

**Targeted Flora Survey:
Chillinup Road
26.22 to 31.22 SLK**



**Report prepared for
The City of Albany
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REPORT CONTENTS

1	SUMMARY	5
2	INTRODUCTION	6
2.1	Project Background.....	6
2.2	Scope and Objectives	6
2.3	Physical and Biological Environment	6
2.3.1	Interim Biogeographic Regionalisation for Australia.....	6
2.3.2	Vegetation	7
2.3.3	Hydrological Features and Environmentally Significant Areas	7
2.3.4	Land Systems and Soils	8
2.3.5	Conservation Reserves	8
3	METHODS	9
3.1	Personnel	9
3.2	Desktop Assessment	9
3.2.1	Database Searches	9
3.3	Field Assessment.....	9
3.3.1	Field Survey Schedule and Type	9
3.3.2	Weather	9
3.4	Targeted Flora Search	10
3.5	Post-Survey Likelihood of Occurrence Assessment.....	10
3.6	Weeds	11
3.7	Survey Limitations.....	12
4	FLORA RESULTS	13
4.1	Desktop Assessment	13
4.1.1	Flora.....	13
4.1.2	Vegetation	13
4.2	Field Assessment.....	13
4.2.1	Flora.....	13
4.2.2	Conservation Significant Flora	14
4.2.3	Weeds.....	22
4.2.4	Post-Survey Flora Likelihood of Occurrence	22
5	REFERENCES	24
6	APPENDIX A - Conservation Status Definitions	26
7	APPENDIX B - Map Series A-C	28
8	APPENDIX C - Plant Taxa Inventory	29

9	APPENDIX D - Floristic Quadrat Data.....	37
10	APPENDIX E - Likelihood of Occurrence Analysis	41
11	APPENDIX F - Significant Flora Locations.....	44
12	APPENDIX G - Naturemap and PMST search results	48

LIST OF FIGURES

Figure 1. Location of target flora survey area (solid blue line) and 10 km buffer (black dashed line), Chillinup Road north east of Albany.....	8
Figure 2. Rainfall statistics for 10 months leading up to the assessment period compared with historical averages (all years available) from the nearest weather station (Chillinup 10729) (BOM 2021).	10

LIST OF TABLES

Table 1. Matrix of habitat suitability and effectiveness of field surveys to determine the likely presence of significant flora and fauna post survey.....	11
Table 2. Assessment of potential survey limitations for flora.	12
Table 3. Extent of pre-European vegetation from the survey area (GoWA 2019).	13

LIST OF PLATES

Plate 1 & 2. <i>Stylidium diplectroglossum</i> (P1) and regional distribution (DBCA 2021).....	15
Plate 3 & 4. <i>Styphelia cymbiformis</i> (P2) and regional distribution (DBCA 2021).....	15
Plate 5. <i>Synaphea</i> sp. Woodanilling (P2) and regional distribution (DBCA 2021).....	16
Plate 6 & 7. <i>Chamelaucium</i> sp. Cape Riche (P2) and regional distribution (DBCA 2021).	16
Plate 8 & 9. <i>Chordifex leucoblepharus</i> (P2) and regional distribution (DBCA 2021).....	17
Plate 10 & 11. <i>Desmocladus biformis</i> (P3) and regional distribution (DBCA 2021).....	17
Plate 12 & 13. <i>Isopogon buxifolius</i> var. <i>obovatus</i> (P3) and regional distribution (DBCA 2021).....	18
Plate 14 & 15. <i>Lasiopetalum</i> sp. Denmark (P3) and regional distribution (DBCA 2021).....	18
Plate 16 & 17. <i>Opercularia acolyantha</i> (P3) and regional distribution (DBCA 2021)	19
Plate 18. <i>Spyridium mucronatum</i> subsp. <i>recurvum</i> (P3) regional distribution (DBCA 2021).....	20
Plate 19 & 20. <i>Thomasia pygmaea</i> (P3) and regional distribution (DBCA 2021-)	20
Plate 21 & 22. <i>Thysanotus gageoides</i> (P3) and regional distribution (DBCA 2021)	21
Plate 23. <i>Bossiaea divaricata</i> (P4) regional distribution (DBCA 2021)	21
Plate 24 & 25. <i>Pultenaea calycina</i> subsp. <i>calycina</i> (P4) and regional distribution (DBCA 2021-).....	22

1 SUMMARY

Southern Ecology was engaged by the City of Albany to conduct a targeted flora survey of a 5 km length of Chillinup Road, located approximately 85 km northeast of Albany. The survey area was located between Straight Line Kilometre (SLK) 26.22 to 31.22 on Chillinup Road and includes 5 m from the road edge either side of the Chillinup Road.

- The field assessment identified a total of 244 species from 35 families within the survey area (including 9 weed species, Appendix E). The most species rich families were Fabaceae (42), Myrtaceae (41), Proteaceae (39) and Asparagaceae (11).
- No 'Threatened' flora protected under the *Biodiversity Conservation Act 2016* (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were recorded within the survey area.
- Fourteen taxa listed as Priority flora by the Department of Biodiversity, Conservation and Attractions recorded in the survey area: -
 - *Stylidium diplectroglossum* (P1)
 - *Chamelaucium* sp. Cape Riche (C.A. Gardner 2153) (P2)
 - *Chordifex leucoblepharus* (P2)
 - *Styphelia cymbiformis* (P2)
 - *Synaphea* ?sp. Woodanilling (G.J. Keighery & N. Gibson 4614) (P2)
 - *Desmocladius biformis* (P3)
 - *Isopogon buxifolius* var. *obovatus* (P3)
 - *Lasiopetalum* sp. Denmark (B.G. Hammersley 2012) (P3)
 - *Opercularia acolytantha* (P3)
 - *Spyridium ?mucronatum* subsp. *recurvum* (P3)
 - *Thomasia pygmaea* (P3)
 - *Thysanotus gageoides* (P3)
 - *Pultenaea calycina* subsp. *calycina* (P4)
 - *Bossiaea divaricata* (P4)
- The survey area was delineated into two broad vegetation types: Eheb (*Eucalyptus hebetifolia*) occurred on loam and marine sediments in the eastern portion; Eade/Eple (*E. adesmophloia* and *E. pleurocarpa*) occurred on grey sands in the western portion. Both vegetation types are putatively concordant with the Proteaceae Dominated Kwongkan Shrublands TEC (Kwongkan TEC), which is listed as an Endangered TEC under the EPBC Act.

2 INTRODUCTION

2.1 Project Background

The City of Albany is planning to conduct upgrades of a section of Chillinup road, approximately 85 km north-east of Albany. Southern Ecology was engaged by the City of Albany to conduct a targeted flora survey of a 5 km length of Chillinup Road, to inform the environmental planning for the proposed upgrades. The survey area is located on Chillinup Road from Straight Line Kilometre (SLK) 26.22 to SLK 31.22. The impact area associated with the project is purported to be limited to within 1-2 m of the road edge. The surveyed area includes an additional 5 m buffer to provide detailed contextual information and encompasses approximately 20 hectares (ha) (Figure 1).

2.2 Scope and Objectives

The objective of the targeted flora survey is to delineate key flora values within the survey area to inform the environmental assessment and approvals process. The scope of works included the following:

- **Desktop**

Prior to field survey work complete a desktop assessment results of the study area (10km radius of survey area) to identify if any threatened and priority flora species may occur in the survey area. Prior to the survey, identify all biological features and constraints, which may be in, or nearby the project area.

- **Field survey**

Conduct a detailed single-phase targeted flora survey to:

- verify/ground truth the desktop assessment findings.
- record the presence of any Threatened and Priority flora, Weeds of National Significance (WoNS) or Declared Pests and map the extent of populations if encountered.

- **Provide a targeted flora assessment report.**

2.3 Physical and Biological Environment

2.3.1 *Interim Biogeographic Regionalisation for Australia*

The Interim Biogeographic Regionalisation for Australia (IBRA version 7) divides the Australian continent into 89 large geographically distinct bioregions based on common climate, geology, landform, native vegetation and species information. The 89 bioregions are further refined to form 419 subregions

which are more localised and homogenous geomorphological units in each bioregion (Department of the Environment [DotE] 2014).

The survey area occurs in the Esperance Plains bioregion, of which 29% is protected within the national reserve system (Department of the Environment and Energy 2016) which includes all lands protected by State and Commonwealth government, Indigenous Protected Areas and private lands (Department of the Environment and Energy 2016).

The study area is located in the north-western section of the Fitzgerald subregion (ESP1), which is described by Comer et al. (2003) as follows: “The ESP1 subregion has variable relief, comprising subdued relief on the sandplains of the coastal region, punctuated with metamorphosed granite and quartzite ranges both inland and on the coastal plain. It lies mainly on the Bremer Sedimentary Basin and the eastern and western sections of the ESP1 subregion within the Albany-Fraser Orogen of the Yilgarn Craton. It has extensive western plains over Eocene marine sediment basement with small areas of Gneiss outcropping. Archaean greenstones – sand sheets with varying levels of lateralisation with gravel soils also occurs. The region is dominated by duplex soils and deep and shallow sands on the plains and dissected areas and by shallow sandy soils on the mountain ranges”.

2.3.2 **Vegetation**

Broad scale (1:250,000) pre-European vegetation mapping (Shepherd *et al.* 2002) indicates that the native vegetation of the area is composed of:

- “Mixed heath with scattered mallee e.g., tallerack *Eucalyptus tetragona* (Vegetation association Qualup 47).

The survey area forms part of a vegetated linear road verge approximately 30 m in width on either side of the road. The road verge adjoins 950 m and 1500 m of crown reserve on the northern and southern sides of the road, respectively. The remainder of the road verge is adjacent to cleared agricultural land.

2.3.3 **Hydrological Features and Environmentally Significant Areas**

No Wetlands of International Importance (i.e., Ramsar wetlands) or Nationally Important Wetlands occur within the survey area (Department of the Environment and Energy 2018b, 2018a). The nearest Ramsar wetlands are the Lake Muir – Byenup Lagoon system is located more than 160 km west of the survey area. The nearest Nationally Important Wetland is the seasonal Balicup Lake system (located approximately 51 km west north-west of the survey area) (Department of the Environment and Energy 2018b).

The survey area is located 5.5 km to the southeast of the Stirling Range National Park which is classed as an Environmentally Significant Area (ESA). The next nearest ESA to the survey area is Basil Road Nature Reserve which occurs approximately 23km to the southeast (DAFWA 2020).

2.3.4 Land Systems and Soils

One soil-landscape system within soil-landscape zone has been mapped within the survey area (DAFWA 2020):

Albany Sandplain Zone (242): Gently undulating plain dissected by a number of short rivers flowing south. Eocene marine sediments overlying Proterozoic granitic and metamorphic rocks. Soils are sandy duplex soils, often alkaline and sodic, with some sands and gravels.

- **Chillinup System (242Ch):** Level to gently undulating sandplain with scattered small lakes and depressions. Some lunettes and linear dunes. Lower slopes are often saline. Mallee-heath and yate and banksia woodlands.

2.3.5 Conservation Reserves

The City of Albany contains several reserves vested for various purposes. Two crown reserves are adjacent to the survey area, reserve 25850 to the north of Chillinup Road and reserve 25325 to the south. The nearest conservation reserve is the Stirling Range National Park, approximately 6.5km to the northwest of the survey area.



Figure 1. Location of target flora survey area (solid blue line) and 10 km buffer (black dashed line), Chillinup Road north east of Albany.

3 METHODS

3.1 Personnel

The flora survey (desktop and field assessment) was conducted by Damien Rathbone (BScHons Plant Science, Scientific License 012382). Damien has over 14 years of experience conducting biological surveys in southern Western Australia. Within the South Coast region, he has previously undertaken Department of Biodiversity, Conservation and Attractions (DBCA) regional surveys (Albany Regional Vegetation Survey, Fitzgerald River National Park Flora Survey, Ravensthorpe Range Flora Survey), threatened species survey and recovery implementation.

3.2 Desktop Assessment

3.2.1 *Database Searches*

A desktop assessment of known or potential significant flora within a 10 km radius of the survey area (the study area) was undertaken using the following sources:

- NatureMap (DBCA 2021; results attached in Appendix H).
- Protected Matters Search Tool (PMST) (Department of the Environment and Energy [DotEE] 2021; results attached in Appendix H).

Prior to conducting the survey, the taxa and occurrence records returned from the database searches were assessed (pre-survey likelihood of occurrence) for several attributes including, spatial accuracy or records, key morphological characteristics, flowering times and habitat preferences.

3.3 Field Assessment

3.3.1 *Field Survey Schedule and Type*

The survey was conducted in accordance with the Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016). The survey effort encompassed a targeted flora survey. The field survey was undertaken on the 2nd and 7th of October 2021. The survey effort (derived from GPS tracklogs) is shown in Appendix B (map series C).

3.3.2 *Weather*

Daily weather observations recorded from Chillinup weather station (10729) were used to describe local rainfall totals preceding the survey period (Figures 2). Overall rainfall in 2021 was above average (515 mm to October compared to the average of 354 mm to October) Bureau of Meteorology [BOM] 2021).

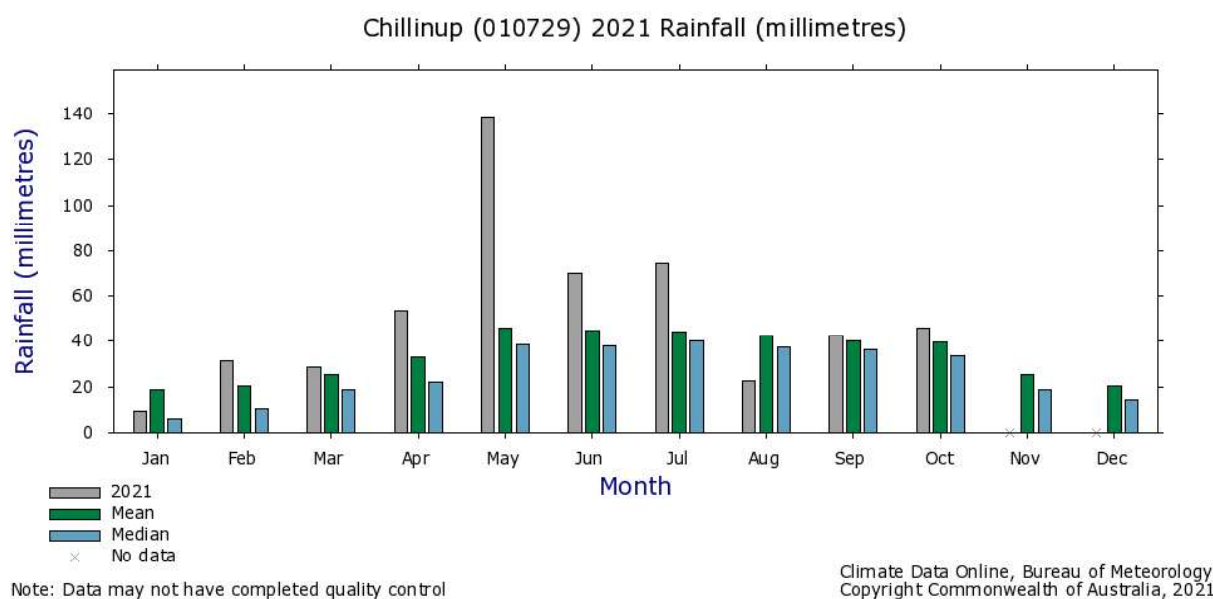


Figure 2. Rainfall statistics for 10 months leading up to the assessment period compared with historical averages (all years available) from the nearest weather station (Chillinup 10729) (BOM 2021).

3.4 Targeted Flora Search

A targeted search for potential threatened and priority flora identified from the desktop assessment was conducted across the survey area. The search was conducted in the appropriate season (spring) to detect the majority of threatened or priority species considered possible or likely to occur within the survey area. Population census and site information of threatened or priority flora was recorded in accordance with the Threatened and Priority Flora Report Form Field Manual (Department of Biodiversity, Conservation, and Attractions 2017). Population size was determined by either direct counts, area occupied (for rhizomatous or spreading plants), or by estimation of plant density using transects or suitably sized quadrats. The locations of Priority flora within the survey area was recorded with a handheld GPS (Garmin Oregon 700, ± 5m).

3.5 Post-Survey Likelihood of Occurrence Assessment

Following the field survey, all conservation significant flora and fauna species identified in the database searches that were not detected during the survey were assessed to determine their likelihood of occurrence in the survey area (post-survey likelihood of occurrence, Appendix E). Habitat suitability was determined from information in herbarium voucher labels, published descriptions, and knowledge from the authors. Survey effectiveness reflected the probability of detecting a particular species where suitable habitat was present, which could be dependent on thoroughness of the survey, flowering period or timing of emergence (i.e., annuals or disturbance responsive species). Each species in the post-survey likelihood of occurrence was assessed on a case-by-case basis according to the general categories summarized in Table 1.

Table 1. Matrix of habitat suitability and effectiveness of field surveys to determine the likely presence of significant flora and fauna post survey.

		Survey Effectiveness		
		No survey limitations present that would have prevented detection; all habitats were thoroughly surveyed	Moderate survey limitations present (i.e. inconspicuous or cryptic species; dense vegetation)	Major survey limitations present (i.e. species is a post fire ephemeral and habitat are long unburnt; habitat inaccessible)
Habitat and Proximity	Species reliably recorded within close vicinity (<2 km) and suitable habitat present	Unlikely	Possible	Likely
	Species previously recorded within vicinity (2-10 km) but suitable habitat present or unknown	Unlikely	Possible	Possible
	No suitable habitat appears to be present	Highly Unlikely	Unlikely	Possible

3.6 Weeds

The locations of all weeds considered to be significant (Declared pests (DPIRD 2019a) or WoNS (DotEE 2019) were mapped (Appendix B; map series B). Cleared or pasture areas devoid of native vegetation were not comprehensively surveyed, therefore not all weeds within the survey area were necessarily recorded.

3.7 Survey Limitations

In accordance with the EPA (2016a) document *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* an assessment of potential survey limitations was undertaken (Table 2). No avoidable limitations were identified that can be expected to have affected the reliability of the results of the field survey.

The information provided within this report is accurate and correct to the best of the author's knowledge. However, no liability is accepted for loss, damage or injury arising from its use. Plant populations can fluctuate over time, particularly after disturbance events such as fire and drought. Consequently, all mapping, vegetation descriptions and population estimates within this report should not be considered accurate indefinitely.

Table 2. Assessment of potential survey limitations for flora.

Potential for limitation	Assessment
Availability of contextual information	Some regional vegetation mapping and flora records were available to allow for an appropriate level of contextual information prior to the field survey. However, the Albany Regional Vegetation Survey (Sandiford and Barrett 2010) does not cover the survey area.
Personnel experience	The senior ecologists conducting the assessments are competent with extensive experience (>10 years) in surveying south coast biota.
Proportion of flora recorded or identification issues	Three taxa could not be confirmed to species level identification. Two of these are potential Priority flora (discussed in section 4.2.2). One species of <i>Schoenus</i> could not be identified to species level will undergo further assessment at the Herbarium of Western Australia.
Extent of survey and site access	The vegetated areas in the survey area were covered in over multiple field days during mid spring. Each road verge was assessed by one single meandering traverse that focussed on the 1-2 m edge where impacts are proposed.
Timing/weather/season/cycle	Whilst below average rainfall occurred in three years prior to the survey, this was counteracted by high rainfall preceding the spring survey, such that the seasonal conditions were considered appropriate for recording the flora values present. The survey timing was in mid-spring, which is considered appropriate for botanical surveys in this bioregion. However, not all taxa can be guaranteed to flower within this period. The desktop assessment assessed the flowering times of potential conservation significant taxa, which indicated that all significant flora were likely to have been flowering during the survey period (see section 4.1.1).
Disturbances (e.g. fire, flood, accidental human intervention etc.) which affected results of survey	No disturbances were likely to have affected the survey results. The absence of recent fire in most of the survey area may have prevented the detection of post-fire ephemeral flora (see section 4.1.1).

4 FLORA RESULTS

4.1 Desktop Assessment

4.1.1 Flora

The desktop assessment identified 42 conservation significant flora species which have been previously recorded within 10 km of the survey area (Appendix E). This included 19 Threatened species, one Priority one, four Priority two, 11 Priority three and seven Priority four taxa.

A pre-survey likelihood of occurrence assessment discounted 14 species as no suitable habitat was anticipated to be in the survey area (i.e., montane or highly saline habitat) or they represented geospatial errors. Habitat for the remaining 28 species was considered to potentially occur in the survey area, therefore these species were incorporated into the targeted flora surveys. The database search results are appended to this document (Appendix G).

4.1.2 Vegetation

The desktop assessment determined that one TEC occurs within the survey area: “*Proteaceae Dominated Kwongkan Shrublands*” (DotEE 2014b). The Kwongkan TEC is listed as an Endangered TEC under the EPBC Act.

The extents and reservation status of broad-scale regional vegetation mapping within the survey area is presented in Table 3. One vegetation type is present, which is currently above the 30% threshold of remaining extent in the state.

Table 3. Extent of pre-European vegetation from the survey area (GoWA 2019).

Vegetation Type	Pre-European Extent (ha)	Proportion of Pre-European extent remaining (%)	Current extent in Jarrah Forest bioregion (ha)	Current extent in formal protection (%)
Qualup 47: Mixed heath with scattered mallee e.g. tallerack <i>Eucalyptus tetragona</i>	393,399.9	47.6	187,348.1	32.8

4.2 Field Assessment

4.2.1 Flora

The field assessment identified a total of 244 species from 35 families within the survey area (including 9 weed species, Appendix E). The most species rich families were Fabaceae (42), Myrtaceae (41), Proteaceae (39) and Asparagaceae (11).

4.2.2 Conservation Significant Flora

No 'Threatened' flora protected under the BC Act or the EPBC Act were recorded within the survey area.

Fourteen taxa listed by the DBCA as Priority flora were recorded within the survey area. Locations for all species are mapped Appendix B; habitat and abundance details are summarised below.

Priority flora recorded in the survey area included:

- *Stylidium diplectroglossum* (P1)
- *Styphelia cymbiformis* (P2)
- *Synaphea* ?sp. Woodanilling (G.J. Keighery & N. Gibson 4614) (P2)
- *Chamelaucium* sp. Cape Riche (C.A. Gardner 2153) (P2)
- *Chordifex leucoblepharus* (P2)
- *Desmocladius biformis* (P3)
- *Isopogon buxifolius* var. *obovatus* (P3)
- *Lasiopetalum* sp. Denmark (B.G. Hammersley 2012) (P3)
- *Opercularia acolytantha* (P3)
- *Thomasia pygmaea* (P3)
- *Thysanotus gageoides* (P3)
- *Spyridium* ?*mucronatum* subsp. *recurvum* (P3)
- *Bossiaea divaricata* (P4)
- *Pultenaea calycina* subsp. *calycina* (P4)

***Stylidium diplectroglossum* P1**

Stylidium diplectroglossum from the Stylidiaceae, is a creeping perennial with pink flowers. It is a Priority 1 flora, known from 29 records, 23 of which are located within 16 km of the Stirling Range National Park (SRNP). The remaining 6 records are disjunct occurring approximately 400 km to the northwest near York. The nearest known occurrence to the survey area is 18 km to the northwest in the SRNP. The species is found on plains in loamy sands. Four colonies (number of genets unknown) were recorded from the survey area.



Plate 1 & 2. *Stylidium diplectroglossum* (P1) and regional distribution (DBCA 2021)

***Styphelia cymbiformis* P2**

Styphelia cymbiformis from the Ericaceae, is a low sprawling shrub with white flowers. It is a Priority 2 flora, known from 15 records across a distribution of approximately 89 km from the northwest corner of the SRNP to Chyenes Beach in the south. The nearest known record to the survey area occurs 3.5 km to the west adjacent to Chillinup Road. The species is usually found in low open woodland on sandy or loamy soils. One plant was recorded from an old gravel pit within the survey area.



Plate 3 & 4. *Styphelia cymbiformis* (P2) and regional distribution (DBCA 2021)

***Synaphea* ?sp. Woodanilling (G.J. Keighery & N. Gibson 4614) P2**

Synaphea sp. Woodanilling from the Proteaceae, is a sprawling shrub with yellow flowers. It is a Priority 2 flora, known from 12 records, 10 of which are located in the vicinity of Woodanilling and two which occur some 200 km to the east near Fitzgerald. The species is usually found on gentle slopes on white/grey sands or brown gravelly loams. This species has no formal description and its stigma characters are similar to *S. petiolaris*, which is a widespread species. Further examination at the Herbarium of Western Australia is required to confirm the identity of these specimens (5 plants) from the survey area. The nearest known record to the survey area occurs near Fitzgerald approximately 113 km to the northeast, as such this new record may represent a significant range extension.

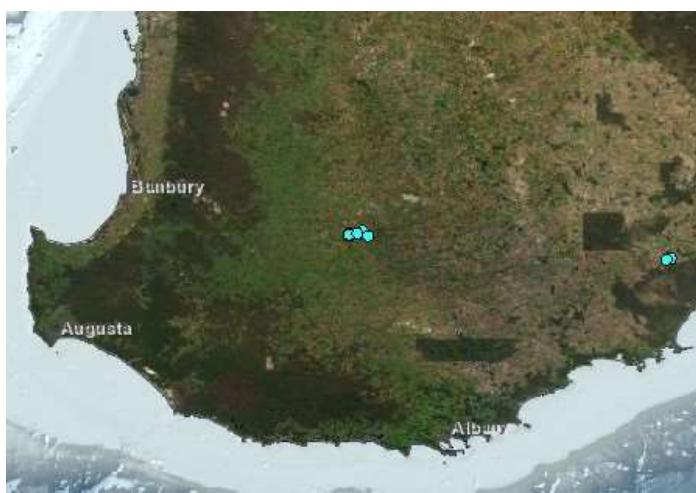


Plate 5. *Synaphea* sp. Woodanilling (P2) and regional distribution (DBCA 2021)

***Chamelaucium* sp. Cape Riche (C.A. Gardner 2153) P2**

Chamelaucium sp. Cape Riche from the Myrtaceae, is an erect shrub with white flowers. It is a Priority 2 flora, known from 32 records, across a range of 97 km from South Stirling in the west to the Bremer Bay area to the east. The nearest known record to the survey area is adjacent to Chillinup road approximately 7 km to the east. The species is found on grey sandy clay soil in heath. Six plants were recorded from the survey area.



Plate 6 & 7. *Chamelaucium* sp. Cape Riche (P2) and regional distribution (DBCA 2021).

***Chordifex leucoblepharus* P2**

Chordifex leucoblepharus from the Restionaceae, is a rhizomatous perennial with brown flowers. It is a Priority 2 flora, known from 31 records, across a range of approximately 78km from the Camel Lake Nature Reserve to the Cape Riche area. The nearest known record to the survey area occurs approximately 500m to south, within the crown reserve that is continuous with the verge on Chillinup road. The species is usually found in dry heath on sand. Well over 1000 patches of *Chordifex leucoblepharus* were recorded from the survey area, however this likely to be an underestimate. The number of individuals (genets) is difficult to determine due to the rhizomatous habit of this species.



Plate 8 & 9. *Chordifex leucoblepharus* (P2) and regional distribution (DBCA 2021)

***Desmocladius biformis* P3**

Desmocladius biformis from the Restionaceae, is a rhizomatous, densely tufted perennial, sedge-like herb. It is a Priority 3 flora, known from 31 records, four of which are located within the Stirling Range National Park. The species occurs in two disjunct population groups; the southern group with a range of approximately 185 km from the SRNP to the Fitzgerald River NP and the northern group (approximately 400km to the north) with a range of 180 km. The nearest known record to the survey area is located 4km to the east on Chillinup road. The species is found on sand, sandy clay and lateritic soils. One patch of this species was recorded in the survey area.



Plate 10 & 11. *Desmocladius biformis* (P3) and regional distribution (DBCA 2021)

***Isopogon buxifolius* var. *obovatus* P3**

Isopogon buxifolius var. *obovatus* from the Proteaceae, is a perennial herb with purple flowers. It is a Priority 3 flora, known from approximately 13 records that occur over a range of 52km between South Stirling and Cape Riche. The majority of records are found near Cape Riche, but two occur on Chillinup Road, 4km to the west and 12km to the east of the survey area. Plants were at 18 locations in the survey area; however, this species is likely to be more numerous than this estimate.



Plate 12 & 13. *Isopogon buxifolius* var. *obovatus* (P3) and regional distribution (DBCA 2021)

***Lasiopetalum* sp. Denmark (B.G. Hammersley 2012) P3**

Lasiopetalum sp. Denmark from the Malvaceae, is a prostrate shrub with cream/white flowers. It is a Priority 3 flora, known from 106 records over a range of 120km from 30km north of Walpole in the west, to North Sister Nature Reserve in the east. The nearest known record to the survey area occurs 47km to the west within the SRNP. Three plants of this taxon were recorded from the survey area, which also represents a range extension.



Plate 14 & 15. *Lasiopetalum* sp. Denmark (P3) and regional distribution (DBCA 2021).

***Opercularia acolytantha* P3**

Opercularia acolytantha from the Rubiaceae, is a small, perennial herb or shrub with grey flowers. It is a Priority 3 flora, known from 13 records. The species occurs over a range of approximately 525km from the Stirling Range National Park in the west through to Cape Arid National Park east of Esperance. The nearest known record to the survey area occurs 27km to the southwest in South Stirling Nature Reserve. Four dense colonies (>1000 plants) of *Opercularia acolytantha* were recorded from the survey area. The actual number of individual (genets) within the survey area is likely to be greater than this estimate.



Plate 16 & 17. *Opercularia acolytantha* (P3) and regional distribution (DBCA 2021)

***Spyridium ?mucronatum* subsp. *recurvum* P3**

Spyridium mucronatum subsp. *recurvum* from the Rhamnaceae, is an erect or spreading shrub with cream flowers. It is a Priority 3 flora, known from nine records across a range of 187 km from Borden in the west, through to Lake King in the east and south to the Fitzgerald River National Park. The species is usually found on plains with sandy or clayey soils. The distinction between several species of *Spyridium* is difficult to determine, particularly in a field setting. Several hundred plants of *Spyridium* were observed that may represent one or more different taxa. Further examination of these specimens will be undertaken at the Herbarium of Western Australia. The nearest known record of *Spyridium mucronatum* subsp. *recurvum* to the survey area occurs 45 km to the northwest, as such this new record may represent the species most southerly occurrence. Thirty-nine plants of this taxon were putatively recorded in the survey area.



Plate 18. *Spyridium mucronatum* subsp. *recurvum* (P3) regional distribution (DBCA 2021).

***Thomasia pygmaea* P3**

Thomasia pygmaea from the Malvaceae, is a small shrub up to 30cm high with blue/purple/pink flowers. It is a Priority 3 flora, known from 9 records. The species is found across a range of approximately 277 km from Kojaneerup South in the west to north of Stokes inlet on the east. The nearest known record to the survey area occurs approximately 10 km to the southwest adjacent to Kojoneerup Spring Road. The species is often found on stony sandy loam or clayey sand on marine plains. One plant of *Thomasia pygmaea* was recorded from the survey area.



Plate 19 & 20. *Thomasia pygmaea* (P3) and regional distribution (DBCA 2021-)

***Thysanotus gageoides* P3**

Thysanotus gageoides from the Asparagaceae, is a perennial herb with purple flowers. It is a Priority 3 flora, known from 28 records across a range of 270 km from Boyup Brook in the west, through to Jerremungup/Bremer Bay in the east and south to Albany. The nearest known record to the survey area occurs approximately 19km to the northwest within the SRNP. One plant of *Thysanotus gageoides* was recorded from the survey area.



Plate 21 & 22. *Thysanotus gageoides* (P3) and regional distribution (DBCA 2021)

***Bossiaea divaricata* P4**

Bossiaea divaricata from the Fabaceae, is an erect shrub with linear leaves and yellow/brown flowers. The species is found around across a north-south range of approximately 204km, from Lake Grace to Albany. Four records occur in close vicinity (<12 km) of the survey area, the closest located in reserve 25850 which is continuous with the road verge on the northern side of Chillinup Road. The species is often found on sandy lateritic soils. Approximately 204 plants were recorded from the survey area.

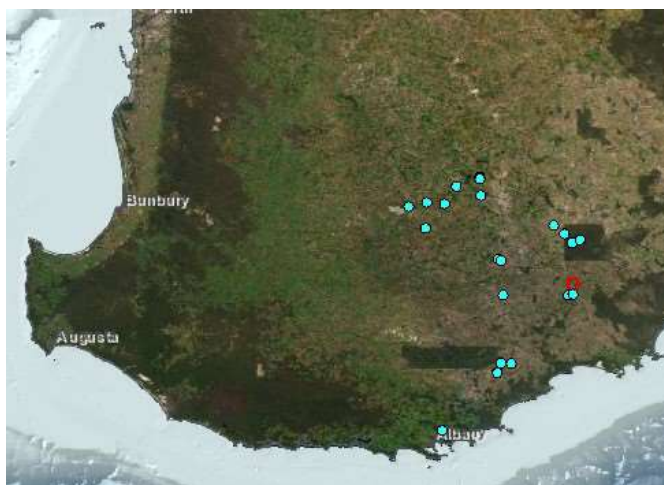


Plate 23. *Bossiaea divaricata* (P4) regional distribution (DBCA 2021)

***Pultenaea calycina* subsp. *calycina* P4**

Pultenaea calycina subsp. *calycina* from the Fabaceae, is a compact shrub, with yellow flowers. It is a Priority 4 flora, known from 16 records. The species is found across a range of approximately 113km from Chillinup in the west to West Mount Barren in the east. The species has previously been recorded in the eastern section of the survey area with the next nearest record occurring approximately 700m to the north in the crown reserve adjacent to the survey area. The species is often found on moderate slopes adjacent to creekbeds, on sand or clayey soils with gravel, over magnesite. Approximately 89 plants were recorded from the survey area.



Plate 24 & 25. *Pultenaea calycina* subsp. *calycina* (P4) and regional distribution (DBCA 2021-)

4.2.3 Weeds

One significant weed species recognised as a Weed of National Significance (WoNS) (DotEE 2019b) and a Declared Pest (DP) in Western Australian under the BAM Act (DPIRD 2019b) and one weed of local concern was recorded from the survey area:

- **Asparagus asparagoides* (Bridal creeper) (WoNS and DP)
- **Acacia longifolia* (weed of concern in LGA)

The locations of these species are mapped in Appendix B.

4.2.4 Post-Survey Flora Likelihood of Occurrence

A post-survey likelihood of occurrence assessment of conservation significant flora (Appendix E) was undertaken after the field visits to determine the suitability of habitats derived from the current survey and the effectiveness of the survey effort and timing (in accordance with Table 1). The assessment determined the following:

- Eight significant taxa identified in the desktop assessment were recorded in the survey area.
- Nineteen species were considered 'Unlikely' to occur as either no suitable habitat was present (combining both pre-survey and post-survey assessment) or all suitable habitats were thoroughly searched and no survey limitations were identified.

- One taxon remained “possible” to occur in the survey following the survey. *Thelymitra psammophila* may not have been detected as the field visits were undertaken on cloudy days, therefore may not have had ‘opened’ flowers at the time of the survey.

4.2.5 **Vegetation**

The survey area was delineated into two broad vegetation types that are mapped (Appendix B) and characterised by relevé site assessments (Appendix D). Eheb (*Eucalyptus hebetifolia*) occurred on loam and marine sediments in the eastern portion; Eade/Eple (*E. adesmophloia* and *E. pleurocarpa*) occur on grey sands in the western portion. Proteaceous shrubs occurred across both vegetation types and had a foliage cover greater than 30% in many locations, therefore was putatively concordant with the “Kwongkan TEC” (*Proteaceae Dominated Kwongkan Shrublands* - DotE 2014b) (mapped in Appendix B), which is listed as an Endangered TEC under the EPBC Act.

5 REFERENCES

- Bureau of Meteorology (BOM) (2021) Climate Data Online. Commonwealth of Australia. URL: <http://www.bom.gov.au/climate/data/index.shtml>.
- Comer, S, Gilfillan, S, Grant, M, Barrett, S & Anderson, L (2001) *Esperance 1 (ESP1 – Fitzgerald Subregion)*, (M. Cowan, chairman), *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*, Department of Conservation and Land Management, Perth.
- Department of Agriculture and Food Western Australia [DAFWA] (2019) NRM SLIP. Available from: <https://www.agric.wa.gov.au/maps-and-data>
- Department of Biodiversity, Conservation and Attractions [DBCA] (2021) NatureMap: Mapping Western Australia's Biodiversity. URL: <https://naturemap.dpaw.wa.gov.au/>
- Department of Environment and Conservation [DEC] (2017) *Threatened and Priority Flora Report Form - Field Manual*. Version 1.0.
- Department of Primary Industries and Regional Development [DPIRD] (2019a) List of Declared plants in Western Australia. Available from: <https://www.agric.wa.gov.au/pests-weeds-diseases/weeds/declared-plants>.
- Department of Primary Industries and Regional Development [DPIRD] (2019b) Biosecurity and agriculture management Act. <https://www.agric.wa.gov.au/bam/biosecurity-and-agriculture-management-act-2007>
- Department of the Environment [DotE] (2014a) Interim Biogeographic Regionalisation of Australia, Version 7. Available from: <http://www.environment.gov.au/topics/land/nrs/science/maps/data/australiasbioregions/ibra>.
- Department of the Environment [DotE] (2014b). *Approved Conservation Advice for Proteaceae Dominated Kwongan Shrublands of the southeast coastal floristic province of Western Australia*. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/126-conservation-advice.pdf>.
- Department of the Environment and Energy (2018a) 'Australian Wetlands Database: Ramsar Wetlands', Dept. of the Environment and Energy, Canberra ACT.
- Department of the Environment and Energy (2018b), 'Directory of Important Wetlands in Australia', Commonwealth of Australia.
- Department of the Environment and Energy [DotEE] (2016), *National Reserve System*, <<http://www.environment.gov.au/topics/land/national-reserve-system>>.
- Department of the Environment and Energy [DotEE] (2017) *Australian Vegetation Attribute Manual: National Vegetation Information System, Version 7.0*. Department of the Environment and Heritage, Canberra. URL: <https://www.environment.gov.au/land/publications/australian-vegetation-attribute-manual-version-7>
- Department of the Environment and Energy [DotEE] (2019) *Weeds of National Significance*. URL: <http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html>

Department of the Environment and Energy [DotEE] (2021) *Protected Matters Search Tool*. URL: <https://www.environment.gov.au/epbc/protected-matters-search-tool>

Department of Water and Environmental Regulation [DWER] (2019) Western Australian Government Data. Available from: <https://catalogue.data.wa.gov.au/organization/department-of-water-and-environmental-regulation>.

Environmental Protection Authority [EPA] (2016a) *Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment*.

Sandiford, EM and Barrett S (2010) Albany Regional Vegetation Survey, Extent Type and Status. Report for the Department of Environment and Conservation, Western Australia.

Shepherd, DP, Beeston, GR, & Hopkins, AJM (2002) Native Vegetation in Western Australia: Extent, Type and Status. *Resource Management Technical Report 249*.

Western Australian Herbarium [WAH] (1998–) *Florabase – the Western Australian Flora*. Department of Parks and Wildlife. <https://florabase.dpaw.wa.gov.au>.

6 APPENDIX A - Conservation Status Definitions

Table A1. Acts relevant to environmental impact assessment.

<i>Environment Protection and Biodiversity Conservation [EPBC] Act 1999</i>	https://www.legislation.gov.au/Details/C2016C00777
<i>Environmental Protection [EP] Act 1986</i>	https://www.slp.wa.gov.au/legislation/statutes.nsf/law_a252.html
<i>Biodiversity Conservation [BC] Act 2016</i>	https://www.slp.wa.gov.au/legislation/statutes.nsf/law_a147120.html

Table A2. The categories for flora and fauna listed as Threatened or specially protected. Taxa can be recognised as Threatened (T) or Conservation Dependent under Commonwealth (EPBC) and / or State (BC) Acts.

Threat category	Definition
Threatened - Critically Endangered (T-CR)	Considered to be facing an extremely high risk of extinction in the wild
Threatened – Endangered (T-EN)	Considered to be facing a very high risk of extinction in the wild
Threatened – Vulnerable (T-VN)	Considered to be facing a high risk of extinction in the wild
Threatened - Presumed extinct (T-EX)	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died.
Conservation dependant (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened
Migratory birds protected under international agreement (IA)	Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds
Other specially protected fauna (OS)	Fauna otherwise in need of special protection to ensure their conservation

Table A3. Flora or fauna that are potentially threatened but do not meet the survey criteria or are otherwise data deficient are listed under Priority categories with the Department of Biodiversity, Conservation and Attractions.

Category	Description
Priority One (P1)	Known from few locations (generally <5), small populations and/or occurring on land with insecure tenure
Priority Two (P2)	Known from few locations (generally <5), small populations with some occurring on land with secure tenure
Priority Three (P3)	Known from several locations with habitat not under imminent threat
Priority Four (P4)	(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 are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy

Table A4. Categories for ecological communities listed as Threatened (TEC). Communities can be recognised as Threatened under Commonwealth (EPBC) and / or State (BC) Acts.

Category	Description
Presumed totally destroyed (PU)	Adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.
Critically Endangered (CR)	Adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
Endangered (EN)	Adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future.
Vulnerable (VU)	Adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium (within approximately 50 years) to long-term future.

Table A5. The categories for ecological communities listed as Priority (PEC) with the Department of Biodiversity, Conservation and Attractions.

Category	Description
Priority One (P1)	Known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of ≤ 100 ha) and are currently under threat
Priority Two (P2)	Known from few occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of ≤ 200 ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years)
Priority Three (P3)	Known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or; (iii) made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc
Priority Four (P4)	Adequately known, rare but not threatened or meet criteria for Near Threatened or that have been recently removed from the threatened list. These communities require regular monitoring
Priority Five (P5)	Conservation dependant ecological communities. Not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years

Table A6. Species that are 'introduced' or 'weeds' can potentially be listed under the state Biosecurity Management Act (DPIRD 2019) or under the commonwealth Weeds of National Significance (WoNS) (DotEE 2019b).

Category	Description
Declared Pest, Prohibited - s12	Prohibited organism 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
WoNS	Weeds of National Significance – this is nationally recognised list of weeds agreed by Australian governments based on an assessment process that prioritised weeds based on their invasiveness, potential for spread and environmental, social and economic impacts. Consideration was also given to their ability to be successfully managed.

7 APPENDIX B - Map Series A-C (see attached)

CONTENTS:

Map A 1&2 - Vegetation Type and Conservation Significant Flora

Map B 1&2 - Vegetation Condition and Weeds

Map C 1&2 - Survey Effort (derived from GPS track log)



Map A 1 of 2: Targeted Flora Survey, Chillinup Road .

Report Reference: Rathbone, DA (2021). Targeted Flora Survey Chillinup Road 26.22 to 31.22 SLK. Unpublished report by Southern Ecology for the City of Albany (SE2112).
 Map Projection: Transverse Mercator Horizontal Datum GDA 1994
 Grid: MGA Zone 50 Map Size: A3 Map Scale 1:7,500










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






 Survey Area

Vegetation Type

-  Eheb
-  Eple/Eade
-  Kwongkan TEC

Significant Flora

-  *Stylidium diplectroglossum* P1
-  *Chamelaucium* sp. Cape Riche (C.A. Gardner 2153) P2
-  *Chordifex leucoblepharus* P2
-  *Styphelia cymbiformis* P2
-  *Synaphea* ?sp. Woodanilling (G.J. Keighery & N. Gibson 4614) P2
-  *Desmocladius biformis* P3
-  *Isopogon buxifolius* var. *obovatus* P3

-  *Lasiopetalum* sp. Denmark (B.G. Hammersley 2012) P3
-  *Opercularia acolyantha* P3
-  *Pultenaea calycina* subsp. *calycina* P3
-  *Spyridium* ?*mucronatum* subsp. *recurvum* P3
-  *Thomasia pygmaea* P3
-  *Thysanotus gageoides* P3
-  *Bossiaea divaricata* P4




**Map B 1 of 2: Targeted Flora Survey,
Chillinup Road .**

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 Survey Area

Vegetation Condition

-  Excellent
-  Good
-  Degraded
-  Completely Degraded

Weeds

-  **Asparagus asparagoides* (WoNs)
-  **Acacia longifolia*





**Map C 1 of 2: Targeted Flora Survey,
Chillinup Road .**

Report Reference: Rathbone, DA (2021). Targeted Flora Survey Chillinup Road 26.22 to 31.22 SLK.
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 Survey Area

 Handheld GPS track log 2nd and 7th October, 2021





**Map C 2 of 2: Targeted Flora Survey,
Chillinup Road .**

Report Reference: Rathbone, DA (2021). Targeted Flora Survey Chillinup Road 26.22 to 31.22 SLK.
 Unpublished report by Southern Ecology for the City of Albany (SE2112).
 Map Projection: Transverse Mercator Horizontal Datum GDA 1994
 Grid: MGA Zone 50 Map Size: A3 Map Scale 1:7,500



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-  Survey Area
-  Handheld GPS track log 2nd and 7th October, 2021




Map B 2 of 2: Targeted Flora Survey, Chillinup Road .

Report Reference: Rathbone, DA (2021). Targeted Flora Survey Chillinup Road 26.22 to 31.22 SLK.
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 Survey Area

Vegetation Condition

-  Excellent
-  Good
-  Degraded
-  Completely Degraded

Weeds

-  **Asparagus asparagoides* (WoNs)
-  **Acacia longifolia*



Map A 2 of 2: Targeted Flora Survey, Chillinup Road .

Report Reference: Rathbone, DA (2021). Targeted Flora Survey Chillinup Road 26.22 to 31.22 SLK. Unpublished report by Southern Ecology for the City of Albany (SE2112).
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Survey Area

Vegetation Type

- Eheb
- Eple/Eade
- Kwongkan TEC

Significant Flora

- Stylidium diplectroglossum* P1
- Chamelaucium* sp. Cape Riche (C.A. Gardner 2153) P2
- Chordifex leucoblepharus* P2
- Styphelia cymbiformis* P2
- Synaphea* ?sp. Woodanilling (G.J. Keighery & N. Gibson 4614) P2
- Desmocladius biformis* P3
- Isopogon buxifolius* var. *obovatus* P3

- Lasiopetalum* sp. Denmark (B.G. Hammersley 2012) P3
- Opercularia acolytantha* P3
- Pultenaea calycina* subsp. *calycina* P3
- Spyridium ?mucronatum* subsp. *recurvum* P3
- Thomasia pygmaea* P3
- Thysanotus gageoides* P3
- Bossiaea divaricata* P4

8 APPENDIX C - Plant Taxa Inventory

Table C1: Vascular plant taxa recorded opportunistically in the survey area. Nomenclature and status according WAH (1998-), DotEE (2017b) and DPIRD (2018). *denotes weed taxon. DP = Declared pest. WoNS = Weed of National Significance.

FAMILY	TAXON	STATUS
Anarthriaceae	<i>Anarthria laevis</i>	
Anarthriaceae	<i>Lyginia barbata</i>	
Apocynaceae	<i>Alyxia buxifolia</i>	
Asparagaceae	* <i>Asparagus asparagoides</i>	
Asparagaceae	<i>Chamaescilla corymbosa</i>	
Asparagaceae	<i>Chamaescilla spiralis</i>	
Asparagaceae	<i>Chamaexeros serra</i>	
Asparagaceae	<i>Laxmannia brachyphylla</i>	
Asparagaceae	<i>Laxmannia ramosa</i>	
Asparagaceae	<i>Laxmannia sessiliflora</i>	
Asparagaceae	<i>Lomandra integra</i>	
Asparagaceae	<i>Lomandra micrantha</i> subsp. <i>micrantha</i>	
Asparagaceae	<i>Thysanotus gageoides</i>	3
Asparagaceae	<i>Thysanotus patersonii</i>	
Asparagaceae	<i>Thysanotus thyrsoides</i>	
Asteraceae	* <i>Arctotheca calendula</i>	
Asteraceae	* <i>Ursinia anthemoides</i>	
Asteraceae	<i>Argentipallium niveum</i>	
Asteraceae	<i>Waitzia acuminata</i>	
Casuarinaceae	<i>Allocasuarina huegeliana</i>	
Casuarinaceae	<i>Allocasuarina humilis</i>	
Casuarinaceae	<i>Allocasuarina microstachya</i>	
Casuarinaceae	<i>Allocasuarina thuyoides</i>	
Cupressaceae	<i>Callitris drummondii</i>	
Cyperaceae	<i>Baumea juncea</i>	
Cyperaceae	<i>Caustis dioica</i>	
Cyperaceae	<i>Chorizandra enodis</i>	
Cyperaceae	<i>Cyathochaeta equitans</i>	
Cyperaceae	<i>Gahnia ancistrophylla</i>	
Cyperaceae	<i>Lepidosperma tuberculatum</i>	

FAMILY	TAXON	STATUS
Cyperaceae	<i>Mesomelaena stygia</i> subsp. <i>stygia</i>	
Cyperaceae	<i>Schoenus caespititius</i>	
Cyperaceae	<i>Schoenus obtusifolius</i>	
Cyperaceae	<i>Tetraria</i> sp. Jarrah Forest (R. Davis 7391)	
Dasyopogonaceae	<i>Calectasia gracilis</i>	
Dilleniaceae	<i>Hibbertia gracilipes</i>	
Dilleniaceae	<i>Hibbertia hemignosta</i>	
Dilleniaceae	<i>Hibbertia mucronata</i>	
Dilleniaceae	<i>Hibbertia pungens</i>	
Droseraceae	<i>Drosera huegelii</i>	
Droseraceae	<i>Drosera roseana</i>	
Ericaceae	<i>Acrotriche cordata</i>	
Ericaceae	<i>Leucopogon carinatus</i>	
Ericaceae	<i>Leucopogon glabellus</i>	
Ericaceae	<i>Lysinema ciliatum</i>	
Ericaceae	<i>Styphelia tenuiflora</i>	
Euphorbiaceae	<i>Ricinocarpos glaucus</i>	
Euphorbiaceae	<i>Stachystemon polyandrus</i>	
Fabaceae	* <i>Acacia longifolia</i>	
Fabaceae	<i>Acacia aemula</i> subsp. <i>aemula</i>	
Fabaceae	<i>Acacia biflora</i>	
Fabaceae	<i>Acacia crassiuscula</i>	
Fabaceae	<i>Acacia crispula</i>	
Fabaceae	<i>Acacia cyclops</i>	
Fabaceae	<i>Acacia delphina</i>	
Fabaceae	<i>Acacia glaucoptera</i>	
Fabaceae	<i>Acacia gonophylla</i>	
Fabaceae	<i>Acacia harveyi</i>	
Fabaceae	<i>Acacia lasiocarpa</i>	
Fabaceae	<i>Acacia leioderma</i>	
Fabaceae	<i>Acacia luteola</i>	
Fabaceae	<i>Acacia maxwellii</i>	
Fabaceae	<i>Acacia pycnocephala</i>	
Fabaceae	<i>Acacia subcaerulea</i>	

FAMILY	TAXON	STATUS
Fabaceae	<i>Acacia sulcata</i>	
Fabaceae	<i>Bossiaea divaricata</i>	4
Fabaceae	<i>Bossiaea praetermissa</i>	
Fabaceae	<i>Bossiaea preissii</i>	
Fabaceae	<i>Chorizema cytisoides</i>	
Fabaceae	<i>Chorizema glycinifolium</i>	
Fabaceae	<i>Chorizema uncinatum</i>	
Fabaceae	<i>Daviesia decipiens</i>	
Fabaceae	<i>Daviesia decurrens</i>	
Fabaceae	<i>Daviesia emarginata</i>	
Fabaceae	<i>Daviesia lancifolia</i>	
Fabaceae	<i>Daviesia teretifolia</i>	
Fabaceae	<i>Daviesia trigonophylla</i>	
Fabaceae	<i>Gastrolobium bracteolosum</i>	
Fabaceae	<i>Gastrolobium latifolium</i>	
Fabaceae	<i>Gompholobium confertum</i>	
Fabaceae	<i>Gompholobium knightianum</i>	
Fabaceae	<i>Gompholobium marginatum</i>	
Fabaceae	<i>Gompholobium polymorphum</i>	
Fabaceae	<i>Gompholobium scabrum</i>	
Fabaceae	<i>Gompholobium venustum</i>	
Fabaceae	<i>Hovea trisperma</i>	
Fabaceae	<i>Jacksonia condensata</i>	
Fabaceae	<i>Jacksonia grevilleoides</i>	
Fabaceae	<i>Pultenaea calycina</i> subsp. <i>calycina</i>	3
Fabaceae	<i>Sphaerolobium drummondii</i>	
Fabaceae	<i>Sphaerolobium linophyllum</i>	
Goodeniaceae	<i>Cooperhooia polygalacea</i>	
Goodeniaceae	<i>Dampiera fasciculata</i>	
Goodeniaceae	<i>Dampiera juncea</i>	
Goodeniaceae	<i>Goodenia incana</i>	
Goodeniaceae	<i>Goodenia pterigosperma</i>	
Goodeniaceae	<i>Goodenia pulchella</i>	
Goodeniaceae	<i>Goodenia scapigera</i>	

FAMILY	TAXON	STATUS
Goodeniaceae	<i>Lechenaultia formosa</i>	
Goodeniaceae	<i>Scaevola striata</i>	
Haemodoraceae	<i>Anigozanthos rufus</i>	
Haemodoraceae	<i>Conostylis pusilla</i>	
Haemodoraceae	<i>Conostylis setigera</i>	
Haemodoraceae	<i>Conostylis vaginata</i>	
Haemodoraceae	<i>Haemodorum laxum</i>	
Haloragaceae	<i>Glischrocaryon aureum</i>	
Hemerocallidaceae	<i>Agrostocrinum hirsutum</i>	
Hemerocallidaceae	<i>Dianella revoluta</i>	
Iridaceae	<i>Patersonia lanata</i>	
Iridaceae	<i>Patersonia limbata</i>	
Iridaceae	<i>Patersonia occidentalis</i>	
Lamiaceae	<i>Hemiandra pungens</i>	
Lamiaceae	<i>Microcorys barbata</i>	
Lamiaceae	<i>Microcorys lenticularis</i>	
Loganiaceae	<i>Logania micrantha</i>	
Loranthaceae	<i>Nuytsia floribunda</i>	
Malvaceae	<i>Lasiopetalum</i> sp. Denmark (B.G. Hammersley 2012)	3
Malvaceae	<i>Thomasia pygmaea</i>	3
Myrtaceae	<i>Astartea aspera</i>	
Myrtaceae	<i>Beaufortia micrantha</i>	
Myrtaceae	<i>Beaufortia schaueri</i>	
Myrtaceae	<i>Calothamnus gibbosus</i>	
Myrtaceae	<i>Calothamnus gracilis</i>	
Myrtaceae	<i>Calothamnus quadrifidus</i>	
Myrtaceae	<i>Calytrix leschenaultii</i>	
Myrtaceae	<i>Chamelaucium ciliatum</i>	
Myrtaceae	<i>Chamelaucium</i> sp. Cape Riche (C.A. Gardner 2153)	2
Myrtaceae	<i>Conothamnus aureus</i>	
Myrtaceae	<i>Cyathostemon tenuifolius</i>	
Myrtaceae	<i>Darwinia citriodora</i>	
Myrtaceae	<i>Eucalyptus buprestium</i>	
Myrtaceae	<i>Eucalyptus hebetifolia</i>	

FAMILY	TAXON	STATUS
Myrtaceae	<i>Eucalyptus incrassata</i>	
Myrtaceae	<i>Eucalyptus neutra</i>	
Myrtaceae	<i>Eucalyptus occidentalis</i>	
Myrtaceae	<i>Eucalyptus pachyloma</i>	
Myrtaceae	<i>Eucalyptus pleurocarpa</i>	
Myrtaceae	<i>Eucalyptus preissiana</i>	
Myrtaceae	<i>Eucalyptus uncinata</i>	
Myrtaceae	<i>Kunzea micromera</i>	
Myrtaceae	<i>Kunzea preissiana</i>	
Myrtaceae	<i>Melaleuca araucarioides</i>	
Myrtaceae	<i>Melaleuca blaeeriifolia</i>	
Myrtaceae	<i>Melaleuca calycina</i>	
Myrtaceae	<i>Melaleuca lateralis</i>	
Myrtaceae	<i>Melaleuca rigidifolia</i>	
Myrtaceae	<i>Melaleuca societatis</i>	
Myrtaceae	<i>Melaleuca spathulata</i>	
Myrtaceae	<i>Melaleuca striata</i>	
Myrtaceae	<i>Melaleuca suberosa</i>	
Myrtaceae	<i>Melaleuca thymoides</i>	
Myrtaceae	<i>Melaleuca torquata</i>	
Myrtaceae	<i>Melaleuca villosisepala</i>	
Myrtaceae	<i>Melaleuca violacea</i>	
Myrtaceae	<i>Regelia inops</i>	
Myrtaceae	<i>Taxandria spathulata</i>	
Myrtaceae	<i>Tetrapora glomerata</i>	
Myrtaceae	<i>Verticordia habrantha</i>	
Myrtaceae	<i>Verticordia subulata</i>	
Orchidaceae	<i>Caladenia falcata</i>	
Orchidaceae	<i>Caladenia flava</i>	
Orchidaceae	<i>Caladenia pectinata</i>	
Orchidaceae	<i>Elythranthera brunonis</i>	
Orchidaceae	<i>Microtis media</i>	
Orchidaceae	<i>Pterostylis vittata</i>	
Orchidaceae	<i>Pyrorchis nigricans</i>	

FAMILY	TAXON	STATUS
Pittosporaceae	<i>Billardiera variifolia</i>	
Poaceae	* <i>Aira caryophyllea</i>	
Poaceae	* <i>Ehrharta calycina</i>	
Poaceae	* <i>Eragrostis curvula</i>	
Poaceae	* <i>Vulpia myuros</i>	
Poaceae	<i>Amphipogon laguroides</i>	
Poaceae	<i>Amphipogon turbinatus</i>	
Poaceae	<i>Austrostipa elegantissima</i>	
Poaceae	<i>Neurachne alopecuroidea</i>	
Primulaceae	* <i>Lysimachia arvensis</i>	
Proteaceae	<i>Adenanthos cuneatus</i>	
Proteaceae	<i>Banksia alliacea</i>	
Proteaceae	<i>Banksia armata</i>	
Proteaceae	<i>Banksia baueri</i>	
Proteaceae	<i>Banksia baxteri</i>	
Proteaceae	<i>Banksia caleyi</i>	
Proteaceae	<i>Banksia cirsioides</i>	
Proteaceae	<i>Banksia drummondii</i>	
Proteaceae	<i>Banksia falcata</i>	
Proteaceae	<i>Banksia gardneri</i>	
Proteaceae	<i>Banksia media</i>	
Proteaceae	<i>Banksia nutans</i>	
Proteaceae	<i>Banksia plumosa</i> subsp. <i>plumosa</i>	
Proteaceae	<i>Banksia repens</i>	
Proteaceae	<i>Banksia tenuis</i>	
Proteaceae	<i>Conospermum caeruleum</i>	
Proteaceae	<i>Grevillea nudiflora</i>	
Proteaceae	<i>Grevillea oligantha</i>	
Proteaceae	<i>Hakea ceratophylla</i>	
Proteaceae	<i>Hakea corymbosa</i>	
Proteaceae	<i>Hakea cucullata</i>	
Proteaceae	<i>Hakea ferruginea</i>	
Proteaceae	<i>Hakea laurina</i>	
Proteaceae	<i>Hakea nitida</i>	

FAMILY	TAXON	STATUS
Proteaceae	<i>Hakea pandanica</i>	
Proteaceae	<i>Hakea trifurcata</i>	
Proteaceae	<i>Isopogon buxifolius</i> var. <i>obovatus</i>	3
Proteaceae	<i>Isopogon trilobus</i>	
Proteaceae	<i>Lambertia inermis</i>	
Proteaceae	<i>Persoonia striata</i>	
Proteaceae	<i>Petrophile acicularis</i>	
Proteaceae	<i>Petrophile crispata</i>	
Proteaceae	<i>Petrophile ericifolia</i>	
Proteaceae	<i>Petrophile filifolia</i>	
Proteaceae	<i>Petrophile squamata</i>	
Proteaceae	<i>Petrophile teretifolia</i>	
Proteaceae	<i>Stirlingia anethifolia</i>	
Proteaceae	<i>Synaphea polymorpha</i>	
Proteaceae	<i>Synaphea</i> ?sp. Woodanilling (G.J. Keighery & N. Gibson 4614)	2
Restionaceae	<i>Chordifex leucoblepharus</i>	2
Restionaceae	<i>Cytogonidium leptocarpoides</i>	
Restionaceae	<i>Desmocladus austrinus</i>	
Restionaceae	<i>Desmocladus biformis</i>	3
Restionaceae	<i>Desmocladus fasciculatus</i>	
Restionaceae	<i>Hypolaena fastigiata</i>	
Rhamnaceae	<i>Spyridium microcephalum</i>	
Rhamnaceae	<i>Spyridium</i> ? <i>mucronatum</i> subsp. <i>recurvum</i>	3
Rhamnaceae	<i>Stenanthemum emarginatum</i>	
Rhamnaceae	<i>Stenanthemum notiale</i> subsp. <i>notiale</i>	
Rhamnaceae	<i>Stenanthemum tridentatum</i>	
Rhamnaceae	<i>Trymalium myrtillus</i>	
Rubiaceae	<i>Opercularia acolyantha</i>	3
Rutaceae	<i>Boronia crenulata</i>	
Rutaceae	<i>Boronia inornata</i>	
Rutaceae	<i>Boronia octandra</i>	
Rutaceae	<i>Boronia spathulata</i>	
Rutaceae	<i>Nematolepis phebalioides</i>	
Rutaceae	<i>Phebalium lepidotum</i>	

FAMILY	TAXON	STATUS
Rutaceae	<i>Rhadinothamnus rudis</i> subsp. <i>amblycarpus</i>	
Santalaceae	<i>Exocarpos sparteus</i>	
Santalaceae	<i>Leptomeria pauciflora</i>	
Stylidiaceae	<i>Levenhookia pusilla</i>	
Stylidiaceae	<i>Stylidium diplectroglossum</i>	1
Stylidiaceae	<i>Stylidium glandulosissimum</i>	
Stylidiaceae	<i>Stylidium piliferum</i>	
Stylidiaceae	<i>Stylidium rupestre</i>	
Stylidiaceae	<i>Stylidium schoenoides</i>	
Xanthorrhoeaceae	<i>Xanthorrhoea platyphylla</i>	

9 APPENDIX D - Floristic Relevé Data



Relevé:	101	Latitude:	-34.430051	Vegetation Structure:	
Date:	7/11/2021	Longitude:	118.505852	-Upper (u):	6m, 10-30%
Soil Colour:	brown	Condition:	Excellent	-Middle (m):	1-4m, 30-70%
Soil Type:	clay loam	Fire Age:		-Ground (g):	1m, 30-70%
Rock Type:	nil				
Vegetation Type:	Eheb				
Site Comments:	Proteceae <30% combined cover				

Vegetation Description:

U (6m, 10-30%): *Eucalyptus hebetifolia*, *Eucalyptus incrassata*; M (1-4m, 30-70%): *Banksia media*, *Daviesia teretifolia*, *Hakea nitida*, *Isopogon buxifolius* var. *obovatus*, *Pultenaea calycina* subsp. *calycina*; G (1m, 30-70%): *Banksia alliacea*, *Gahnia ancistrophylla*, *Tetraria* sp. Jarrah Forest (R. Davis 7391)

Taxon	Layer	Outside	Dominant	Weed	Status	Comments
<i>Eucalyptus hebetifolia</i>	u		y			
<i>Eucalyptus incrassata</i>	u		y			
<i>Banksia media</i>	m		y			
<i>Daviesia teretifolia</i>	m		y			
<i>Hakea nitida</i>	m		y			
<i>Isopogon buxifolius</i> var. <i>obovatus</i>	m		y		3	
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	m		y		3	
<i>Banksia alliacea</i>	g		y			
<i>Gahnia ancistrophylla</i>	g		y			
<i>Tetraria</i> sp. Jarrah Forest (R. Davis 7391)	g		y			



Relevé:	102	Latitude:	-34.441241	Vegetation Structure:	
Date:	7/10/2021	Longitude:	118.48439	-Upper (u):	5m, <10%
Soil Colour:	sandy	Condition:	excellent	-Middle (m):	2-4m, 30-70%
Soil Type:	loam	Fire Age:		-Ground (g):	1m, 20-10%
Rock Type:	nil				
Vegetation Type:	Eade/Eple				
Site Comments:	Proteceae <30% combined cover				

Vegetation Description:

U (5m, <10%): *Eucalyptus pleurocarpa*; M (2-4m, 30-70%): *Banksia plumosa* subsp. *plumosa*, *Calothamnus gracilis*, *Hakea pandanica*, *Isopogon trilobus*, *Melaleuca striata*; G (1m, 20-10%): *Banksia repens*, *Chordifex leucoblepharus*, *Hypolaena fastigiata*, *Lyginia barbata*, *Schoenus caespititius*

Taxon	Layer	Outside	Dominant	Weed	Status	Comments
<i>Eucalyptus pleurocarpa</i>	u		y			
<i>Banksia plumosa</i> subsp. <i>plumosa</i>	m		y			
<i>Calothamnus gracilis</i>	m		y			
<i>Hakea pandanica</i>	m		y			
<i>Isopogon trilobus</i>	m		y			
<i>Melaleuca striata</i>	m		y			
<i>Banksia repens</i>	g		y			
<i>Chordifex leucoblepharus</i>	g		y		2	
<i>Hypolaena fastigiata</i>	g		y			
<i>Lyginia barbata</i>	g		y			
<i>Schoenus caespititius</i>	g		y			



Relevé: 103 **Latitude:** -34.446778 **Vegetation Structure:**
Date: 7/10/2021 **Longitude:** 118.474459 **-Upper (u):** 6m, 2-10%
Soil Colour: grey **Condition:** excellent **-Middle (m):** 1.5m, 30-70%
Soil Type: sand **Fire Age:** **-Ground (g):** 1m, 10-30%
Rock Type:
Vegetation Type: Eade/Eple
Site Comments: Proteceae <30% combined cover

Vegetation Description:

U (6m, 2-10%): *Eucalyptus buprestium*; M (1.5m, 30-70%): *Banksia plumosa* subsp. *plumosa*, *Calothamnus gracilis*, *Hakea corymbosa*, *Isopogon trilobus*, *Lambertia inermis*, *Melaleuca societatis*, *Melaleuca striata*, *Taxandria spathulata*; G (1m, 10-30%): *Caustis dioica*, *Dampiera juncea*, *Hypolaena fastigiata*, *Patersonia limbata*

Taxon	Layer	Outside	Dominant	Weed	Status	Comments
<i>Eucalyptus buprestium</i>	u		y			
<i>Banksia plumosa</i> subsp. <i>plumosa</i>	m		y			
<i>Calothamnus gracilis</i>	m		y			
<i>Hakea corymbosa</i>	m		y			
<i>Isopogon trilobus</i>	m		y			
<i>Lambertia inermis</i>	m		y			
<i>Melaleuca societatis</i>	m		y			
<i>Melaleuca striata</i>	m		y			
<i>Taxandria spathulata</i>	m		y			
<i>Caustis dioica</i>	g		y			
<i>Dampiera juncea</i>	g		y			
<i>Hypolaena fastigiata</i>	g		y			
<i>Patersonia limbata</i>	g		y			



Relevé: 104 **Latitude:** -34.451511 **Vegetation Structure:**
Date: 7/10/2021 **Longitude:** 118.464892 **-Upper (u):** 5m, 2-10%
Soil Colour: grey **Condition:** degraded **-Middle (m):** 3m, 10-30%
Soil Type: sand **Fire Age:** **-Ground (g):** 1m, 30-70%

Rock Type:

Vegetation Type: Eade/Eple

Site Comments: agricultural grass invasion

Vegetation Description:

U (5m, 2-10%): *Eucalyptus pleurocarpa*; M (3m, 10-30%): *Banksia media*, *Hakea corymbosa*, *Isopogon trilobus*, *Lambertia inermis*; G (1m, 30-70%):

Taxon	Layer	Outside	Dominant	Weed	Status	Comments
<i>Eucalyptus pleurocarpa</i>	u		y			
<i>Banksia media</i>	m		y			
<i>Hakea corymbosa</i>	m		y			
<i>Isopogon trilobus</i>	m		y			
<i>Lambertia inermis</i>	m		y			
<i>Aira caryophyllea</i>	g			*		
<i>Arctotheca calendula</i>	g			*		
<i>Austrostipa elegantissima</i>	g					
<i>Ehrharta calycina</i>	g			*		
<i>Eragrostis curvula</i>	g			*		
<i>Lysimachia arvensis</i>	g			*		
<i>Ursinia anthemoides</i>	g			*		
<i>Vulpia myuros</i>	g			*		

10 APPENDIX E - Likelihood of Occurrence Analysis

A post-survey likelihood of occurrence of all conservation significant species (flora and fauna) was assessed based on the presence of suitable habitat and survey effectiveness (see section 3.7).

Table E1. Likelihood of occurrence of significant flora recorded in the vicinity of the survey area (<10 km). NM = Naturemap, PMST = Protected Matters Search Tool, WAHERB = Western Australia Herbarium Database, TPFL = Threatened and Priority Flora Database.

Taxon [FAMILY]	Status		Source	Description, Habitat & Distribution	Pre-survey	Post-survey
	EPBC Act	WC Act/ DBCA				
<i>Conospermum coerulescens</i> subsp. <i>coerulescens</i> [Proteaceae]		P1	NM	Erect, non-lignotuberous shrub, 0.3-1 m high. Fl. Blue (Sep-Dec). Low woodland, Heath B, Flat, sand on laterite/spongolite.	Possible	Unlikely
<i>Chamelaucium</i> sp. Cape Riche (C.A. Gardner 2153) [Myrtaceae]		P2	NM	Erect shrub to 1 m x 0.75 m with white to pink flowers (November). Plains, low heath/E.tetragona mallee heath, white to grey sand over clay.	Possible	Present
<i>Chordifex leucoblepharus</i> [Restionaceae]		P2	NM	Rhizomatous, perennial, herb, ca 0.4 m high. Fl. brown, Nov to Dec. Sand. Dry heath.	Possible	Present
<i>Leucopogon cymbiformis</i> [Ericaceae]		P2	NM	Dense, erect or spreading shrub, 0.1-0.6(-0.8) m high. Fl. white, Jul to Nov or Feb to Mar. White/grey or yellow sand, lateritic gravelly soils. Sandplains, wet flats, foothills.	Possible	Present
<i>Monotoca aristata</i> [Ericaceae]		P2	NM	Erect, dioecious shrub, 0.1-0.5 m high. Stony quartzitic sandy soils. Hillslopes. Red flowers.	Possible	Unlikely
<i>Desmocladus biformis</i> [Restionaceae]		P3	NM	Rhizomatous, densely tufted perennial, herb (sedge-like), 0.1-0.2 m high. Fl. Sep to Oct. Sand, sandy clay, lateritic soils. Dry sites.	Possible	Present
<i>Hakea oldfieldii</i> [Proteaceae]		P3	NM	Open, straggling shrub, up to 2.5 m high. Fl. white-cream/yellow, Aug to Oct. Red clay or sand over laterite. Seasonally wet flats.	Possible	Unlikely
<i>Isopogon buxifolius</i> var. <i>obovatus</i> [Proteaceae]		P3	NM	Upright shrub, (0.3)-0.6-1.5 m high. Fl. pink, May or Jul to Oct. Sandy soils, gravelly loam or clay.	Possible	Present
<i>Lasiopetalum parvuliflorum</i> [Malvaceae]		P3	NM	Erect, spreading shrub, 0.35-1 m high. Fl. green-cream, Sep to Oct. Sand, gravelly loam. Along creeks, seasonal swamps.	Possible	Unlikely
<i>Latrobea recurva</i> [Fabaceae]		P3	NM	Erect or procumbent, spreading shrub, 0.3-1 m high. Grey or white sand over laterite.	Possible	Unlikely
<i>Laxmannia grandiflora</i> subsp. <i>stirlingensis</i> [Asparagaceae]		P3	NM	Tall, slender, rambling, stilt-rooted perennial, herb, to 0.22 m high. Fl. white, Sep to Nov. White sand, sandy clay. Winter-wet locations.	Possible	Unlikely
<i>Melaleuca pritzelii</i> [Myrtaceae]		P3	NM	Shrub, 0.7-1.6 m high. Fl. cream, Aug to Oct or Dec. Sandy or clayey soils. Swampy areas.	Possible	Unlikely
<i>Pultenaea calycina</i> subsp. <i>calycina</i> [Fabaceae]		P3	NM	Erect, shrub, spindly shrub (broom-like). Yellow red orange fl. October. Hillsides, flats. Dry, brown, sandy clay and ironstone gravel.	Possible	Present
<i>Sphaerolobium validum</i> [Fabaceae]		P3	NM	Erect shrub, to 0.9 m high. Fl. yellow & red, Sep. White-grey sand, red-brown clayey sand, laterite gravel and quartz pebbles. Gently undulating areas, flats, roadsides.	Possible	Unlikely
<i>Spyridium oligocephalum</i> [Rhamnaceae]		P3	NM	Shrub, (0.3)-0.6-1.5 m high. Fl. white-cream, Mar or Jul to Oct. Sandy soils. Sandplains.	Possible	Unlikely
<i>Thomasia pygmaea</i> [Malvaceae]		P3	NM	Low shrub, 0.05-0.3 m high. Fl. blue-purple-pink, Aug to Oct. Stony sandy loam, clayey sand. Marine plains.	Possible	Present

<i>Acrotriche dura</i> [Ericaceae]		P4	NM	Slender, erect shrub, to 1 m high. Fl. white, Aug to Sep. Brown loam, clay loam over granite. Lower valley slopes, road verges.	Possible	Unlikely
<i>Bossiaea divaricata</i> [Fabaceae]		P4	NM	Shrub, to 0.6 m high. Sandy lateritic soils.	Possible	Present
<i>Eucalyptus erectifolia</i> [Myrtaceae]		P4	NM	(Mallee), 1-4 m high, bark smooth, grey. Fl. white, Mar to May. White sand, sandy loam & gravel. Hillslopes, sandplains.	Possible	Unlikely
<i>Eucalyptus marginata x pachyloma</i> [Myrtaceae]		P4	NM	(Mallee), 1.5-5 m high, bark rough at the base. Sandy loam or loam & gravel, sand & gravel. Plains, hills.	Possible	Unlikely
<i>Eucalyptus x kalganensis</i> [Myrtaceae]		P4	NM	(Spreading mallee), 1.5-7 m high, bark smooth, grey. Fl. cream/white/yellow, Sep to Oct. Sand/sandy clay over laterite/limestone.	Possible	Unlikely
<i>Jacksonia calycina</i> [Fabaceae]		P4	NM	Erect or straggling shrub, (0.2-)0.4-1.4 m high. Fl. orange/yellow & red, Sep to Nov. Gravelly sandy or clayey soils. Sandplains, low rises, hillslopes.	Possible	Unlikely
<i>Tecticornia uniflora</i> [Chenopodiaceae]		P4	NM	Prostrate perennial, herb, 0.01-0.03 m high, 0.8-1.5 m wide. Clay, sandy clay, loam. Salt lakes & creeks.	No saline areas.	na
<i>Adenanthos pungens</i> subsp. <i>pungens</i> [Proteaceae]	V	T	PMST	An erect shrub to 3 m with deep pink flowers (Nelson 1978, 1995). Rigid leaves are circular in cross-section and usually divided into three pointed segments (Brown et al.).	Unlikely	na
<i>Banksia anatona</i> [Proteaceae]	CE	T	PMST	Upright, non-lignotuberous shrub, to 5 m high. Fl. yellow, Jan to Mar. Grey sand over gravelly shale, rocky silty clay loam. Lower slopes of ranges.	Unlikely, conspicuous shrub restricted to dieback free areas in the SRNP.	na
<i>Banksia brownii</i> [Proteaceae]	E	T	PMST	Bushy, non-lignotuberous shrub or tree (small), 1-6 m high. Fl. cream & brown/orange-red, Mar to Jul. Sand over laterite, gravel, loam over granite. In gullies.	Unlikely, restricted to montane zone.	na
<i>Banksia pseudoplumosa</i> [Proteaceae]	E	T	PMST	Non-lignotuberous shrub, to 1.8 m high. Fl. Nov to Dec. Gravelly soils.	Unlikely, conspicuous shrub most collection in northern SRNP.	na
<i>Banksia rufa</i> subsp. <i>pumila</i> [Proteaceae]	E	T	PMST	Erect, non-lignotuberous shrub, 0.2-0.5 m high. Fl. yellow, Aug to Oct. Rocky shale slopes.	Possible, known from firebreak on southern boundary of SRNP.	Unlikely
<i>Caladenia bryceana</i> subsp. <i>bryceana</i> [Orchidaceae]	E	T	PMST	Tuberous, perennial, herb, 0.05-0.1 m high. Fl. green-yellow, Aug to Oct. Sand, loam. Adjacent to watercourses, winter-wet sites.	Unlikely	na
<i>Conostylis misera</i> [Haemodoraceae]	E	T	PMST	Rhizomatous, tufted perennial, grass-like or herb, 0.05-0.18 m high. Fl. yellow, Oct to Nov. White or grey sand, sandy loam. Winter-wet flats.	Possible	Unlikely
<i>Darwinia oxylepis</i> [Myrtaceae]	E	T	PMST	Upright, dense shrub, 0.6-1.5 m high. Fl. red, Aug to Nov. Stony, peaty sand. Rocky gullies.	Unlikely, restricted to montane zone.	na
<i>Daviesia obovata</i> [Fabaceae]	E	T	NM, PMST	Erect, slender shrub, 0.7-1.5 m high. Fl. yellow & black, Sep to Oct. Stony loam, sandy loam. Hillslopes, outcrops.	Unlikely, restricted to montane zone.	na
<i>Daviesia pseudophylla</i> [Fabaceae]	E	T	PMST	Spreading open shrub, 0.15-0.35 m high, to 1.5 m wide. Fl. yellow/orange & red. Shallow stony sandy soils. Plains at base of slopes.	Possible	Unlikely

<i>Grevillea maxwellii</i> [Proteaceae]	E	T	NM, PMST	Prostrate to spreading shrub, 0.2-1.2 m high, up to 2 m wide. Fl. red, May or Aug to Sep. Sandy clay or clay loam over granite. Hilltop.	Unlikely	na
<i>Lambertia fairallii</i> [Proteaceae]	E	T	PMST	Dense, erect, non-lignotuberous shrub, to 1.5 m high. Fl. yellow, May or Sep or Nov or Jan. Skeletal rocky soils, sandy or silty clay over shalestone or quartzite. Low to mid slopes of range, edge of breakaway.	Unlikely, restricted to montane zone.	na
<i>Leucopogon gnaphalioides</i> [Ericaceae]	E	T	PMST	Slender or sprawling shrub, 0.25-1 m high. Fl. white, Jul or Oct to Dec. Shallow rocky soils. Rocky slopes & plateaus.	Unlikely, restricted to montane zone.	na
<i>Myoporum cordifolium</i> [Myoporaceae]	V	T	PMST	Spindly, erect shrub, 0.3-0.8 m high. Fl. white/white-pink, Jul to Nov. Sandy loam or clay loam. Flat plains.	Possible	na
<i>Persoonia micranthera</i> [Proteaceae]	E	T	PMST	Decumbent to prostrate shrub, 0.1-0.4 m high. Fl. yellow, Aug. Sandy, stony soils. Summit of plateau.	Unlikely, restricted to montane zone.	na
<i>Roycea pycnophylloides</i> [Chenopodiaceae]	E	T	PMST	Perennial, herb, forming densely branched, silvery mats to 1 m wide. Fl. Sep. Sandy soils, clay. Saline flats.	Unlikely	na
<i>Sphenotoma drummondii</i> [Ericaceae]	E	T	PMST	Tufted shrub, 0.15-0.5 m high. Fl. white, Sep to Dec. Stony or shallow soils over granite or quartzite. Steep rocky slopes, crevices of rocks.	Unlikely, restricted to montane zone.	na
<i>Thelymitra psammophila</i> [Orchidaceae]	V	T	PMST	Tuberous, perennial, herb, 0.15-0.25 m high. Fl. yellow, Sep to Oct. Sandy clay, loam.	Possible	Possible
<i>Verticordia carinata</i> [Myrtaceae]	V	T	PMST	Open, slender shrub, 0.8-1 m high. Fl. pink-red, Mar to May. Grey sand over sandstone.	Possible	Unlikely

TaxonName	WAConStat	Abundance	DateObs
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	2	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	5	2/10/2021
<i>Spyridium ?mucronatum</i> subsp. <i>recurvum</i>	P3	2	2/10/2021
<i>Spyridium ?mucronatum</i> subsp. <i>recurvum</i>	P3	3	2/10/2021
<i>Spyridium ?mucronatum</i> subsp. <i>recurvum</i>	P3	1	2/10/2021
<i>Spyridium ?mucronatum</i> subsp. <i>recurvum</i>	P3	5	2/10/2021
<i>Lasiopetalum</i> sp. Denmark (B.G. Hammersley 2012)	P3	1	2/10/2021
<i>Lasiopetalum</i> sp. Denmark (B.G. Hammersley 2012)	P3	1	2/10/2021
<i>Lasiopetalum</i> sp. Denmark (B.G. Hammersley 2012)	P3	1	2/10/2021
<i>Spyridium ?mucronatum</i> subsp. <i>recurvum</i>	P3	1	2/10/2021
<i>Thysanotus gageoides</i>	P3	1	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	2	2/10/2021
<i>Spyridium ?mucronatum</i> subsp. <i>recurvum</i>	P3	1	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	2	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Spyridium ?mucronatum</i> subsp. <i>recurvum</i>	P3	2	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	5	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Spyridium ?mucronatum</i> subsp. <i>recurvum</i>	P3	10	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	5	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	3	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	5	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	6	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	3	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	4	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	2	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Opercularia acolytantha</i>	P3	1000	2/10/2021
<i>Opercularia acolytantha</i>	P3	1000	2/10/2021
<i>Opercularia acolytantha</i>	P3	1000	2/10/2021
<i>Opercularia acolytantha</i>	P3	1000	2/10/2021
<i>Desmocladus biformis</i>	P3	1	2/10/2021
<i>Pultenaea calycina</i> subsp. <i>calycina</i>	P3	1	2/10/2021
<i>Isopogon buxifolius</i> var. <i>obovatus</i>	P3	1	7/10/2021
<i>Isopogon buxifolius</i> var. <i>obovatus</i>	P3	1	7/10/2021
<i>Isopogon buxifolius</i> var. <i>obovatus</i>	P3	1	7/10/2021
<i>Isopogon buxifolius</i> var. <i>obovatus</i>	P3	1	7/10/2021
<i>Isopogon buxifolius</i> var. <i>obovatus</i>	P3	1	7/10/2021
<i>Isopogon buxifolius</i> var. <i>obovatus</i>	P3	1	7/10/2021
<i>Isopogon buxifolius</i> var. <i>obovatus</i>	P3	1	7/10/2021
<i>Isopogon buxifolius</i> var. <i>obovatus</i>	P3	1	7/10/2021

12 APPENDIX G - Naturemap and PMST search results (see attached)
