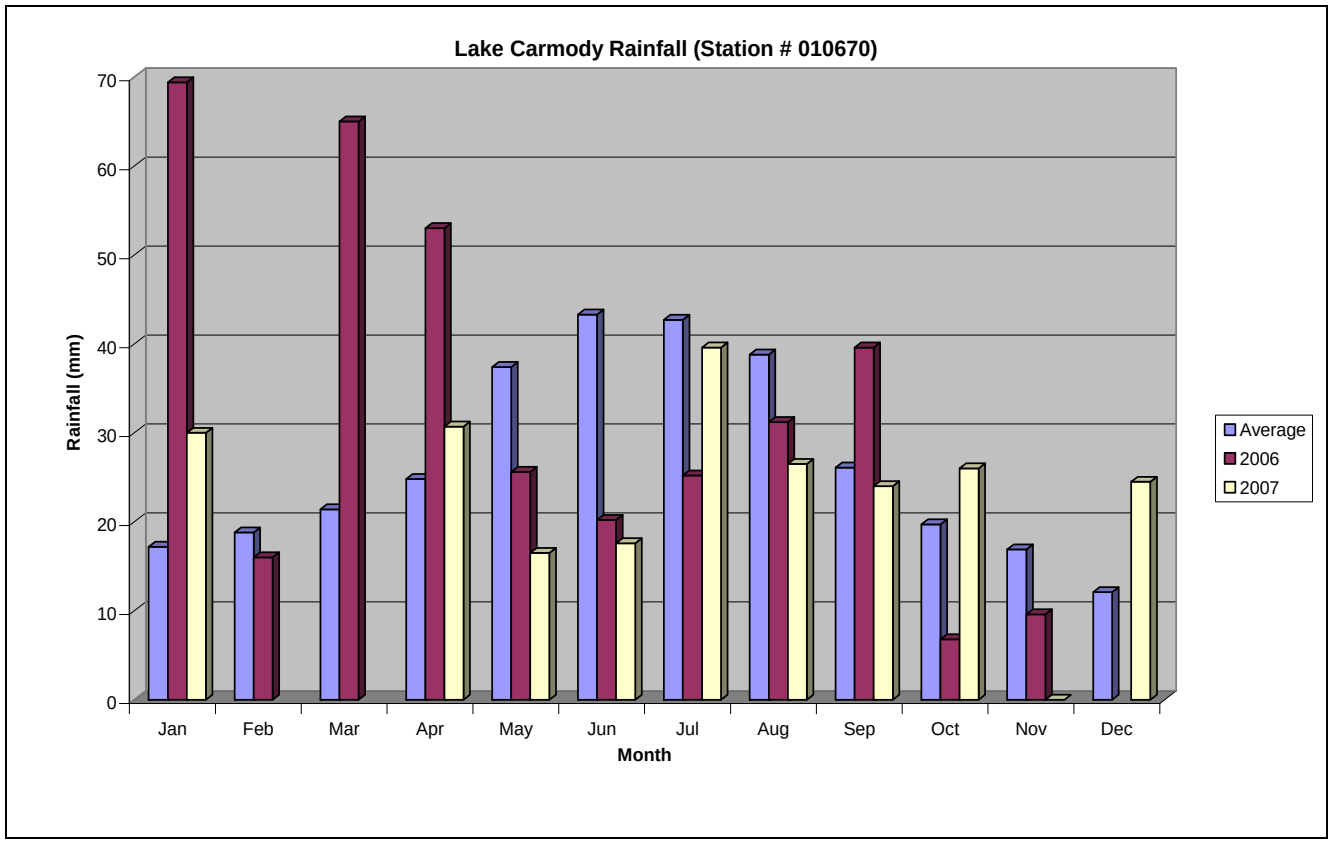

Figure 1: Total monthly rainfall for Lake Carmody (Station # 010670), for 2006 and 2007 (BOM, 2008).

3 Results

Four vegetation groups were encountered within the survey area, Salmon Gum woodland, Mallee woodland, Heath land vegetation and Dryandra heath land. The dominant families were Myrtaceae, Proteaceae, Mimosaceae and Papilionaceae.

The vegetation group was comprised of 23 Families, 38 Genera and 90 Species in total. No DRF were recorded in the area however two Priority Flora were recorded, Dillwynia acerosa (P1) and Dryandra ferruginea ssp flavescens (P3).

3.1 Salmon Gum Woodland

3.1.1 Flora

Flora recorded in the Salmon Gum woodland vegetation group was represented by 12 Families, 17 Genera and 38 Species (Appendix 4) and covered an area of approximately 279.3ha.

No Declared Rare Flora species, pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act (1950)* and as defined by the DEC (Atkins, 2006) were found in the area surveyed.

No Priority Flora Species as defined by DEC (Atkins, 2006) were located in this vegetation group during the survey.

The area has no national environmental significance as defined by the Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act* 1999 (DEWHA, 2008).

3.1.2 Vegetation

The flora was representative of Salmon Gum woodland vegetation. The dominant species was *Eucalyptus salmonophloia.*

Vegetation assemblages according to Muir (1977) can be seen in table 2 below.

Table 2: Vegetation assemblages according to Muir (1977) for the vegetation group.

Life Form/Height Class	**Canopy Cover**	**Dominant species present**
Trees >30	10-30%	*Eucalyptus salmonophloia*
Shrub > 2m	10-30%	*Acacia coolgardiensis, A. jennerae*
Shrubs 1.5-2m	10-30%	*Melaleuca acuminata, M. pauperiflora ssp pauperiflora*
Shrub 0.5-1m	10-30%	*Eremophila decipiens, ssp decipiens, Daviesia benthamii*
Shrub < 0.5m	10-30%	*Westringia cephalantha, W. rigida, Phebalium tuberculosum*
Sedges >0.5m	2-10%	*Lepidosperma drummondii, L. brunonianum*

This vegetation group is classed as “Tall woodland” according to Muir (1977).

Broad scale clearing of this vegetation group has occurred in the area for agricultural purposes; however this vegetation group is well represented within the undisturbed native vegetation situated to the east of the survey area.

This vegetation is best represented by the *Eucalyptus* woodlands vegetation group according to ANRA, which covers 3.5% of the State of Western Australia (ANRA, 2008).

Figure 2 – Salmon Gum woodland

3.2 Mallee Woodland

3.2.1 Flora

Flora recorded in the Mallee woodland vegetation group was represented by 11 Families, 17 Genera and 36 Species (Appendix 4) and covered an area of approximately 85.2ha.

No Declared Rare Flora species, pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act (1950)* and as defined by the DEC (Atkins, 2006) were recorded in the area surveyed.

One Priority Flora Species, *Dillwynia acerosa* (P1), was recorded at the location shown in Appendix 5.

The area has no national environmental significance as defined by the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (DEWHA, 2008).

3.2.2 Vegetation

The dominant species was *Eucalyptus eremophila subsp. Eremophila*

Vegetation assemblages according to Muir (1977) can be seen in table 2 below.

Table 3: Vegetation assemblages according to Muir (1977) for the vegetation group.

Life Form/Height Class	**Canopy Cover**	**Dominant species present**
Mallee Tree Form	10-30%	*Eucalyptus eremophila subsp. eremophila*
Shrubs 1.5-2m	10-30%	*Melaleuca acuminata, M. pauperiflora ssp pauperiflora, Hakea francisiana*
Shrub 0.5-1m	10-30%	*Eremophila decipiens, ssp decipiens, Daviesia benthamii, Daviesia nematophylla*
Shrub < 0.5m	10-30%	*Westringia cephalantha, W. rigida, Phebalium tuberculosum, Acacia erinacea*
Sedges >0.5m	2-10%	*Lepidosperma drummondii, L. brunonianum*

Broad scale clearing of this vegetation group has occurred in the area for agricultural purposes;

however this vegetation group is well represented within the undisturbed native vegetation situated to the east of the survey area.

This vegetation is best represented by the Mallee woodland vegetation group according to ANRA, which covers 2% of the State of Western Australia (ANRA, 2008).

Figure 3 – Mallee woodland

3.3 Heathland Vegetation

3.3.1 Flora

Flora recorded in the Heathland vegetation group was represented by 19 Families, 26 Genera and 46 Species (Appendix 4) and covered an area of approximately 5.7ha.

No Declared Rare Flora species, pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act (1950)* and as defined by the DEC (Atkins, 2006) were found in the area surveyed.

No Priority Flora Species defined by DEC (Atkins, 2006) was located during the survey.

The area has no national environmental significance as defined by the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (DEWHA, 2008).

3.3.2 Vegetation

The vegetation recorded in this community was representative of Heathland. The dominant species was *Allocasuarina campestris.*

Vegetation assemblages according to Muir (1977) can be seen in table 2 below.

Table 4: Vegetation assemblages according to Muir (1977) for the vegetation group.

Life Form/Height Class	Canopy Cover	Dominant species present
Shrub > 2m	10-30%	*Allocasuarina campestris*
Mallee tree form	2-10%	*Eucalyptus pileata*
Shrubs 1.5-2m	10-30%	*Eremophila decipiens ssp decipiens*
Shrub 0.5-1m	10-30%	*Eremophila decipiens, ssp decipiens, Daviesia benthamii, Gastrolobium spinosum*
Shrub < 0.5m	10-30%	*Phebalium tuberculosum, P. megaphyllum*
Sedges >0.5m	2-10%	*Lepidosperma brunonianum*

Broad scale clearing of this vegetation group has occurred in the area for agricultural purposes; however this vegetation group is well represented within the undisturbed native vegetation situated to the east of the survey area.

This vegetation is best represented by the Heathland vegetation group according to ANRA, which covers less than 0.7% of the State of Western Australia (ANRA, 2008).

Figure 4 – Photograph of Heathland vegetation

3.4 *Dryandra* Heath

3.4.1 Flora

Flora recorded in the open *Dryandra* heath vegetation group was represented by 6 Families, 12 Genera and 17 Species (Appendix 4) and covered an area of approximately 8.1ha.

No Declared Rare Flora species, pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act (1950)* and as defined by the DEC (Atkins, 2006) were found in the area surveyed.

One Priority Flora Species, *Dryandra ferruginea ssp flavescens* (P3), was recorded at the locations listed in Appendix 5.

The area has no national environmental significance as defined by the Commonwealth *EPBC Act* 1999 (DEWHA, 2008).

3.4.2 Vegetation

The dominant species in the upper storey were *Dryandra cirsioides, D. erythrocephala var. erythrocephala, D. ferruginea subsp. flavescens (P3).*

Vegetation assemblages according to Muir (1977) can be seen in table 2 below.

Table 5: Vegetation assemblages according to Muir (1977) for the vegetation group

Life Form/Height Class	**Canopy Cover**	**Dominant species present**
Shrub > 2m	10-30%	*Dryandra cirsioides,*
Shrubs 1.5-2m	10-30%	*Dryandra erythrocephala var. erythrocephala, Dryandra ferruginea subsp. flavescens (P3)*
Shrub 0.5-1m	10-30%	*Gastrolobium parviflorum*

Broad scale clearing of this vegetation group has occurred in the area for agricultural purposes; however this vegetation group is well represented within the undisturbed native vegetation situated to the east of the survey area.

This vegetation is best represented by the Heath vegetation group according to ANRA, which covers less than 0.7% of the State of Western Australia (ANRA, 2008).

Figure 5 – Photograph of Dryandra heath

4 Vegetation condition

The Vegetation condition of the Salmon Gum Woodland within the area surveyed by Botanica Consulting is classed as being in a "very good" health condition (Keighery, 1994). A 'very good' health condition depicts that the health condition was altered due to obvious signs of disturbance. This disturbance was in the form of grazing and clearing for farmland.

The Vegetation condition of the Mallee Woodland, Heathland vegetation and *Dryandra* Heath within the area surveyed by Botanica Consulting is classed as "degraded" health condition. "Degraded" health condition depicts that the structure is severely disturbed. It has the ability to regenerate to a good condition however this requires intensive management (Keighery, 1994). Disturbances were in the form of grazing and clearing for farmland.

5 Introduced Species

One weed species was recorded in the survey area, *Brassica tournefortii* (Mediterranean Turnip).

The Department of Agriculture and Food does not class this species as a declared weed (DAF, 2007).

6 Threatened Flora

Two Priority Flora species were recorded in the survey area. *Dryandra ferruginea ssp flavescens* (P3) and *Dillwynia acerosa* (P1) were recorded at locations shown in Appendix 5.

- *Dryandra ferruginea ssp flavescens* (P3)

This species is described as a prostrate, lignotuberous shrub, to 0.45 m high producing cream/yellow flowers during July through August. It occurs on sandy loam or sand with gravel.

Figure 6: Photo of *Dryandra ferruginea ssp flavescens* (P3).

- *Dillwynia acerosa* (P1)

This species is described as a shrub, to 0.5 m high, producing yellow or red flowers in September. It occurs in gravelly clay with laterite.

Figure 7: *Dillwynia acerosa* (P1) sampled from within the survey area.

7 Discussion

The survey of the combined areas resulted with four vegetation groups which comprised of 23 Families, 38 Genera and 90 Species and covering a total survey area of 378ha.

No Declared Rare Flora species, pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act (1950)* and as defined by the DEC (Atkins, 2007) were found in the area surveyed.

Two Priority Flora species were recorded in the survey area *Dillwynia acerosa* (P1) and *Dryandra ferruginea ssp flavescens* (P3).

No vegetation communities recorded within the proposed clearing area which was surveyed are considered to have regional environmental significance as defined by the Commonwealth *EPBC Act 1999* (DEWHA, 2008).

7.1 Recommendations/Conclusions

BC recommends that clearing be avoided where Priority Flora occur.

BC submits comments relating to the relevant clearing principals as follows:

(a) **Native vegetation should not be cleared if it comprises a high level of biological diversity.**

As stated in the Biodiversity Audit of Western Australia's 53 Biogeographical Subregions (CALM, 2002), Eucalypt woodlands in this Mallee 2 subregion have a particularly high floristic diversity and contain a high proportion of Declared Rare Flora. This survey revealed diverse flora that are not restricted to the project area but occur across the region.

The total survey area is approximately 378 ha of remnant vegetation. Proposed activities within the farmland involve the establishment of infrastructure which may encroach into the native vegetation. WSA is committed to limiting the amount of remnant native vegetation required for clearing.

(c) **Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.**

No DRF were recorded in the survey area

(d) **Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of a threatened ecological community (TEC).**

The definition of a Threatened Ecological Community (TEC) for the purposes of the clearing principles is defined under Regulation 7 of the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. No TECs that fall within this definition are located in the survey area. According to the DEWHA protected matters search tool, no TECs as listed for the purposes of protection under the EPBC Act 1999 are located in the survey area.

(e) **Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared**

Vegetation considered as a significant remnant of extensively cleared vegetation was identified during the survey. However, the vegetation groups identified in the survey area are well represented within undisturbed native vegetation to the east of the survey area.

(f) **Native vegetation should not be cleared if it is growing, in, or in association with, an environment associated with a watercourse or wetland**

No vegetation group growing in, or in association with a watercourse or wetland was recorded during the survey.

(h) **Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

The survey area lies directly adjacent to the northern side of the Jackson Nature Reserve. This is a Class A Nature Reserve gazetted with the Conservation Commission for the conservation of flora and fauna. No clearing within the Nature Reserve is proposed however clearing of vegetation near this boundary will require a hygiene management plan to prevent the potential spread of weeds into the Nature Reserve.

8 Personnel involved

Jim Williams - Botanist/Environmental Consultant (Diploma of Horticulture).

Eren Reid - Botanist/Environmental Consultant (BSc- Biological Science).

Bevan Harris – Ecologist/Environmental Consultant (Diploma in Marine Studies, BSc-Ecology).

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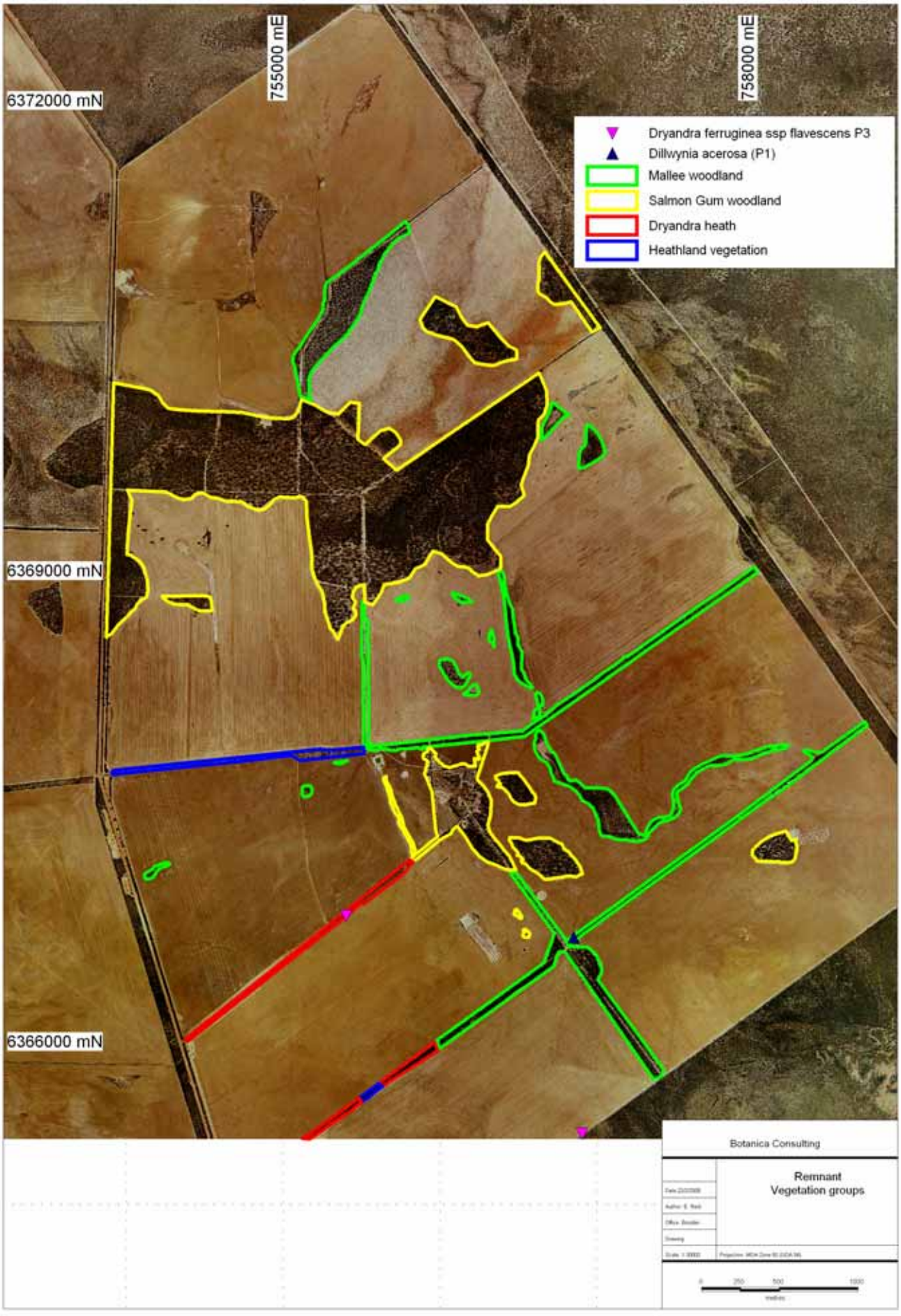
Appendix 1: Map of the surveyed area



Appendix 2: DEC Databases search results for Rare and Priority Flora species within the survey area

GENUS	SPECIES	RANK	INFRASP	CONS.CODE
Thomasia	gardneri			X
Acacia	lanuginophylla			R
Banksia	sphaerocarpa	var.	dolichostyla	R
Boronia	revoluta			R
Eucalyptus	steedmanii			R
Leucopogon	marginatus			R
Muelleranthus	crenulatus			R
Acacia	tetraneura			P1
Baeckea	sp.Forrestania(K.R.Newbey 1105)			P1
Baeckea	sp.Lake Cronin(K.R.Newbey 9191)			P1
Brachyloma	nguba			P1
Chorizema	circinale			P1
Dampiera	scaevolina			P1
Dicrastylis	capitellata			P1
Dillwynia	acerosa			P1
Eucalyptus	myriadena	subsp.	parviflora	P1
Gastrolobium	tenue			P1
Gnephosis	intonsa			P1
Grevillea	lullfitzii			P1
Grevillea	marriottii			P1
Hibbertia	axillibarba			P1
Hibbertia	carinata			P1
Melaleuca	agathosmoides			P1
Microcorys	sp.Forrestania(V.English 2004)			P4
Microcybe	pauciflora	subsp.	grandis	P1
Mirbelia	densiflora			P1
Mirbelia	taxifolia			P1
Pultenaea	daena			P1
Scaevola	tortuosa			P1
Stenanthemum	liberum			P1
Stylidium	validum			P1
Acacia	asepala			P2
Acacia	heterochroa	subsp.	robertii	P2
Acacia	kerryana			P2
Baeckea	sp.North Ironcap(R.J.Cranfield 105			P2
Bentleya	diminuta			P2
Boronia	westringioides			P2
Conospermum	sigmoideum			P2
Gastrolobium	rigidum			P2
Guichenotia	asteriskos			P2
Haegiela	tatei			P2
Hakea	pendens			P2
Isolepis	australiensis			P2
Keraudrenia	adenogyna			P2
Logania	exilis			P2
Microcorys	lenticularis			P2
Olearia	laciniifolia			P2
Stylidium	sejunctum			P2
Acacia	repanda			P3
Acacia	singula			P3
Acacia	undosa			P3
Baeckea	sp.Hatter Hill(K.R.Newbey 3284)			P3

GENUS	SPECIES	RANK	INFRASP	CONS.CODE
Baeckea	sp.Hyden(J.M.Brown 141)			P3
Calytrix	nematoclada			P3
Comesperma	calcicola			P3
Cryptandra	polyclada	subsp.	polyclada	P3
Daviesia	elongata	subsp.	implexa	P3
Dryandra	ferruginea	subsp.	flavescens	P3
Dryandra	viscida			P3
Elatine	macrocalyx			P3
Eucalyptus	exigua			P3
Euryomyrtus	leptospermoides			P3
Eutaxia	sp.Hatter Hill(K.R.Newbey 6532)			P3
Frankenia	drummondii			P3
Grevillea	insignis	subsp.	elliotii	P3
Grevillea	pilosa	subsp.	redacta	P3
Isoetes	brevicula			P3
Leucopogon	sp.Ironcaps(N.Gibson & K.Brown 307			P3
Melaleuca	macronychia	subsp.	trygonoides	P3
Microcorys	macredieana			P3
Monotoca	leucantha			P3
Persoonia	cymbifolia			P3
Phebalium	brachycalyx			P3
Pityrodia	sp.Yilgarn(A.P.Brown 2679)			P3
Synaphea	divaricata			P3
Verticordia	gracilis			P3
Verticordia	stenopetala			P3
Calamphoreus	inflatus			P4
Eremophila	biserrata			P4
Eremophila	racemosa			P4
Eucalyptus	cerasiformis			P4
Eucalyptus	deflexa			P4
Eucalyptus	georgei	subsp.	fulgida	P4
Eucalyptus	rhomboidea			P4
Eucalyptus	rugulata			P4
Grevillea	aneura			P4
Grevillea	dissecta			P4
Grevillea	prostrata			P4
Gyrostemon	ditrigynus			P4
Sowerbaea	multicaulis			P4

Appendix 3: Coordinates of waypoints recorded within the surveyed area

GDA 94		
	Easting	**Northing**
50 H	759282	6367175
50 H	758721	6366765
50 H	756908	6365452
50 H	756567	6365207
50 H	755839	6365011
50 H	755664	6364573
50 H	755532	6364460
50 H	754811	6365154
50 H	755180	6365412
50 H	755505	6365647
50 H	755996	6365993
50 H	756530	6366391
50 H	756854	6366704
50 H	757454	6367131
50 H	757189	6367325
50 H	758129	6367357
50 H	756617	6366762
50 H	756210	6367519
50 H	755715	6367070
50 H	755404	6366841
50 H	754127	6367054
50 H	754142	6367760
50 H	755143	6367647
50 H	755386	6368935
50 H	755207	6368985
50 H	755181	6369164
50 H	755312	6370029
50 H	755477	6369878
50 H	755724	6369707
50 H	756336	6370113
50 H	756834	6370463
50 H	756535	6371284
50 H	755533	6371069
50 H	755107	6370454
50 H	755186	6369711
50 H	755505	6369522
50 H	755755	6368867

Appendix 4: Species list of the surveyed area

Family		Genus	Species	Salmon Gum woodland	Dryandra heath	Heath shrubland	Mallee woodland
Amaranthaceae		Ptilotus	polystachyus	*		*	
Apiaceae		Trachymene	maxwellii			*	
Boraginaceae		Halgania	cyanea var cyanea				*
Boryaceae		Borya	constricta			*	
Brassicaceae	#	Brassica	tournefortii			*	
Casuarinaceae		Allocasuarina	acutivalvis			*	
Casuarinaceae		Allocasuarina	campestris		*	*	
Casuarinaceae		Allocasuarina	corniculata		*		
Casuarinaceae		Allocasuarina	huegeliana		*		
Casuarinaceae		Allocasuarina	microstachya		*		
Cupressaceae		Callitris	preissii		*	*	
Cyperaceae		Lepidosperma	brunonianum	*		*	*
Cyperaceae		Lepidosperma	drummondii	*			*
Epacridaceae		Astroloma	serratifolium			*	
Goodeniaceae		Coopernookia	strophiolata			*	
Lamiaceae		Cyanostegia	lanceolata			*	
Lamiaceae		Dicrastylis	parvifolia	*			*
Lamiaceae		Microcorys	sp (sterile)		*		
Lamiaceae		Westringia	cephalantha	*			*
Lamiaceae		Westringia	rigida	*			*
Mimosaceae		Acacia	acanthoclada ssp acanthoclada			*	
Mimosaceae		Acacia	coolgardiensis	*			
Mimosaceae		Acacia	enervia			*	
Mimosaceae		Acacia	erinacea	*		*	*
Mimosaceae		Acacia	jennerae	*			
Mimosaceae		Acacia	sphacelata ssp sphacelata			*	
Mimosaceae		Acacia	sulcata var platyphylla			*	
Mimosaceae		Acacia	verricula				*
Myoporaceae		Eremophila	decipiens ssp decipiens	*		*	*
Myrtaceae		Callistemon	phoeniceus	*			
Myrtaceae		Calothamnus	quadrifidus		*		
Myrtaceae		Eucalyptus	celastroides subsp. virella				*
Myrtaceae		Eucalyptus	eremophila ssp eremophila	*		*	*
Myrtaceae		Eucalyptus	leptophylla	*			*
Myrtaceae		Eucalyptus	loxophleba subsp. lissophloia			*	
Myrtaceae		Eucalyptus	phaenophylla subsp. phaenophylla			*	
Myrtaceae		Eucalyptus	pileata			*	
Myrtaceae		Eucalyptus	polita	*			*
Myrtaceae		Eucalyptus	salmonophloia	*			*
Myrtaceae		Eucalyptus	salubris	*			
Myrtaceae		Leptospermum	erubescens			*	
Myrtaceae		Leptospermum	spinescens		*		
Myrtaceae		Melaleuca	acuminata	*			*
Myrtaceae		Melaleuca	cardiophylla	*			*
Myrtaceae		Melaleuca	cordata			*	
Myrtaceae		Melaleuca	cucullata	*			*
Myrtaceae		Melaleuca	eleuterostachya	*			*
Myrtaceae		Melaleuca	elliptica	*		*	*
Myrtaceae		Melaleuca	hamata	*		*	*
Myrtaceae		Melaleuca	lateriflora ssp lateriflora	*			*
Myrtaceae		Melaleuca	pauperiflora ssp pauperiflora	*			*
Myrtaceae		Melaleuca	radula	*		*	*
Myrtaceae		Melaleuca	sapientes				*
Myrtaceae		Melaleuca	teuthidoides	*			*
Myrtaceae		Verticordia	sp (sterile)			*	

Family		Genus	Species	Salmon Gum woodland	Dryandra heath	Heath shrubland	Mallee woodland
Papilionaceae		Chorizema	aciculare ssp aciculare				*
Papilionaceae		Daviesia	benthamii	*		*	*
Papilionaceae		Daviesia	nematophylla	*			*
Papilionaceae		Daviesia	rhizomata		*		
Papilionaceae		Dillwynia	acerosa P1 499				*
Papilionaceae		Gastrolobium	parviflorum		*		
Papilionaceae		Gastrolobium	spinosum			*	
Papilionaceae		Templetonia	sulcata	*			*
Pittosporaceae		Pittosporum	angustifolium	*		*	
Proteaceae		Banksia	elderiana			*	
Proteaceae		Banksia	laevigata			*	
Proteaceae		Banksia	violacea		*		
Proteaceae		Dryandra	cirsioides		*		
Proteaceae		Dryandra	erythrocephala var. erythrocephala		*		
Proteaceae		Dryandra	ferruginea ssp flavescens P3 489-5 506		*		
Proteaceae		Grevillea	acuaria	*		*	*
Proteaceae		Grevillea	cagiana			*	
Proteaceae		Grevillea	eriostachya			*	
Proteaceae		Grevillea	eryngioides		*		
Proteaceae		Grevillea	nematophylla			*	
Proteaceae		Grevillea	oncogyne	*		*	*
Proteaceae		Grevillea	shuttleworthiana ssp obovata			*	
Proteaceae		Hakea	commutata	*			
Proteaceae		Hakea	corymbosa	*			
Proteaceae		Hakea	erecta		*		
Proteaceae		Hakea	francisiana	*			*
Proteaceae		Persoonia	helix			*	
Proteaceae		Synaphea	interioris		*		
Rutaceae		Phebalium	megaphyllum			*	
Rutaceae		Phebalium	tuberculosum	*		*	*
Santalaceae		Exocarpos	aphyllus			*	
Santalaceae		Exocarpos	sparteus			*	
Santalaceae		Santalum	acuminatum	*		*	*
Sapindaceae		Dodonaea	?divaricata			*	
Sapindaceae		Dodonaea	bursariifolia	*		*	*

# denotes weed species

Appendix 5: Priority Flora recorded in the survey area.

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Zone	**Easting**	**Northing**	**Species**	**Numbers**
50 H	758721	6366765	Dryandra ferruginea ssp flavescens (P3)	20+
50 H	756530	6366391	Dillwynia acerosa (P1)	2
50 H	755715	6367070	Dryandra ferruginea ssp flavescens (P3)	20+