



FLORA SURVEY REPORT

AIRPORT RESERVE - R41390

(PRE-PRESCRIBED BURNING)



NOVEMBER 2021

<u>Contents</u>	Page
Acknowledgements	3
Introduction	3
Background	3
Methodology	4-6
Equipment	6
Limitations	7
Discussion	7-9
Findings	10-14
<ul style="list-style-type: none"> • Species Abundance - cover • Species Occurrence – family group representativeness • Species Diversity • Dominant Species • Bushland Condition 	
Recommendations	14
Appendices:	
<ul style="list-style-type: none"> • Map of Transect sites • Species list • Flora transect survey template • Photo images of Transect 1 and Transect 3 (Southern Jarrah) 	15 16-18 19-20 21-30
Tables	
Table 1: <i>Cover Abundance Scale</i>	
Table 2: <i>Bushland Condition Scale</i>	
Figures	
Figure 1: <i>Reserve 41390 Vegetation Complexes</i>	
Figure 2: <i>Reserve 41390 Transect sites</i>	
Figure 3: <i>Species Abundance per Transect site</i>	
Figure 4: <i>Family group Representativeness across Transect sites</i>	
Figure 5: <i>Diversity of Species per Transect site</i>	
Figure 6: <i>Dominant Species per Transect site</i>	
Figure 7: <i>Species Abundance & Bushland Condition per Transect site</i>	

Acknowledgements

The contributions of the following are gratefully acknowledged: Shire Sustainability Officer Yvette Caruso, Shire Revegetation Officer Mark Parre and Revegetation Assistant Terran Ablett; Bushfire Risk Planning Co-ordinator Melanie Haymont, A/ Community Emergency Services Manager Will Miller and Lee Shelley.

Acknowledgement of Country: we acknowledge the Noongar Minang and Bibbulmun people as the traditional custodians of this land and respect their culture and continuing contribution they make to this region. We acknowledge and pay our respects to Elders, both past, present and emerging.

Introduction

A flora survey was conducted of Airport Reserve R41390 to obtain data as to species abundance, vegetation condition and floral species composition in the 4 different vegetation types represented across the Reserve. The fuel age of the vegetation is in excess of 15-20+ years since burnt, and the Reserve is planned for a prescribed burn this 2021-22 season with the aim of reducing the risk of bushfire threat to the adjacent East Denmark community.

The objective of conducting the flora survey is to obtain relevant data prior to the prescribed burning disturbance activity, with the intent to do follow-up flora surveys of the Reserve post-burn at annual intervals to assess the impact of prescribed burning on floral species composition, abundance and bushland condition across the various vegetation types over time.

Background

Airport Reserve R41390 is an 18.8 hectare-sized bushland reserve situated approximately 5km north-east of the Denmark township vested in the Shire of Denmark. The Reserve is circumnavigated by East River Rd to the north, McIntosh Rd on the eastern boundary, and gravel roads to the south and west. The Reserve is split into two cells, east and west block with a gravel track running north-south through the middle of the Reserve.

Disturbance History

The western block of the Reserve was burnt in a prescribed burn in 2006. The eastern block historically had an extractive industry gravel pit site, and was rehabilitated through the Shire's revegetation program in 2009. The Reserve is listed on the Shire's prescribed burning program for the 2021-22 season as the fuel ages across the reserve range from 15-20+ years. A prescribed burn has been drafted to treat fuels from 32 t/ha to 5 t/ha with an intended low intensity hand ignition burn with a maximum ROS of 50m/hr and a maximum scorch height of 3m.

Vegetation Complexes

The Reserve is comprised of broad vegetation complexes Dempster Dc2 and Ds (Redmond Siltstone Plain Uplands) characteristic of an open forest and low woodland of *Eucalyptus marginata* subsp. *marginata*, *Corymbia calophylla*, *Banksia attenuata*, *Allocasuarina fraseriana* and *Eucalyptus staeri*. The north-east section of the eastern block is classified as vegetation complex S7 Broad Valleys (Redmond Siltstone Plain Valleys) characterised by woodland of *Banksia attenuata*, *Banksia grandis*, *Allocasuarina fraseriana*, *Eucalyptus staeri*, and low woodland of *Melaleuca preissiana* and open heath of Myrtaceae and Proteaceae species.



Figure 1: Reserve 41390 Vegetation Complexes

The Reserve can be further categorised into 4 main vegetation types:

- Southern Jarrah
- Revegetation area
- Woodland heath
- Open heath

Environmental Sensitivity

It has been noted that there is a large, very old She-oak (*Allocasuarina fraseriana*) occurring within the Reserve situated in the Eastern block northern-mid section, located approximately 10m from the middle track. As this species is highly susceptible to damage from fire it has been recommended for a firebreak to be raked around this particular tree, and for it to be wet down prior to the burn taking place so as to protect it from potential adverse impacts from the prescribed burning activity.

Methodology

The survey at Reserve 41390 for pre-burn flora species data collection was conducted on 28th September 2021 by Shire of Denmark officers Yvette Caruso - Sustainability Officer; Mark Parre – Revegetation Officer; and Terran Ablett – Revegetation Assistant.

6 transect survey sites were chosen to adequately represent the different vegetation types across the Reserve:

- 2 x Southern Jarrah (TR1 and TR3)
- 2 x Revegetation area (TR2 and TR4)
- 1 x Woodland Heath (TR5)
- 1 x Open Heath (TR6)

Cover Abundance Scale (A)	
Cover Abundance Value	Description
1	one- a few individuals
2	uncommon and < 5% cover
3	common and > 5% cover
4	abundant and 5-20% cover
5	very abundant 20-50% cover
6	50-75% cover
7	75-100% cover

Table 1: Cover Abundance Scale

Bushland Condition Scale (B)		
4	Very Good - Excellent (VG)	80-100% Native Flora Composition. Vegetation structure intact or nearly so. Vover/abundance of weeds less than 5%. No or minimal signs of disturbance.
3	Fair - Good (G)	50-80% Native Flora Composition. Vegetation structure modified or nearly so. Cover/abundance of weeds 5-20% any number of individuals. Minor signs of disturbance.
2	Poor (P)	20-50% Native Flora Composition. Vegetation structure completely modified. Cover/abundance of weeds 20-60% any number of individuals. Disturbance incidence high.
1	Degraded (D)	0-20% Native Flora Composition. Vegetation structure disappeared. Cover/abundance of weeds 60-100% any number of individuals. Disturbance incidence very high.

Table 2: Bushland Condition Scale

Equipment

- Star pickets x 12 (engraved with transect site reference) (eg. TR1N; TR1S)
- Mallet
- 20m tape measure
- Clamp
- Transect survey forms x 6
- GPS
- Camera
- Trowel
- Specimen bags
- Specimen labels

Limitations

Limitations of the survey include: Species knowledge and lack of resources to enable specimen identification post-survey. This resulted in a number of species remaining unidentified even at family level (eg. Poaceae sp.1). However, the species abundance and occurrence of these species remains represented in the survey data, and can still be utilised to assess trends of species occurrence and richness over time in subsequent surveys.

Transect 3 was incomplete for the middle section of the transect between TR5 and TR10 due to the unfortunate occurrence of a beehive being situated in the middle of the transect resulting in aggressive bee attacks rendering the transect collection to be incomplete due to the safety risk to the survey project officers. The data can still be utilised, however with the knowledge that the species abundance and potentially species floral diversity and composition is under-represented within that transect. Photo data was captured for the entire transect which can be utilised for comparative purposes for future surveys [please refer to *Appendix 4: Photos of Transect Sites 1 & 3 (Southern Jarrah)*].

Discussion

A summary of data collected at each transect site is outlined below:

Transect 1:

Location: Eastern Block; North-mid section; located 10m East of middle track)

GPS: N end: S 34° 56' 33.8" E 117° 24' 05.0"

S end: S 34° 56' 34.2" E 117° 24' 04.7"

Vegetation Type: Southern Jarrah

Soil Type: Grey sand and laterite

Species Abundance: A total of 245 plants were recorded as being represented across the 20m x 2m transect site of Transect 1. Species abundance was rated between the full range of 1-7 throughout the transect, however with a predominance towards 5 (20-50% cover), and an average of 4 (very abundant with 5-20% cover).

Bushland Condition: Vegetation condition was rated as (4) being classed as very good to excellent condition with 80-100% native flora composition, intact structure with little to no signs of disturbance. No weeds were recorded as occurring at this site.

Species Occurrence: Floral species were represented across 21 family groups, with a predominance towards representation from Proteaceae, Fabaceae and Myrtaceae. 38 different species were recorded as occurring within the transect. Dominant species included *Taxandria parviceps* recorded 24 times within the transect, *Beaufortia decussata* recorded 22 times, and *Anarthria prolifera* noted as occurring 21 times. Other dominant species included sedge species (unidentified), *Agonis theiformis*, fern species (unidentified), and *Xanthosia rotundifolia*.

Transect 2:

Location: Eastern Block; South-mid section; located 10m East of middle track)

GPS: N end: S 34° 56' 34.3" E 117° 24' 04.9"

S end: S 34° 56' 38.6" E 117° 24' 05.9"

Vegetation Type: Revegetation site

Soil Type: Sandy brown loam

Species Abundance: A total of 63 plants were recorded as being represented across the 20m x 2m transect site of Transect 2 with a predominance of plant species representation from Myrtaceae, Fabaceae, Iridaceae and Cyperaceae family groups. Species abundance was rated as 1 (one to a few individuals) consistently across the transect.

Bushland Condition: Vegetation condition was rated as (1) being classed as degraded with 0-20% native flora composition, nil identifiable structure with a high incidence of disturbance. 2 weed species were recorded as occurring at this site (*Watsonia meriana* var. *bulbillifera* and *Gladiolus undulatus*).

Species Occurrence: Floral species were represented across 8 family groups, with 13 different species recorded as occurring within the transect. Dominant species included *Agonis flexuosa* recorded 11 times within the transect, *Ficinia nodosa* recorded 10 times, and Moss sp. 1 noted as occurring 8 times. Other dominant species included *Corymbia calophylla*, *Gladiolus undulatus*, *Melaleuca preissiana*, *Acacia alata* and *Anigozanthos flavidus*.

Transect 3:

Location: Western Block; South-mid section; located 20m West of middle track)

GPS: N end: S 34° 56' 38.1" E 117° 24' 04.7"

S end: S 34° 56' 38.6" E 117° 24' 04.7"

Vegetation Type: Southern Jarrah

Soil Type: Brown loam

NB Beehive located in middle of transect between 4-10m section from southern end.

Species Abundance: A total of 161 plants were recorded as being represented across the 20m x 2m transect site of Transect 3 with a predominance of plant species representation from Proteaceae, Fabaceae and Myrtaceae family groups. The number of plants recorded can be presumed to be significantly under-represented due to the lack of data obtained for a 6 metre section of the transect due to the presence of the beehive posing a safety risk to survey project officers. Species abundance was rated as between 4-7 throughout the transect, however with a predominance towards 7 (75-100% cover), with a mean average of 6 (50-75% cover).

Bushland Condition: Vegetation condition was rated as (4) being classed as very good to excellent condition with 80-100% native flora composition, intact structure with little to no signs of disturbance. No weeds were recorded as occurring at this site.

Species Occurrence: Floral species were represented across 21 family groups, with 37 different species recorded as occurring within the transect. Dominant species included *Beaufortia decussata* recorded 20 times within the transect, *Leucopogon* sp.1 recorded 19 times, and *Anarthria prolifera* noted as occurring 18 times. Other dominant species included Sedge sp.1 (unidentified), *Lomandra* sp. 2. and *Taxandria parviceps*.

Transect 4:

Location: Eastern Block; South-mid section; located 50m East of middle track)

GPS: N end: S 34° 56' 37.8" E 117° 24' 07.0"

S end: S 34° 56' 38.7" E 117° 24' 07.0"

Vegetation Type: Revegetation site

Soil Type: Grey sand

Species Abundance: A total of 52 plants were recorded as being represented across the 20m x 2m transect site of Transect 4 with a predominance of representativeness from Myrtaceae and Iridaceae family groups. Species abundance was rated as 1 (one to a few individuals) consistently across the transect.

Bushland Condition: Vegetation condition was rated as (1) being classed as degraded with 0-20% native flora composition, nil identifiable structure with a high incidence of disturbance. 3 weed species were recorded as occurring at this site (*Cenchrus clandestinus* [kikuyu], *Watsonia meriana* var. *bulbillifera* and *Gladiolus undulatus*).

Species Occurrence: Floral species were represented across 7 family groups, with 11 different species recorded as occurring within the transect. Dominant species included a higher prevalence of overstorey species including *Agonis flexuosa* recorded 23 times within the transect and *Corymbia calophylla* recorded 7 times. *Cenchrus clandestinus* (kikuyu) was noted as occurring 6 times. Other dominant species included *Ficinia nodosa* and *Gladiolus undulatus*.

Transect 5:

Location: Western Block; North-west corner; located 10m East of north-west corner of reserve)

GPS: N end: S 34° 56' 38.5" E 117° 24' 06.9"
S end: S 34° 56' 33.2" E 117° 23' 50.9"

Vegetation Type: Woodland heath

Soil Type: Grey sand

Species Abundance: A total of 169 plants were recorded as being represented across the 20m x 2m transect site of Transect 5 with a predominance towards representation from Myrtaceae, Restionaceae and Asparagaceae family groups. Species abundance was rated between the full range of 1-7 throughout the transect, however with a predominance and mean average of 4 (very abundant with 5-20% cover).

Bushland Condition: Vegetation condition was rated as (4) being classed as very good to excellent condition with 80-100% native flora composition, intact structure with little to no signs of disturbance. No weeds were recorded as occurring at this site.

Species Occurrence: Floral species were represented across 18 family groups, with 35 different species recorded as occurring within the transect. Dominant species included Poaceae sp. 1 (unidentified) recorded 18 times within the transect, *Anarthria scabra* recorded 14 times, and *Lepidosperma gracile* noted as occurring 13 times. Other dominant species included Moss sp. 1 (unidentified), *Agonis theiformis* and *Dasypogon bromeliifolius*.

Transect 6:

Location: Eastern Block; located 20m west of eastern boundary)

GPS: N end: S 34° 56' 36.1" E 117° 24' 18.4"
S end: S 34° 56' 37.0" E 117° 24' 18.6"

Vegetation Type: Open heath

Soil Type: Grey clay and laterite conglomerate

Species Abundance: A total of 121 plants were recorded as being represented across the 20m x 2m transect site of Transect 6 with a predominance towards representation from Cyperaceae, Restionaceae, Fabaceae and Myrtaceae. Species abundance was rated between the range of 2-7 throughout the transect, however with a predominance towards 7 (75-100% cover), and a mean average of 6 (very abundant with 50-75% cover).

Bushland Condition: Vegetation condition was rated as (4) being classed as very good to excellent condition with 80-100% native flora composition, intact structure with little to no signs of disturbance. No weeds were recorded as occurring at this site.

Species Occurrence: Floral species were represented across 11 family groups, with 20 different species recorded as occurring within the transect. Dominant species included *Tremulina tremula* recorded 36 times within the transect, *Taxandria parviceps* recorded 20 times, and *Darwinia oederoides* noted as occurring 19 times. Other dominant species included *Mesomelaena tetragona* and *Conostylis setigera*.

Findings

Species Abundance

Comparison between the transect sites indicates that species cover abundance was more prevalent in transects 1, 3, 5 and 6 (Southern Jarrah; Woodland Heath; and Open Heath) which were rated as having cover abundance of between 4 and 6 on average. Transect 1 (Southern Jarrah) had the most number of plants recorded at 245, and a cover abundance mean value of 4; with Transect 5 (Woodland Heath) recording 169 plants recorded and a cover abundance mean value of 5.

Transect 3 (Southern Jarrah) had 161 plants recorded, however this can be presumed to be significantly under-represented due to 6m of the transect not having any data collection due to the presence of the beehive and potential risk to the safety of survey project officers. This presumption of under-representation in number of plants recorded is supported with the cover abundance mean value attributed to transect 3 as 6 (50-75% cover).

Transect 6 (Open Heath) recorded 121 plants as occurring, with a cover abundance mean rating of 6 being 50-75% cover abundance.

Transects 2 and 4 (Revegetation sites) showed only 63 and 52 plants being recorded with cover abundance rating of 1, classified as only one to a few individuals being represented across the transect.

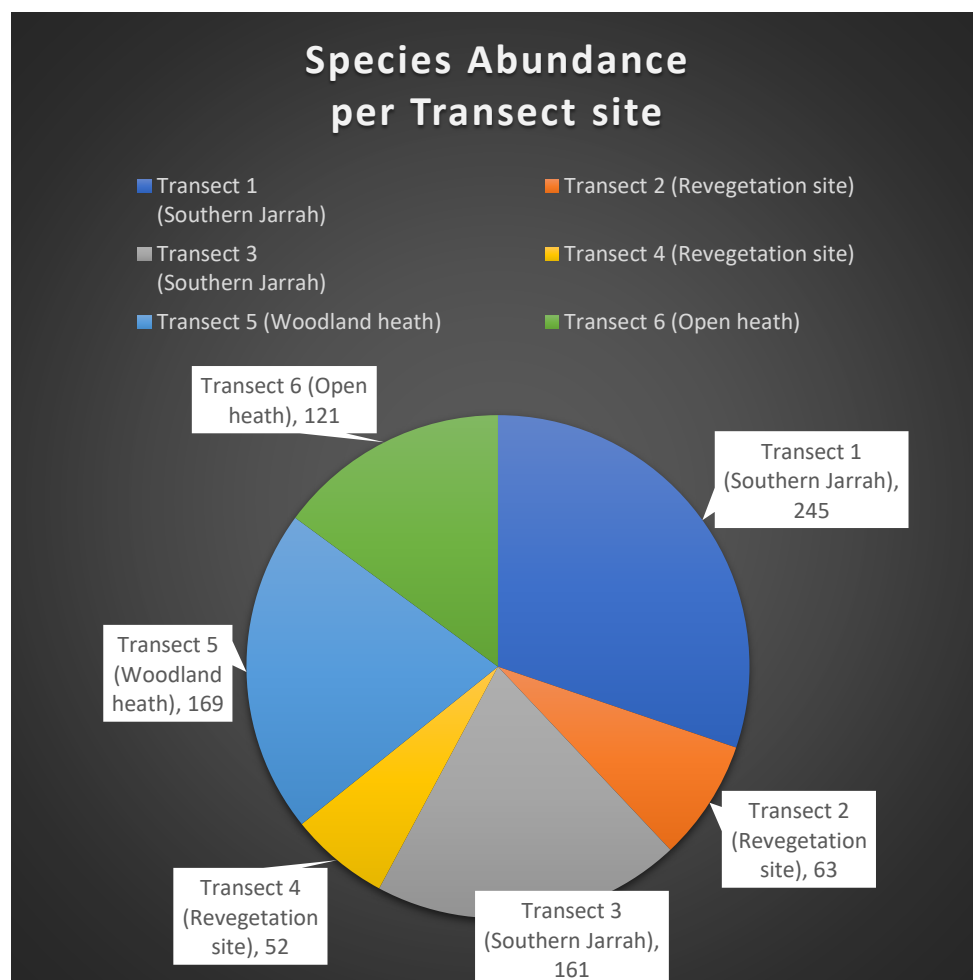


Figure 3: Species Abundance per Transect site

Species Occurrence

The majority of plant species recorded across the southern jarrah vegetation community (transects 1 and 3) were representative of the Proteaceae, Myrtaceae and Fabaceae family groups. The revegetation sites indicated representativeness predominantly from the Myrtaceae and Iridaceae families. The woodland heath vegetation (transect 4) had a high incidence of Myrtaceae plant species, with a lesser representation from Restionaceae and Asparagaceae families; whilst the open heath vegetation (transect 6) showed a predominance towards plant species from the Myrtaceae, Fabaceae, Cyperaceae, and Restionaceae family groups.

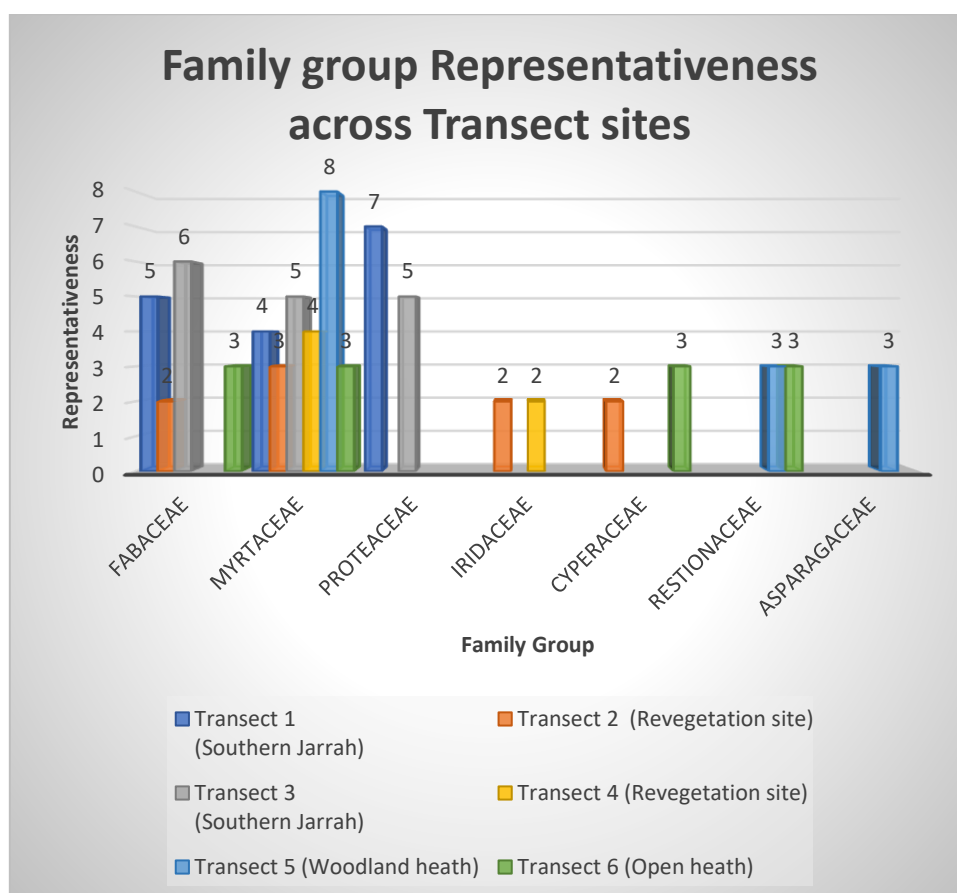


Figure 4: Family group Representativeness across Transect sites

Species Diversity

Transect 1 and 3 (Southern Jarrah vegetation) represented the highest species diversity at 38 and 37 different species recorded as occurring within the transect sites. This was closely followed closely by Transect 5 (Woodland Heath) with 35 different species noted as occurring. Transect 6 (Open Heath) had approximately half the number of species at 20 recorded different species, although it had one of the highest rated cover abundance.

Species diversity was least represented in Transects 2 and 4 (Revegetation sites) at 13 and 11 different species being recorded respectively as occurring across the transect sites. This was clearly observable during the survey due to the lack of understorey species present. This lack of understorey can be attributed to the success of the rehabilitation efforts of the overstorey species (*Agonis flexuosa*, *Corymbia calophylla*) outcompeting the understorey plant species for resources such as sunlight.

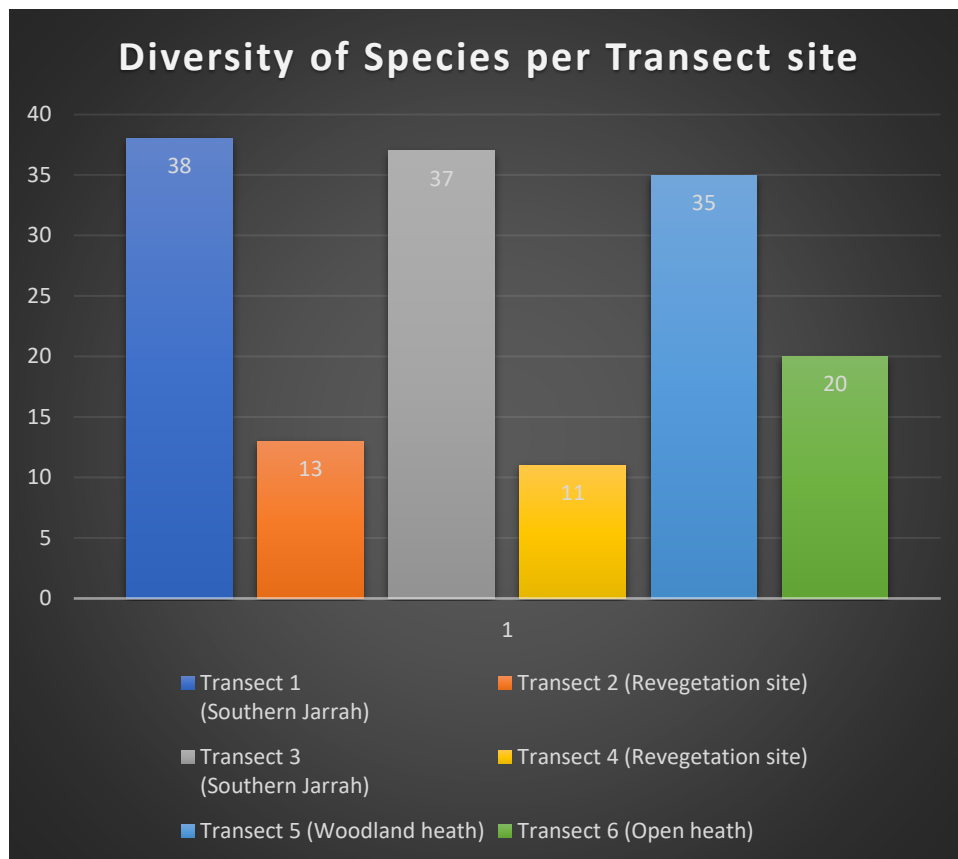


Figure 5: Diversity of Species per Transect site

Dominant Species

The dominant species found to occur in the Southern Jarrah vegetation transects 1 and 3 included *Taxandria parviceps*, *Beaufortia sparsa*, *Anarthria prolifera*, *Leucopogon* sp.1, *Agonis theiformis* and *Sedge* sp. 1 (unidentified). No weed species were found to occur.

The dominant species recorded as occurring in the Woodland Heath transect 5 were *Poaceae* sp.1, *Anarthria scabra*, *Lepidosperma gracile* and *Agonis theiformis*. Moss was also prevalent across sections of the transect. No weed species were found to occur.

The dominant species within the Open Heath transect 6 comprised of *Tremulina tremula*, *Taxandria parviceps*, *Darwinia oederoides* and *Mesomelaena tetragona*. No weed species were known to occur.

The dominant species within the Revegetation sites in transects 2 and 4 were predominantly overstorey species *Agonis flexuosa* and *Corymbia calophylla*, with *Ficinia nodosa*, moss and kikuyu as the predominant understorey. Weed species found to occur include *Watsonia meriana* var. *bulbillifera*, *Gladiolus undulatus*, and *Cenchrus clandestinus* (kikuyu).

Anecdotally, the *Watsonia* and associated species have been much reduced since the extractive industry has ceased at the site and can be presumed to be attributed to the success of the rehabilitation of the site of the overstorey Peppermint and Marri tree species.

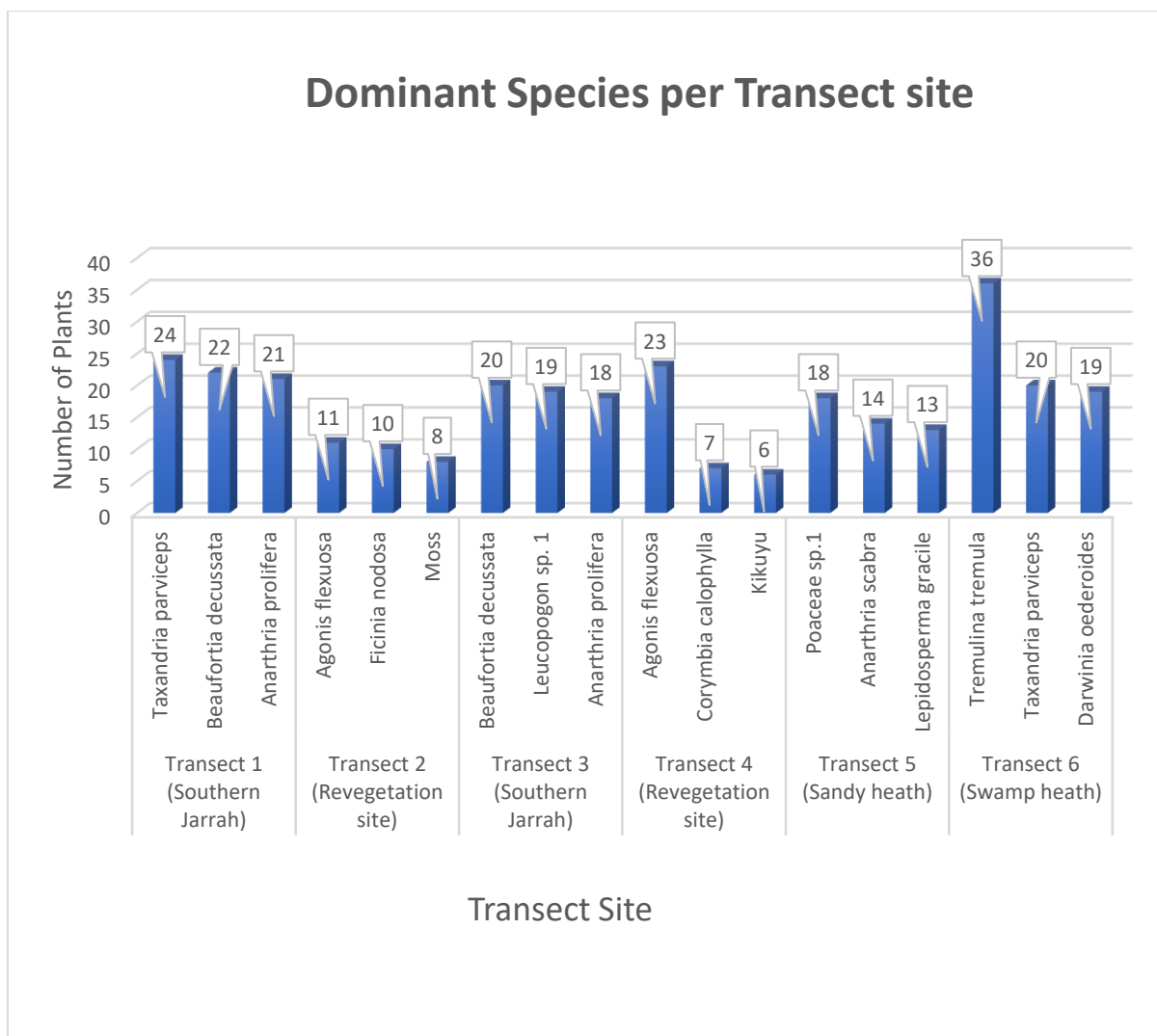


Figure 6: Dominant Species per Transect site

Bushland Condition

Bushland condition was recorded as a value of 4 (classified as very good to excellent) across all of the historically undisturbed native vegetation community transect sites (transects 1, 3, 5, and 6). This value was attributed consistently to every section of each of the aforementioned transects.

The bushland condition of the revegetation sites (transects 2 and 4) were attributed a value of 1 (classified as degraded, with disturbance incidence very high). This value was attributed consistently to every section of both transect sites.

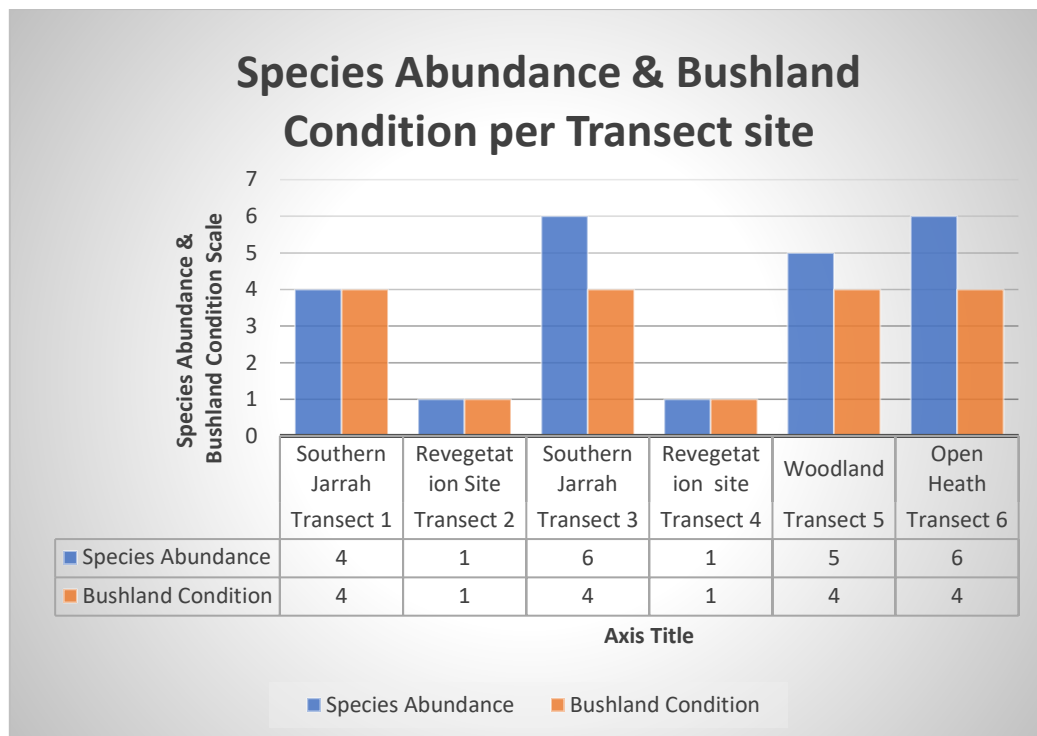


Figure 7: Species Abundance & Bushland Condition per Transect site

Recommendations

Recommendations for future survey data collection is to undertake annual surveys of all six transect sites at the same approximate time (September) each year post-burn utilising the same methodology to enable accurate comparisons and assess trends over time. Surveying in spring can also assist with species identification due to the majority of species being in flower.

Post-burn data could potentially indicate a shift in vegetation composition and structure. A low intensity prescribed burn could potentially change the floral composition, particularly in the revegetation sites, enabling fire adaptive species to respond to smoke and ash encouraging germination of understorey seed bank stored in the soil.

The intensity of the prescribed burn will be of significance in regards the impact upon the existing mature plant species as well as the effect upon germination and regrowth, so future surveys should also consider inclusion of the prescribed burning conditions, intensity and subsequent scorch height.

Appendices

Appendix 1: Map of Transect sites

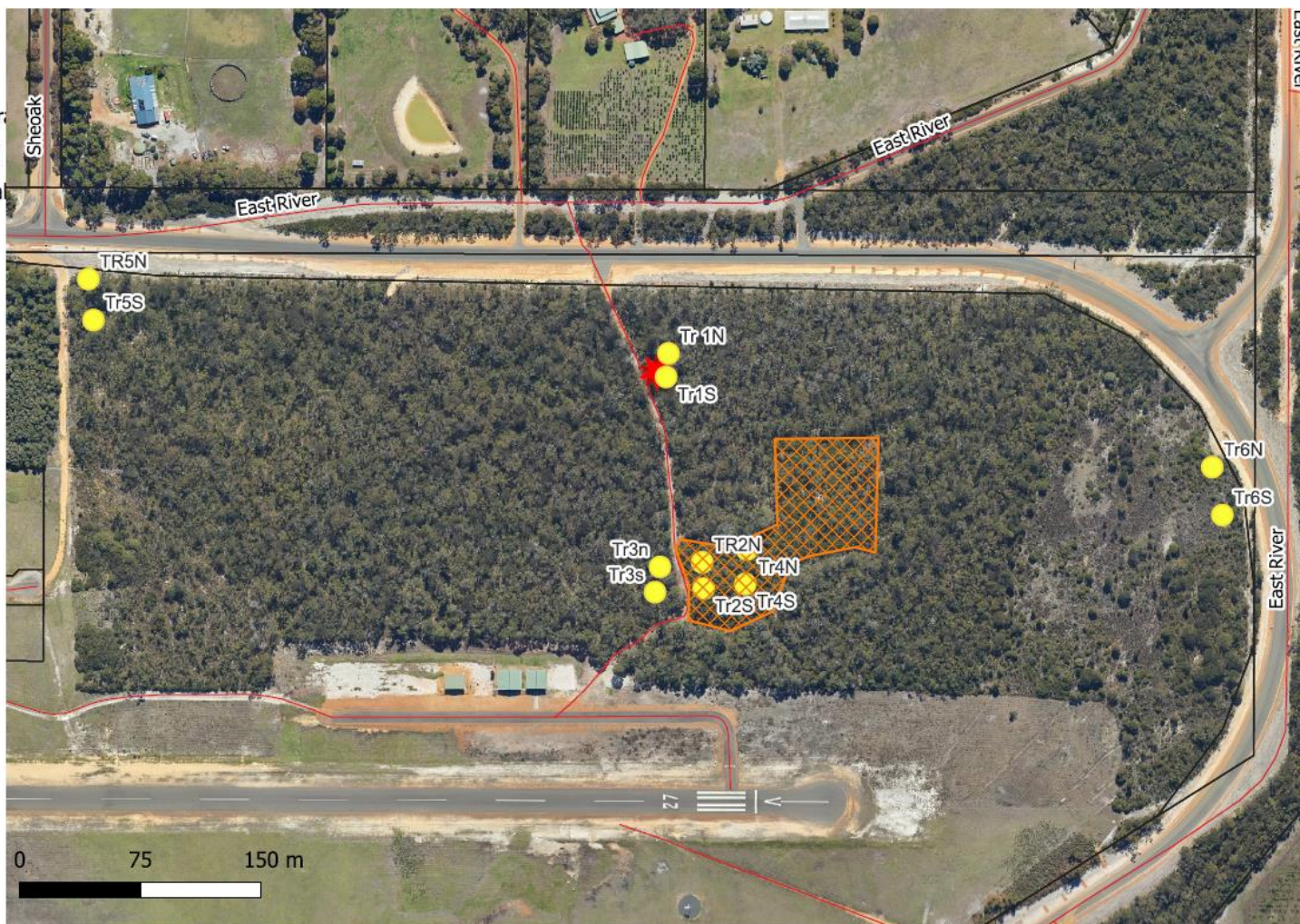
Appendix 2: Species list

Appendix 3: Flora transect survey template

Appendix 4: Photo images of Transect 1 and Transect 3 (Southern Jarrah)

LEGEND

- Roads
- R41390_floratr
- ▨ R41390_reveg
- ★ R41390_sheoa



Produced by Sustainability Officer - Y.Caruso. Shire of Denmark. 06//10/21.
 Whilst all care has been taken, no responsibility shall be taken for any omissions or errors in this documentation.
 Please advise the Shire of Denmark of any errors or omissions in this document.
 Digital Cadastral Data Supplied by the Western Australian Land Information Authority.



Airport reserve
 R41390 A5413
 Flora Transect sites Tr1-Tr6
 Planned spring burn 2021

Appendix 1: Map of Transect sites

Airport Reserve R41390 Flora Transect Survey Species List											
Species recorded from Flora survey conducted Pre-burn on 28/09/2021					TRANSECT OCCURRENCE						
FAMILY	GENUS	SPECIES	COMMON NAME	SURVEY REFERENCE	VEGETATION TYPE	1 (SJ)	2 (reveg)	3 (SJ)	4 (reveg)	5 (woodland)	6 (open heath)
ANARTHRIACEAE	<i>Anarthria</i>	<i>prolifera</i>		Ana pro	Grass	21	1	18		5	1
ANARTHRIACEAE	<i>Anarthria</i>	<i>scabra</i>		Ana scab	Grass	2		6		14	
ANARTHRIACEAE	<i>Anarthria</i>	<i>sp.1</i>		Anarth sp.1	Grass						1
APIACEAE	<i>Xanthosia</i>	<i>rotundifolia</i>	Southern Cross	Xan rot	Herb	13		2		7	
APIACEAE	<i>Xanthosia</i>	<i>sp.1</i>		Xant sp.1	Herb					2	
APIACEAE	<i>Xanthosia</i>	<i>sp.2</i>		Xant sp.2	Herb						1
ASPARAGACEAE	<i>Lomandra</i>	<i>sp.1</i>		Lom sp.1	Grass	2				1	
ASPARAGACEAE	<i>Lomandra</i>	<i>sp.2</i>		Lom sp.2	Grass	2		14		2	
ASPARAGACEAE	<i>Thysanotus</i>	<i>sp.1</i>	Fringe lily	Thysan sp.1	Herb					1	
CASUARINACEAE	<i>Allocasuarina</i>	<i>fraseriana</i>	Karri She-oak	Alloc fras	Tree	2		1		5	
CYPERACEAE	<i>Baumea</i>	<i>sp.1</i>		Baumea sp.1	Sedge	1					
CYPERACEAE	<i>Cyperaceae</i>	<i>sp.1</i>		Cyper sp.1	Grass						2
CYPERACEAE	<i>Ficinia</i>	<i>nodosa</i>	Knotted club rush	Fic nod	Grass		10	1	4		
CYPERACEAE	<i>Lepidosperma</i>	<i>gracile</i>	Slender sword sedge	Lep grac	Grass					13	1
CYPERACEAE	<i>Mesomelaena</i>	<i>tetragona</i>	Semaphore sedge	Meso tet	Grass						13
CYPERACEAE	<i>Sedge</i>	<i>sp.1</i>		Sedge sp.1	Grass	18	1	16			
DASYPOGONACEAE	<i>Dasypogon</i>	<i>bromeliifolius</i>	Pineapple bush	Dasy brom	Herb	9		6		10	
DENNSTAEDTIACEAE	<i>Pteridium</i>	<i>esculentum</i>	Bracken	Pter esc	Herb		1				
DILLENACEAE	<i>Hibbertia</i>	<i>amplexicaulis</i>		Hib amp	Herb	3		2			
DROSERACEAE	<i>Drosera</i>	<i>sp.1</i>	Sundew	Drosera sp.1	Herb	1		2		9	2
ERICACEAE	<i>Leucopogon</i>	<i>verticillatus</i>	Tassel flower	Leuc ver	Shrub	1		2			
ERICACEAE	<i>Leucopogon</i>	<i>sp.1</i>		Leuc. sp.1	Shrub	3		19			
FABACEAE	<i>Acacia</i>	<i>alata</i>	Winged Wattle	A.alata	Shrub		5				
FABACEAE	<i>Acacia</i>	<i>browniana</i>		A.brown	Shrub	4		1			
FABACEAE	<i>Acacia</i>	<i>myrtifolia</i>		A.myrt	Shrub			1			
FABACEAE	<i>Acacia</i>	<i>sp.1</i>		Acacia sp.1	Herb						1
FABACEAE	<i>Bossiaea</i>	<i>linophylla</i>		Bos lin	Shrub		1	1			
FABACEAE	<i>Bossiaea</i>	<i>rufa</i>		B.rufa	Herb	2		1		3	

FAMILY	GENUS	SPECIES	COMMON NAME	SURVEY REFERENCE	VEGETAT ION TYPE	1 (SJ)	2 (reveg)	3 (SJ)	4 (reveg)	5 (woodl and)	6 (open heath)
FABACEAE	<i>Gompholobium</i>	<i>knightianum</i>		Gom kni	Herb	1		1			
FABACEAE	<i>Hovea</i>	<i>chorizemifolia</i>	Holly-leaved Hovea	Hov chor	Herb	5		1			
FABACEAE	<i>Jacksonia</i>	<i>sp.1</i>		Jack sp.1	Shrub					4	
FABACEAE	<i>Kennedia</i>	<i>coccinea</i>	Coral vine	Ken cocc	Herb						1
FABACEAE	<i>Sphaerolobium</i>	<i>grandiflorum</i>		Sphaer gra	Herb	9					4
GOODENIACEAE	<i>Dampiera</i>	<i>linearis</i>	Common Dampiera	Damp lin	Herb	5		1		6	
GOODENIACEAE	<i>Hibbertia</i>	<i>sp.1</i>		Hibb sp.1	Herb					1	
GOODENIACEAE	<i>Scaevola</i>	<i>striata</i>	Royal robe	Scaev stri	Herb					2	4
HAEMODORACEAE	<i>Anigozanthos</i>	<i>flavidus</i>	Yellow Kangaroo Paw	A.flav	Grass		5		1		
HAEMODORACEAE	<i>Conostylis</i>	<i>setigera</i>	Bristly cottonhead	Cono set	Herb						5
HAEMODORACEAE	<i>Constylis</i>	<i>sp.1</i>		Con sty	Grass	1					
IRIDACEAE	<i>Gladiolus</i>	<i>undulatus</i>	Wild Gladiolus	Glad und	Grass		7		4		
IRIDACEAE	<i>Patersonia</i>	<i>umbrosa</i>	Yellow flag	Pat umb	Grass	1		2			
IRIDACEAE	<i>Watsonia</i>	<i>meriana</i> var. <i>bulbillifera</i>	Bugle Lily	Wats	Grass		1		1		
JUNCACEAE	<i>Juncus</i>	<i>pallidus</i>	Pale rush	Junc pal	Grass				1		
MYRTACEAE	<i>Agonis</i>	<i>theiformis</i>		Ago thei	Shrub	17		2		11	
MYRTACEAE	<i>Agonis</i>	<i>flexuosa</i>	Peppermint	Ago flex	Tree		11		23		
MYRTACEAE	<i>Astartea</i>	<i>sp.1</i>		Astart sp.1	Shrub					5	
MYRTACEAE	<i>Beaufortia</i>	<i>decussata</i>	Gravel bottlebrush	Beau dec	Shrub	22		20			
MYRTACEAE	<i>Corymbia</i>	<i>calophylla</i>	Marri	Marri	Tree		7	4	7	2	
MYRTACEAE	<i>Darwinia</i>	<i>oederoides</i>		Darwin oed	Herb						19
MYRTACEAE	<i>Eucalyptus</i>	<i>marginata</i>	Jarra	Jarra	Tree	11		4	1	1	
MYRTACEAE	<i>Eucalyptus</i>	<i>staeri</i>	Albany blackbutt	Euc staeri	Tree					1	
MYRTACEAE	<i>Hypocalymma</i>	<i>strictum</i>		Hypocal sp.1	Herb					3	
MYRTACEAE	<i>Kunzea</i>	<i>sulphurea</i>		Kunz sulph	Shrub						1
MYRTACEAE	<i>Melaleuca</i>	<i>preissiana</i>	Moonah Paperbark	Mel preis	Tree		5		1		
MYRTACEAE	<i>Melaleuca</i>	<i>thymoides</i>		Mel thym	Shrub					3	
MYRTACEAE	<i>Taxandria</i>	<i>parviceps</i>		Tax parv	Shrub	24		13		4	20
ORCHIDACEAE	<i>Caladenia</i>	<i>flava</i>	Cowslip orchid	Calad. Sp.1	Herb					1	
ORCHIDACEAE	<i>Orchid</i>	<i>sp.1</i>		Orchid sp.1	Herb	1		1			

FAMILY	GENUS	SPECIES	COMMON NAME	SURVEY REFERENCE	VEGETATION TYPE	1 (SJ)	2 (reveg)	3 (SJ)	4 (reveg)	5 (woodland)	6 (open heath)
ORCHIDACEAE	<i>Orchid</i>	<i>sp.2</i>		Orchid sp.2	Herb						2
PARMELIACEAE	<i>Lichen</i>	<i>sp.1</i>		Lichen sp.1	Herb					2	
PITTOSPORACEAE	<i>Billardiera</i>	<i>variifolia</i>		Bil var	Herb	2		1			
POACEAE	<i>Cenchrus</i>	<i>clandestinus</i>	Kikuyu	kikuyu	Grass				6		
POACEAE	<i>Poaceae</i>	<i>sp.1</i>		Poaceae sp.1	Grass					18	
POLYTRICHACEAE	<i>Moss</i>	<i>sp.1</i>	Moss	Moss	Herb		8		3	11	1
PROTEACEAE	<i>Adenanthus</i>	<i>obovatus</i>	Basket flower	Aden obo	Herb	8		1		1	
PROTEACEAE	<i>Banksia</i>	<i>grandis</i>	Bull Banksia	B.grand	Tree	2					
PROTEACEAE	<i>Conospermum</i>	<i>caeruleum</i>	Blue brother	Con caer	Herb	1		1		7	
PROTEACEAE	<i>Hakea</i>	<i>amplexicaulis</i>	Prickly Hakea	Hak amp	Shrub			3			
PROTEACEAE	<i>Isopogon</i>	<i>sphaerocephalus</i>		Iso sphaer	Herb	8		2			
PROTEACEAE	<i>Persoonia</i>	<i>elliptica</i>		Pers ell	Shrub	1					
PROTEACEAE	<i>Persoonia</i>	<i>longifolia</i>	Snottygobble	Pers lon	Shrub	10		2			
PROTEACEAE	<i>Petrophile</i>	<i>diversifolia</i>		Pet div	Shrub	2					
RESTIONACEAE	<i>Desmocladus</i>	<i>fasciculatus</i>		Des fasc	Herb	11				6	
RESTIONACEAE	<i>Restionaceae</i>	<i>sp.1</i>		Rest sp.1	Grass					3	5
RESTIONACEAE	<i>Restionaceae</i>	<i>sp.2</i>		Rest sp.2	Grass					1	1
RESTIONACEAE	<i>Tremulina</i>	<i>tremula</i>		Trem trem	Grass						36
RUBIACEAE	<i>Opercularia</i>	<i>hispidula</i>	Hispid Stinkweed	Oper his	Herb			1			
RUTACEAE	<i>Boronia</i>	<i>spathulata</i>		Bor spath	Herb			1			
STYLIDIACEAE	<i>Stylidium</i>	<i>sp.1</i>	Trigger plant	Stylidium sp	Herb					2	
XANTHORRHOEA	<i>Xanthorrhoea</i>	<i>preissii</i>	Grass tree	Xan pre	Grass			1			
UNKNOWN	<i>Dodder</i>	<i>sp.1</i>		Dodder sp.1	Herb	1		1			
UNKNOWN	<i>Fern</i>	<i>sp.1</i>		Fern sp.1	Herb	13		5			
UNKNOWN	<i>Herbaceous</i>	<i>sp.1</i>		Herb sp.1	Herb	5					
UNKNOWN	<i>Herbaceous</i>	<i>sp.2</i>		Herb sp.2	Herb					2	

Flora Survey Transect Template Form							
Date:			Transect ID:		Size:		
Location:							
Lat/Long:				Lat/Long:			
Soil Type:				Survey Project Officers:			
Colour							
Texture							
(s/l/c)							
sand/loam/clay							
	Cover Abundance Scale (A)						
	Cover Abundance Value	Description					
	1	one- a few individuals					
	2	uncommon and < 5% cover					
	3	common and > 5% cover					
	4	abundant and 5-20% cover					
	5	very abundant 20-50% cover					
	6	50-75% cover					
	7	75-100% cover					
	Bushland Condition Scale (B)						
4	Very Good - Excellent (VG)	80-100% Native Flora Composition. Vegetation structure intact or nearly so. Vover/abundance of weeds less than 5%. No or minimal signs of disturbance.					
3	Fair - Good (G)	50-80% Native Flora Composition. Vegetation structure modified or nearly so. Cover/abundance of weeds 5-20% any number of individuals. Minor signs of disturbance.					
2	Poor (P)	20-50% Native Flora Composition. Vegetation structure completely modified. Cover/abundance of weeds 20-60% any number of individuals. Disturbance incidence high.					
1	Degraded (D)	0-20% Native Flora Composition. Vegetation structure disappeared. Cover/abundance of weeds 60-100% any number of individuals. Disturbance incidence very high.					
General Comments/Observations:							

Flora Survey Transect Template Form					
Transect ID:		ABUNDANCE & BUSHLAND CONDITION		Project Officers:	
Date:					
SPECIES	NORTH END			SPECIES	SOUTH END
		1			
		A =			
		B =			
		2			
		A =			
		B =			
		3			
		A =			
		B =			
		4			
		A =			
		B =			
		5			
		A =			
		B =			
		6			
		A =			
		B =			
		7			
		A =			
		B =			
		8			
		A =			
		B =			
		9			
		A =			
		B =			
		10			
		A =			
		B =			
		11			
		A =			
		B =			
		12			
		A =			
		B =			
		13			
		A =			
		B =			
		14			
		A =			
		B =			
		15			
		A =			
		B =			
		16			
		A =			
		B =			
		17			
		A =			
		B =			
		18			
		A =			
		B =			
		19			
		A =			
		B =			
		20			
		A =			
		B =			

Photos of Transects:
Transect 1 (Southern Jarrah):



TR1_2m



TR1_2m



TR1_3m



TR1_4m



TR1_5m



TR1_6m



TR1_7m



TR1_8m



TR1_9m



TR1_10m



TR1_11m



TR1_12m



TR1_13m



TR1_14m



TR1_15m



TR1_16m



TR1_17m



TR1_18m



TR1_19m

Transect 3 (Southern Jarrah):



TR3_1m



TR3_2m



TR3_4m



TR3_3m



TR3_5m



TR3_6m



TR3_7m



TR3_8m



TR3_9m



TR3_10m



TR3_11m



TR3_12m



TR3_13m



TR3_14m



TR3_15m



TR3_16m



TR3_17m



TR3_18m



TR3_19m



TR3_20m

