Detailed Flora and Vegetation Survey

11 Moores Rd, Pinjarra
2024.

Prepared for: Coterra Environment

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EXECUTIVE SUMMARY

This report has been prepared by Del Botanics Environmental Consulting on behalf of Coterra Environment to present the results of a spring Detailed Flora and Vegetation survey at 11 Moores Rd, Pinjarra. The location of the site is shown on **Figures 1** and **2.**

The recent Flora and Vegetation Assessment undertaken in the area described above identified 48 flora species, with 45.8% represented by weed species. The vegetation condition is "Good" to "Completely Degraded."

One vegetation community was recorded at a local level during the survey. No species of Threatened (T), or Priority Flora or Threatened Ecological Communities (TEC's) pursuant to the *Biodiversity Conservation* (BC) Act, 2016 and the *Environment Protection and Biodiversity Conservation* (EPBC) Act, 1999 were located during the time of the survey.

STATEMENT OF LIMITATIONS

This environmental report has been prepared in accordance with the scope of services set out in the original quotation. In preparing the report, Del Botanics Environmental Consulting relied on data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report. Del Botanics Environmental Consulting has not verified the accuracy or completeness of the data to the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report are based in whole or in part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Del Botanics Environmental Consulting will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, unavailable, misrepresented or otherwise not fully disclosed.

In accordance with the scope of services, Del Botanics Environmental Consulting has relied on the data and have conducted environmental field monitoring in the preparation of the report. The nature and extent of monitoring conducted is described in the report. Within the limitations imposed by the scope of services, the monitoring and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care. No other warranty, express or implied, is made.

The report has been prepared for the benefit of the Client and for no other party. Del Botanics Environmental Consulting assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report. Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

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1. INTRODUCTION

1.1 BACKGROUND

This report has been prepared by Del Botanics Environmental Consulting on behalf of Coterra Environment to present the results of a spring Detailed Flora and Vegetation survey within 11 Moores Rd, Pinjarra. The location of the site is shown on **Figures 1** & **2**. The site is approximately 81.8 kilometres south of the Perth central area.

The botanical survey of the flora species and vegetation was undertaken on 22nd October 2024.

Figure 1: Site Location

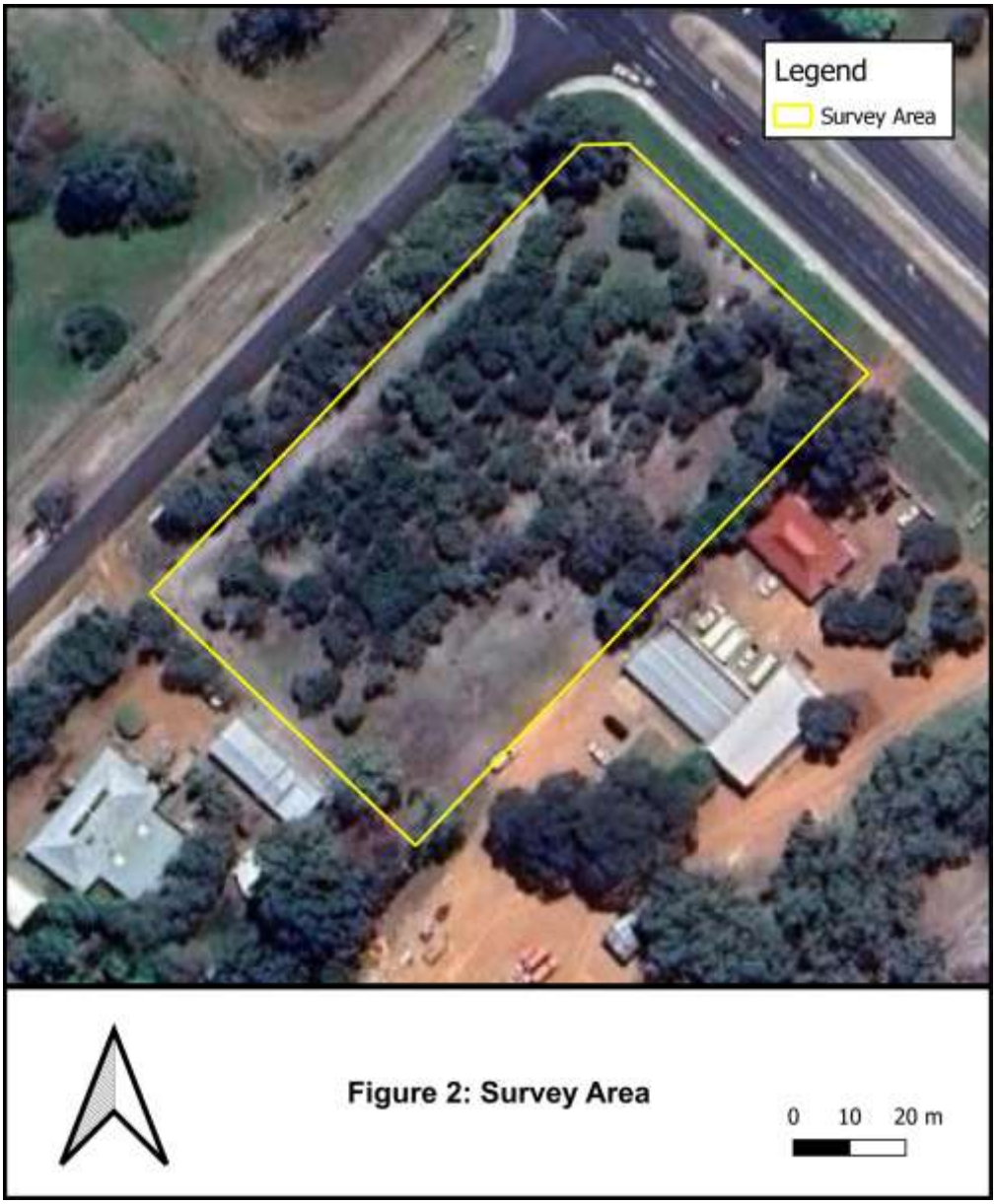

Figure 2: Survey Area

1.2 PURPOSE OF THIS REPORT

This report was prepared to present the results of the Flora and Vegetation Survey undertaken within the area described above. The flora species and vegetation were used to determine the significance of the site. In summary this report provides:

- A Department of Biodiversity, Conservation and Attractions (DBCA)Threatened Flora (T) and Threatened Ecological Communities (TEC's) database search;
- A Department of Climate Change, Energy, the Environment and Water (DCCEEW) database search;
- A spring botanical survey; and
- An assessment of vegetation communities and conditions.

2. EXISTING ENVIRONMENT

2.1 LANDFORM, TOPOGRAPHY AND SOILS

Soil-landscape system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales. The survey area is within the Bassendean System.

The Bassendean system occurs along the Swan Coastal Plain from Busselton to Jurien. It consists of fixed dunes inland from the coastal dune zone. It has non-calcareous mid Pleistocene Bassendean sand and podsolised soils with low-lying wet areas. It contains dunes and sandplains with pale deep sand, semi-wet and wet soil. Associated vegetation includes Banksia-paperbark woodlands and mixed heaths (Department of Agriculture and Food WA, 2012).

2.2 VEGETATION

The survey area lies in the Drummond Botanical Subdistrict within the Southwest Botanical Province as described by Beard (1990). Flora composition has been described by Beard (1990) as predominantly consisting of Banksia Low Woodlands on leached sands with Melaleuca swamps, where ill drained and Woodlands of Eucalyptus spp. on less leached soils.

2.2.1 Regional vegetation

The Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological and geographical/geological attributes. Western Australia has 26 biogeographic regions, and 53 subregions based on dominant landscape characteristics of climate, lithology, geology, landform and vegetation. The study area is on the Swan Coastal Plain (SWA) bioregion. The Swan Coastal Plain Bioregion comprises of the Dandaragan Plateau and the Perth Coastal Plain. The Swan Coastal Plain (SCP) is dominated by woodlands of Banksia and Tuart on sandy soils, Sheoak on outwash plains, and Paperbark in swampy areas (DCCEEW, 2024).

2.2.2 Vegetation Complex

The term vegetation complex describes the pre-1750 distribution of vegetation communities of the southwest forest region of Western Australia described by Mattiske and Havel (1998). This was part of the biodiversity assessment for the comprehensive regional assessment for the southwest forest region.

Based on this mapping at a scale of 1:50,000, the Department of Primary Industries and Regional Development (DPIRD) has compiled a list of vegetation extent and types across WA. This mapping

suggests one vegetation complex occurs within the survey area. The survey area lies within the Swan Complex.

The Swan vegetation complex consists of fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca rhaphiophylla* (Swamp Paperbark) with localised occurrence of low open forest of *Casuarina obesa* (Swamp Sheoak) and *Melaleuca cuticularis* (Saltwater Paperbark) (DataWA, 2024).

3. CLIMATE

The closest Bureau of Meteorology (BoM) weather station is approximately 19km west of the survey area in Mandurah (Site No.009977). The long-term mean minimum temperature for Mandurah ranged from 10.1˚C in July to 19.4˚C in February between 2001 and 2025. The long-term mean maximum temperature ranged from 17.7˚C in July to 29.9˚C in February between 2001 to 2025 (Bureau of Meteorology, 2024).

The long-term annual average rainfall is 707.2 millimetres (mm) from 2001 to 2025 (Bureau of Meteorology, 2024). Recent annual data is show below on **Figure 3**.

The temperature recorded in October 2024 was within the normal climatic conditions historically recorded for this area. The rainfall recorded in October 2024 was 7.4mm more than recorded in October 2023. This is however consistent with the annual average rainfall recorded between 2001 to 2025 and therefore would not have had a significant impact on the flora recorded within the survey area.

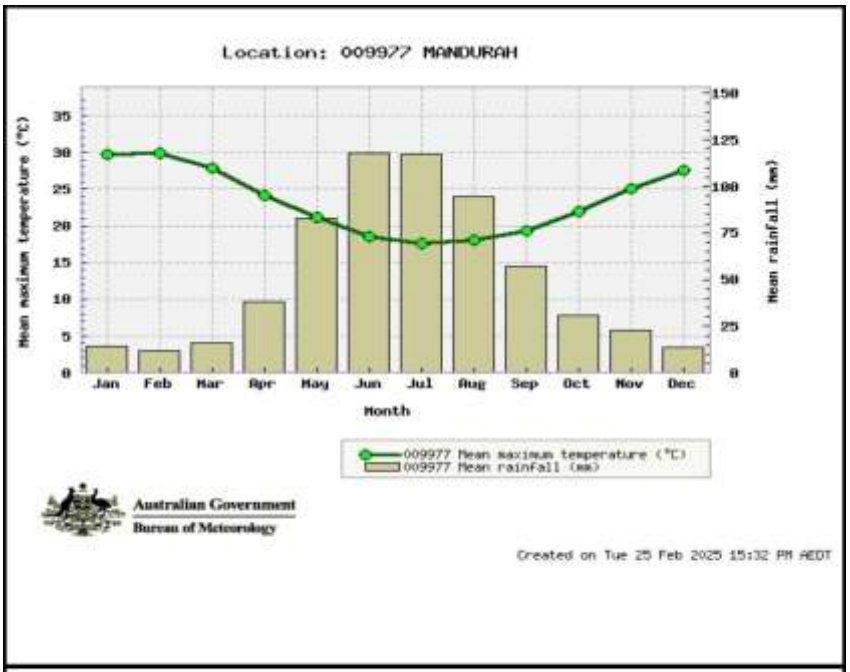

Figure 3: Weather Data

4. FLORA AND VEGETATION ASSESSMENT

4.1 VEGETATION METHODS

A Detailed Flora and Vegetation Survey was undertaken on the 22nd October 2024. The site was surveyed for flora species including, Threatened Flora (T), Priority Flora (PF), potential areas of Threatened Ecological Communities (TEC's) and vegetation condition. Each variation or difference in vegetation was recorded with three 10 metre by 10 metre quadrats.

Data was recorded to statistically determine vegetation communities and condition. In total, three quadrats were assembled to record each vegetation community. Each quadrat recorded flora species, heights, percentage cover and percentage dead and alive. Quadrats were not assembled permanently; Quadrat data is available in **Appendix B.**

The survey methodology was undertaken in accordance with EPA Position Statement No.3: *Terrestrial Biological Surveys as an Element of Biodiversity Protection* and EPA Guidance Statement No. 51: *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia.*

All plant specimens collected during the field survey were dried, pressed and then sorted in accordance with the requirements of the Western Australian State Herbarium. Identification of specimens occurred through comparison with named material and through the use of taxonomic keys.

The use of standard data collection forms ensured the data was collected in a systematic and consistent manner. At each quadrat the following information was recorded:

- Vegetation condition;
- Vegetation community;
- Flora species;
- Local disturbances;
- Topography;
- Soils; and
- Age since fire.

The vegetation communities occurring on this site were described in detail. Aerial photography was used to extrapolate and map plant communities in combination with running notes made during the course of the survey.

4.2 DECLARED RARE AND PRIORITY FLORA

Species of flora acquire “Threatened”, “Presumed Extinct” or “Priority” conservation status where populations are restricted geographically or threatened by local processes.

The Department of Biodiversity, Conservation and Attractions (DBCA) recognise these threats and subsequently applies regulations towards population protection and species conservation. The DBCA enforces regulations under the *Biodiversity Conservation Act*, 2016 to conserve Threatened species and protect significant populations. Priority Flora species are potentially rare or threatened and are classified in order of threat. Threatened and Priority Flora category definitions are listed in **Table 1**.

The likelihood of each flora species and vegetation community occurring onsite is determined by background research on the known soil types and vegetation communities. This information together with botanical knowledge provides an informative result on whether the flora species is likely to occur on the site.

Table 1: Definition of Threatened and Priority Flora Species (DEC 2012)

Conservation Code	Category
T	**Threatened Flora (Declared Rare Flora – Extant)**. Schedule 1 under the Wildlife Conservation Act 1950 Rare Flora Notice 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. **Threatened Flora (Schedule 1) are further ranked by the Department according to their level of threat using IUCN Red List criteria:** **CR**: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild. **EN**: Endangered considered to be facing a very high risk of extinction in the wild. **VU**: Vulnerable - considered to be facing a high risk of extinction in the wild
X	**Presumed Extinct Flora (Declared Rare Flora – Extinct)** Schedule 2 under the Wildlife Conservation Act 1950 Rare Flora Notice Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died and have been gazetted as such.
P1	**Priority One: Poorly known species** Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes
P2	**Priority Two: Poorly known species** Species that are known from one or a few collections or sight records, some of which are on land not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State Forest, vacant Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
P3	**Priority Three: Poorly known species** Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
P4	**Priority Four: Rare, Near Threatened and other species in need of monitoring** (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
P5	**Priority Five: Conservation Dependent species** Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years

4.2.1 Environment Protection and Biodiversity Conservation Act (1999) – Species level significance

The *Environment Protection and Biodiversity Conservation* (EPBC) *Act*, 1999, promotes the conservation of biodiversity by providing strong protection for plants at a species level. Section 178 and 179 provides the lists and categories of threatened species under the Act and is presented in **Table 2** below.

Table 2: Categories of Threatened Species (EPBC Act, Section 179, 1999)

1	**Extinct** A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
2	**Extinct in the Wild** A native species is eligible to be included in the **extinct in the wild** category at a particular time if, at that time:(a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
3	**Critically Endangered** A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
4	**Endangered** A native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
5	**Vulnerable** A native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
6	**Conservation Dependant** A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: (a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

A search using the Department of Climate Change, Energy, the Environmental and Water (DCCEEW) Protected Matters Tool was undertaken within a 5km radius of the site. The search result noted thirteen flora species of significance likely to occur in the area. Seven flora species have been listed as Endangered; four species are listed as Vulnerable, and two are recorded as Critically Endangered. These species are listed in **Table 3** below.

Table 3: DCCEEW Protected Matters listed flora species.

Species Name	Conservation Code	Likely to occur onsite	Survey undertaken in flowering time
Andersonia gracilis	Endangered	Yes	Yes
Banksia mimica	Endangered	Yes	No
Caladenia huegelii	Endangered	No	Yes
Diuris drummondii	Vulnerable	Yes	No
Diuris micrantha	Vulnerable	No	Yes
Diuris purdiei	Endangered	Yes	Yes
Drakaea elastica	Endangered	Yes	Yes
Drakaea micrantha	Vulnerable	Yes	Yes
Morelotia australiensis	Vulnerable (listed as *Tetraria*	Unknown	Unknown

	australiensis)		
Synaphea sp. Fairbridge Farm	Critically Endangered	Yes	Yes
Synaphea sp. Pinjarra Plain	Endangered	Yes	Yes
Synaphea sp. Serpentine	Critically Endangered	Unknown	Unknown
Synaphea stenoloba	Endangered	Yes	Yes

4.2.2 Department of Biodiversity, Conservation and Attractions (DBCA) Database Search

In addition to the background search undertaken through the DCCEEW Protected Matters, a Threatened and Priority flora search was undertaken through the DBCA. The search is undertaken on records from the Threatened and Priority Flora Database (TPFL) and the WA Herbarium database (WAHerb), which provides known locations of each species. The results are provided below in **Table 4**. The search was conducted within a 10km radial area from the central coordinate.

Table 4: DBCA Threatened and Priority Flora Search Results

Taxon	Conservation Status EPBC	DBCA	Likely to occur onsite	Survey undertaken in flowering time
Acacia benthamii	2		No	Yes
Acacia lasiocarpa var. *bracteolata*	1		Yes	No
Amanita drummondii	3		No	No
Aponogeton hexatepalus	4		No	Yes
Blennospora doliiformis	3		No	Yes
Caladenia huegelii	T		No	Yes
Caladenia speciosa	4		Yes	Yes
Calothamnus graniticus subsp. *leptophyllus*	4		No	No
Chamaescilla gibsonii	3		No	Yes
Cyanothamnus tenuis	4		Unknown	Unknown
Cyathochaeta teretifolia	3		No	Unknown
Dillwynia dillwynioides	3		No	Yes
Diuris drummondii	T	EN	Yes	No
Diuris micrantha	T	VU	No	Yes
Diuris purdiei	T	EN	Yes	Yes
Drakaea elastica	T	CR	Yes	Yes
Drosera occidentalis	4		No	Yes
Drosera paleacea	1		Yes	Yes
Eryngium sp. Ferox	3		Unknown	Unknown
Eucalyptus rudis subsp. *cratyantha*	4		No	Yes
Grevillea bipinnatifida subsp. *pagna*	1		No	Yes
Grevillea ornithopoda	2		No	Yes
Hemigenia microphylla	3		No	Yes
Hibbertia acrotoma	1		Unknown	Unknown
Jacksonia gracillima	3		Yes	Yes
Jacksonia sericea	4		Yes	Yes
Johnsonia pubescens subsp. *cygnorum*	2		Yes	No
Levenhookia preissii	1		Yes	Yes
Microtis quadrata	4		Unknown	Unknown

Morelotia australiensis	T	VU	Unknown	Unknown
Myriophyllum echinatum	3		Unknown	Unknown
Ornduffia submersa	4		Unknown	Unknown
Parsonsia diaphanophleba	4		No	No
Phyllangium palustre	2		No	Yes
Pterostylis frenchii	2		Yes	Unknown
Ptilotus sericostachyus subsp. *roseus*	X		Yes	Yes
Rumex drummondii	4		Yes	Unknown
Schoenus benthamii	3		Yes	Yes
Schoenus natans	4		Yes	Yes
Schoenus pennisetis	3		Yes	Yes
Schoenus sp. Waroona	3		Yes	Yes
Stylidium aceratum	3		No	Yes
Stylidium longitubum	4		Yes	Yes
Stylidium roseonanum	3		No	Yes
Synaphea sp. Fairbridge Farm	T	CR	Yes	Yes
Synaphea sp. Pinjarra	T	CR	Yes	Yes
Synaphea stenoloba	T	EN	Yes	Yes
Tripterococcus sp. Brachylobus	4		Unknown	Unknown
Trithuria australis	4		Unknown	Unknown
Verticordia plumosa var. *ananeotes*	T		No	No

4.3 THREATENED ECOLOGICAL COMMUNITIES

In Western Australia Threatened Ecological Communities (TECs) are assessed through a procedure coordinated by the DBCA and are assigned to one of the categories outlined below in **Table 5**. While they are not afforded direct statutory protection at a state level (unlike Threatened Flora under the *Biodiversity Conservation Act*, 2016) their significance is acknowledged through other State environmental approval processes (i.e. Environmental Impact Assessment pursuant to Part IV of the *Environmental Protection Act*, 1986). Scheduled TECs are afforded statutory protection at a federal level pursuant to the EPBC Act.

The Department has been identifying and listing threatened ecological communities since 1994 through the non-statutory process.

The Minister for Environment previously listed ecological communities as threatened through a non-statutory process if the community was presumed to be totally destroyed or at risk of becoming totally destroyed. The *Biodiversity Conservation Act, 2*016 (BC Act) provides for the statutory listing of threatened ecological communities (TECs) by the Minister. The new legislation also describes statutory processes for preparing recovery plans for TECs, the registration of their critical habitat, and penalties for unauthorised modification of TECs.

The Department has been identifying and listing TECs since 1994 through the non-statutory process. The WA Minister for Environment has endorsed 69 ecological communities as threatened in the following categories:

- 20 critically endangered
- 17 endangered
- 28 vulnerable
- 4 presumed totally destroyed.

25 of these are listed under the Commonwealth's *Environment Protection and Biodiversity Conservation Act,* 1999. As of January 2019, an additional 393 ecological communities (community types and sub-types) with insufficient information available to be considered a TEC, or which are rare but not currently threatened, have been placed on the Priority list and referred to as Priority Ecological Communities (PECs)**.**

Table 5: Categories of DBCA's Threatened Ecological Communities

PD	**Presumably Totally Destroyed** An ecological community that has been adequately searched for but for which no representative occurrences have been located.
CE	**Critically Endangered** An ecological community that has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
E	**Endangered** An ecological community that has been adequately surveyed and is not critically endangered but is facing a very high risk of total destruction in the near future.
V	**Vulnerable** An ecological community that has been adequately surveyed and is not critically endangered or endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future.

The EPBC Act provides for the strong protection of TECs, which are listed under section 181 of the Act and are described as 'Critically Endangered', 'Endangered' or 'Vulnerable' under section 182. Schedules of protected TECs maintained pursuant to the EPBC Act are based on the same Floristic Community Types (FCTs) as adopted by DBCA, however not all TECs listed by the DBCA are scheduled under the EPBC Act.

The Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Report indicated there are four known Threatened Ecological Communities (TECs) likely to occur within a 5km radius of the area, the TECs are listed in **Table 6** below.

Table 6: DCCEEW listed Threatened Ecological Communities

Species Name	Conservation Code	Likely to occur on site
Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	No
Empodisma peatlands of southwestern Australia	Endangered	No
Clay Pans of the Swan Coastal Plain	Critically Endangered	No
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Yes

4.3.1 Department of Biodiversity, Conservation and Attractions (DBCA) Database Search

In addition to the background search undertaken through the DCCEEW Protected Matters, a Threatened Ecological Community (TEC) search was undertaken through the DBCA. The search is undertaken on records from the DBCA, which provides known locations of TECs. The results noted four known TECs to occur within a 10km radial area from the central coordinate. This information is provided in **Table 7** below.

Table 7: DBCA listed Threatened Ecological Communities

Species Name	Conservation Code	Likely to occur on site
SCP07 Herb rich saline shrubland in clay pans (FCT 7 as originally described in Gibson et al. 1994)	Endangered [DBCA] Critically Endangered [EPBC]	No
SCP 09 Dense shrublands on clay flats (FCT 9 as originally described in Gibson et al. 1994)	Endangered [DBCA] Critically Endangered [EPBC]	No
SCP3a *Corymbia calophylla-Kingia australis* woodlands on heavy soils (FCT 3a as originally described in Gibson et al. 1994)	Critically Endangered [DBCA] Endangered [EPBC]	No
SCP15 Forests and woodlands of deep seasonal wetlands of the Swan Coastal Plain (FCT 15 as originally described in Gibson et al. 1994)	Critically Endangered [DBCA]	No

5. FLORA AND VEGETATION ASSESSMENT RESULTS

A total of 48 taxa, comprising of 19 families and 45 genera were recorded on site. A list of these species has been provided in **Appendix A**. Species representation was greatest among the Asteraceae and Poaceae families.

5.1 INTRODUCED SPECIES

Twenty-two introduced flora species were recorded on the site, shown in **Table 8** below. This represents 45.8% of the total number of flora species recorded on site. No weeds recorded onsite are listed as Weeds of National Significance (WoNS) (Department of Climate Change Energy, the Environment and Water (DCCEEW 2024). Definitions are provided in **Appendix C**.

Table 8: Introduced Flora Recorded in the Survey Area

Taxa	Common Name	BAM Act
**Agapanthus* sp.	African lily	Unable to determine
**Arctotheca calendula*	Cape Weed	Permitted - s11
**Briza maxima*	Blowfly Garss	Permitted - s11
**Briza minor*	Shivery Grass	Permitted - s11
**Cotula turbinata*	Funnel Weed	Permitted - s11
**Ehrharta longiflora*	Annual Veldt Grass	Permitted - s11
**Eragrostis curvula*	African Lovegrass	Permitted - s11
**Eucalyptus camaldulensis*	River Gum	Permitted - s11
**Hypochaeris glabra*	Smooth Cats-ear	Permitted - s11
**Lagurus ovatus*	Hare's Tail Grass	Permitted - s11
**Lotus angustissimus*	Narrowleaf Trefoil	Permitted - s11
**Ornithopus compressus*	Yellow Serradella	Permitted - s11
**Ornithopus pinnatus*	Slender Serradella	Permitted - s11
**Oxalis glabra*	Finger-leaf Oxalis	Permitted - s11
**Romulea rosea*	Guildford Grass	Permitted - s11
**Schismus barbatus*	Kelch Grass	Permitted - s11
**Taraxacum khatoonae*	Dandelion	Permitted - s11
**Ursinia anthemoides*	Ursinia	Permitted - s11
**Vellereophyton dealbatum*	White Cudweed	Permitted - s11
**Vulpia bromoides*	Squirrel Tail Fescue	Permitted - s11
**Vulpia* sp.	Vulpia	Unable to determine
**Wahlenbergia capensis*	Cape Bluebell	Permitted - s11

5.2 THREATENED AND PRIORITY FLORA

No species of Threatened (T) or Priority Flora were recorded during the survey; No other flora, pursuant to the *Biodiversity Conservation* (BC) Act, 2016 or the *Environment Protection and Biodiversity*

Conservation (EPBC) Act, 1999 or listed by the Department of Biodiversity, Conservation and Attractions (DBCA) were located during the time of the survey.

5.3 THREATENED ECOLOGICAL COMMUNITIES

No Threatened Ecological Communities listed by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) or Department of Biodiversity, Conservation and Attractions (DBCA) were located during the time of the survey.

5.4 LOCAL VEGETATION COMMUNITIES

Vegetation structure recorded in each vegetation community is used to determine the coverage class as described below in **Table 9.** These vegetation structure classes are defined in the Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (2016).

Table 9: Vegetation Structure Classes

Life Form/ Height Class	**Canopy Cover (percentage)**			
	100% - 70%	**70% - 30%**	**30% - 10%**	**10% - 2%**
Trees 10-30m Trees < 10m	Closed Forest Low Closed Forest	Open Forest Low Open Forest	Woodland Low Woodland	Open Woodland Low Open Woodland
Shrub Mallee	Closed Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
Shrubs > 2m Shrubs 1-2m Shrubs <1m	Closed Tall Scrub Closed Heath Closed Low Heath	Tall Open Scrub Open Heath Open Low Heath	Tall Shrubland Shrubland Low Shrubland	Tall Open Shrubland Open Shrubland Low Open Shrubland
Grasses	Closed Grassland	Grassland	Open Grassland	Very Open Grassland
Herbs	Closed Herbland	Herbland	Open Herbland	Very Open Herbland
Sedges	Closed Sedgeland	Sedgeland	Open Sedgeland	Very Open Sedgeland

One vegetation community was represented on the site at a local level, which has been described below in **Table 10.** Photographic representations of the vegetation community are shown in the Quadrat data sheets in **Appendix B**. The vegetation community, conditions and quadrat locations are shown on **Figures 4** & **5.**

Table 10: Local Vegetation Community recorded within 11 Moores Rd, Pinjarra, October 2024.

Community Description
Vegetation Community 1 –*Melaleuca preissiana* Woodland
Low woodland of *Melaleuca preissiana* over tall shrubland of *Kunzea ericifolia* over open sedgeland of *Chaetanthus aristatus* over very open herbland of **Taraxacum khatoonae* and**Hypochaeris glabra.*

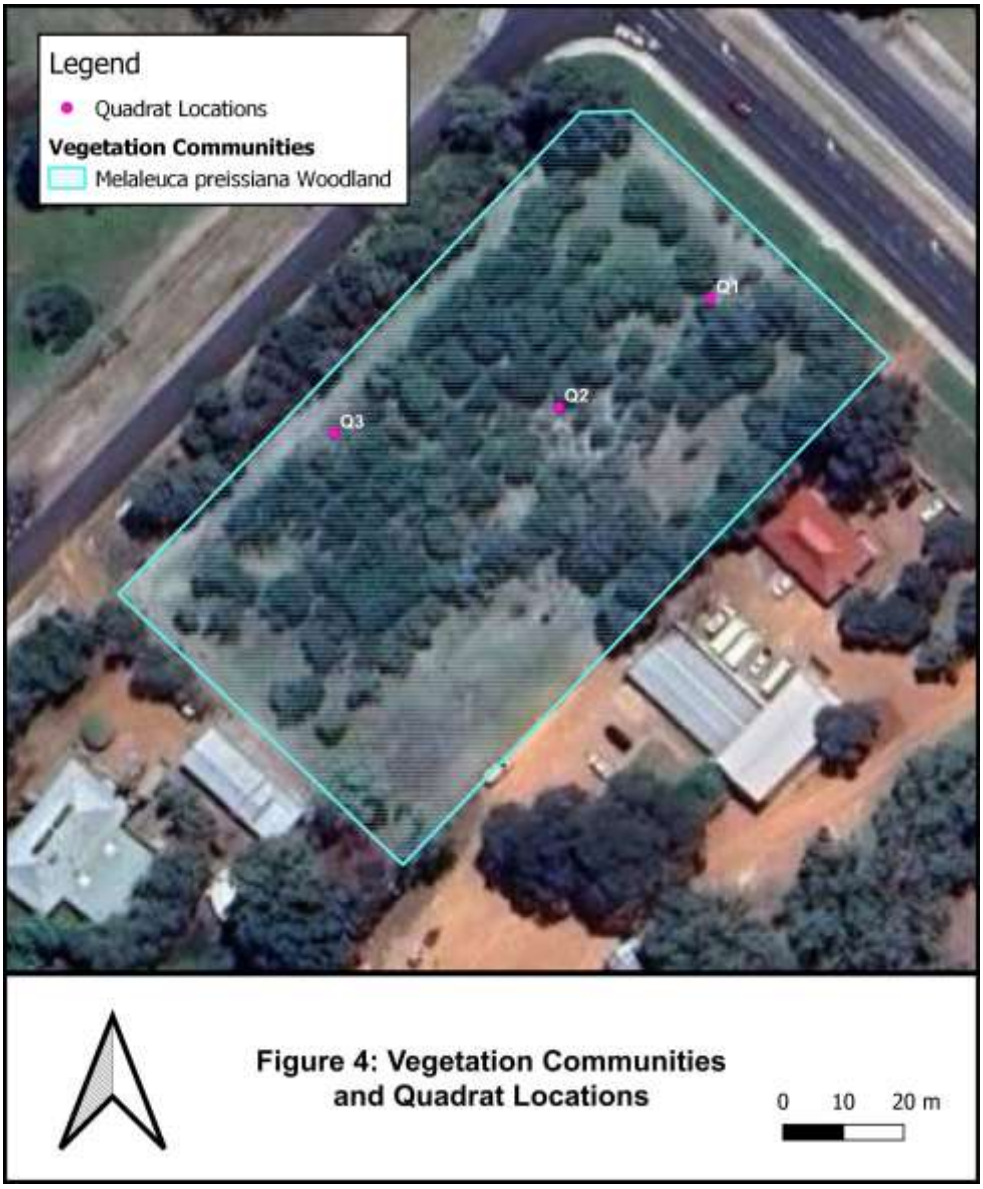

Figure 4: Vegetation Communities and Quadrat Locations

6. VEGETATION CONDITION

Many bushland remnants have been historically degraded and current land use activities continue degradation and fragmentation processes. As a result, these remnants are especially susceptible to disturbances arising from indirect impacts such as surrounding developments and human activity.

Degradation is caused by a wide range of factors, including isolation and edge effects, weed invasion, plant diseases, changes in fire frequency and behaviour, landscape fragmentation, increased predation on native fauna by feral animals, resulting in a decrease in species richness and general modification of ecological function (Urban Bushland Council, 2018).

The site has had significant historic land disturbances, primarily for agriculture. The survey area has limited structure with significant bare areas and isolated remnants of vegetation. The remnant vegetation

is predominantly shrubland with few trees and a high weed density and diversity. The site is currently used for stock grazing.

The vegetation condition was rated according to the Vegetation Condition Scale used in the Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (2016). The definitions are described in **Table 11** below.

Table 11: Vegetation Condition Scale

Vegetation Condition	Southwest and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds
Poor		Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs

The vegetation condition recorded across the site was "Good" to "Completely Degraded". Vegetation condition mapping is provided on **Figure 5.**

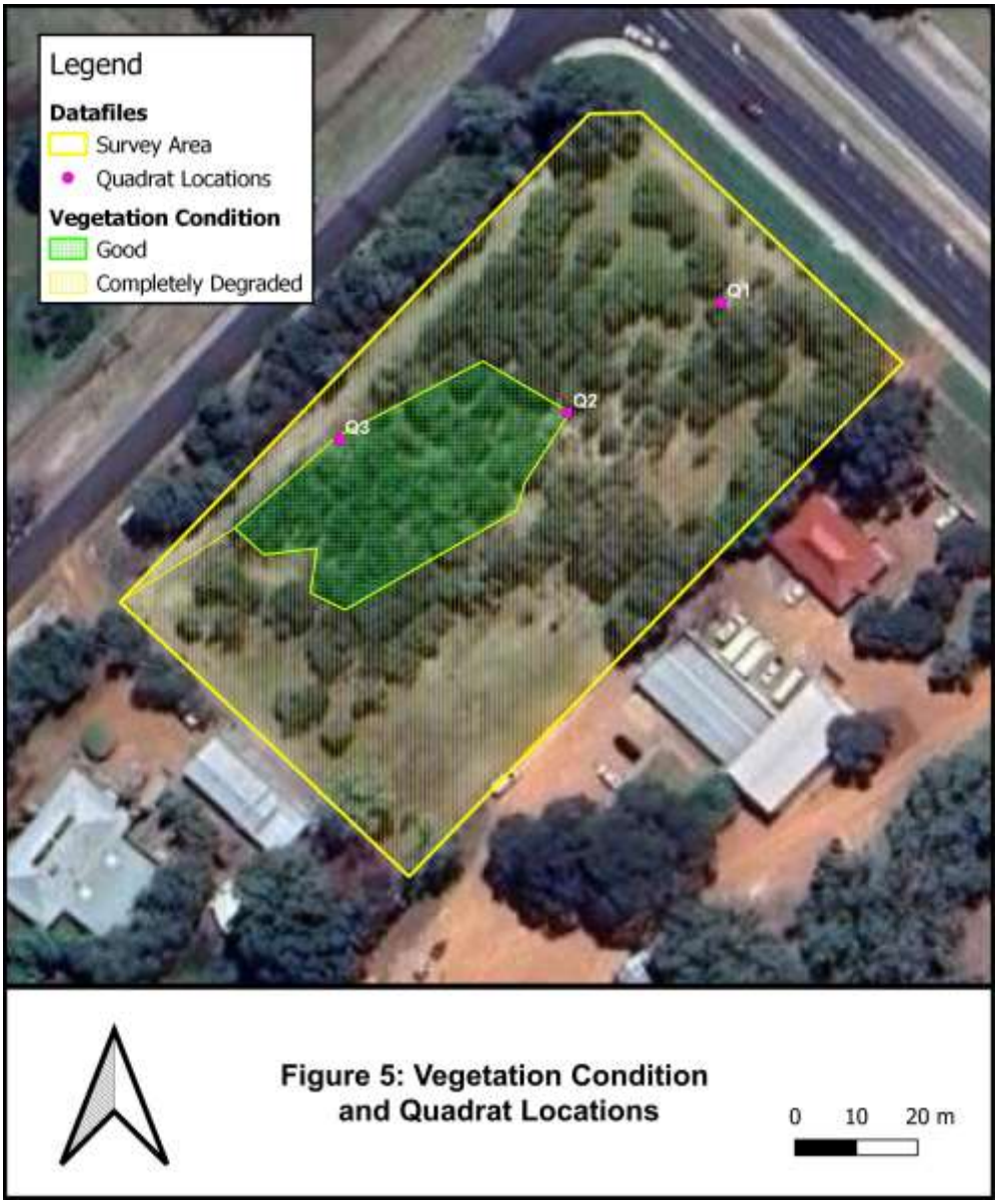

Figure 5: Vegetation Condition and Quadrat Locations

7. DISCUSSION AND CONCLUSION

The Detailed Flora and Vegetation survey within 11 Moored Rd, Pinjarra identified a total of 48 taxa representing 45 genera and 19 families. Weed species comprised of 45.8% of the total flora recorded. The vegetation condition across the site is "Good" to "Completely Degraded".

One vegetation community was recorded at a local level during the survey. Vegetation consisted of low woodland of *Melaleuca preissiana* over tall shrubland of *Kunzea ericifolia* over open sedgeland of *Chaetanthus aristatus* over very open herbland of **Taraxacum khatoonae* and**Hypochaeris glabra.*

No species of Threatened (T), or Priority Flora pursuant to the *Biodiversity Conservation* (BC) Act 2016 or the *Environment Protection and Biodiversity Conservation* (EPBC) Act 1999 were located during the time of the survey.

The botanical survey was undertaken in spring to coincide with the majority of the flowering times of the threatened species. A number of species listed in **Tables 3 & 4**, have been acknowledged as likely to occur within the survey area, based on soils and vegetation composition. The high diversity and density of weed species combined with stock grazing and the degraded condition of the site, suggests that it is unlikely to support any of the listed Threatened or Priority flora species. Most of the species identified as likely to occur were also recorded as flowering during the time of the sure, which would suggest they would be visible if occurring within the survey area. The listed species not flowering but are likely to be onsite are recognisable without flowers, including *Johnsonia pubescens* subsp. *cygnorum*, *Banksia mimica* and *Acacia lasiocarpa* var. *bracteolate.* Only one species not flowering and likely to occur within the survey area is *Diuris drummondii*, however due to recent grazing it is unlikely to occur within the survey area.

No Threatened Ecological Communities listed by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) or Department of Biodiversity, Conservation and Attractions (DBCA) were located during the time of the survey.

The vegetation lacks the appropriate structure and species diversity to be classified as the only TEC likely to occur within the survey area. The likely TEC is *Banksia Woodlands of the Swan Coastal Plain* Ecological Community. In addition, the size and condition of the remnant vegetation and species composition in the survey area, does not meet the size and condition thresholds for the other listed (**Tables 6 & 7**) Ecological Communities. The survey area consists of low woodland of *Melaleuca preissiana* with a very degraded understorey. This species composition recorded in the survey area does

not represents those recorded as the likely TECs in the vicinity. Historical land uses and current grazing has impacted the site and degraded the vegetation condition.

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APPENDIX A
VASCULAR PLANT SPECIES RECORDED

APPENDIX A:
VASCULAR PLANT SPECIES RECORDED AT 11 MOORES RD, PINJARRA, OCTOBER 2024
*(*Denotes a weed species)*

Amaryllidaceae	**Agapanthus* sp.
Apiaceae	*Homalosciadium homalocarpum*
Araliaceae	*Trachymene pilosa*
Asteraceae	**Arctotheca calendula*
	**Cotula turbinata*
	**Hypochaeris glabra*
	**Taraxacum khatoonae*
	**Ursinia anthemoides*
	**Vellereophyton dealbatum*
	Asteraceae sp.
	Hypocalymma angustifolium
	Myriocephalus occidentalis
Campanulaceae	**Wahlenbergia capensis*
Dasypogonaceae	*Dasypogon bromeliifolius*
Fabaceae	**Lotus angustissimus*
	**Ornithopus compressus*
	**Ornithopus pinnatus*
	Acacia saligna
	Bossiaea eriocarpa
	Isotropis cuneifolia
Haemodoraceae	*Conostylis* sp.
Hemerocallidaceae	*?Caesia micrantha*
Iridaceae	**Romulea rosea*
Juncaceae	*Juncus pallidus*
Loranthaceae	*Nuytsia floribunda*
Myrtaceae	**Eucalyptus camaldulensis*
	Agonis flexuosa
	Astartea?affinis
	Hypocalymma angustifolium
	Kunzea ericifolia
	Leptospermopsis erubescens
	Melaleuca preissiana
Oxalidaceae	**Oxalis glabra*
Poaceae	**Briza maxima*
	**Briza minor*
	**Ehrharta longiflora*
	**Eragrostis curvula*
	**Lagurus ovatus*
	**Lotus angustissimus*
	**Schismus barbatus*
	**Vulpia bromoides*
	**Vulpia* sp.
	Austrostipa sp.
Proteaceaea	*Adenanthos?obovatus*
Restionaceae	*Desmocladus asper*
	Chaetanthus aristatus

Stylidiaceae	*Stylidium* sp.
Xanthorrhoeaceae	*Xanthorrhoea preissii*

APPENDIX B
QUADRAT DATA

Del Botanics Environmental Consulting

FIELD SHEET – FLORA AND VEGETATION SURVEY

Job Code: 11 Moores Rd, Pinjarra	**Date:** 22/10/2024	**Site:** Q1
GPS Datum: (50) 393145.70 m E 6390284.91 m S	**Topography:** Lower slope	**Litter cover:** 5 % twigs, 20 % leaves 0% logs
Age since fire: >10 yrs	**Disturbance: Hi** Med Lo	**Soils:** Grey sand
Vegetation Description: *Melaleuca preissiana* woodland		
Vegetation Condition: Completely Degraded		
Observations: Heavily grazed, compacted soils. Good stand of old Melaleuca trees.		

Coll No.	Taxon	Ht (cm)	% Alive	% Dead	% Cover
Top	*Melaleuca preissiana*	300	100		25
	Agonis flexuosa	500	100		7
Middle	*Kunzea ericifolia*	300	100		25
Bottom SP1	*Chaetanthus aristatus*	40	95	5	35
	**Hypochaeris glabra*	5	100		7
	**Taraxacum khatoonae*	5	100		7
	**Arctotheca calendula*				
	**Briza minor*				
	**Lotus angustissimus*				
SP2	**Cotula turbinata*				
	Juncus pallidus				
	**Ursinia anthemoides*				
	Austrostipa sp.				

	**Ehrharta longiflora*				
	**Briza maxima*				
	Acacia saligna				
	**Oxalis glabra*				
	**Lagurus ovatus*				
SP3	**Schismus barbatus*				
SP4	**Ornithopus pinnatus*				
Opp	*Xanthorrhoea preissii*				
Opp	**Eucalyptus camaldulensis*				
Opp	**Agapanthus* sp.				

Del Botanics

FIELD SHEET – FLORA AND VEGETATION SURVEY

Job Code: 11 Moores Rd, Pinjarra	**Date:** 22/10/2024	**Site:** Q2
GPS Datum: (50) 393120.54 m E 6390266.89 m S	**Topography:** Lower slope	**Litter cover:** 10 % twigs, 25 % leaves 0% logs
Age since fire: >10 yrs	**Disturbance: Hi** Med Lo	**Soils:** Grey sand
Vegetation Description: *Melaleuca preissiana* woodland		
Vegetation Condition: Good		
Observations: Heavily grazed.		

Coll No.	Taxon	Ht (cm)	% Alive	% Dead	% Cover
Top	**Eucalyptus camaldulensis*	250	100		2.5
	Melaleuca preissiana	500	100		30
Middle	*Kunzea ericifolia*	200	100		7
	Hypocalymma angustifolium	100	100		8
SP6	*Leptospermopsis erubescens*	100	100		3
Bottom SP1	*Chaetanthus aristatus*	100	100		15
	**Hypochaeris glabra*	5	100		6
	**Taraxacum khatoonae*	5	100		7
	**Briza minor*				
	**Ursinia anthemoides*				
SP5	*Myriocephalus occidentalis*				
	**Eragrostis curvula*				

	**Lotus angustissimus*				
	Dasypogon bromeliifolius				
	**Ehrharta longiflora*				
	Xanthorrhoea preissii				
	**Wahlenbergia capensis*				
	**Oxalis glabra*				
SP7	*Homalosciadium homalocarpum*				
	Astartea?affinis				
SP 8	**Vellereophyton dealbatum*				
	**Vulpia bromoides*				

Del Botanics

FIELD SHEET – FLORA AND VEGETATION SURVEY

Job Code: 11 Moores Rd, Pinjarra	**Date:** 22/10/2024	**Site:** Q3
GPS Datum: (50) 393083.30 m E 6390262.54 m S	**Topography:** Lower slope	**Litter cover:** 10 % twigs, 20 % leaves 0% logs
Age since fire: >10 yrs	**Disturbance: Hi** Med Lo	**Soils:** Grey sand
Vegetation Description: *Melaleuca preissiana* woodland with *Kunzea ericifolia*		
Vegetation Condition: Completely Degraded		
Observations: Heavily grazed, compacted soils. Good stand of old Melaleuca trees.		

Coll No.	Taxon	Ht (cm)	% Alive	% Dead	% Cover
Middle	*Kunzea ericifolia*	800	100		50
	Hypocalymma angustifolium	150	100		35
	Xanthorrhoea preissii	100	100		2.5
Bottom	*Dasypogon bromeliifolius*	40	70	30	5
	**Taraxacum khatoonae*	5	100		2
	Hypocalymma angustifolium	5	100		
SP 9	*Adenanthos?obovatus*				
	**Briza maxima*				
	**Briza minor*				
SP7	*Homalosciadium homalocarpum*				
	**Lotus angustissimus*				
	Desmocladus asper				

	**Romulea rosea*				
	**Ehrharta longiflora*				
	**Ursinia anthemoides*				
	Asteraceae sp.				
SP5	*Myriocephalus occidentalis*				
	**Wahlenbergia capensis*				
	Conostylis sp.				
SP1	*Chaetanthus aristatus*				
	Trachymene pilosa				
	Isotropis cuneifolia				
	Stylidium sp				
	Bossiaea eriocarpa				
	**Ornithopus compressus*				
	**Vulpia* sp.				
SP2	**Cotula turbinata*				

APPENDIX C
BAM ACT DEFINITIONS

BAM Act Definitions

Legal status

Each listed organism is declared under the Biosecurity Management act with certain legal requirements:

Declared Pest, Prohibited - s12

Prohibited organisms are declared pests by virtue of section 22(1), and may only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.

Permitted - s11

Permitted organisms must satisfy any applicable import requirements when imported. They may be subject to an import permit if they are potential carriers of high-risk organisms.

Declared Pest - s22(2)

Declared pests must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia.

Permitted, Requires Permit - r73

Regulation 73 permitted organisms may only be imported subject to an import permit. These organisms may be subject to restriction under legislation other than the *Biosecurity and Agriculture Management Act 2007*. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.

Unlisted - s14

If you are considering importing an unlisted organism/s you will need to submit the name/s for assessment, as unlisted organisms are automatically prohibited entry