

Twin Hills Wind Farm Detailed and Targeted Flora Survey Report



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Executive Summary

Stantec Australia Pty Ltd was engaged by Twin Hills Wind Farm Pty Ltd, care of Wind Prospect Pty Ltd to undertake a detailed and targeted flora and vegetation survey to inform the development application process for the proposed Twin Hills Wind Farm development. The Twin Hills Survey Area (the Survey Area) is located in the Geraldton Sandplains bioregion of Western Australia, approximately 260 kilometers north of Perth and comprises 9,993 hectares (ha) of land that is primarily cleared for crops and livestock grazing, with interspersed patches of remnant native vegetation that is generally (but not exclusively) associated with ridges, hills and slopes. The proposed wind turbines, and ancillary permanent and temporary infrastructure associated with the Project are to be established within the Survey Area.

Detailed and targeted flora and vegetation surveys were also conducted on 12,769 ha of additional area (hereafter, 'Additional Area'). Information from the Additional Area, including flora and vegetation data, has been provided for local context.

Survey effort consisted of four surveys: Preliminary Survey conducted between 6 and 9 October 2023 (10 person days), Trip 1 of the Detailed Flora and Vegetation Survey conducted between 23 and 29 June 2024 (28 person days), Trip 2 of the Detailed Flora and Vegetation Survey conducted between 20 and 26 August 2024 (28 person days), and the Targeted Survey conducted between 29 October and 02 November 2024 (20 person days). A total of 84 quadrats were sampled over the course of the four surveys between 2023 and 2024 within the Survey Area and Additional Area.

A total of 477 fully identified vascular flora (including species, subspecies, varieties, forms, hybrids, native and introduced species) have been recorded within the Survey Area. The 477 vascular flora comprises 62 families and 213 genera. The most represented families were Myrtaceae, Proteaceae and Fabaceae, and the most diverse genus was *Banksia*. Three species listed as Threatened flora were recorded within the Survey Area: *Paracaleana dixonii* (En/T), *Thelymitra stellata* (En/T) and *Eucalyptus crispata* (En/T). There were 23 Significant flora species recorded in the Survey Area from previous surveys/database searches and the Survey; including three Priority 1, five Priority 2, nine Priority 3 and six Priority 4 flora species. The post-survey likelihood of occurrence results indicated that four significant flora were considered 'Likely' to occur, while 60 significant species are 'Possible' to occur within the Survey Area, the remaining were considered 'Unlikely'. Nine species of 'other significance' were recorded within the Survey Area, representing seven range extensions and two species that could potentially represent priority flora

A total of 36 confirmed introduced flora taxon were recorded within the Survey and Additional Area, with 22 occurring within the Survey Area and none of which represent a Weed of National Significance or Declared pest for the Geraldton Sandplains bioregion; the suite of weeds recorded during the Survey are common across the Geraldton Sandplains bioregion.

Fourteen vegetation types were mapped within the Survey Area, none of which represent a Threatened ecological community or a Priority ecological community. The dominant vegetation type within the Survey Area comprised Low Open Woodland of *Eucalyptus tottiana*, over shrubland, accounting for 1,336 ha (13.37% of the Survey Area).

Vegetation condition ranged from 'Excellent' to 'Degraded', with the majority of remnant vegetation in the Survey Area (15.31% of the Survey Area) mapped as 'Excellent' condition. Just over 25% of the Survey Area is comprised of remnant vegetation, with the remaining 75% of the Survey Area comprising crop or farmland. The dominant disturbances within the Survey Area included grazing, edge effects from farming practices and land clearing.



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1. Introduction

1.1 Project Background

Stantec Australia Pty Ltd (Stantec) was engaged by Twin Hills Wind Farm Pty Ltd, care of Wind Prospect Pty Ltd (Wind Prospect) to undertake a detailed and targeted flora and vegetation survey (the Survey) to inform the development application process for the proposed Twin Hills Wind Farm development (the Project).

The Twin Hills Survey Area (the Survey Area) is located in the Geraldton Sandplains bioregion of Western Australia (WA) (**Figure 1-1**), approximately 260 kilometers (km) north of Perth. The Survey Area comprises 9,993 hectares (ha) of land that is primarily cleared for crops and livestock grazing, with interspersed patches of remnant native vegetation that is generally (but not exclusively) associated with ridges, hills and slopes.

In 2023, Stantec was engaged by Wind Prospect to conduct a flora and vegetation desktop assessment and preliminary survey (Stantec 2023). The outcomes subsequently informed the key objectives and requirements of this detailed and targeted survey and assisted in planning the approach.

Detailed and targeted flora and vegetation surveys were also conducted on 12,769 ha of additional area (hereafter, 'Additional Area'). Information from the Additional Area, including flora and vegetation data collected during the Survey, has been provided for local context. The proposed wind turbines and ancillary permanent and temporary infrastructure associated with the Project are to be established within the Survey Area, but not the Additional Area.

1.2 Objectives and Scope

The overarching objective of this work was to identify the flora and vegetation values of the Survey Area and determine and the significant values that will require consideration during future environmental approvals for the Project. The scope requirements to meet these objectives comprise:

- Update the desktop assessment (Stantec 2023), to develop a list of vascular flora species and vegetation types that have previously been recorded within and in the vicinity of the Survey Area, including species and communities of significance.
- Undertake a single-phase detailed flora and vegetation survey for the Project to:
 - Identify, describe and map the vegetation types and vegetation condition;
 - Ascertain the occurrence and likely distribution of vegetation communities of significance; and
 - Develop a list of vascular flora species present at the Project.
- Undertake a targeted significant flora survey, to ascertain the occurrence, abundance and distribution of significant flora.
- Assess the Survey findings in a local and regional context, by comparing them to available data from other localities within the bioregion.

1.3 Regulatory Guidelines

The objectives and methods adopted for the Survey are aligned with the following guidelines and technical documents:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- *Biodiversity Conservation Act 2016* (BC Act);
- *Environmental Protection Act 1986* (EP Act);
- EPBC Act Policy Statement 2.3 Wind Farm Industry (DEWHA 2009);



- Best Practice Guidelines – For implementation of Wind Farm Energy Projects in Australia (Auswind 2006);
- Environmental Factor Guidelines – Flora and Vegetation (EPA 2016a);
- Technical Guidance: Flora and vegetation surveys for environmental impact assessment (EPA 2016c);
- Survey Guidelines for Australia's Threatened orchids (Australia 2013);
- Approved Conservation Advice (s266B of the EPBC Act) for *Paracaleana dixonii* Hopper & A.P.Br. *nom. inval.* (Sandplain Duck Orchid) (DCCEEW 2008a);
- Approved Conservation Advice (s266B of the EPBC Act) for *Thelymitra stellata* (Star Sun-orchid) (DCCEEW 2008c);
- Approved Conservation Advice (s266B of the EPBC Act) for *Eucalyptus crispata* ((Yandanooka Mallee) (DCCEEW 2008b);
- Significant Impact Guidelines – Matters of National Environmental Significance (DoE 2013);
- Statement of Environmental Principles, Factors, Objectives and Aims of EIA (EPA 2023) and
- Instructions for the preparation of data packages for the Index of Biodiversity Surveys for Assessment (IBSA) (EPA 2021).

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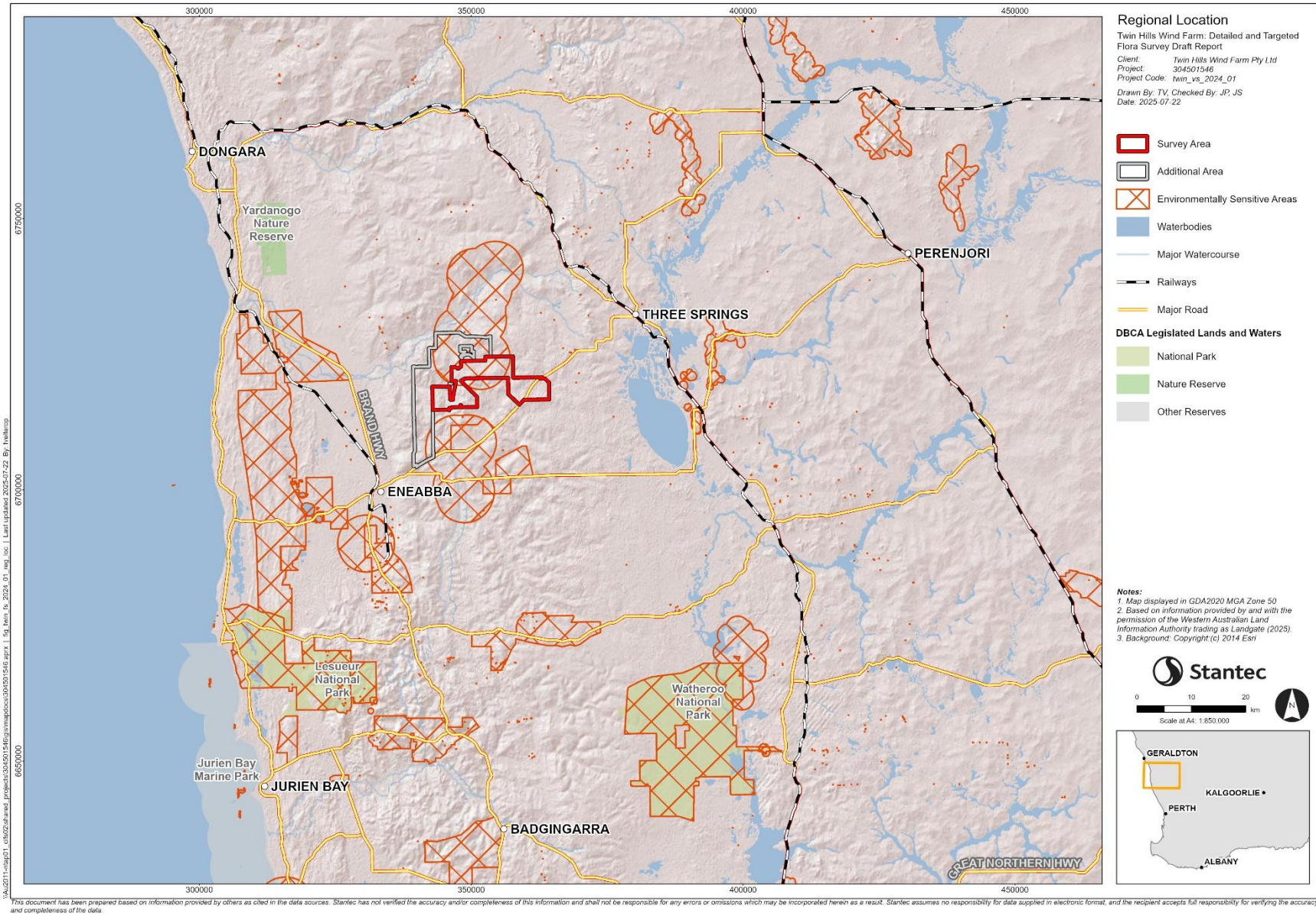


Figure 1-1: Regional location of the Survey Area



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2. Existing Environment

2.1 Biophysical Environment

2.1.1 Biogeographic Location

The Interim Biogeographic Regionalisation for Australia (IBRA (version 7.0)) is a bioregional framework that divides Australia into 89 biogeographic regions and 419 subregions on the basis of climate, geology, landforms, vegetation, and fauna (Thackway and Cresswell 1995). It was developed through collaboration between State and Territory conservation agencies with coordination by the then Commonwealth Department of Environment, Sport & Territories (now Department of Climate Change, Energy, the Environment and Water; DCCEEW).

The Survey Area occurs within the Lesueur Sandplain (GS3) subregion of the Geraldton Sandplains bioregion (**Figure 1-1**). The Geraldton Sandplains bioregion covers an area of 3,142,149 ha (DAWE 2022) and comprises the central and northern Perth Basin, the Pinjarra Orogen, and the south end of the Carnarvon Basin (McKenzie *et al.* 2003). The bioregion is characterised by semi-arid warm Mediterranean conditions supporting mainly proteaceous scrub heaths, rich in endemics, with extensive York Gum and Jam woodlands on outwash plains associated with drainage (Thackway and Cresswell 1995).

The GS3 encompasses 1,172,152 ha within the Geraldton Sandplains bioregion, comprising a mosaic of lateritic mesas, sandplains and coastal sands on Jurassic siltstones and sandstones of the central Perth Basin (DAWE 2022). The subregion exhibits extremely high floristic endemism, with a large number of distinct, species rich and geographically restricted communities occurring in the Mt Lesueur and Coomallo area (Desmond and Chant 2001).



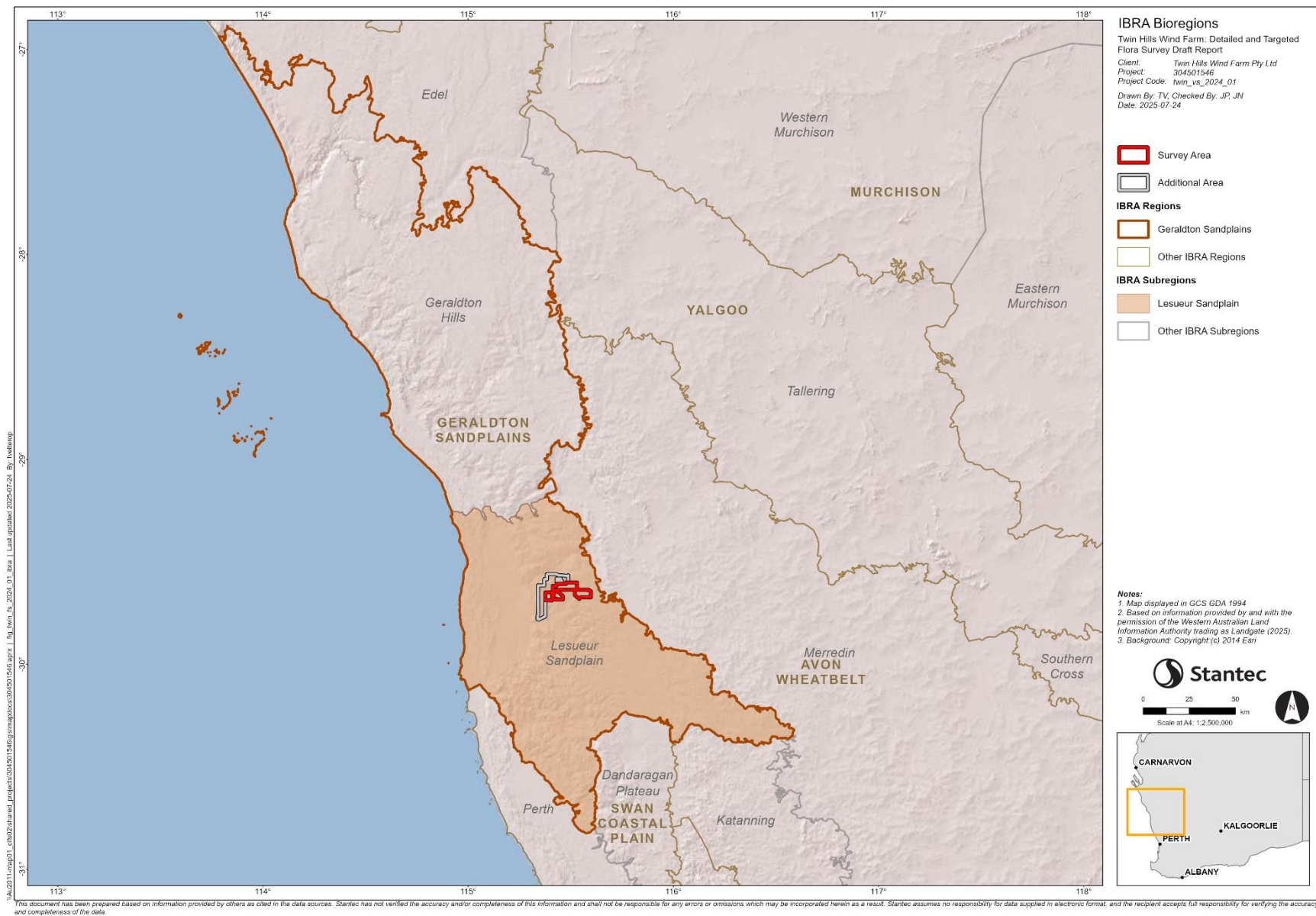


Figure 2-1: IBRA bioregions and subregions associated with the Survey Area.

2.1.2 Land Systems

Land systems are defined as an area or group of areas throughout which there is a recurring pattern of topography, soils and vegetation (Tille 2006b). An understanding of land systems provides an indication of the occurrence and distribution of vegetation types within and surrounding the Survey Area.

A total of 34 land systems have been mapped within the Geraldton Sandplain bioregion, of which four intersect the Survey Area (**Table 2-1**) (**Figure 2-1**). The dominant land system is the Coalara System, characterised by *Eucalyptus tottiana* open low woodland with heath and scrub heath on lateritic plateaus and breakaways, and sandy drainage lines (**Table 2-1**).

Table 2-1: Description of land systems within the Survey Area.

Land System	Description	Land System Vegetation	Extent in the Survey Area		Extent in the Additional Area	
			ha	%	ha	%
Coalara System	Partially dissected plateau with lateritic caps and intervening sandy drainage lines; Pale and yellow deep sand, sandy gravels and sand over gravel	Heath, scrub heath with Banksia and <i>Eucalyptus tottiana</i> open low woodland	6,424.98	64.29	92.63	0.73
Otorowiri System	Undulating to rolling sandplain and low hills. Gentle to moderately steep valley sides at margins of Mooladara Hill System. Spring lines are a common occurrence	<i>Eucalyptus tottiana</i> woodland with river red gum woodland in valley floors	2,515.35	25.17	2,020.47	15.82
Mount Adams System	Gently undulating sandplain with low gravel ridges and occasional laterite breakaways.	Scrub heath	1,045.98	10.47	9,275.73	72.64
Mooladara Hill System	Sandplain with dissected lateritic outcrops on margins and prominent dry valleys and drainages; west of Three Springs; Yellow, pale and brown deep sands, sand over gravel, minor sandy gravel, sandy duplexes; Banksia woodland and scrub heath	Banksia woodland and scrub heath	6.97	0.07	1,015.74	7.95
Boothendarra System	Subdued stripped lateritic plateau, undulating and gently undulating rises; Sandy duplexes, pale deep	Wandoo woodland, <i>Eucalyptus tottiana</i> and Banksia low open woodland,	0	0	364.08	2.85



Land System	Description	Land System Vegetation	Extent in the Survey Area		Extent in the Additional Area	
			ha	%	ha	%
	sand, sandy and loamy gravels and minor clays	scrub heath some mallee				
Total¹			9,993.28	100	12,768.65	

¹ Totals may have inconsistencies due to rounding.



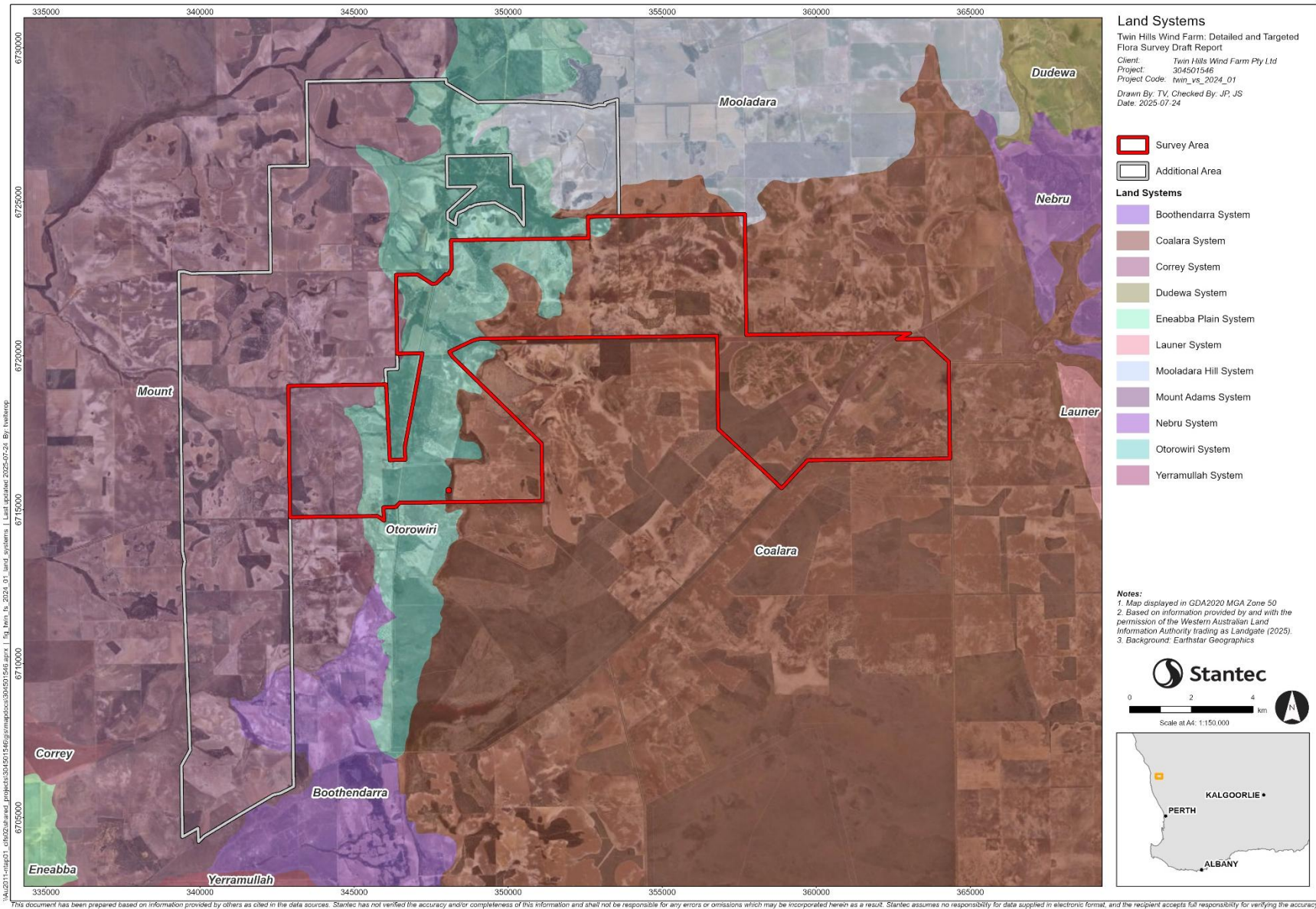


Figure 2-2: Land systems of the Survey Area.



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2.2 Flora and Vegetation

2.2.1 Botanical Region

The Survey Area is located in the South Western Botanical Province in the Irwin Botanical District (Beard 1990) that is typically characterised by low hills and undulating plains of low heath vegetation.

2.2.2 Pre-European Vegetation

Beard (1975a) mapped the vegetation of the Northern Sandplains region of Western Australia on a broad scale (1:250,000). These vegetation units were reassessed by Shepherd *et al.* (2001) for the purpose of providing increased resolution of regions and accounting for the extensive land clearing and changes in land use since the creation of the original report by Beard (1975a). At a scale of 1:1,000,000 to 1:250,000, Beard (1975a) mapping only provides a broad overview of expected vegetation types within the Survey Area.

The Survey Area is comprised of three pre-European vegetation associations: Tathra 379, Tathra 49 and Tathra 391 (**Table 2-2**). The significance of clearing a vegetation association can be determined by comparing current extents (ha) with pre-European extents, and **Table 2-3** summarises the current and pre-European extent of the vegetation associations across three scales: state, bioregion and subregion. The current extent suggests that extensive land clearing has occurred across the three scales of assessment, with close to 50% or less of vegetation remaining.

Table 2-2: Pre-European vegetation system associations and extent within the Survey Area

System	System Association Code	Description	Extent in the Survey Area	
			Ha	%
Tathra	379	Shrublands; scrub-heath on lateritic sandplain in the central Geraldton Sandplain Region	8,607.97	86.14
Tathra	49	Shrublands; mixed heath	1,165.22	11.66
Tathra	391	Shrublands; <i>Melaleuca uncinata</i> thicket	220.08	2.20
Total			9,993.27	100



Table 2-3: Extent of pre-European vegetation system associations for the Survey Area remaining across three scales (state, bioregion and subregion).

System	Scale	Pre-European extent (ha)	Current extent (ha)	Proportion remaining (%)	Current extent within the IUCN Class I-IV Reserves (ha)	Proportion of extent protected within IUCN Class I-IV Reserves (%)
Tathra (391)	State-wide	3,063.14	1,622.19	52.96	645.60	21.08
	Bioregion (Geraldton Sandplains)	3,063.14	1,622.19	52.96	645.60	21.08
	Subregion (Lesueur)	3,063.14	1,622.19	52.96	645.60	21.08
Tathra (49)	State-wide	52,134.84	26,102.69	50.17	10,650.49	20.43
	Bioregion (Geraldton Sandplains)	39,718.26	14,489.68	36.48	3,191.34	8.03
	Subregion (Lesueur)	33,139.33	13,618.88	41.10	3,191.30	9.63
Tathra (379)	State-wide	547,736.94	129,736.79	23.69	28,019.02	5.12
	Bioregion (Geraldton Sandplains)	546,507.25	129,495.80	23.70	28,003.65	5.12
	Subregion (Lesueur)	370,029.76	111,632.48	30.17	20,606.46	5.57

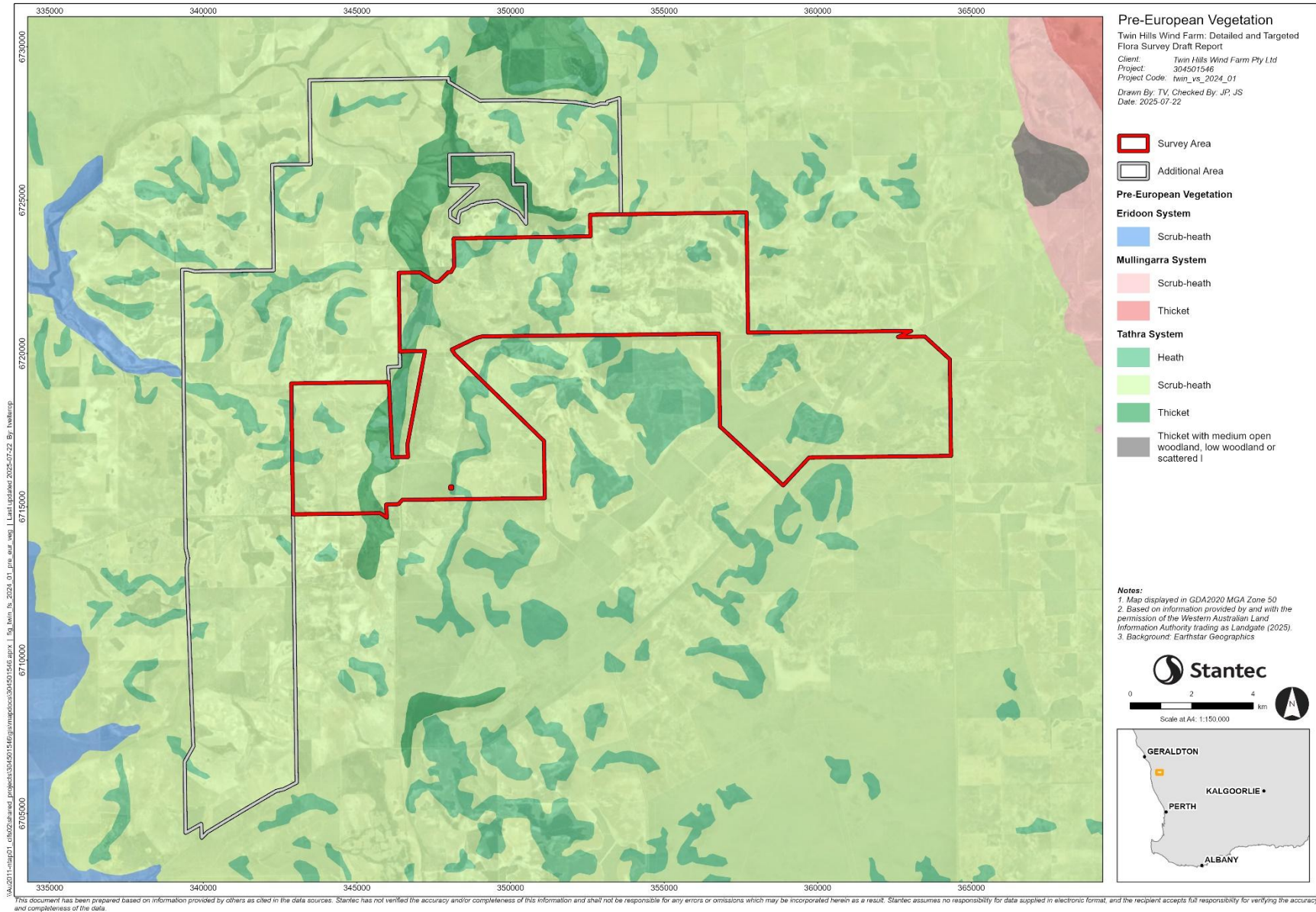


Figure 2-3: Pre-European vegetation of the Survey Area.



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2.3 Physical Environment

2.3.1 Climate

The GS3 is characterized by a semi-arid Mediterranean climate, with mild wet winters and hot dry summers. Precipitation is predominantly during winter months (300 – 500 millimeters (mm)) and there are seven to eight dry months per year (Tille 2006a). The nearest active Bureau of Meteorology (BoM) weather station with long term rainfall data is Carnamah Station (station no. 008025), which is approximately 35 km east of the Survey Area. Based on the long-term rainfall data from Carnamah Station, the mean annual rainfall since 1887 is 373.8 mm. The majority of rainfall (240.82 mm) is in winter, between the months of May and August (BoM 2025).

Carnamah Station is also the nearest BoM weather station with long-term temperature data. Based on the long-term temperature data from Carnamah Station, the warmest months of the year are between November and March, with daily maximum temperatures averaging above 30°C (**Figure 2-4, Table 4-1**). The coolest months occur during winter, from June to August, with minimum temperatures consistently falling below 9°C. The long-term mean maximum temperature since 1940 is 27.12°C, and the long-term mean minimum temperature is 12.6°C (BoM 2025).



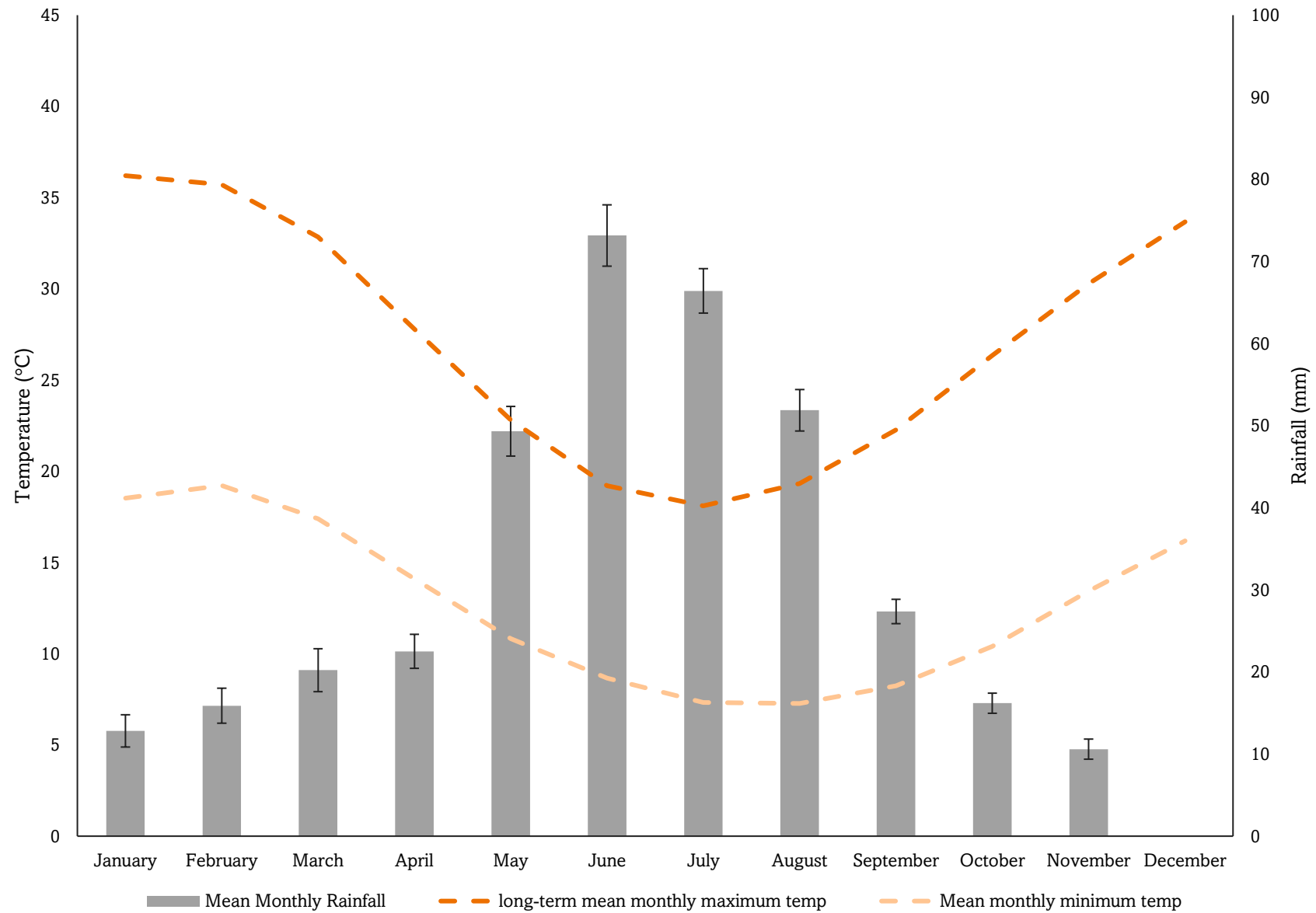


Figure 2-4: Long-term rainfall (1887 - 2025) ($\pm$ Standard Error) and temperature (1940 – 2025) from the Carnamah Weather Station (no. 008025) (BoM 2025).



2.3.2 Surface Geology and Soils

The underlying geology of the Irwin Botanical Province is predominantly Permian to Cretaceous sedimentary basins and horsts of Proterozoic rocks (Desmond and Chant 2001). The area is characterised by undulating lateritic sandplains with leached sandy soils over laterite near the coast, and yellow sands over laterite further inland.

The Survey area occurs in association with six broad geological formations, based on mapping by the Government of Western Australia (1978) captured at a scale of 1:500 000 (**Table 2-4; Figure 2-5**). The dominant geological formation is Sand plain 38499 (61.48%), which comprises sand or gravel plains, while nearly one third (27.58%) comprises the colluvium 38491 and alluvium 38494 geological formations.

The soils of the Survey Area were mapped by Tille (2006a) and occur in the Greenough Province. The area is dominated by extensive laterite formation commencing in the Tertiary period comprising extensive yellow and deep sands, pale sands, gravelly pale deep sands and duplex sandy gravels (Tille 2006a).

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Table 2-4: Surface Geology within the Survey Area.

Name (code)	Name	Geological Description	Extent within Survey Area (ha)	Proportion of Survey Area (%)	Extent within Additional Area (ha)	Proportion of Additional Area (%)
Czs	Sand plain 38499	Sand or gravel plains; may include some residual alluvium; quartz sand sheets commonly with ferruginous pisoliths or pebbles; local clay, calcrete, laterite, silcrete, silt, colluvium	6180.47	61.85	6457.002	50.57
Qrc	colluvium 38491	Colluvium and/or residual deposits, sheetwash, talus, scree; boulder, gravel, sand; may include minor alluvial or sand plain deposits, local calcrete and reworked laterite	1,512.39	15.13	3438.627	26.93
Cza	alluvium 38494	Reworked or incised alluvium in older stream channels; alluvial terraces above younger alluvium; alluvial and colluvial outwash deposits not in defined channel systems; lateritised alluvium; sand, silt, gravel, clay, evaporites	1,219.08	12.20	40.539	0.32
Kspm	Parmelia Group	Sandstone, siltstone, shale	524.94	5.25	634.249	4.97
Jsys	Yarragadee Formation	Fine to coarse-grained, poorly sorted feldspathic sandstone, thin beds of shale, siltstone; minor conglomerate and coal present.	422.81	4.23	1807.838	14.16
Czl	ferruginous duricrust 38498	Ferruginous duricrust, laterite; pisolitic, nodular, vuggy; may include massive to pisolitic ferruginous subsoil, mottled clays, magnesite, reworked products of ferruginous and siliceous duricrusts, calcrete, gossan; residual ferruginous saprolite	133.60	1.34	390.400	3.06
Total			9,993.28	100	12,768	100



2.3.3 Surface Water and Drainage

The Survey Area occurs approximately evenly over the Arrowsmith River and Hill River catchment areas, with the Additional Area extending South from the Arrowsmith River catchment to the Indoonlogue catchment. The Survey Area does not intersect the Arrowsmith River or any other major watercourses, but it does intercept numerous smaller unnamed tributaries (Figure 2-6).

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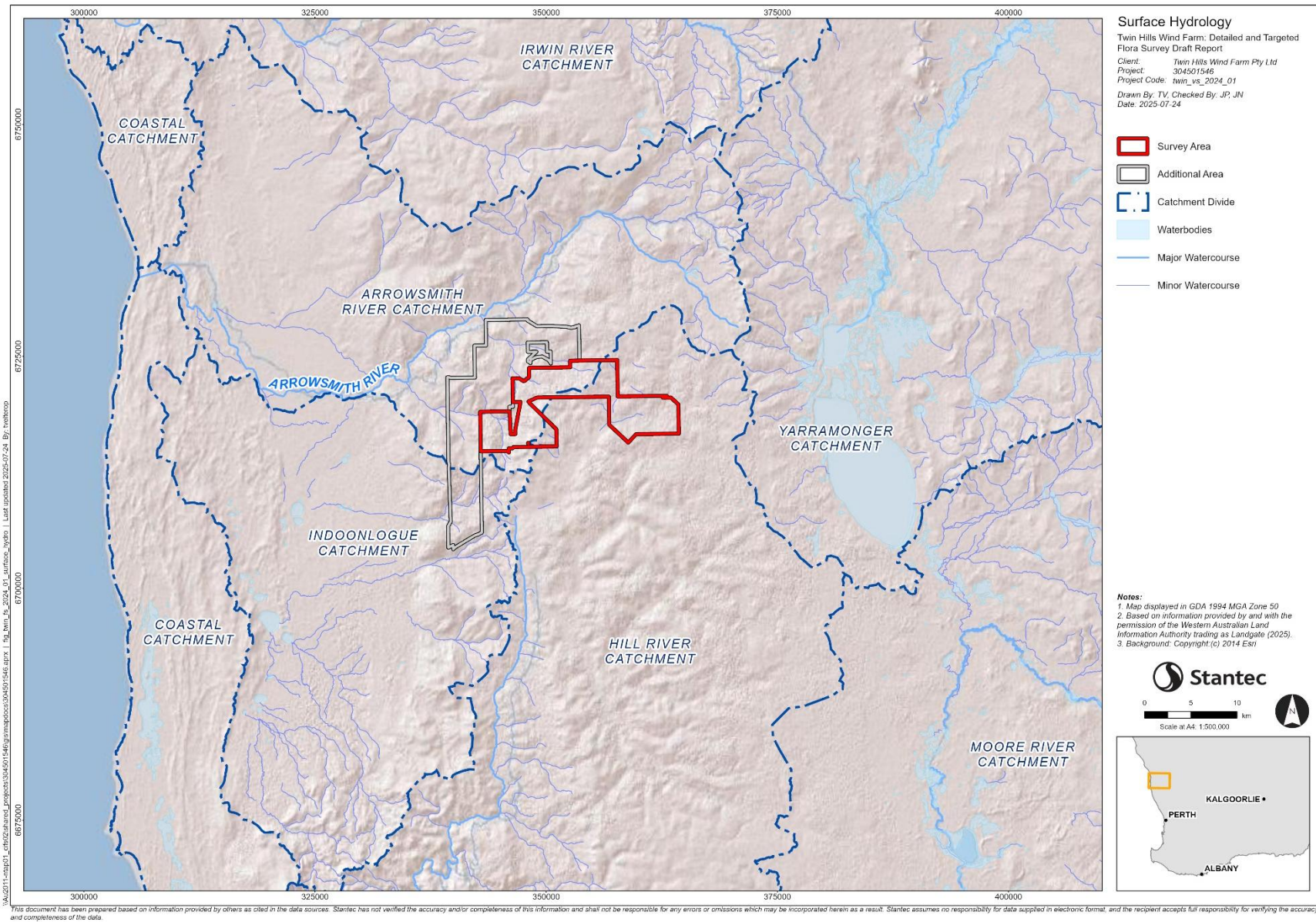


Figure 2-6: Surface hydrology in relation to the Survey Area.



2.3.4 Land Tenure and Use

The Survey Area is within the Shire of Three Springs while the southern extent of the Additional Area is within the Shire of Carnamah. The dominant land-use in the GS3 is dry-land agriculture (69.34%), with lesser areas of conservation (17.6%) and Unallocated Crown Land and Crown Reserves (12.5%) (**Figure 2-7**) (Desmond and Chant 2001). Non-exclusive native title exists over the whole of the Survey Area, as determined by the Yamatji Nation tribunal case (9,993 ha or 100% of the Survey Area) (National Native Title Tribunal 2022).

2.3.5 Conservation Reserves and Environmentally Sensitive Areas

2.3.5.1 National Parks, Nature Reserves and other Protected Areas

The Survey Area does not directly overlap with any conservation reserves; however, one small unnamed nature reserve (R 48098) borders the Survey Area (**Figure 3-4**). The next closest conservation reserves are R 12705 (450 m north, bounded by the Additional Area), Wilson Nature Reserve (adjacent to the north of the Additional Area) and Depot Hill Nature Reserve (adjacent to the south of the Additional Area). Other conservation reserves in the vicinity of the Survey Area include the Wotto Nature Reserve (1.5 km south of the Survey Area), White Gums Nature Reserve (7.5 km south), Tathra National Park (10 km south-east), and Leda Nature Reserve (10 km east) (DCCEEW 2020).

2.3.5.2 Environmentally Sensitive Areas

It is an offence under the *Environmental Protection Act 1986* (EP Act) to clear native vegetation unless under a clearing permit or where an exemption applies. Under section 51B of the EP Act the Minister for Environment may declare an area or class of areas to be an Environmentally Sensitive Area (ESA). Once declared, the exemptions to clear native vegetation under the regulations do not apply in these areas unless the clearing is a requirement by law. The types of areas which are declared as ESAs are listed in the Environmental Protection (Environmentally Sensitive Areas) Notice 2005 (Government of Western Australia 2005), but one example is any area covered by a threatened ecological community (TEC).

The Survey Area intersects the buffers of two ESAs, both declared due to the presence of the TECs '*Ferricrete floristic community (Rocky springs type)*'; and '*Assemblages of organic mound springs of the Three Springs area*' (DWER 2023) (**Figure 3-4**). The buffer for the Ferricrete TEC covers an approximate area of 17,000 ha and intersects a small area of the southern extension of the Survey Area. The buffer for the mound springs TEC covers an approximate area of 32,000 ha and overlaps with the northern extent of the Survey Area.

There is an ESA for a declared rare flora (50 m buffer) within a segment of DBCA managed land, which is surrounded by the Survey Area but does not directly intersect it.



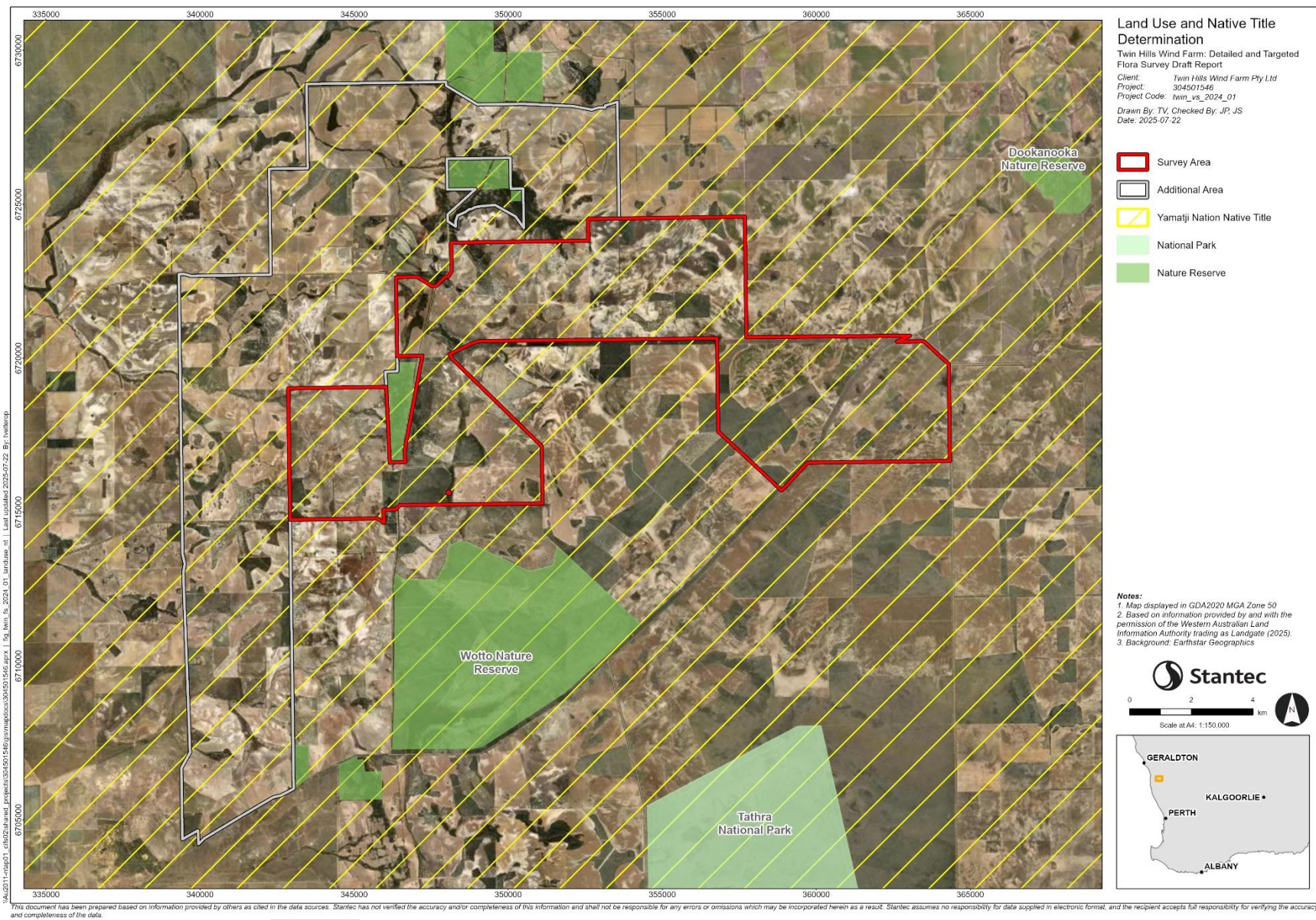


Figure 2-7: Land use in relation to the Survey Area.



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3. Desktop Assessment

3.1 Approach

The desktop assessment conducted by Stantec in 2023 (Stantec 2023) was updated prior to the Survey, to gather contextual information of the flora and vegetation of the Survey Area, particularly in relation to significant species and communities and to inform a likelihood of occurrence for significant flora and vegetation to occur within the Survey Area.

Significance and rankings used are consistent with the EPBC Act, the BC Act, as well as the Department of Biodiversity, Conservation and the Attractions (DBCA) priority list.

3.2 Desktop Methods

3.2.1 Database Searches

To inform the desktop assessment and preliminary survey (Stantec 2023), DBCA database searches were conducted, the results of which were retained for the Survey. Database searches were undertaken to generate a list of significant flora and vegetation previously recorded within, and in the vicinity of, the Survey Area, with an emphasis on species of significance. Six database searches were conducted based on a Survey Area and Additional Area shapefile (**Table 3-1**). Appropriate search buffers were applied depending on the technical capabilities (maximum buffer, accuracy of data) of the databases and the ecological features of the Survey Area. The results of the database searches are provided in Stantec (Stantec 2023) and **Section 3.3**.

Table 3-1: Database searches conducted for the desktop assessment.

Custodian	Database name	Method of search	Buffer
ALA (2023)	Atlas of the Living	Survey Area and Additional Area	20 km
DCCEEW (2023)	Protected Matters Search Tool		
DBCA (2023a)	Significant Communities		
DBCA (2023d)	Threatened and Priority Flora		
DBCA (2023c)	WA Herbarium Database Search Tool		
DBCA (2023b)	Dandjoo Biodiversity Data Platform	Survey Area and Additional Area	10 km



3.2.2 Literature Review

As part of the desktop assessment and preliminary survey conducted by Stantec (Stantec 2023), a literature review was undertaken to gather information on species records and habitats that might be present within the Survey Area, and to place the Survey Area in a regional context. Historic vegetation mapping (Beard 1975b; Shepherd *et al.* 2002) soil and landform mapping and characteristics (Tille 2006a), geological mapping (Geoscience Australia 2012) and IBRA classification system information (Thackway and Cresswell 1995) were reviewed to provide broad context.

Prior to the Survey, there have been eight publicly available flora and vegetation surveys undertaken in the GS3 subregion, one of which (ENV Australia 2013) intersects the Survey Area (**Table 3-2**). The findings of the flora and vegetation surveys included in the literature review are presented in **Table 3-2**, while the boundaries of the flora and vegetation surveys within 20 km of the Survey Area are presented in **Figure 3-1**.

SENSITIVE



Table 3-2: Flora surveys completed in the vicinity of the Survey Area.

Project [location]	Survey Timing	Survey details	Proximity to Survey Area	Survey effort	Vegetation types & conditions	Flora recorded	Species and communities of conservation significance ²
Preliminary Flora and Vegetation and Fauna Assessment of Twin Hills and One Tree Hill, Eneabba ENV Australia (2013)	2012 25th – 29th June	- Area 37,177 ha - Study type: Level 2 Seasonal conditions: Sub-optimal	Both Twin Hills and One Tree Hill Survey Areas intersect the Survey Area	Flora survey: consisted of 16 relevés, approximately 10 x 10 m.	- Shrubland; <i>Melaleuca uncinata</i> [<i>Melaleuca concreta</i>?] thicket - Shrubland; scrub-heath on lateritic sandplain in the central Geraldton sandplain region. - Shrublands' scrub-heath with <i>Banksia</i> spp. <i>Eucalyptus tottiana</i> and <i>Xylomelum angustifolium</i> on deep sandy flats in the Geraldton sandplains Region. Shrubland; mixed heath	109 taxa including; 29 families 63 genera	<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i> (P4) <i>Banksia fraseri</i> var. <i>crebra</i> (P3)
Ocean Hill 3D Seismic Acquisition survey: <i>Environmental Protection Act 1986</i> Section 38 Referral Supporting Document JBS&G (2021)	2017 & 2021	- Level 2 conservation significant flora and vegetation survey - Desktop Assessment and Level 2 significant flora and vegetation survey. - To provide supporting information for referral of the Ocean Hill 3D Seismic Acquisition Survey	1 km south of the Survey Area	Flora and vegetation survey of approximately 200 km of linear seismic lines in 2017. Flora and vegetation survey of proposed seismic corridors in 2021.	<i>Banksia attenuata</i> and/or <i>Allocasuarina humilis</i> with mixed Proteaceous and Myrtaceous low shrubs over spars shrubland. <i>Banksia glaucifolia</i> and <i>Banksia kippistiana</i> subsp. <i>kippistiana</i> low shrubland to open shrubland over <i>Mesomelaena</i> spp. sparse sedgeland <i>Calothamnus longissimus</i> low shrubland <i>Eucalyptus rudis</i> open woodland over <i>Acacia saligna</i> and <i>Melaleuca raphiophylla</i> tall shrubland. <i>Eucalyptus tottiana</i> open mallee woodland to isolated mallee trees over mxd Proteaceous and Myrtaceous low shrubland to open shrubland over <i>Mesomelaena spseudostygia</i> sparse sedgeland. <i>Hakea psilorrhyncha</i> and <i>Scholtia</i> sp. tall open shrubland with isolated <i>Eucalyptus tottiana</i>. <i>Melaleuca raphiophylla</i> tall shrubland with patches of <i>Acacia blakelyi</i> and <i>Acacia saligna</i> tall open shrubland	1 Priority 1 species 13 Priority 3 species 1 Priority 4 species	<i>Verticordia luteola</i> var. <i>rosea</i> (P1) <i>Persoonia filiformis</i> (P3) <i>Allocasuarina ramosissima</i> (P3) <i>Banksia fraseri</i> var. <i>crebra</i> (P3) <i>Jacksonia anthoclada</i> (P3) <i>Persoonia rudis</i> (P3) <i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i> (P3) <i>Stylidium ?hymenocraspedum</i> (P3) <i>Verticordia fragrans</i> (P3) <i>Hemiandra</i> sp. <i>Eneabba</i> (H. Demarz 3687) (P3) <i>Banksia chamaephyton</i> (P3) <i>Calytrix chrysantha</i> (P3) <i>Calytrix eneabensis</i> (P3) <i>Eremaea acutifolia</i> (P3) <i>Verticordia aurea</i> (P4)
Flora and Vegetation Assessment: Arrowsmith central Survey Area Mattiske Consulting Pty Ltd (2022b)	One survey in each of 2018, 2019 and 2021	- Area: 1,570 ha - Study Type: Vegetation assessment - Seasonal Condition:	10 km west of the Survey Area	118 vegetation monitoring quadrats	- Open heath with isolated trees - Heathland on white/grey sand. - Isolated trees over mixed understory of Proteaceae and Myrtaceae species on white/grey sand. - Open shrubland on grey/white sands. - Open shrubland on white/grey sand. - Thicket to scrub on white sand over grey to brown clay/loam. - Open woodland to isolated trees, over open shrubland on cream sand.	314 taxa including; 52 families 134 genera	<i>Grevillea leptopoda</i> (P3) <i>Hemiandra</i> sp. <i>Eneabba</i> (H. Demarz 3687) (P3) <i>Hopkinsia anoetocolea</i> (P3) <i>Persoonia rudis</i> (P3) <i>Stylidium torticarum</i> (P3) <i>Styphelia filifolia</i> (P3) <i>Banksia elegans</i> (P4) <i>Calytrix chrysantha</i> (P4) <i>Schoenus griffinianus</i> (P4)
EP3 Study Area – Eneabba Flora and vegetation Desktop Assessment Umwelt (2021)	2021	- Area: 14,624 ha - Study type: desktop assessment	10 km south-west from Survey Area	- Review of all publicly available flora and vegetation data relevant to the Study Area. 23 reports and assessments were assessed	- Assemblages of the organic mound springs of the Three Springs area TEC (Endangered) - Ferricrete floristic community (rock springs type) TEC (Vulnerable)	Desktop study only	158 significant taxa identified to occur within and within the vicinity of the Study Area comprising of; 19 Threatened taxa 139 DBCA-classified Priority flora.

² Flora priority status updated to reflect current status at the time of submission of this report

Project [location]	Survey Timing	Survey details	Proximity to Survey Area	Survey effort	Vegetation types & conditions	Flora recorded	Species and communities of conservation significance ²
		The assessment encompasses the Study Area with a 5 km buffer.			<i>Petrophile chrysanthra</i> low Lesueur dissected uplands PEC (P3)		
West Erregulla Field Development Program – response to submissions JBS&G (2023) (Original report not accessible)	2020	Ecological field survey of a proposed development area including: Targetted survey for <i>P. dixonii</i>.	17 km north west of the Survey Area	Survey conducted by JBS&G 2020 in accordance with EPA Technical Guidance: Flora and Vegetation Surveys for Enviromental Impact Assessment.	Eight vegetation types were recorded (further detail unavailable).	2 Threatened species 3 Priority 1 species 1 Priority 2 species 8 Priority 3 species 2 Priority 4 species	<i>Thelymitra stellata</i> (T) <i>Paracaleana dixonii</i> (T) <i>Lasiopetalum ogilvieanum</i> (P1) <i>Micromyrtus rogeri</i> (P1) <i>Stylidium carnosum</i> subsp. Narrow leaves (J.A. Wege 490) (P1) <i>Schoenus badius</i> (P2) <i>Comesperma rhadinocarpum</i> (P3) <i>Haemodorum loratum</i> (P3) <i>Hemiandra</i> sp. Eneabba (H. Demarz 3687) (P3) <i>Mesomelaena stygia</i> subsp. <i>deflexa</i> (P3) <i>Persoonia filiformis</i> (P3) <i>Persoonia rudis</i> (P3) <i>Stylidium drummondianum</i> (P3) <i>Synaphea oulopha</i> (P3) <i>Banksia scabrella</i> (P4) <i>Schoenus griffinianus</i> (P4)
Flora & Vegetation Assessment: Arrowsmith North Survey Area Mattiske Consulting Pty Ltd (2022a)	Six surveys between 2018 and 2021	- Area: 2,109 ha - Study Type: Vegetation Assessment - Seasonal conditions	26 km north-west of Survey Area	157 vegetation monitoring quadrats 113 quadrats were established between 2018 and 2019 - Additional 44 vegetation quadrats were established in 2020.	- North Mine - Open heath to closed heath on cream and white surface sands. - Open heath to closed heath on white sands on plains. - Open heath with isolated trees on cream/grey sands on plains. - Open heath on yellow-cream/white sand on flats. - Open heath to closed heath on pale yellow sandy flats. - Scrub on white-yellow sand on flats and slopes - Ticket of scrub on grey/cream/orange red sands on flats and slopes. - Low open woodland on cream to white sands on plains. - North Transport Corridor - Open heath to closed heath on cream and white surface sands. - Open heath to closed heath on cream sand on lower slopes. - Open shrubland on cream/grey sand on flats to lower slopes. - Thicket on cream sand flats. - Thick to scrub on grey sand on flats	305 taxa including; 52 families 136 genera	<i>Schoenus</i> sp. <i>Eneabba</i> (F. Obbens & C. Godden I154) <i>Beyeria gardneri</i> (P3) <i>Comesperma rhadinocarpum</i> (P3) <i>Lechenaultia juncea</i> (P3) <i>Hemiandra</i> sp. Eneabba (H. Demarz 3687) (P3) <i>Hopkinsia anoectocolea</i> (P3) <i>Lechenaultia juncea</i> (P3) <i>Persoonia rudis</i> (P3) <i>Banksia elegans</i> (P4) <i>Schoenus griffinianus</i> (P4) <i>Stawellia dimorphantha</i> (P4)

Project [location]	Survey Timing	Survey details	Proximity to Survey Area	Survey effort	Vegetation types & conditions	Flora recorded	Species and communities of conservation significance ²
					• Thicket on sandy loam/clay on low lying flats • Thicket on cream/grey sand on flats • Open mallee woodland on grey clay loam on flats • Woodland to isolated trees on cream sand with limestone outcropping on slopes. • Isolated trees with limestone outcropping on flats and slopes.		
Arrowsmith Hydrogen Project Vegetation Management Plan Infinite Green Energy (2021)	• 2020	• 1,929 ha Area surveyed	• 30 km West of the Survey Area	• Detailed survey conducted by Ecoscape informing the management plan	• Limestone uplands (near coastal) • Sandplain (with limestone pavement) • Riparian areas (drainage lines and floodplain) • Limestone uplands • Karst (limestone upland) • Uplands (disturbed) • Lakes and floodplain	191 taxa	• <i>Anthocercis intricata</i> (P3) • <i>Beyeria cinerea</i> subsp. <i>cinerea</i> (P3) • <i>Eucalyptus zopherophloia</i> (P4)
Spring Flora and vegetation Survey and Black cockatoo Habitat Survey Outback Ecology Pty Ltd (2014)	• 2013 • 30th of October to the 1st November	• Area: 249.67 ha • Study Type: Level 1 Spring Flora Survey and Significant fauna habitat assessment for Black Cockatoo	• 100 km south of the Survey Area	• Relevés conducted within Survey area and targeted searching for priority and conservation significant species.	• Proteaceous heath: Scattered <i>Nuytsia floribunda</i> open shrubland of <i>Xanthorrhoea ?drummondii</i> and <i>Allocasuarina humilis</i> over closed proteaceous heath.	78 taxa including; • 24 families • 52 genera	• <i>Lepidobolus quadratus</i> (P3) • <i>Tetratheca angulata</i> (P3) • <i>Stylidium aeonoides</i> (P4)

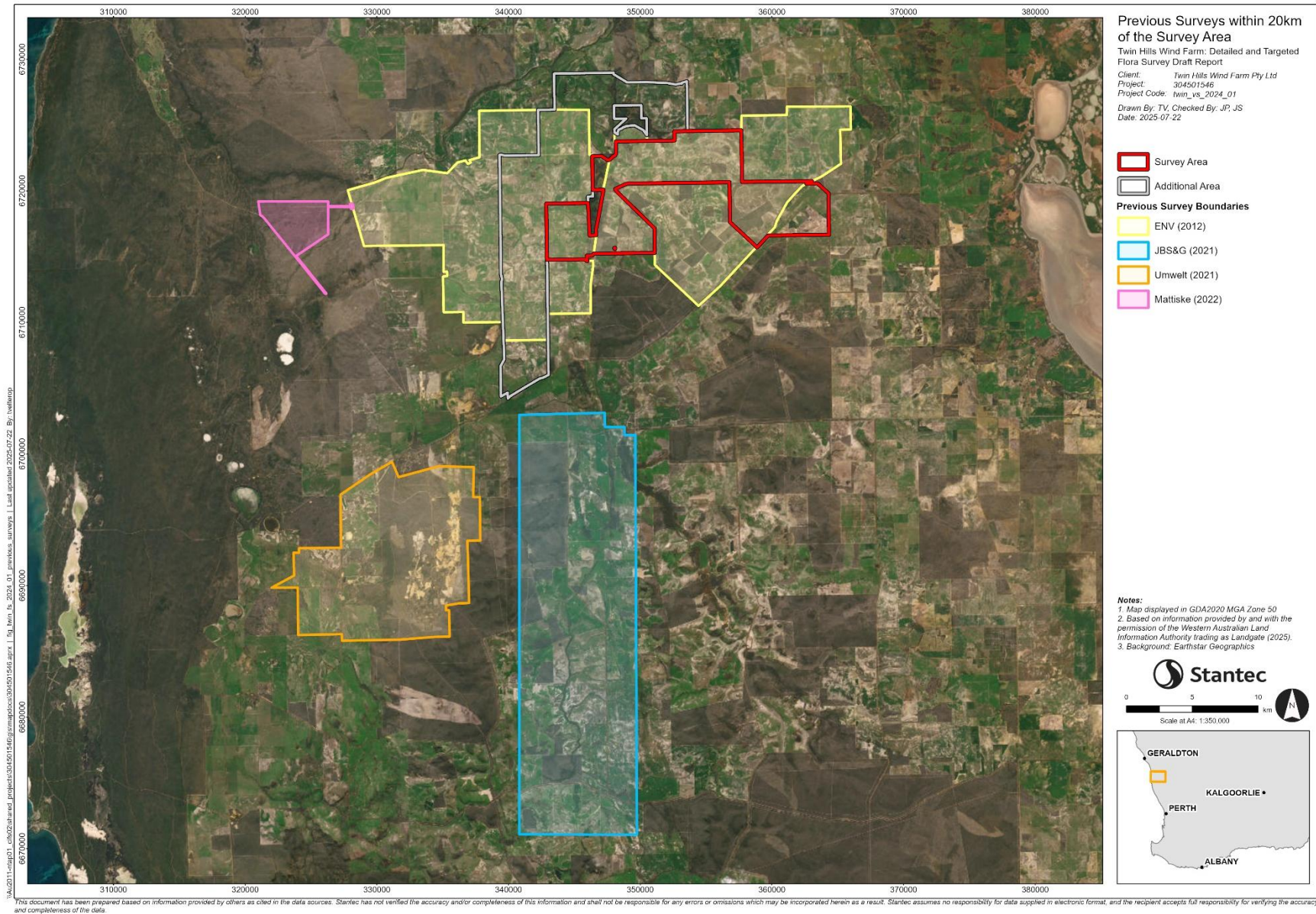


Figure 3-1: Previous flora and vegetation surveys within 20 km the Survey Area.



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3.2.3 Likelihood of Occurrence

Prior to undertaking the Survey, the significant species identified from the database searches and literature review were assessed for their likelihood of occurrence within the Survey Area. This assessment was based on the results of the preliminary survey, interpretation of habitat types from aerial imagery, known preferred habitat and the nearest known location of each species. The likelihood of occurrence assessment was used to inform targeted survey methods employed during the targeted survey component of the Survey.

Each species of significant flora was assessed and ranked for likelihood of occurrence in the Survey Area according to the following presented in **Table 3-3**.

Table 3-3: Criteria used for assessing the likely occurrence of significant flora in the Survey Area.

Potential to Occur	Description
Confirmed	The species has been recorded unambiguously during the last ten years (i.e., during recent surveys or from reliable records obtained via database searches) in the Survey Area.
Likely	There is a medium to high likelihood that the species occurs in the Survey Area as the Survey Area occurs within the known species distribution, contains suitable habitat, and the species has been recorded recently nearby.
Possible	There is a potential for the species to use the Survey Area as: • The species has not been recorded recently nearby however: - The species may not have been detected during previous surveys e.g. is rare, patchily distributed; and - The species is known to be cryptic and may not have been detected despite extensive surveys. • The species has been recorded recently nearby and species presence cannot be ruled out due to factors such as species ecology or distribution; - Doubt remains over taxonomic identification. - The majority of habitat does not appear suitable; and - Coordinates are doubtful
Unlikely	There is an outward potential for the species to occur in the Survey Area as: • The Survey Area lacks critical habitat, only supports marginally suitable habitat, or is severely degraded; and/or • There are few historic record/s and no other current records in the local area

Following the field survey, the significant flora species identified from the database searches and literature review were re-assessed to determine the post-survey likelihood of occurrence within the Survey Area. Species were categorised based on the proximity of known populations to the Survey Area, the presence and level of inspection of habitats within the Survey Area, the life form, preferred habitat and flowering period for each species (**Appendix C**).



3.3 Findings

3.3.1 Threatened and Priority Flora

The DBCA, DCCEEW and WAH database search results and the literature review identified 161 significant flora within 20 km of the Survey Area and Additional Area **Figure 3-2** to **Figure 3-3**. Of these, 23 species are listed as Threatened flora and 138 as Priority flora species; including 11 Priority 1 (P1) species, 36 Priority 2 (P2) species, 63 Priority 3 (P3) species and 28 Priority 4 (P4) species (**Figure 3-2**). Thirteen of these species have known occurrences within the boundaries of the Survey Area (**Table 3-4**).

Results from the ALA were referenced; however, they are not presented because the records are supplied as buffered points. This generalization occurs primarily for privacy or uncertainty reasons and the ALA advises that for high-resolution ecological work, buffered points should be excluded.

Table 3-4: Significant Flora confirmed to occur within the Survey Area.

Family	Taxa	Conservation Status
Myrtaceae	<i>Eucalyptus crispata</i>	Vu/T
Myrtaceae	<i>Verticordia luteola</i> var. <i>rosea</i>	P1
Myrtaceae	<i>Homalocalyx chapmanii</i>	P2
Myrtaceae	<i>Micromyrtus uniovulum</i>	P2
Asteraceae	<i>Millotia jacksonii</i>	P2
Stylidiaceae	<i>Stylidium tinkeri</i>	P2
Proteaceae	<i>Petrophile septemfida</i>	P3
Ericaceae	<i>Styphelia hyaline</i>	P3
Goodeniaceae	<i>Lechenaultia juncea</i>	P3
Myrtaceae	<i>Verticordia luteola</i> var. <i>luteola</i>	P3
Lamiaceae	<i>Hemiandra</i> sp. Watheroo (S. Hancocks 4)	P4
Myrtaceae	<i>Calytrix chrysantha</i>	P4
Restionaceae	<i>Lepidobolus densus</i>	P4



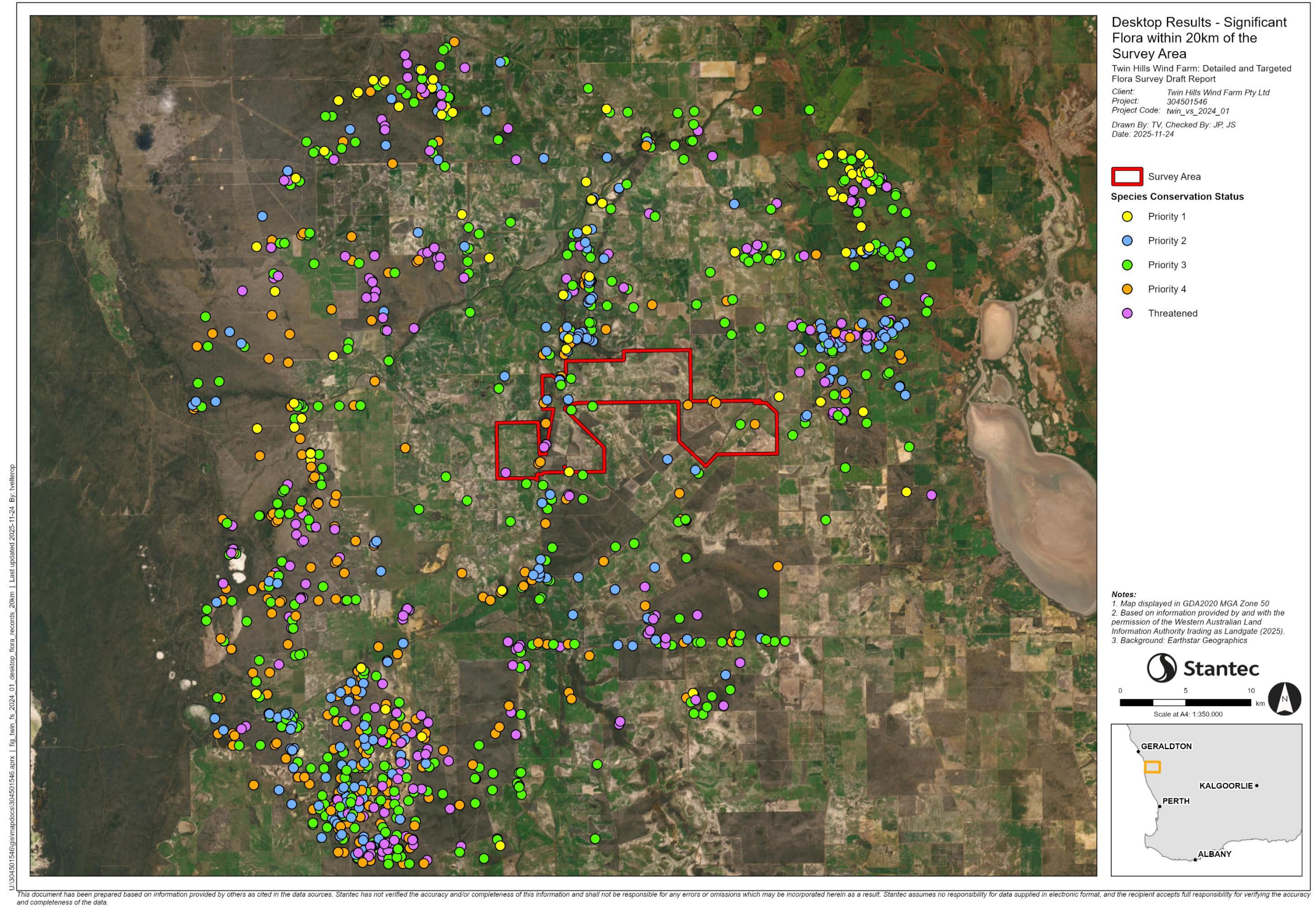


Figure 3-2: Previous Threatened and priority flora records within 20 km of the Survey Area (DBCA 2023d)

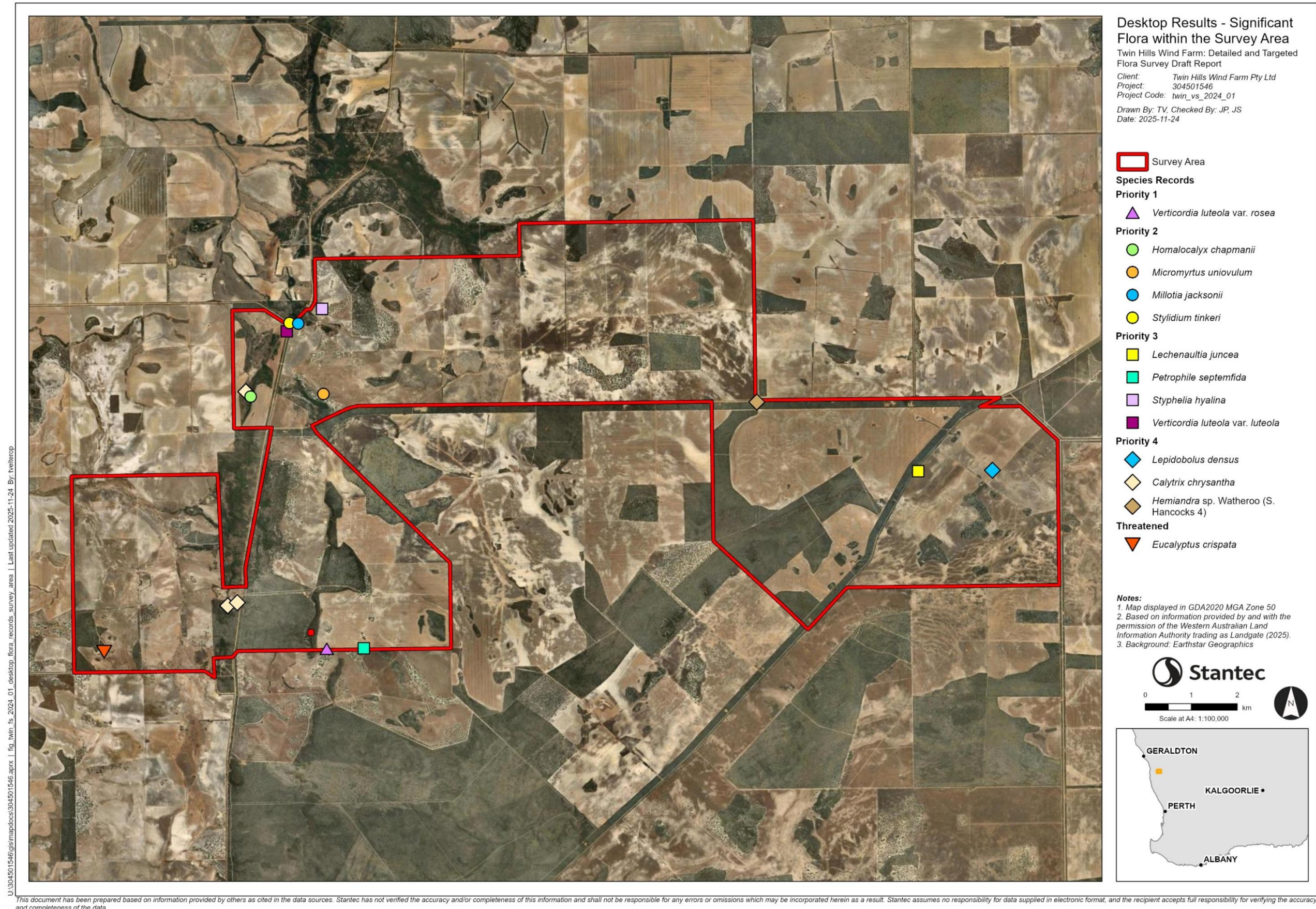


Figure 3-3: Previous Threatened and priority flora records within the Survey Area (DBCA 2023d).

Likelihood of Occurrence

Thirteen current significant flora species are known to occur within the Survey Area as a result of previous survey work (Table 3-4, Appendix C). In addition to these species, based on the proximity of known populations to the Survey Area, the life form, and preferred habitat, 51 significant flora species were considered likely to occur in the Survey Area; comprising six Threatened, one P1, nine P2, 24 P3 and 11 P4 (Appendix C).

The remaining significant flora species were considered possible and/or unlikely to occur within the Survey Area as detailed in Appendix C.

3.3.2 Introduced Flora

There have been 16 introduced flora taxon recorded within or in the vicinity of, the Survey Area, three of which are listed as Weeds of National Significance (Australian Weeds Committee 2024), **Asparagus asparagoides*, **Lycium ferocissimum* and **Tamarix aphylla*.

Table 3-5: Introduced species previously identified within, or in the vicinity of, the Survey Area

Taxon	Common name	DPaW prioritisation ranking		Status ³
		Ecological impact	Invasiveness	
<i>*Aira caryophylla</i>	Silvery Hairgrass	High	Rapid	
<i>*Arctotheca calendula</i>		High	Rapid	
<i>*Asparagus asparagoides</i>	Bridal creeper	Not assessed	Not assessed	WoNS, declared pest
<i>*Avellinia festucoides</i>		Not assessed	Not assessed	
<i>*Avena barbata</i>		High	Rapid	
<i>*Cenchrus ciliaris</i>	Buffel-grass	High	Rapid	
<i>*Echium plantagineum</i>	Paterson's curse	High	Rapid	Declared pest
<i>*Ehrharta calycina</i>	Perennial Veldt Grass	High	Rapid	
<i>*Hypochaeris glabra</i>	Smooth Cats-ear	Low	Rapid	
<i>*Lupinus angustifolius</i>		Medium	Moderate	
<i>*Lycium ferocissimum</i>	African boxthorn	High	Rapid	WoNS
<i>*Lysimachia arvensis</i>	Pimpernel	Low	Rapid	
<i>*Pentameris airoides</i>	False Hairgrass	Unknown	Rapid	
<i>*Tamarix aphylla</i>	Athel Pine	Not assessed	Not assessed	WoNS, declared pest
<i>*Ursinia anthemoides</i>	Ursinia	High	Rapid	
<i>*Wahlenbergia capensis</i>	Cape Bluebell	Unknown	Rapid	

3.3.3 Vegetation of Significance

The Environmental Factor Guideline for Flora and Vegetation (EPA 2016a) states that vegetation may be considered significant for a range of reasons, including:

- Where vegetation is identified as Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) (Appendix A);
- Where vegetation represents a restricted distribution;
- The degree of historical impact from threatening processes to vegetation;
- Where vegetation provides important refuge, including vegetation supporting Priority flora;
- Where vegetation supports Priority flora; and

³ Declared pest status for WA only



- Where vegetation provides an important function required to maintain ecological integrity of a significant ecosystem.

The PMST results indicated that the Commonwealth-listed Critically Endangered TEC (categorized as a Priority 3 PEC under the BC Act) “Eucalypt Woodlands of the Western Australian Wheatbelt” community occurs within the 20 km search area, but does not overlap with the Survey Area (DCCEEW 2023). The DBCA communities database search result listed two State-listed TECs as occurring within the Survey Area (**Figure 3-4, Table 3-6**). While these communities are shown to intersect the Survey Area, they represent a DBCA-applied buffer surrounding known locations of TECs, as per the database search metadata.

Table 3-6: State-listed TECs occurring within the Survey Area.

Community	Category (state)	Description	Occurrence
Assemblages of the organic mound springs of the Three Springs area	Critically endangered	The community occurs in the Three Springs area. The mound spring habitat is characterised by continuous discharge of groundwater in raised areas of peat. The peat and surrounds provide a stable, permanently moist series of microhabitats. There is a high level of heterogeneity of invertebrate fauna assemblages between occurrences, and all are associated with a rich and healthy fauna. The distinctive assemblages are composed of invertebrate groups commonly including beetles, oligochaetes, non-biting midges and bugs. The vegetation component of the community contains many moisture-loving species including an overstorey of <i>Melaleuca preissiana</i> (moonah) trees. <i>Eucalyptus camaldulensis</i> (river red gum) and <i>Eucalyptus rudis</i> (flooded gum) are also found in a number of the mound springs. The shrub layer often includes <i>Hypocalymma angustifolium</i> (white myrtle) and <i>Acacia saligna</i> (orange wattle) over <i>Machaerina vaginalis</i> (sheath twigrush) and other sedges. The herbaceous <i>Patersonia occidentalis</i> (purple flag, swamp variant) has been recorded at several occurrences.	Intersects with the northern half of the Survey Area.
Ferricrete floristic community (Rocky Springs type)	Critically endangered	The community comprises tall shrubland and has been recorded between Arrino and Eneabba, on irregularly inundated red brown sandy loams over ferricrete. It is generally dominated by <i>Acacia blakelyi</i> , <i>Allocasuarina campestris</i> and <i>Labichea lanceolata</i> subsp. <i>lanceolata</i> . Associated species include <i>Alyogyne hakeifolia</i> , <i>Borya sphaerocephala</i> , <i>Isotoma hypocrateriformis</i> (Woodbridge poison), <i>Petrophile seminuda</i> , <i>Stylidium dichotomum</i> (pins-and-needles), <i>Thysanotus patersonii</i> and <i>Pterochaeta paniculata</i> (woolly waitzia).	Intersects with a small portion of the Survey Area at the south-western extent.

None of the remaining 106 PECs listed in the DBCA Midwest region occur within 20 km of the Survey Area (DBCA 2023a).



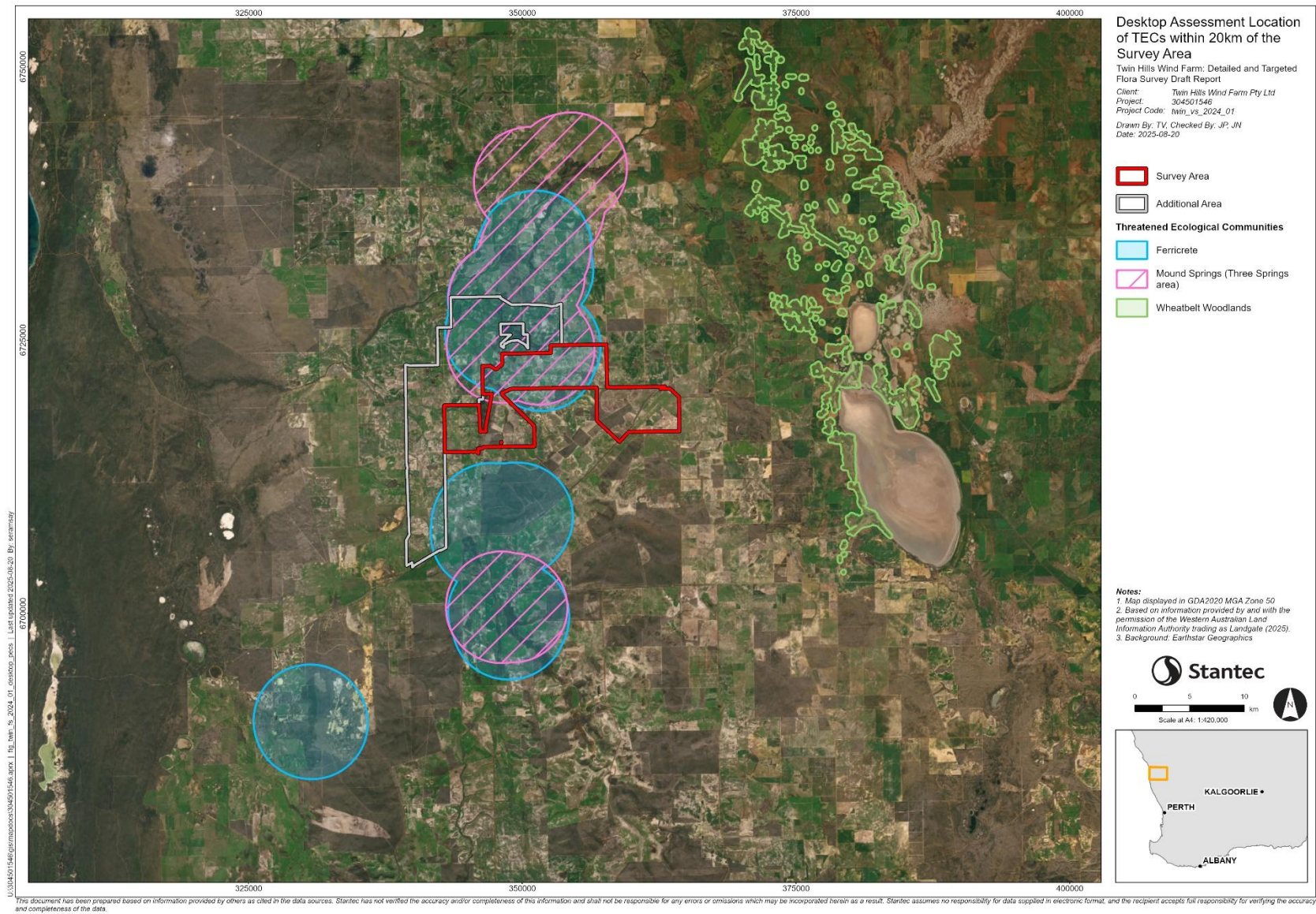


Figure 3-4: Vegetation of Significance within 20 km of the Survey Area.



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4. Survey Methods

4.1 Survey Timing and Personnel

Three surveys were conducted as part of the Survey in 2024, comprising:

- Two detailed flora and vegetation surveys; and
- One targeted flora survey.

Conrad Slee (Principal Botanist) led the planning and implementation of the Survey, with assistance from Brian Morgan (Senior Botanist), Stuart Eaton (Botanist), Jesse Newton (Environmental Scientist), Georgia Volck (Environmental Scientist) and Ruby Broadway (Botanist) (**Table 4-1**). All staff who undertook the field surveys are experienced in conducting flora and vegetation assessments. In accordance with EPA Technical Guidance (EPA 2016c), all phases of the detailed survey were led by a botanist with more than five years' Geraldton Sandplains botanical experience (**Table 4-1**).

4.2 Seasonal Conditions

The (EPA 2016c) recommends that flora and vegetation surveys be undertaken following the season of highest rainfall, to optimise the likelihood of encountering flowering and fruiting taxa, and capturing ephemeral species (a primary survey). The recommended timing for the South-West and Interzone Botanical Province, within which the Survey Area lies, is during Spring (September to November) for the primary survey. The EPA also recommends undertaking a supplementary survey during the dry season (after Autumn rain). The Preliminary survey and Targeted survey were conducted in the primary season, and the Detailed surveys were conducted during the dry season (**Table 4-1**).

To understand the influence of weather conditions and rainfall on the Survey, weather data was collated from active weather stations in the vicinity of the Survey Area. Based on availability of data and proximity to the Survey Area, rainfall data and temperature data was collected from Carnamah Station, located approximately 35 km east of the Survey Area (station no. 008025) (BoM 2025).

During the 12 months preceding the first Detailed survey in 2024, total rainfall was 159 mm, 215 mm below the long-term (1887 to 2025) average for the same time period (BoM 2025), while rainfall in the six months preceding the first Detailed survey in 2024 was 156 mm, 7 mm below the long-term (1887 to 2025) average of 163 mm for the same time period (BoM 2025).

Weather conditions during the field surveys in 2024 were wet, with 12 mm received during the first Detailed survey and 11 mm received during the second Detailed survey (BoM 2025).

Table 4-1: Survey timing and personnel.

Survey Type	Survey Period	Seasonal Condition	Person Days	Field Personnel
Preliminary survey	6 th – 9 th October 2023	Primary season with below average annual rainfall	10	Conrad Slee Owen Raynor
Detailed flora and vegetation survey	23 rd – 29 th June 2024	Supplementary season with above average annual rainfall	28	Conrad Slee Stuart Eaton Brian Morgan Jesse Newton
Detailed flora and vegetation survey	20 th – 26 th August 2024	Supplementary season with above average annual rainfall	28	Conrad Slee Stuart Eaton Brian Morgan Georgia Volck

Survey Type	Survey Period	Seasonal Condition	Person Days	Field Personnel
Targeted flora survey	29 th October – 2 nd November	Primary season with above average annual rainfall	20	Conrad Slee Stuart Eaton Brian Morgan Ruby Broadway
Total			86	

SENSITIVE



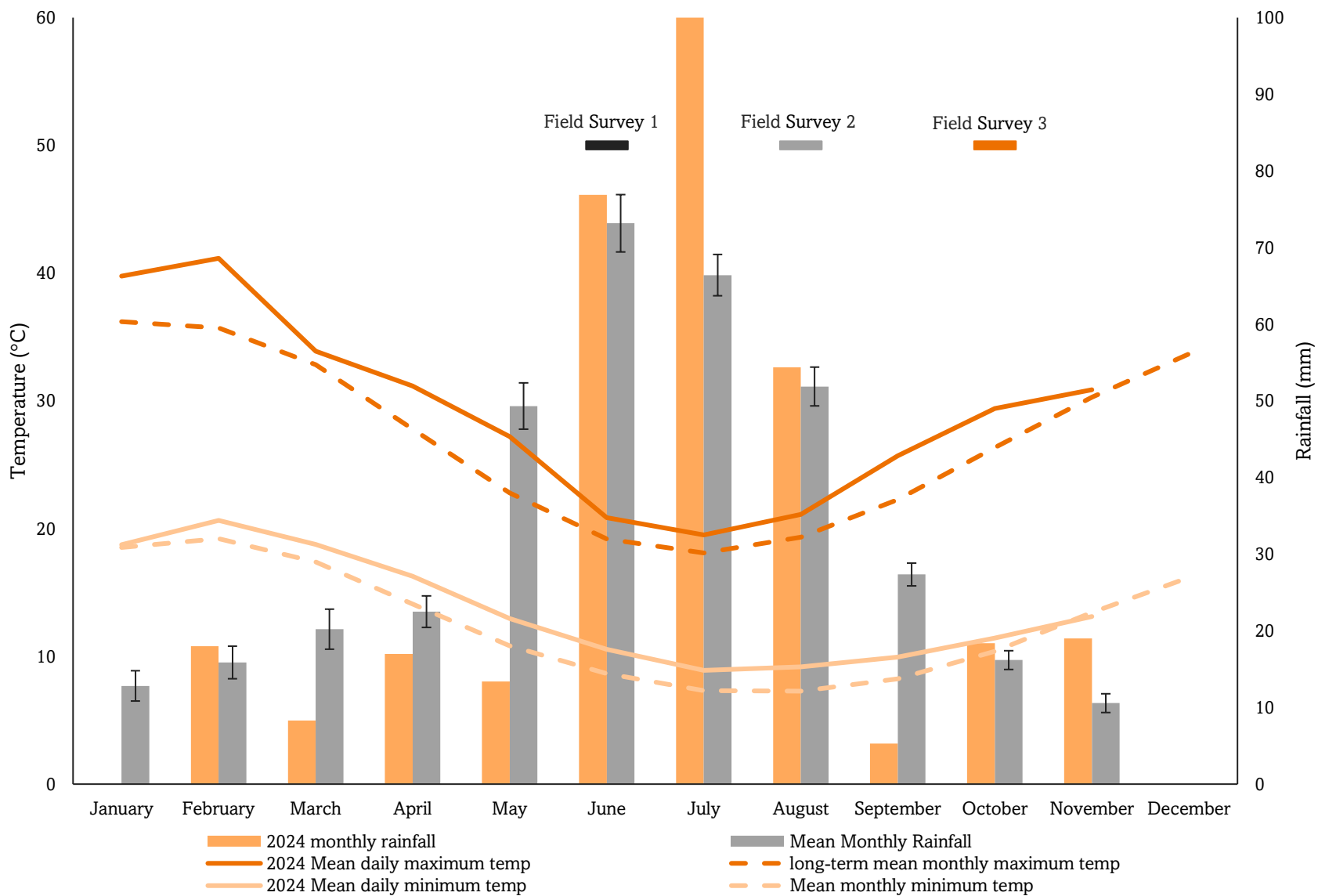


Figure 4-1: Long-term mean temperature (1940 – 2023) and rainfall (1887 – 2025) ($\pm$ Standard Error) compared to actual temperature and rainfall data recorded in 2024 from Carnamah BoM weather station (No. 008025) (BoM 2025).



4.3 Survey Design

4.3.1 Detailed Survey

Vegetation type of the Survey Area and Additional Area was undertaken by Stantec (2023) during the Preliminary Survey. In addition to this, prior to surveys, aerial photography from within, and adjacent to, the Survey Area was reviewed, as well as background information sources (Beard 1975b; Kendrick 2001b; Shepherd et al. 2002; van Vreeswyk et al. 2004).

A survey plan was developed based on the results of the desktop assessment and Preliminary survey to ensure the Survey Area was appropriately assessed in accordance with the EPA, with consideration of the requirement to sample at least three quadrats per vegetation type, where practical. Proposed sampling locations were then selected accordingly, with the presumption of changes to the final quadrat locations dependent on the assessment of the site by field staff.

Following the completion of the Survey, 12,769 ha was excluded from the Survey Area (the Additional Area). Flora and vegetation data recorded from within the Additional Area has been retained to provide valuable contextual information for the Survey Area.

4.3.1.1 Sampling Techniques

Sampling sites were established as quadrats; bounded sampling sites established by typically measuring a square of 10 m x 10 m and permanently marked with a galvanised steel fence dropper at the northwest corner and southeast corner. The attributes recorded within each quadrat were made in accordance with the requirements of EPA (2016c) and are listed in Table 4-2.

Table 4-2: Summary of data recorded from each quadrat during the Survey.

Parameter	Description
Site ID	The unique name that was assigned to the site that was sampled
Coordinates	Measured using a handheld GPS-enabled device from the northwest corner of the site, in GDA94 format
Quadrat dimensions	Specific dimensions of the quadrat in metres
Recorder and Date	The recorder(s) involved in sampling the site and date
Site photograph	At least one landscape photograph from the northwest corner facing southeast
Habitat type	A description of the landform type, slope and aspect
Geology type	A description of the outcropping geology (if present) and coarse fragments
Soil description	A description of the soil colour and types based on the guide in the Australian Soil and Land Survey Field Handbook (McDonald <i>et al.</i> 1998)
Disturbances	A list of any disturbances in the quadrat and surrounding, if present
Time since fire	An estimation of the time since the vegetation was last burnt in categories of 0-2, 2-5, 5-10, 10+ years, and no evidence.
Vascular flora species	A record of each flora species present



Parameter	Description
Height	The average height of each species in metres
Percent foliar cover (PFC)	An estimate of the PFC for each species recorded
Specimen ID	Unique identifier code assigned to any species that cannot be identified in the field
Vegetation structure	A description of the vegetation in accordance with Aplin (1979) adaptation of the vegetation classification system of Specht (1970) and the National Vegetation Information System (NVIS), Level 5 – Association (ESCAVI 2003) (Appendix E).
Vegetation condition	Assessed according to the Keighery (1994) 6-point condition scale as listed in EPA for the South West and Interzone Botanical Province (2016b) (Appendix F)

A total of 84 quadrats were established and sampled throughout the Survey Area and Additional Area over the course of the Survey (**Table 4-3**), to compile a representative flora species list and to characterise the vegetation types within the Survey Area. Of the 84 quadrats, 47 quadrats were within the Survey Area and 37 quadrats were within the Additional Area (**Table 4-3**). Within the Survey Area, 18 were installed and sampled during the June detailed flora and vegetation survey, with 29 quadrats installed during field August detailed flora and vegetation survey (**Table 4-3**).

The locations of all quadrats and survey tracklogs are presented in **Figure 4-2** and the quadrat site data in presented in **Appendix C**.

Table 4-3: Summary of quadrats sampled during the Survey.

Location	Detailed flora and vegetation survey (June)	Detailed flora and vegetation survey (August)	Targeted flora survey (Oct/Nov)	Total
Survey Area	18	29	0	47
Additional Area	27	9	1	37



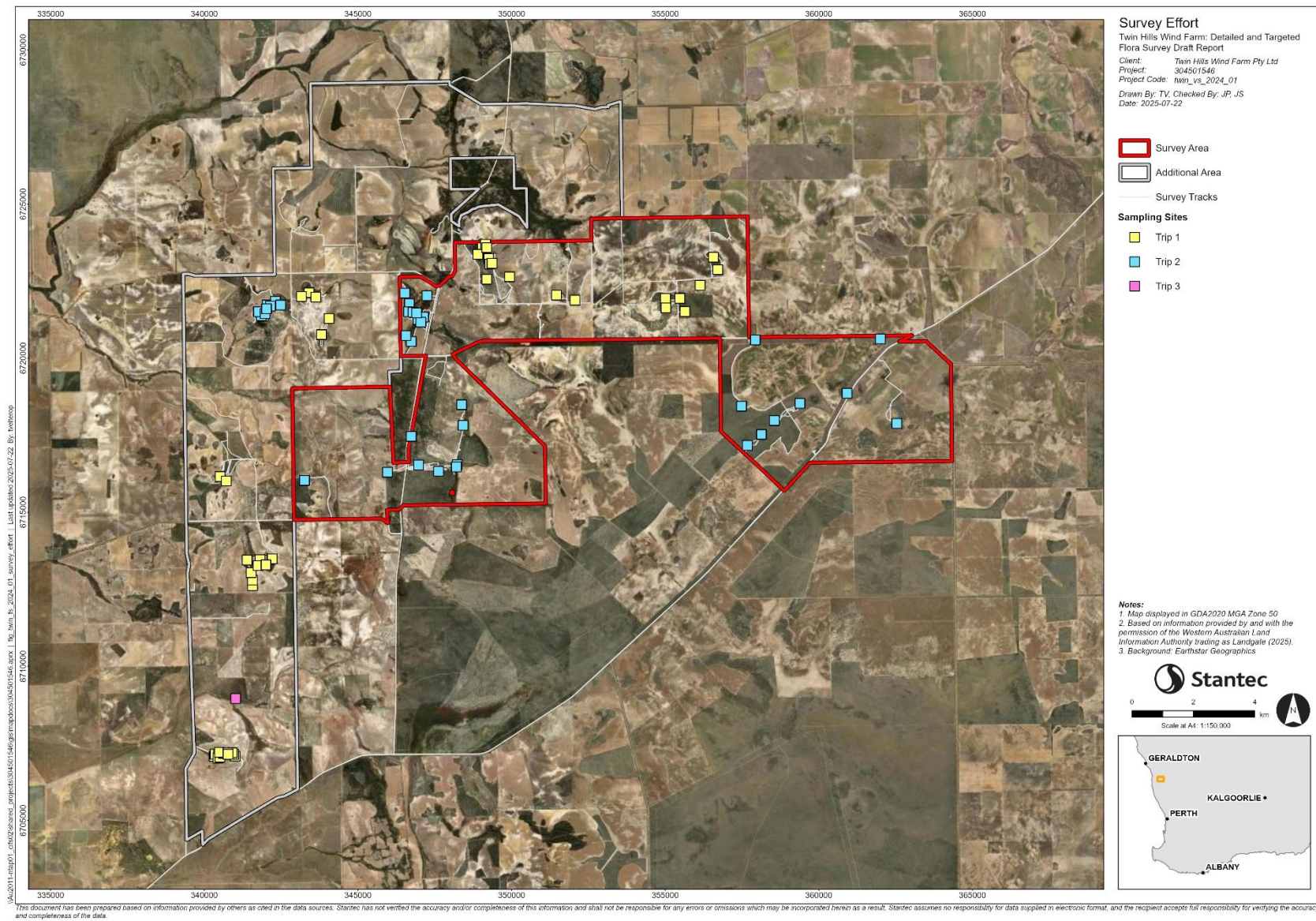


Figure 4-2: Location of quadrats sampled during the Survey



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4.3.1.1.1 Vegetation Type Mapping

Vegetation types were described and mapped using the data collected from quadrats and in-field observations. Mapping notes (brief annotations of dominant species, stratum, and other habitat attributes) were recorded in a proportion of the landforms and vegetation types while traversing the Survey Area. Vegetation types were described based on their structure and species composition, consistent with NVIS Level V – Association, whereby up to three dominant species from the upper, mid and ground strata are categorised based on dominant growth form, percent foliar cover and height (**Appendix E**). The vegetation descriptions from sample sites were compared and grouped by similarity; descriptions that were considered alike typically shared dominant species with similar cover values.

Each vegetation type was given a code representing the dominant flora species from the tallest to lowest stratum. Species names were typically abbreviated to capital letter(s) for the genus, followed by lower case letter(s) for species and sub-species, with multiple letters used where necessary to differentiate taxa with similar abbreviations.

4.3.1.1.2 Vegetation Condition

Vegetation condition was mapped according to vegetation type boundaries throughout the Survey Area, using a combination of quadrat data, opportunistic observations and the mean condition rating for each vegetation type. Vegetation condition was rated at each sample site using the Keighery (1994) scale (**Appendix F**) for the South-West and Interzone Botanical Province, as referenced in EPA (2016c), and typically applied to the whole polygon in which the site was located. A mean condition rating was calculated for each vegetation type using the data collected from survey sites and this was applied to any polygons not already assigned a rating.

4.3.1.1.3 Opportunistic Flora Records

The EPA states quadrats alone should not be relied on during a detailed survey, to obtain a comprehensive inventory of an area (EPA 2016b). Therefore, unstructured, opportunistic sampling was also undertaken throughout the Survey Area and Additional Area where possible, to supplement the suite of flora recorded within quadrats and mapping notes. During the survey, the presence of potentially significant flora or voucher quality specimens were collected opportunistically, with their coordinates and relevant mapping notes recorded against it. For records relevant to monitoring quadrats by distance and vegetation connectivity, these records were referred to the relevant quadrat.

4.3.2 Targeted Survey

A Targeted survey plan was developed based on the results of the likelihood of occurrence assessment (**Section 3.2.2, Appendix C**), which identified significant species previously recorded within the Survey Area, or that are considered 'Likely' to occur in the Survey Area. Prior to the targeted survey, the location and habitat preferences of these species were reviewed to assist in identifying vegetation types and habitat within the Survey Area that have the potential to support significant flora.

The survey timing was informed by the EPA (2016c), which indicates that the ideal timing for encountering fruiting and/or flowering material within the South-West And Interzone Botanical Province is during Spring (September to November).

Of the seven Threatened species that have either been previously recorded within the Survey Area, or that are considered 'Likely' to occur in the Survey Area, two represent orchid species: *Paracaleana dixonii* (En/T) (Likely) and *Thelymitra stellata* (En/T) (Likely). EPBC conservation advice for each of *Paracaleana dixonii* (En/t) (DCCEEW 2008a), *Thelymitra stellata* (En/T) (DCCEEW 2008c), and *Eucalyptus crispata* (Vu/T) (DCCEEW 2008b) were used in conjunction with the *Draft Survey Guidelines for Australia's Threatened Orchids* (Australia 2013) in the survey design to ensure survey adequacy. The timing of the Targeted survey in October 2024 was considered optimal for encountering both orchid species.

Targeted searches for *Paracaleana dixonii* (En/T) and *Thelymitra stellata* (En/T) were undertaken in vegetation types and habitat types identified within the Survey Area prior to the Targeted survey with potential to support these species. According to the *Draft Survey Guidelines for Australia's Threatened Orchids* (Australia 2013), the Stantec Botanists systematically traversed the identified habitat/vegetation type on foot in parallel transects five to ten metres apart.

Targeted searches were also undertaken during the detailed surveys opportunistically while traversing the Survey Area and Additional Area. For each significant flora species identified, the following information was recorded:

- Co-ordinate locations (provided as points for individual plants or polygons for large populations);
- Description of vegetation in which the species is located;



- Estimation of number of individuals (count or approximate number determined via area calculation if counting is not possible); and
- A photograph of the plant in situ (including the date the photograph was taken) wherever possible.

Threatened and Priority Flora Report Forms for significant flora will be provided to DBCA as required under the conditions of flora collecting licenses.

4.4 Specimen Identification and Nomenclature

Flora specimens that were not identified in the field were identified at the Western Australian Herbarium (WAH) by Conrad Slee (Principal Botanist) and externally contracted taxonomists according to their relevant expertise: Bethea Loudon, Udani Sirisena and Robert Davis. Photographs of potential Threatened orchid species were sent to Mr Andrew Brown (Specialist taxonomist) for confirmation

Species nomenclature was assigned according to the current listing of scientific names recognised by the WAH. Where specimens were lacking diagnostic characteristics, or were in poor condition, they were assigned the 'sp. indet' epithet, indicating that identification could not be confirmed beyond genus level. Where a question mark precedes a taxon name, this indicates a lack of confidence in assigning a particular identity, usually due to a lack of diagnostic characteristics. One voucher specimen for each population of significant flora, range extension or novel taxa were lodged with the WAH and Threatened and Priority Report Forms will be submitted to DBCA detailing each population.

4.5 Data Analysis

Following the surveys, flora and vegetation records underwent a quality control process, to ensure accuracy of individual records and clarity of the collated dataset from each field survey. Flora records were checked against WAH databases to ensure spelling, nomenclature and conservation status were current.

Data was filtered in various ways as appropriate for respective analyses, with records omitted according to rules specific to statistical analyses or at the judgement of Stantec botanists.

4.5.1 Sampling Adequacy

An analysis to assess sampling adequacy was run in the form of a species accumulation curve (SAC), providing a statistical evaluation of the taxa detected during the field surveys and indicating whether further sampling effort is likely to improve the resulting recorded species richness.

Analysis was conducted on a site-by-species matrix of quadrats from the Survey Area, comprising 47 quadrats and 415 species. The EstimateS software package (Colwell 2013) was used to assess the adequacy of the survey using species accumulation rarefaction and extrapolation curves, as well as species richness estimators: Chao 1, Chao 2, Bootstrap and Jackknife 1. Bootstrapping was not included in the analysis due to the reported underestimations of species richness in Chiarucci *et al.* (2003) and Hortal *et al.* (2006). A range in the predicted total number of species within the Survey Area was developed using EstimateS to provide a robust approach to the analysis (Hortal 2006). The 95% confidence intervals for both observed and extrapolated SACs were calculated using equations from Colwell (2013); Colwell *et al.* (2004).

4.5.2 Data Preparation

Prior to the local analysis and regional contextual analysis, the first step was a data cleaning phase to compile and reconcile all species records from all surveys to ensure consistency in the use of current nomenclature and treatment. All records were compiled in MS Excel spreadsheets and edited to standardise species name presentation. Any records that included a "?" in their name were excluded unless they comprised a possible dominant species or were likely aligned with an existing confirmed species, and these were considered on an individual basis.

Two separate datasets were created. The first was a dataset from the Survey (local) with species records and percentage foliage cover for quadrats sampled within the Survey Area and Additional Area. This was used for statistical floristic analysis and classification of local vegetation community types. The second was a regional dataset with flora species presence/absence data from the Survey, combined with data from the publicly available (Mattiske Consulting Pty Ltd 2022a) and (Mattiske Consulting Pty Ltd 2022b).



Preparation of the regional dataset was undertaken in the following steps: Firstly, the site by species matrix was subjected to data cleaning described above, including the removal null species records that were not present in any quadrat.

The second step involved combining both the local dataset and the regional datasets. This was completed using a reverse pivot table function to convert both site-by-species matrices into two separate Site and Species lists of presence/absence data. These two lists were then combined into a single pivot table and new single combined site-by-species matrix for both project areas. This combined database is referred to as the Regional Dataset.

The third step was the removal of singletons (single records of a species), doubletons (two records of a species), annual species and weeds (non-dominant) from the datasets prior to analysis to reduce skewing and to assist with assessment of floristic vegetation groups.

4.5.3 Floristic Composition

Hierarchical classification (cluster analysis) was performed on the flora records collected from the field surveys to assess the relationship between vegetation types throughout the Survey and Additional Area. Vegetation types were assigned and mapped based on an *a priori* group basis and the results of the statistical analysis are primarily to assist in confirmation of observed field groupings (Clarke and Gorley 2015). The final local dataset used for analysis was imported into Primer7 software as a final standard site-by-species matrix of floristic data (PFC data) of 84 quadrats (**Appendix E**).

The local data was square root transformed and then the Bray-Curtis index was applied to calculate similarities between quadrats and generate a resemblance matrix. A Group Average Classification analysis was applied, using the group-average linking algorithm, the results of which were presented in the form of a dendrogram. The dendrogram indicates the percentage similarity between quadrats according to vegetation community structure.

Nonmetric multidimensional scaling (nMDS) was implemented for the analysis of community structure as this technique provides a valuable tool for comparing data between sites and surveys. The results of the nMDS procedure are represented by a plot, grouping sites with similar species composition together and separating sites that are dissimilar.

4.5.4 Regional Contextual Analysis

For regional analysis, the data was simplified to presence format (1 = present, 0 = absent) and the Bray-Curtis (B-C) similarity was applied. Initial exploratory data analysis was conducted which identified that some of the total species counts per quadrat had been reduced too low after removal of singletons, doubletons and annuals to allow for a reliable analysis. Subsequently, the final dataset was revised to include annuals and common ephemeral species groups such as *Thysanotus* and orchids, which assisted in producing appropriate floristic groupings in the analysis.

Two separate classification approaches were tested. In the first approach, Group Average Classification analysis was applied, using the group-average linking algorithm, the results of which were presented in the form of a dendrogram. The second approach used Flexible Beta range from -1 to 1 to determine Cophenetic Distance and provide reliable space-conserving classification groupings that align with the observed vegetation community types observed and mapped for both areas. A cophenetic distance of 78 was used as a cutoff to create vegetation groups within the floristic classification dendrogram. The Flexible Beta approach was used to represent the best fit for the regional dataset.



5. Survey Results and Discussion

5.1 Flora

5.1.1 Floristic Composition

A total of 477 fully identified vascular flora (including species, subspecies, varieties, forms, hybrids, native and introduced species) were recorded from the Survey Area and Additional Area by Stantec over 2023 and 2024, of which 414 were recorded from the Survey Area (**Appendix H**). The 414 recorded from the Survey Area comprises 62 families and 213 genera, and typical of most botanical surveys in the Geraldton Sandplains, the most represented families were Myrtaceae (56 species), Proteaceae (55 species) and Fabaceae (44 species) (**Table 5-1**). The most represented genus was *Banksia* (22), *Drosera* (13) and *Melaleuca* (12) (**Table 5-2**).

There were 33 records from the Survey Area which could not be fully identified to species-level, and some of these represent additional families, genera or species.

A consolidated list of vascular flora (including the Preliminary survey and the Survey) has been recorded within the Survey Area is presented in **Appendix H**. Comprehensive quadrat data from the Survey is provided in **Appendix C** quadrat locations are mapped in **Figure 4-2**. A site by species matrix that incorporates all quadrats and sampled in the Survey Area and Additional Area is presented in **Appendix K**.

Table 5-1: Most diverse flora families recorded within the Survey Area

Family	No. Confirmed Taxa	No. of records
Myrtaceae	56	377
Proteaceae	55	268
Fabaceae	44	158
Asteraceae	28	258
Cyperaceae	19	153
Orchidaceae	19	99

Table 5-2: Most diverse flora genera recorded within the Survey Area

Genus	No. Confirmed Taxa	No. of records
<i>Banksia</i>	22	110
<i>Drosera</i>	13	136
<i>Melaleuca</i>	12	125



5.1.2 Species Richness

A species accumulation curve (SAC) was calculated to determine whether sampling effort from the Survey was adequate to describe the species richness of the Survey Area (excluding the Additional Area) (**Figure 5-1**). Within the SAC, the dotted lines represent thresholds where a 10% increase in sampling effort would result in less than a 5% and 2% increase in total species richness of the Survey Area. These percentages are calculated using the total extrapolated sample site number (120) determined for the Bernoulli model analysis.

Based on the 47 quadrats used in the analysis, the SAC is still approaching the asymptote of total species richness. The sample-based extrapolation of the SAC indicates additional sampling up to 97 quadrats (106%) would only increase. The SAC demonstrates that the total species richness for the survey is above the threshold where a 10% increase in sampling effort would result in less than a 5% increase in total species richness (**Figure 5-1**:) Mueller-Dombois and Ellenberg (1974) suggest that an adequate level of sampling has been achieved within a given Survey Area when a 10% increase in sampling intensity results in a 5% (or less) increase in species richness.

The four asymptotic richness estimators (Chao1, Chao2, Jackknife1, Jackknife2) are provided in (**Table 5-3**). Based on these estimators, it is expected that between 62% and 71% of the total species richness in the Survey Area was captured by systematic sampling sites (quadrats). While quadrats represent the primary method used to record species within the Survey Area, supplementary methods such as opportunistic sampling, mapping notes, weed and significant flora searches were also used to record species. A further 83 flora records representing additional species were recorded using these methods. With these species included, it is expected that between 79% and 90% of the total species richness of the Survey Area was recorded (**Table 5-3**).

Based on the SAC, sample-based extrapolation, and total species richness indicators any further systematic sampling effort would be unlikely to achieve a substantial increase in total species richness once supplementary methods are considered. As such, the survey effort is considered appropriate to adequately describe the species richness.

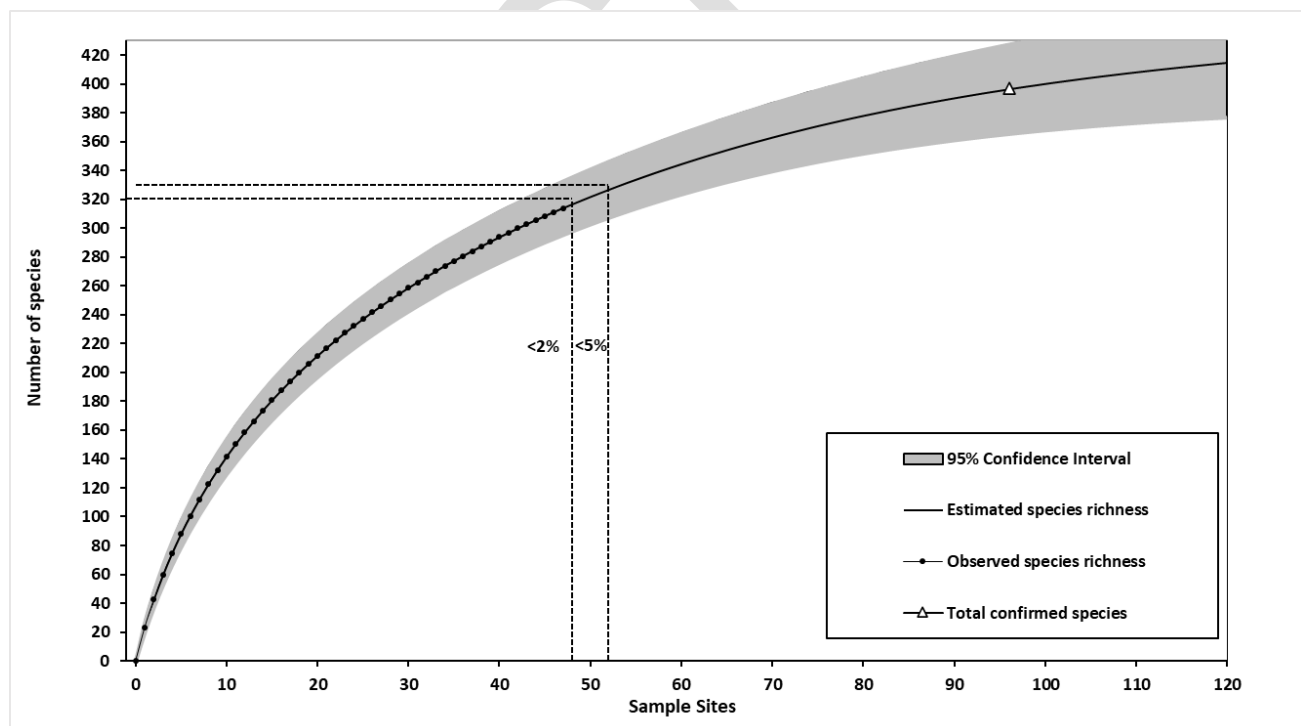


Figure 5-1: Species Accumulation Curve of all quadrats within the Survey Area.



Table 5-3: Total and extrapolated species richness. Brackets indicates the percentage of the richness estimator for the total recorded within sample sites during the survey.

Species recorded	Species recorded within sample site [^]	Chao1	Chao2	Jackknife1	Jackknife2
397	314	446.08 (70%)	443.39 (70.86%)	438.3 (71.64%)	502.76 (62.46%)

[^] following exclusions and mergers of species for the purpose of statistical analysis

5.1.3 Significant Flora

Three Threatened flora species have been recorded within the Survey Area, one of which was recorded from database searches and during the Survey (*Eucalyptus crispata* (En/T)), and two which were recorded during the Survey only (**Table 5-4, Section 3.3.1**): *Paracaleana dixonii* (En/T), *Thelymitra stellata* (En/T) and *Eucalyptus crispata* (En/T) (**Plate 5-1**).

Two *Paracaleana dixonii* (En/T) specimens were recorded within the Survey Area during the Survey, in association with vegetation type LOW_Euc.tod_shrubland, comprising Low Open Woodland of *Eucalyptus tottiana*, over shrubland and totalling 1,336.37 ha (13.37% of the Survey Area). There are 20 vouchered records of *Paracaleana dixonii* (En/T) at the WAH.

One record, representing two specimens of *Thelymitra stellata* (En/T) was recorded within the Survey Area during the Survey, in association with vegetation type LOW_Euc.tod_shrubland. There are 20 vouchered records *Thelymitra stellata* (En/T) at the WAH.

There are three records, representing single specimens of *Eucalyptus crispata* (En/T) within the Survey Area; two records from the Survey and one record from DBCA database searches. *Eucalyptus crispata* (En/T) was found in association with vegetation type LW_CH_Euc.acc.Mel.con.Mel.marg, comprising Low Woodland of *Eucalyptus accedens*, over Tall Shrubland to Closed Heath of *Melaleuca concreta* and *Melaleuca marginata*, totalling 65.81 ha (0.66% of the Survey Area). There are 34 vouchered records of *Eucalyptus crispata* (En/T) at the WAH.

There were 20 Priority flora species recorded in the Survey Area from previous surveys/database searches and the Survey; including one Priority 1, five Priority 2, nine Priority 3 and five Priority 4 flora species (**Figure 5-2, Table 5-4**).

Search effort, represented by GPS tracklogs recorded during traverses of the Survey Area, are displayed in **Figure 4-2**, with targeted search effort for *Paracaleana dixonii* (En/T) and *Thelymitra stellata* (En/T) presented in **Figure 5-4**, while targeted search effort for *Eucalyptus crispata* (En/T) is presented in **Figure 5-3**. Location details, habit descriptions, preferred habitat information and photographs of the significant flora recorded during the Survey are presented in **Appendix G**. Threatened and Priority Flora Report Forms will be compiled and submitted to the DBCA.



Plate 5-1: Representative images of Threatened Flora occurring within the Survey Area.

Eucalyptus crispata



Paracalaena dixonii



Thelymitra stellata



Table 5-4: Consolidated list of all significant flora record within the Survey Area.

Taxa	Conservation Status	Records within the Survey Area			Vouchered specimen records (DBCA 2023c)	Vegetation types within the Survey Area
		Database searches (DBCA 2023b; c; d; DCCEEW 2023)	The Survey	Total		
<i>Eucalyptus crispata</i>	Vu/T	1	2	3	34	LW_CH_Euc.acc.Mel.con.Mel.marg LOW_Euc.tod_shrubland
<i>Thelymitra stellata</i>	En/T	-	1	1	20	LOW_Euc.tod_shrubland
<i>Paracaleana dixonii</i>	En/T	-	2	2	20	LOW_Euc.tod_shrubland
<i>Chamaescilla maculata</i>	P1	-	1	1	5	LW_CH_Euc.acc.Mel.con.Mel.marg
<i>Millotia dimorpha</i>	P1	-	1	1	23	LOW_Euc.tod_shrubland_OS
<i>Verticordia luteola</i> var. <i>rosea</i>	P1	1	-	1	17	TS_Thicket_Alloc.camp.Mel.mar.Mel.rad.Pet.shu.
<i>Homalocalyx chapmanii</i>	P2	1	-	1	17	LW_CH_Euc.acc.Mel.con.Mel.marg
<i>Micromyrtus uniovulum</i>	P2	1	-	1	17	LOW_Euc.tod_shrubland
<i>Millotia jacksonii</i>	P2	1	-	1	7	LOW_Euc.tod_shrubland_OS
<i>Stylidium cornuatum</i>	P2	-	1	1	4	LW_CH_Euc.acc.Mel.con.Mel.marg
<i>Stylidium tinkeri</i>	P2	1	-	1	14	LW-LF-TS Euc.acc.Euc.cam.Aca.sal.
<i>Banksia cypholoba</i>	P3	-	10	10	45	LOW_Euc.tod_shrubland LOW_OS_Allocas.hueg.shrubs-sedges



Taxa	Conservation Status	Records within the Survey Area			Vouchered specimen records (DBCA 2023c)	Vegetation types within the Survey Area
		Database searches (DBCA 2023b; c; d; DCCEEW 2023)	The Survey	Total		
<i>Banksia fraseri</i> var. <i>crebra</i>	P3	-	15	15	16	LOW_Euc.tod_shrubland LOW_Euc.tod_shrubland_OS LW-LF_Euc.acc.Bank.fras.Mel.leu.TS_Aca.sal. TS_Thicket_Alloc.camp.Mel.mar.Mel.rad.Pet.shu.
<i>Hemiandra</i> sp. Eneabba (H. Demarz 3687)	P3	-	2	2	35	LOW_Euc.tod_shrubland
<i>Hensmania stoniella</i>	P3	-	2	2	47	LOW_Euc.tod_shrubland
<i>Hibbertia subvillosa</i>	P3	-	1	1	65	LOW_Euc.tod_shrubland
<i>Lechenaultia juncea</i>	P3	3	1	4	22	LOW_Euc.tod_shrubland LOW_Euc.tod_shrubland_OS
<i>Petrophile septemfida</i>	P3	1	2	3	18	NUOS_LS_Mel.marg.Mel.rad.Xan.drum.Georg.hex.LL TS_Thicket_Alloc.camp.Mel.mar.Mel.rad.Pet.shu.
<i>Styphelia hyalina</i>	P3	1	-	1	11	LOW_Euc.tod_paddock
<i>Verticordia luteola</i> var. <i>luteola</i>	P3	1	-	1	20	TS_Thicket_Alloc.camp.Mel.mar.Mel.rad.Pet.shu. LW-LF-TS Euc.acc.Euc.cam.Aca.sal.
<i>Banksia chamaephyton</i>	P4	-	3	3	42	LOW_Euc.tod_shrubland_OS
<i>Calytrix chrysantha</i>	P4	3	-	3	38	LOW_Euc.tod_shrubland_OS LW_CH_Euc.acc.Mel.con.Mel.marg
<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	P4	-	2	2	59	LOW_Euc.tod_shrubland



Taxa	Conservation Status	Records within the Survey Area			Vouchered specimen records (DBCA 2023c)	Vegetation types within the Survey Area
		Database searches (DBCA 2023b; c; d; DCCEEW 2023)	The Survey	Total		
<i>Hemiandra</i> sp. Watheroo (S.Hancocks 4)	P4	1	-	1		LOW_Euc.tod_shrubland_OS
<i>Lepidobolus densus</i>	P4	3	1	4	36	LOW_Euc.tod_shrubland
<i>Pityrodia viscida</i>	P4	-	1	1	28	TS_Thicket_Alloc.camp.Mel.mar.Mel.rad.Pet.shu.



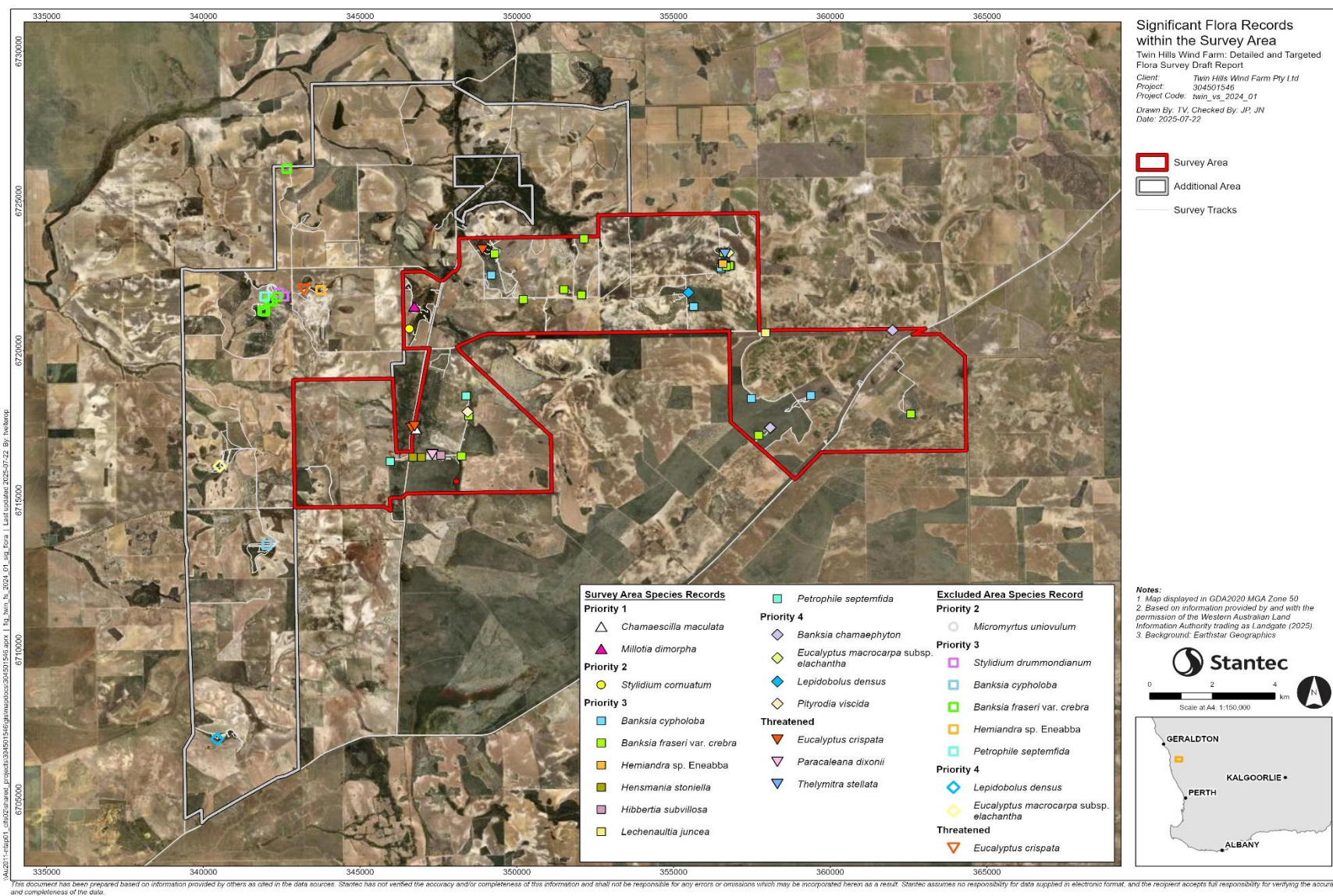


Figure 5-2: Significant flora records within the Survey Area and Additional Area.



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Figure 5-3: Locations and targeted search effort for *Eucalyptus crispata* (En/T)



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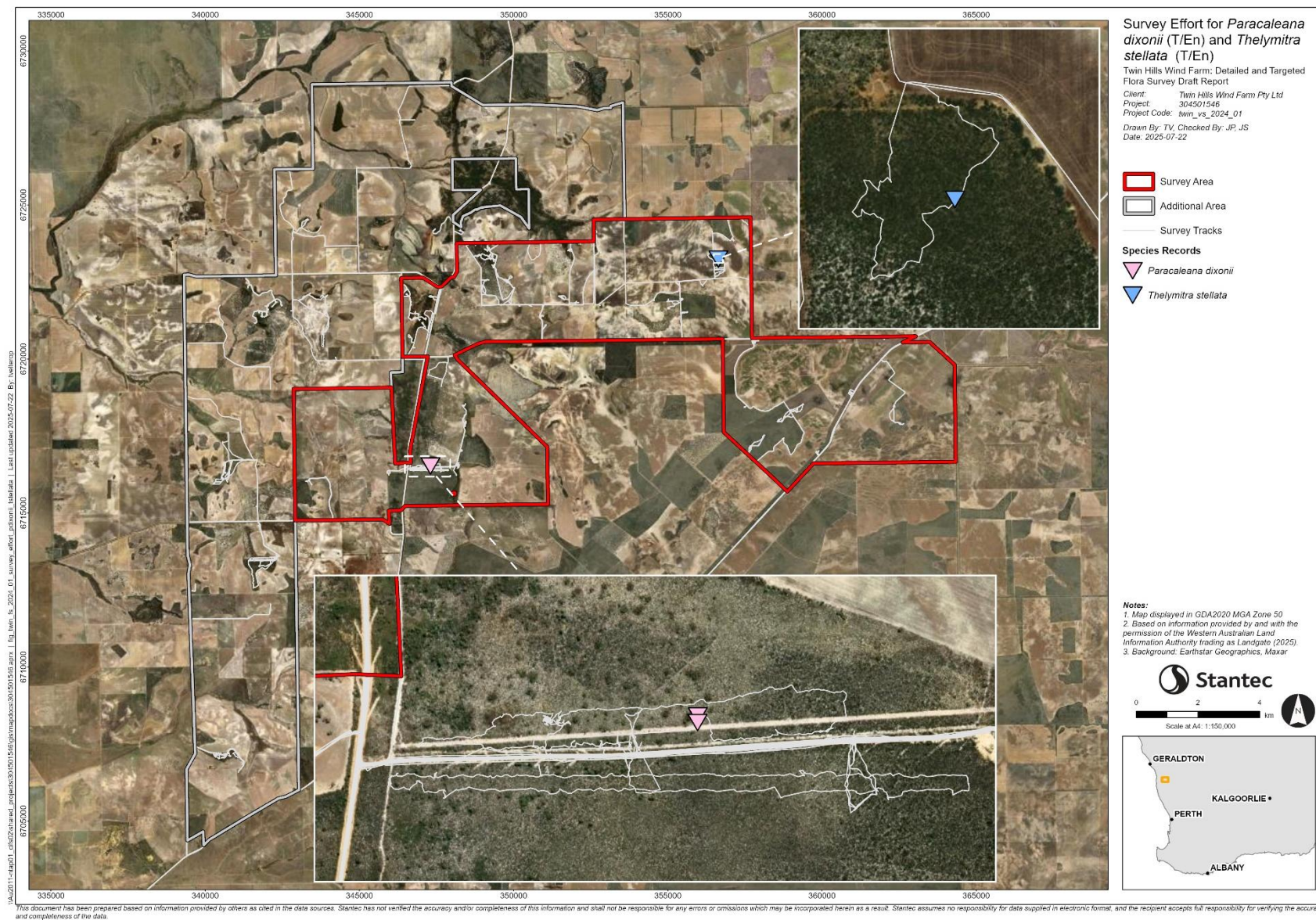


Figure 5-4: Locations and targeted search effort for *Thelymitra stellata* (En/T) and *Paracaleana dixonii* (En/T).



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5.1.4 Post-survey Likelihood of Occurrence

Following the Survey, and with a greater understanding of the landforms, soils and habitats present within the Survey Area, four significant flora were considered 'Likely' to occur, while 60 significant flora taxa were classified as 'Possible' to occur (**Appendix C**). The species assessed as 'Likely' and 'Possible' to occur comprised:

- Species with previous records within 5 km of the Survey Area;
- Species where suitable habitat occurs within the Survey Area; and
- Annual or highly ephemeral species that might not have been readily detectable.

5.1.5 Flora of Other Significance

The EPA (2016c) advises that flora species, subspecies, varieties, hybrids and ecotypes may be considered significant for reasons other than listing as a Threatened or Priority flora species, and include the following:

- a keystone role in a habitat for Threatened species, or supporting large populations representing a significant proportion of the local regional population of a species;
- relic status;
- anomalous features that indicate a potential new discovery;
- being representative of the range of a species (particularly at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- the presence of restricted subspecies, varieties, or naturally occurring hybrids;
- local endemism/a restricted distribution; and/or
- being poorly reserved.

Nine species of 'other significance' were recorded within the Survey Area, representing seven range extensions (Section 5.1.5.2) and two species that could potentially represent priority flora (**Section 5.1.5.1**).

5.1.5.1 Potential Significant Flora

Two records that were unable to be fully identified due to poor material and/or lack of diagnostic material, could potentially represent additional Priority flora:

- *Stylidium ?drummondianum*, which could potentially represent the P3 species *Stylidium drummondianum*; and
- *Melaleuca ?sclerophylla*, which could potentially represent the P3 species, *Melaleuca sclerophylla*.

While the P3 *Stylidium drummondianum* has been confirmed within the Survey Area, no records of the P3 *Melaleuca sclerophylla* have been recorded within the Survey Area.

5.1.5.2 Range Extensions

The extension of the known range of distribution for flora recorded during the surveys was subdivided into two categories within this report, according to the criteria below as stated by EPA (2016b):

- **Category A – Bioregional Extension:** the taxon has not previously been recorded in the IBRA bioregion from which the specimen was recorded;
- **Category B – Outlier:** A record is an isolated outlier of the main range of the species' distribution. I.e. if the species recorded within the Survey Area is found outside the convex hull of Extent of Occurrence (EOO).

To determine if a species is a Category B - Outlier, it is assessed whether the species is found outside its known Extent of Occupancy (EOO), signifying an extension of its known range. The EOO is the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding vagrancy (ALA 2025). This boundary is a polygon drawn around the outermost known points of the species' distribution. If a species recorded in the Survey Area is located beyond this EOO boundary, it is considered an isolated outlier.



There were seven species recorded within the Survey Area that are a range extension from their previously confirmed distribution, these taxon are summarised in **Table 5-5** and their distributions in context to the Survey Area are mapped in **Appendix M**.

Table 5-5: Flora of other significance within the Survey Area.

Taxa	Number of records	Significance	Veg Type
<i>Stylidium ?drummondianum</i>	1	Unconfirmed P3	LOW_Euc.tod_shrubland
<i>Melaleuca ?sclerophylla</i>	1	Unconfirmed P3	TS_Thicket_Alloc.camp.Mel.mar.Mel.rad.Pet.shu.
<i>Andersonia lehmanniana</i> subsp. <i>pubescens</i>	1	Range Extension – Category B - Outlier	LOW_OS_Allocas.hueg.shrubs-sedges
<i>Banksia incana</i> var. <i>incana</i>	1	Range Extension – Category B - Outlier	LOW_Euc.tod_shrubland
<i>Banksia sphaeracarpa</i> var. <i>pumilio</i>	3	Range Extension – Category B - Outlier	LOW_Euc.tod_shrubland
<i>Diplolaena velutina</i>	2	Range Extension – Category B - Outlier	LW-LF_Euc.acc.Bank.fras.Mel.leu.TS_Aca.sal.
<i>Eriochilus scaber</i> subsp. <i>scaber</i>	2 (+1 unconfirmed)	Range Extension – Category B - Outlier	TS_Thicket_Alloc.camp.Mel.mar.Mel.rad.Pet.shu.
<i>Hakea erinacea</i>	6	Range Extension – Category B - Outlier	TS_Thicket_Alloc.camp.Mel.mar.Mel.rad.Pet.shu. LOW_Euc.tod_shrubland_OS
<i>Lepidosperma fimbriatum</i>	3	Range Extension – Category A - Bioregional Extension and B Outlier	LOW_Euc.tod_shrubland LW_CH_Euc.acc.Mel.con.Mel.marg

5.1.6 Introduced Flora

A total of 36 confirmed introduced flora taxon were recorded within the Survey and Additional Area, with 22 of these occurring within the Survey Area (**Appendix J**). None of the weeds identified during the Survey represent a Declared pest in Western Australia (DPaW 2015) or Weeds of National Significance (WoNS) (Australian Weeds Committee 2024). across the Geraldton Plains bioregion.

Appendix J also lists the classification of each weed species based on their potential for ecological impact and invasiveness traits DPaW (2014a; 2016).

The diversity of introduced flora within the Survey Area is considered high; however, the suite of weeds recorded are common. The weed species with the highest number of records within the Survey Area were **Hypochaeris glabra* (Flatweed) (43 records), **Arctotheca calendula* (Capeweed) (23 records), and *Ursinia anthemoides* subsp. *anthemoides* (Ursinia) (21 records). Species descriptions, preferred habitat information and representative photographs of all recorded weeds are provided in **Appendix J**.



5.2 Vegetation

5.2.1 Vegetation Types

Vegetation mapping was undertaken for remnant patches of vegetation within the Survey Area, representing approximately 25% of the Survey Area. The remaining represents areas cleared for cropping, pastures and tracks and farming infrastructure and a portion represents land that has been revegetated (0.45%). A total of 14 vegetation types were described and mapped within the Survey Area, none of which represent a TEC or PEC. Detailed descriptions and representative photographs of each vegetation type recorded within the Survey Area are presented in **Table 5-6**. Vegetation type mapping within the Survey Area is presented in **Figure 5-5**, with detailed figures presented in **Appendix K**.

The 14 vegetation types broadly occurred in association with landforms including:

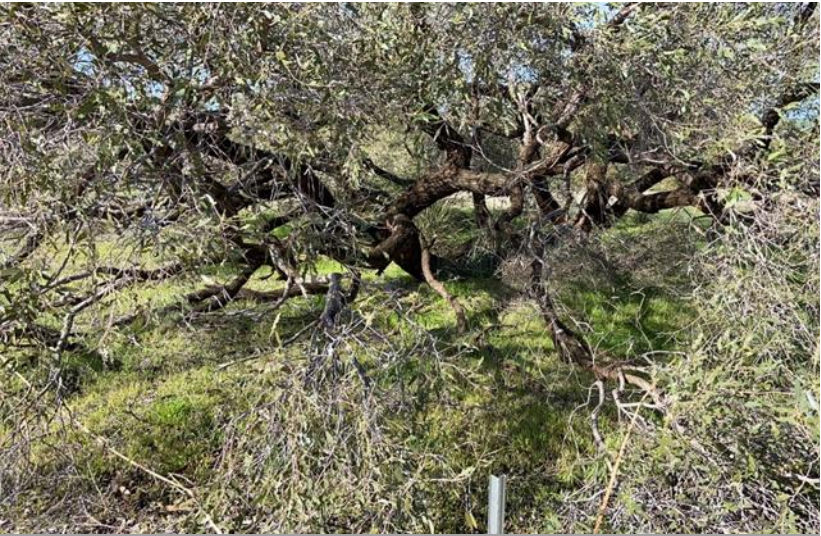
- Sandplains;
- Slopes, breakaways, gravelly areas and drainage lines;
- Hillcrest;
- Ferritic/lateritic rocky areas, flat mesa crest uplands; and
- Wetlands and damp areas.

The vegetation in the Survey Area was considered typical of the Geraldton Sandplains bioregion; comparable to previous descriptions by Beard (1975b).

Due to the exclusion of 12,769 ha from the Survey Area (The Additional Area), some of the vegetation types are represented by less than the minimum of three per vegetation type (EPA 2016c).



Table 5-6: Vegetation types described for the Survey Area.

Vegetation Code	Vegetation Description	Sample Sites	Vegetation Condition	Vegetation Conservation Significance	Survey Area		Representative Photograph
					Area (ha)	Proportion (%)	
LOW Euc.lox.	Low Open Woodland of <i>Eucalyptus loxophleba</i>	TWHQ052	Degraded	Low	8.23	0.08	
LOW_Euc.tod paddock	Low Open Woodland of <i>Eucalyptus tottiana</i> in paddocks	TWHQ064, TWHQ090	Degraded	Medium May contain: - <i>Styphelia hyalina</i> (P3)	306.40	3.07	
LOW_Euc.tod_shrubland	Low Open Woodland of <i>Eucalyptus tottiana</i> , over shrubland	TWHQ056, TWHQ058, TWHQ059, TWHQ060, TWHQ062, TWHQ063, TWHQ078, TWHQ079, TWHQ087, TWHQ097, TWHQ098, TWHQ099	Good to Excellent	High May contain: - <i>Eucalyptus crispate</i> (Vu/T) - <i>Thelymitra stellata</i> (En/T) - <i>Paracaleana dixonii</i> (En/T) - <i>Micromyrtus uniovulum</i> (P2) - <i>Banksia cypholoba</i> (P3) - <i>Banksia fraseri</i> var. <i>crebra</i> (P3) - <i>Hemiandra</i> sp. <i>Eneabba</i> (H. Demarz 3687) (P3) - <i>Hensmania stoniella</i> (P3)	1,336.37	13.37	

Vegetation Code	Vegetation Description	Sample Sites	Vegetation Condition	Vegetation Conservation Significance	Survey Area		Representative Photograph
					Area (ha)	Proportion (%)	
				- <i>Hibbertia subvillosa</i> (P3) - <i>Lechenaultia juncea</i> (P3) - <i>Stylidium drummondianum</i> (P3) - <i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i> (P4) - <i>Lepidobolus densus</i> (P4) - <i>Banksia incana</i> var. <i>incana</i> (range extension) - <i>Banksia sphaeracarpa</i> var. <i>pumilio</i> (range extension) - <i>Lepidosperma fimbiratum</i> (range extension)			
LOW_Euc.tod_shrubland_OS	Low Open Woodland of <i>Eucalyptus tottiana</i> (group) - Open Shrubland	TWHQ061, TWHQ066, TWHQ101, TWHQ103	Good to Excellent	High May contain: - <i>Millotia dimorpha</i> (P1) - <i>Millotia jacksonii</i> (P2) - <i>Banksia fraseri</i> var. <i>crebra</i> (P3) - <i>Lechenaultia juncea</i> (P3) - <i>Banksia chamaephyton</i> (P4) - <i>Calytrix chrysantha</i> (P4) - <i>Hemiandra</i> sp. Watheroo (S.Hancocks 4) (P4) - <i>Hakea erinacea</i> (range extension)	397.52	3.98	

Vegetation Code	Vegetation Description	Sample Sites	Vegetation Condition	Vegetation Conservation Significance	Survey Area		Representative Photograph
					Area (ha)	Proportion (%)	
LOW_OS_Allocas.hueg.shrubs-sedges	Low Open Woodland of <i>Allocasuarina huegelliana</i> , or mixed Open Shrubland	TWHQ071, TWHQ100	Very Good to Excellent	Medium May contain: - <i>Banksia cypholoba</i> (P3) - <i>Andersonia lehmanniana</i> subsp. <i>pubescens</i> (range extension)	37.99	0.39	
LS-OS Thryp.muc.Mel.con.Mel.vim,Alloc.camp	Low Shrubland/Open Shrubland of <i>Melaleuca concreta</i> , <i>Melaleuca viminea</i> or <i>Allocasuarina campestris</i> and/or <i>Acacia rostellifera</i>	TWHQ050, TWHQ053	Very Good	Low	13.98	0.14	
LW_CH_Euc.acc.Mel.con.Mel.marg	Low Woodland of <i>Eucalyptus accedens</i> , over Tall Shrubland to Closed Heath of <i>Melaleuca concreta</i> and <i>Melaleuca marginata</i>	TWHQ055, TWHQ068, TWHQ069, TWHQ075	Excellent	High May contain: - <i>Eucalyptus crispata</i> (VU/T) - <i>Homalocalyx chapmanii</i> (P2) - <i>Stylidium cornuatum</i> (P2) - <i>Calytrix chrysantha</i> (P4) - <i>Lepidosperma fimbriatum</i> (range extension)	65.81	0.66	

Vegetation Code	Vegetation Description	Sample Sites	Vegetation Condition	Vegetation Conservation Significance	Survey Area		Representative Photograph
					Area (ha)	Proportion (%)	
LW-LF_Euc.acc.Bank.fras.Mel.leu.TS_Aca.sal.	Low Woodland to Low Forest of <i>Eucalyptus accedens</i> or <i>Acacia saligna</i> , over Shrubland	TWHQ102, TWHQ104	Good to Very Good	Medium May contain: - <i>Banksia fraseri</i> var. <i>crebra</i> (P3) - <i>Diplolaena velutina</i> (range extension)	84.51	0.85	
LW-LF-TS Euc.acc.Euc.cam.Aca.sal.	Low Woodland, Low Forest or Tall Shrubland of <i>Eucalyptus accedens</i> or <i>Eucalyptus camaldulensis</i> or <i>Acacia saligna</i>	TWHQ045, TWHQ046, TWHQ047A, TWHQ048, TWHQ051	Very Good	Medium May contain: - <i>Stylidium tinkeri</i> (P2) - <i>Verticordia luteola</i> var. <i>luteola</i> (P3)	63.51	0.64	
Mela.vimi.Mela.conc_OS/CHG	<i>Melaleuca viminea</i> , <i>Melaleuca concreta</i> , open tall to medium shrubland, over closed mixed exotic herbland and grasses	Present in the Survey Area, only sampled in the Additional Area.		Low	81.84	0.82	Present in the Survey Area, only sampled in the Additional Area.
NUOS_LS_Mel.marg.Mel.rad.Xan.drum.Georg.hex.LL	Open Shrubland to Low Shrubland of <i>Melaleuca marginata</i> , <i>Melaleuca radula</i> and/or <i>Xanthorrhoea drummondii</i> , over <i>Georgeantha hexandra</i>	TWHQ106	Excellent	Medium May contain: - <i>Petrophile septemfida</i> (P3)	7.69	0.08	

Vegetation Code	Vegetation Description	Sample Sites	Vegetation Condition	Vegetation Conservation Significance	Survey Area		Representative Photograph
					Area (ha)	Proportion (%)	
TOS_Mel.ham.Thrypt.sp.	Tall Open Shrubland of <i>Melaleuca hamata</i> , over <i>Thryptomene</i> sp.	TWHQ049	Excellent	Low	1.56	0.02	
TOS_Mel.ssp._LS_Tecticornia	<i>Melaleuca</i> spp. shrublands in a transitional zone and <i>Melaleuca concreta</i> / <i>Melaleuca</i> spp. open tall shrubland, over <i>Tecticornia lepidosperma</i> (samphire) open low shrubland in a wet area / dampland	Present in the Survey Area, only sampled in the Additional Area.		Low	33.61	0.34	Present in the Survey Area, only sampled in the Additional Area.
TS_Thicket_Alloc.camp.Mel.mar.Mel.rad.Pet.shu.	<i>Allocasuarina campestris</i> tall to medium shrublands (laterite/ferritic rocky areas/flat mesa crests/uplands), often over <i>Hakea auriculata</i> and <i>Petrophile shuttleworthiana</i> shrubs, over mixed shrubs and grasses	TWHQ054, TWHQ065, TWHQ067, TWHQ070, TWHQ080, TWHQ081, TWHQ084, TWHQ086, TWHQ088, TWHQ089	Good to Excellent	High May contain - <i>Verticordia luteola</i> var. <i>rosea</i> (P1) - <i>Banksia fraseri</i> var. <i>crebra</i> (P3) - <i>Petrophile septemfida</i> (P3) - <i>Verticordia luteola</i> var. <i>luteola</i> (P3) - <i>Pityrodia viscida</i> (P4) - <i>Melaleuca ?sclerophylla</i> (unconfirmed P3) - <i>Eriochilus scaber</i> subsp. <i>Scaber</i> (range extension) - <i>Hakea erinacea</i> (range extension)	153.26	1.53	
Total					2,636.65	26.38	

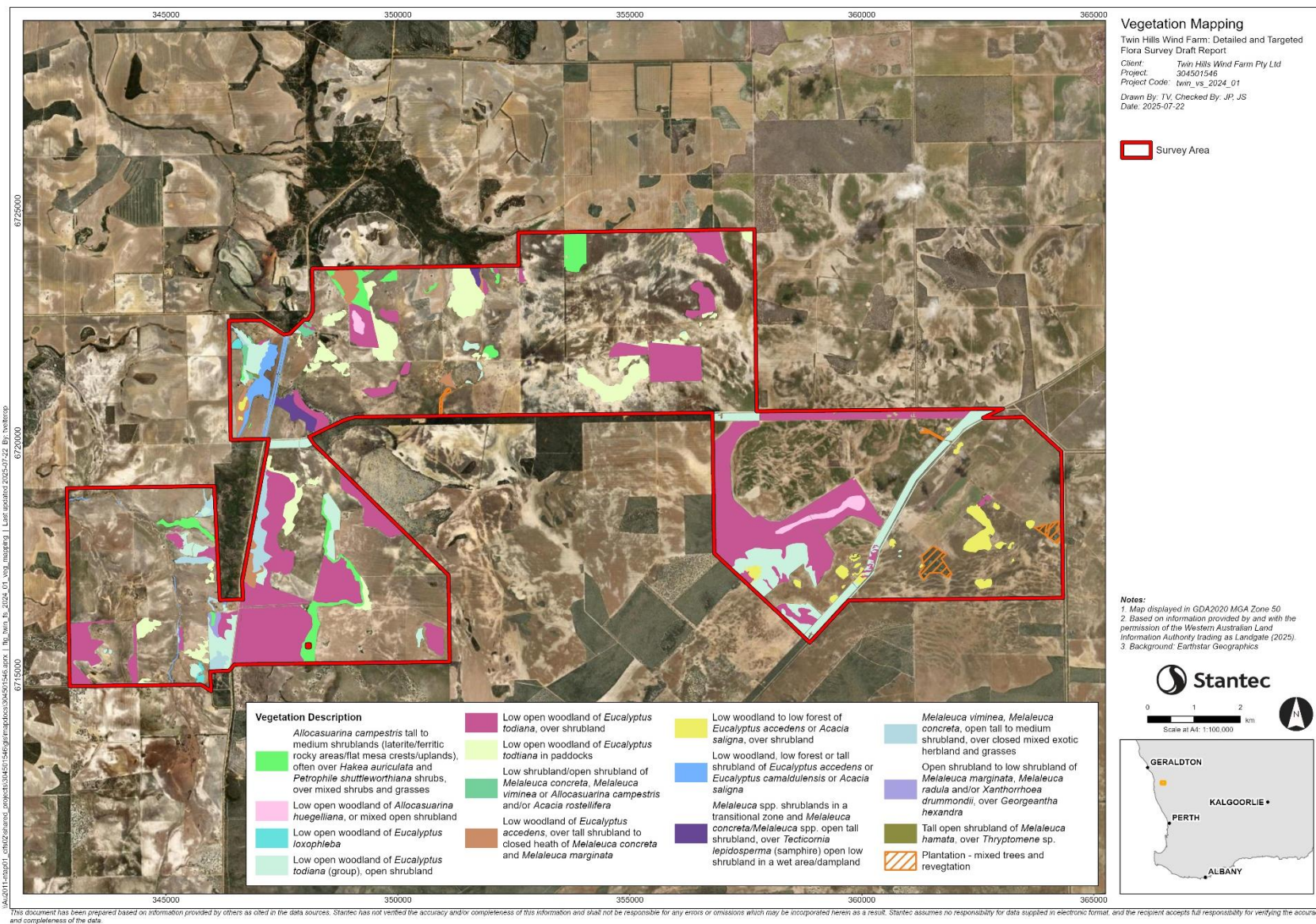


Figure 5-5: Vegetation type mapping for the Survey Area.



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5.2.2 Vegetation of Significance

None of the vegetation types described and mapped within the Survey Area are considered analogous to any State or Commonwealth listed TECs or PECs.

Vegetation supporting significant flora may be considered as core habitat if it includes a significant species as a dominant species. A dominant species within a vegetation type is defined as one of the top three species with the highest percentage of occurrence across one or more strata that constitutes the vegetation type.

5.2.3 Local Floristic Analysis

At a local scale, the dendrogram provided in Appendix N adequately supports the majority of quadrat replication that informed the vegetation types described and delineated within the Survey Area. Some quadrats groupings are interspersed, with significant overlap between *Eucalyptus tottiana* shrubland dominated quadrats.

5.2.4 Regional Contextual Analysis

The dendrogram provided in **Appendix O** presents the results of the vegetation groupings from the regional contextual analysis. Due to the limited number of publicly available surveys conducted within the region, overlap within the dendrogram is limited, however a clustering of quadrats from this Survey and the survey conducted by ENV Australia Pty Ltd (2013) is clear, attributed to the overlap in Survey Area. The separation of the quadrats completed by Mattiske Consulting Pty Ltd (2022a; 2022b) is a reflection of the spatial separation in the survey areas, occurring ~20km south of the Stantec and ENV Australia surveys.

5.2.4.1 Non-metric Multi-Dimensional Scaling Plots

A Bray Curtis Similarity matrix was produced and used to create a non-metric Dimensional Scaling (nMDS) plot (**Figure 5-6**) to assess the suitability of the survey effort against previously conducted flora and vegetation assessments in the vicinity of the Survey Area. The nMDS displays the clustering of quadrats from each study, however a significant overlap in quadrats from ENV Australia (2013) and this Survey reflect the overlap in Survey Area, opposed to the Mattiske (Mattiske Consulting Pty Ltd 2022a; b) quadrats that occurred ~20km south of the survey Area and have overlap with each other. The 3D stress output of 0.14 indicates the nMDS output is an adequate representation of the data (Clarke and Gorley 2015).



Non-metric MDS

Resemblance: S17 Bray-Curtis similarity

3D Stress: 0.14

Source

- ▲ ENV2013
- ▼ Mattiske2022a
- Mattiske2022b
- ◆ Stantec2025

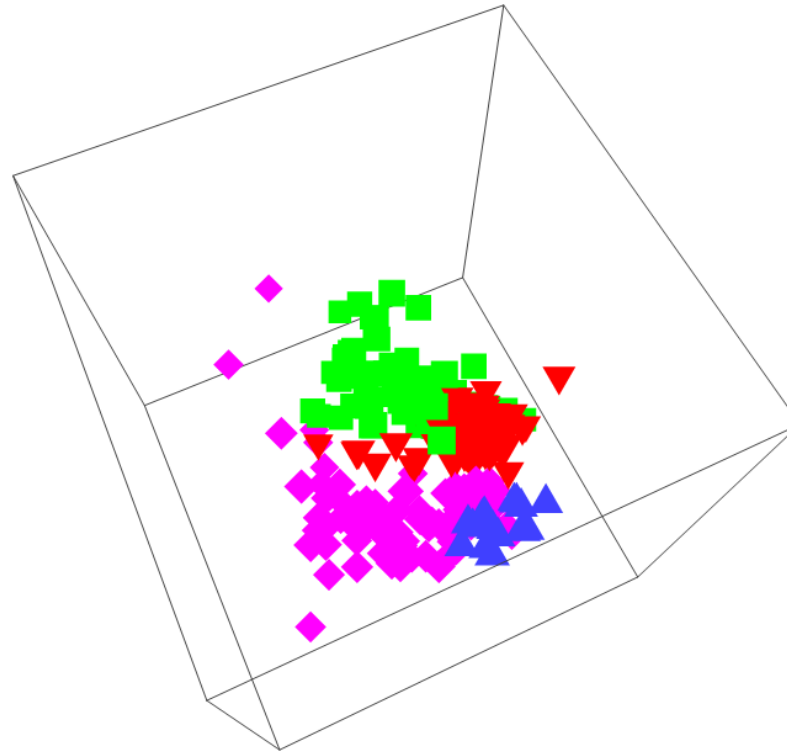


Figure 5-6: Regional contextual analysis nMDS plot



5.2.5 Vegetation Condition

Vegetation condition ranged from 'Excellent' to 'Degraded', with the majority of remnant vegetation within the Survey Area (15.31% of the total Survey Area) mapped as 'Excellent' condition (**Table 5-7**). Just over 25% of the Survey Area is comprised of remnant vegetation, with the remaining 75% of the Survey Area comprising crop or farmland. The dominant disturbances within the Survey Area included grazing, edge effects from farming practices and land clearing.

Remnant vegetation patches that had been fenced were in better condition than remnant vegetation patches that had not been fenced, as access by cattle and sheep resulted in high levels of disturbance. Heavily grazed remnant vegetation was also characterised by the presence of some dominant weed species, and these were considered to be in 'Degraded' condition.

Vegetation that had been fenced from grazing and was also large enough to be isolated from the edge effects of farming were in Very Good to Excellent condition. Vegetation on hillslopes was also representative of more intact vegetation and was in better condition.

Table 5-7: Vegetation Condition within the Survey Area.

Vegetation Condition	Extent within the Survey Area	
	Area (ha)	Proportion (%)
Excellent	1,529.83	15.30
Very Good	567.73	5.68
Good	120.57	1.21
Degraded	418.53	4.19
Total	2,636.65	26.38



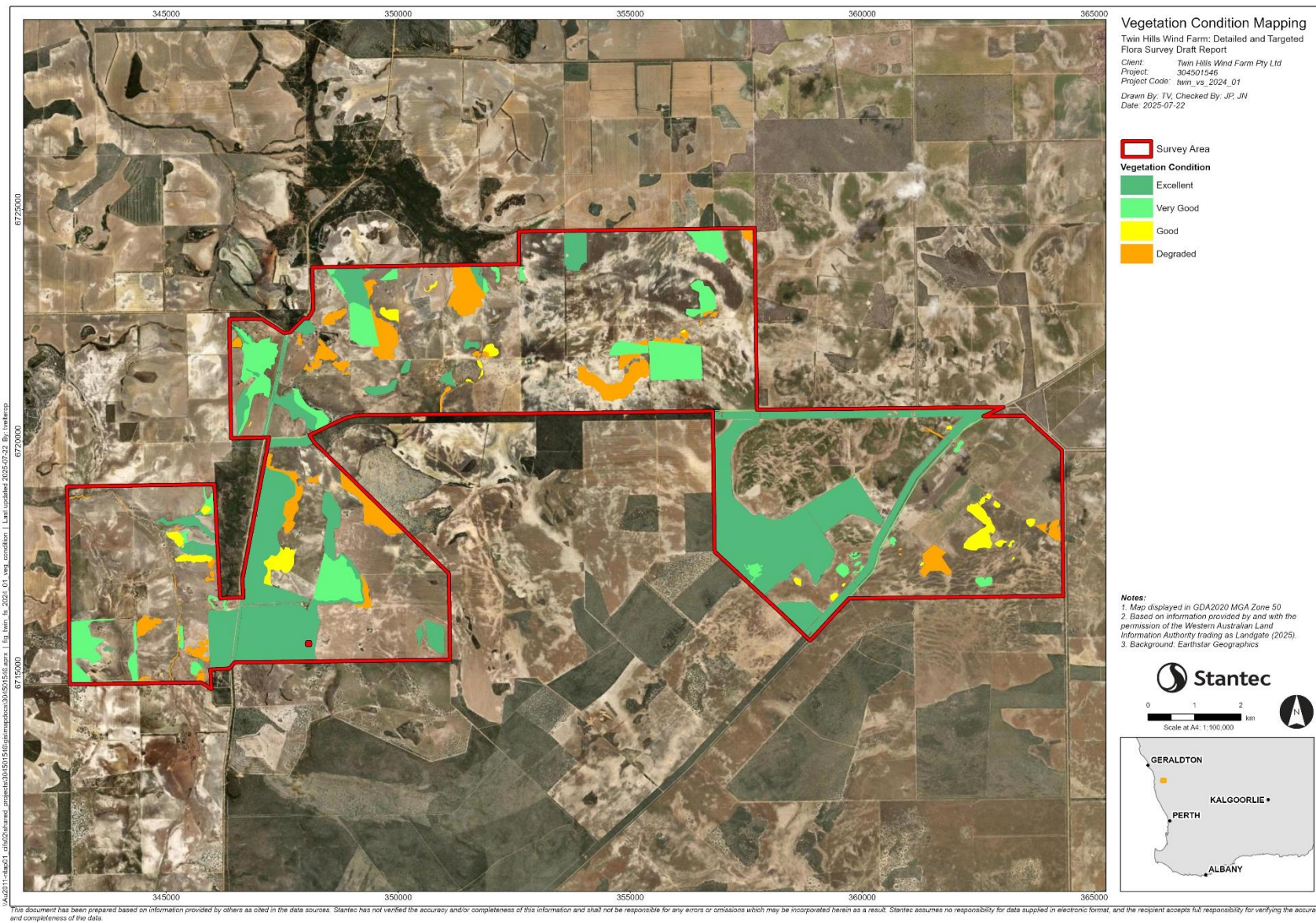


Figure 5-7: Vegetation condition mapping within the Survey Area.



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6. Limitations and Constraints

Table 6-1: Limitations and Constraints of the Assessment

Factor	Constraint	Justification
Competency and experience of consultants	No	The field teams comprised personnel with considerable experience in conducting flora and vegetation surveys in the Geraldton Sandplains bioregion. The Survey lead, Conrad Slee (Principal Botanist), has 25 years of experience and was accompanied by experienced botanist Brian Morgan (35 years' experience) and a team of experienced botanists and ecologists during the Survey.
Proportion of species identified	No	A total of 477 vascular flora taxa have been recorded within the Survey Area and it is expected that between 79% and 90% of the total species richness of the Survey Area was recorded. Most taxonomic groups expected within the Survey Area were represented and the total floristic richness was considered comparable to other surveys in the area.
Information sources (e.g. historic or recent)	Partial	A limited number of studies have been conducted in the region, with data from multiple studies not publicly accessible. Contextual information was obtained from broad-scale vegetation mapping and landform mapping, in addition to the numerous flora and vegetation surveys previously conducted within the Survey Area.
Completeness and intensity	Partial	The boundaries of the Survey Area were revised multiple times, with the final extent confirmed after the completion of the field surveys. This included the exclusion of 12,769 ha (referred to as the Additional Area) from the Survey Area, where a large portion of the survey effort had been undertaken. Quadrats sampled within the Additional Area were retained for the vegetation mapping and statistical analysis, as they still provided valuable contextual information and contributed to achieving the minimum requirement of three replicates per vegetation type.
Timing / weather / season / cycle	Partial	Surveys were timed to coincide with the recommended seasons for flora and vegetation surveys as prescribed by ((EPA 2016c)), however, rainfall leading up to the June survey was significantly below historical averages, leading to some specimens lacking essential identifiable floristic material.
Disturbances	Partial	Vegetation was interspersed by paddocks occupied by sheep, and evidence of sheep and wild rabbit grazing was evident at many sites, removing identifiable characteristics of flora and likely eradicating others. No sites showed any signs of recent fire disturbance.
Resources	No	Resources were adequate to carry out the survey and the field personnel were competent in the identification of species present. Herbarium specimens, taxonomic guides, DBCA database searches and FloraBase were all used to prepare for the survey, and during the subsequent data management. Specimen identification was conducted by experienced taxonomists.
Remoteness / access restrictions	No	Access was arranged with property owners prior to field surveys.



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Appendices

Appendix A Text Codes and Terms used to Describe Communities and Species of Significance and Categories of Introduced Flora

Flora and Vegetation: The Environmental Factor Guideline for Flora and Vegetation (EPA 2016a) states that flora and vegetation may be considered significant for a range of reasons, including, but not limited to the following:

Flora: being identified as threatened or priority species; locally endemic or associated with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems); new species or anomalous features that indicate a potential new species; representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range); unusual species, including restricted subspecies, varieties or naturally occurring hybrids; relic status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

Vegetation: being identified as threatened or priority ecological communities; restricted distribution; degree of historical impact from threatening processes; a role as a refuge; providing an important function required to maintain ecological integrity of a significant ecosystem.

Flora, vegetation and fauna defined as Threatened and Priority are legislated protection under the EPBC Act and/or the BC Act, or by being listed on the DBCA Priority Species List. This Appendix presents a summary of the different rankings and listings used to describe conservation status. Some categories, such as 'extinct', 'extinct in the wild' and 'conservation dependent' (EPBC Act) are not presented here, as the table includes only the information needed to fully understand the codes presented in the preceding report. Refer to the relevant legislation for a full description of all codes in use, as well as their associated criteria.

Categories used under the EPBC Act.

Status	Code	Description
Critically Endangered	Cr	Taxa considered to be facing an extremely high risk of extinction in the wild in the immediate future
Endangered	En	Taxa considered to be facing a very high risk of extinction in the wild in the near future
Vulnerable	Vu	Taxa considered to be facing a high risk of extinction in the wild in the medium-term future
Migratory	Mi	Species that migrate to, over and within Australia and its external territories

Conservation codes used under the BC Act.

Status	Code	Description
Critically Endangered	CR	Taxa rare or likely to become extinct, as critically endangered taxa
Endangered	EN	Taxa rare or likely to become extinct, as endangered taxa
Vulnerable	VU	Taxa rare or likely to become extinct, as vulnerable taxa
Presumed Extinct	EX	Taxa presumed to be extinct



Status	Code	Description
Migratory	IA	Birds subject to international agreements relating to the protection of migratory birds
Conservation Dependent	CD	Taxa of special conservation need, being species dependent on ongoing conservation intervention
Special Protection	OS	Taxa in need of special protection

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Priority Flora and Fauna under the BC Act.

Status	Code	Description
Priority 1: Poorly known Species	P1	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2: Poorly known Species	P2	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3: Poorly known Species	P3	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations 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 locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4: Rare, Near Threatened and other species in need of monitoring	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.

Definitions, categories and criteria for threatened and priority ecological communities.

Term	Description
Ecological community	A naturally occurring biological assemblage that occurs in a particular type of habitat. Note: The scale at which ecological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified.
Threatened ecological community (TEC)	A threatened ecological community (TEC) is one which is found to fit into one of the following categories: “presumed totally destroyed”, “critically endangered”, “endangered” or “vulnerable”. Possible threatened ecological communities that do not meet survey criteria are added to DEC’s Priority Ecological Community (PEC) Lists under Priorities 1, 2 and 3. Ecological Communities that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.



Term	Description
Assemblage	An assemblage is a defined group of biological entities.
Habitat	Habitat is defined as the areas in which an organism and/or assemblage of organisms' lives. It includes the abiotic factors (e.g. substrate and topography), and the biotic factors.
Occurrence	A discrete example of an ecological community, separated from other examples of the same community by more than 20 meters of a different ecological community, an artificial surface or a totally destroyed community. By ensuring that every discrete occurrence is recognised and recorded future changes in status can be readily monitored.
Adequately surveyed	An ecological community that has been searched for thoroughly in most likely habitats, by relevant experts.
Community structure	The spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage (e.g. <i>Eucalyptus salmonophloia</i> woodland over scattered small shrubs over dense herbs; structure in a faunal assemblage could refer to trophic structure, e.g. dominance by feeders on detritus as distinct from feeders on live plants).

Definitions and criteria for Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable Ecological Communities.

Term	Description
Presumed Totally Destroyed (PD)	An ecological community that has been 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. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B): A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or B) All occurrences recorded within the last 50 years have since been destroyed
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C): A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii): i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);



	ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated. B) Current distribution is limited, and one or more of the following apply (I, ii, iii) i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years); ii) there are few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes; iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes . C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in an area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C): A) Geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii): i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short-term future (within approximately 20 years); ii) modification throughout its range is continuing such that in the short-term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. B) Current distribution is limited, and one or more of the following apply (I, ii, iii) i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short-term future (within approximately 20 years); ii) There are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes; iii) There may be many occurrences, but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as Vulnerable when it 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 (within approximately 50 years) to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C):



A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.

B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.

C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long-term future because of existing or impending threatening processes.

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Definitions and criteria for Priority Ecological Communities.

Term	Description
Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.	
Priority 1 Poorly known ecological communities	Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of ≤ 100 ha). Occurrences are believed to be under threat either due to limited extent or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority 2 Poorly known ecological communities	Communities that are 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) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority 3 Poorly known ecological communities	i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat or habitat destruction or degradation ii) communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; iii) communities made up of large, and/or widespread occurrences, that may or 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, and inappropriate fire regimes Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them
Priority 4 Ecological communities that are 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	a) Rare. Ecological communities known from few occurrences 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 communities are usually represented on conservation lands. b) Near Threatened. Ecological communities 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) Ecological communities that have been removed from the list of threatened communities during the past five years
Priority 5 Conservation Dependent ecological communities	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years



Introduced flora: Weed species are classified at both a state and federal level. The Australian Weeds Strategy identified 32 'Weeds of National Significance' (WONS), and although non-statutory, the weeds listed have the potential to substantially impact primary industry, environmental, and/or social values.

The Western Australian Department of Primary Industries regulates introduced flora under the *Biosecurity and Agriculture Management Act 2007*. Species listed under this Act are allocated one of three declared pest categories which define the required level of management. Declared pest species under this act can be assigned to one of three control categories, while prohibited organisms can be assigned as only a C1 or C2 control category.

Category	Definition
C1 Exclusion	Organisms that should be excluded from part or all of Western Australia: Pests that are not established in Western Australia and control measures are to be taken, in order to prevent them entering and establishing in the State.
C2 Eradication	Organisms that should be eradicated from part or all of Western Australia: Pests that are present in Western Australia in low enough numbers, or limited areas that their eradication is still a possibility.
C3 Management	Organisms that should have some form of management applied that will alleviate the harmful impact of the organism: Pests that are established in Western Australia, but it is feasible or desirable to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in numbers or density or contain the spread of the pest.

Many of the commonly occurring weed species in Western Australia have been classified based on their potential for ecological impact and invasiveness traits (DPaW 2013; 2014b).

Component	Description	Scale
Ecological impact	Impact of species within the region, from low impact (causes minimal disruption to ecological processes or loss of biodiversity) to high (causes acute disruption of ecological processes, dominates and/or significantly alters vegetation structure, composition and function of ecosystems).	Low
		Medium
		High
		Unknown
Invasiveness	Rate of spread of a weed in native vegetation, encompassing factors of establishment, reproduction and long-distance dispersal (>100 m).	Slow
		Moderate
		Rapid
		Unknown



Appendix B Database Search Results

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Family	Taxon	Significance	Survey Area	Additional Area
Amaranthaceae	<i>Ptilotus manglesii</i>		X	
Anarthriaceae	<i>Anarthria polyphylla</i>		X	
	<i>Lyginia imberbis</i>		X	
Asparagaceae	<i>Chamaescilla versicolor</i>			X
Asteraceae	<i>Millotia jacksonii</i>	P2	X	X
	<i>Olearia rudis</i>			X
	<i>Podotheca gnaphalioides</i>		X	
	<i>Pterochaeta paniculata</i>		X	
Boryaceae	<i>Borya sphaerocephala</i>			X
Byblidaceae	<i>Byblis lamellata</i>			X
Campanulaceae	* <i>Monopsis debilis</i> ?var. <i>depressa</i>	Alien to Western Australia		X
	* <i>Monopsis debilis</i> var. <i>depressa</i>	Alien to Western Australia		X
	* <i>Wahlenbergia capensis</i>	Alien to Western Australia		X
Colchicaceae	<i>Wurmbea dioica</i> subsp. <i>alba</i>		X	
Cyperaceae	<i>Chaetospora curvifolia</i>		X	
	<i>Schoenus rigens</i>			X
Dilleniaceae	<i>Hibbertia crassifolia</i>		X	
	<i>Hibbertia huegelii</i>		X	
	<i>Hibbertia hypericoides</i> ?subsp. <i>hypericoides</i>		X	
	<i>Hibbertia hypericoides</i> subsp. <i>hypericoides</i>			X
	<i>Hibbertia robur</i>		X	
	<i>Hibbertia striata</i>		X	
Droseraceae	<i>Drosera barbigera</i>		X	
	<i>Drosera echinoblastus</i>			X
	<i>Drosera glanduligera</i>			X
	<i>Drosera heterophylla</i>			X
	<i>Drosera porrecta</i>			X
Ecdeiocolaceae	<i>Ecdeiocola monostachya</i>			X
Ericaceae	<i>Conostephium pendulum</i>		X	
	<i>Leucopogon simulans</i>		X	
	<i>Leucopogon tenuis</i>			X
	<i>Styphelia hyalina</i>	P3	X	
	<i>Styphelia microdonta</i>			X
	<i>Styphelia tortifolia</i>			X
	<i>Styphelia xerophylla</i>		X	
Euphorbiaceae	<i>Monotaxis bracteata</i>		X	X
Fabaceae	<i>Acacia auronitens</i>			X
	<i>Acacia dilatata</i>			X
	<i>Acacia fagonioides</i>		X	X



Family	Taxon	Significance	Survey Area	Additional Area
	<i>Acacia multispicata</i>			X
	<i>Chorizema aciculare</i> ?subsp. <i>aciculare</i>			X
	<i>Daviesia incrassata</i> subsp. <i>teres</i>		X	
	<i>Daviesia oxyclada</i>			X
	<i>Gastrolobium callistachys</i>			X
	<i>Gastrolobium polystachyum</i>			X
	<i>Jacksonia angulata</i>			X
	<i>Jacksonia restioides</i>			X
Goodeniaceae	<i>Dampiera lindleyi</i>			X
	<i>Dampiera</i> sp. Wongan Hills (R.D.Royce 6637)			X
	<i>Dampiera spicigera</i>			X
	<i>Goodenia trinervis</i>			X
	<i>Lechenaultia juncea</i>	P3	X	
	<i>Scaevola virgata</i>			X
Haemodoraceae	<i>Conostylis aculeata</i> subsp. <i>breviflora</i>		X	
	<i>Conostylis androstemma</i>			X
	<i>Conostylis aurea</i>			X
	<i>Conostylis canteriata</i>		X	X
	<i>Conostylis dielsii</i> subsp. <i>dielsii</i>		X	
	<i>Conostylis prolifera</i>		X	
	<i>Conostylis teretifolia</i> subsp. <i>teretifolia</i>		X	
	<i>Conostylis teretiuscula</i>			X
	<i>Conostylis tomentosa</i>			X
	<i>Haemodorum spicatum</i>			X
	<i>Tribonanthes australis</i>		X	
	<i>Tribonanthes violacea</i>		X	X
Haloragaceae	<i>Gonocarpus pithyoides</i>			X
Hemerocallidaceae	<i>Caesia micrantha</i>		X	
Iridaceae	<i>Patersonia occidentalis</i> ?var. <i>occidentalis</i>			X
Juncaginaceae	<i>Cycnogeton lineare</i>			X
Lamiaceae	<i>Hemiandra glabra</i>			X
	<i>Hemiandra</i> sp. Eneabba (H.Demarz 3687)	P3		X
	<i>Hemiandra</i> sp. Watheroo (S. Hancocks 4)	P4	X	
	<i>Hemigenia drummondii</i>			X
	<i>Hemiphora bartlingii</i>		X	
Malvaceae	<i>Guichenotia quasicalva</i>	P2		X
	<i>Thomasia grandiflora</i>			X
Myrtaceae	<i>Babingtonia erecta</i>		X	X
	<i>Babingtonia grandiflora</i>		X	
	<i>Beaufortia elegans</i>			X
	<i>Calothamnus accedens</i>	P4		X



Family	Taxon	Significance	Survey Area	Additional Area
	<i>Calothamnus hirsutus</i>		X	X
	<i>Calothamnus longissimus</i>		X	
	<i>Calothamnus oldfieldii</i>		X	
	<i>Calothamnus quadrifidus</i> subsp. <i>angustifolius</i>			X
	<i>Calothamnus quadrifidus</i> subsp. <i>homalophyllus</i>			X
	<i>Calytrix aurea</i>		X	X
	<i>Calytrix chrysantha</i>	P4	X	X
	<i>Calytrix cravenii</i>			X
	<i>Calytrix depressa</i>		X	X
	<i>Calytrix flavescens</i>			X
	<i>Calytrix gracilis</i>			X
	<i>Calytrix leschenaultii</i>			X
	<i>Calytrix sapphirina</i>			X
	<i>Darwinia neildiana</i>			X
	<i>Eremaea atala</i>		X	
	<i>Eremaea beaufortoides</i> ?var. <i>beaufortoides</i>		X	
	<i>Eremaea ectadioclada</i>			X
	<i>Eremaea pauciflora</i> var. <i>lonchophylla</i>			X
	<i>Eremaea violacea</i>			X
	<i>Eucalyptus albida</i>		X	
	<i>Eucalyptus arachnaea</i> subsp. <i>arachnaea</i>		X	
	<i>Eucalyptus captiosa</i>			X
	<i>Eucalyptus conveniens</i>			X
	<i>Eucalyptus crispata</i>	T	X	X
	<i>Eucalyptus diminuta</i>			X
	<i>Eucalyptus flocktoniae</i>			X
	<i>Eucalyptus gittinsii</i>			X
	<i>Eucalyptus gittinsii</i> subsp. <i>illucida</i>			X
	<i>Eucalyptus horistes</i>		X	
	<i>Eucalyptus rudis</i> ?subsp. <i>rudis</i>			X
	<i>Eucalyptus rudis</i> subsp. <i>rudis</i>			X
	<i>Eucalyptus sargentii</i>			X
	<i>Eucalyptus zopherophloia</i>	P4		X
	<i>Homalocalyx chapmanii</i>	P2	X	X
	<i>Hypocalymma xanthopetalum</i>			X
	<i>Kunzea micrantha</i> subsp. <i>petiolata</i>		X	
	<i>Kunzea recurva</i>		X	
	<i>Melaleuca acutifolia</i>			X
	<i>Melaleuca amydra</i>		X	
	<i>Melaleuca aspalathoides</i>		X	X
	<i>Melaleuca caeca</i>		X	X



Family	Taxon	Significance	Survey Area	Additional Area
	<i>Melaleuca concreta</i>		X	X
	<i>Melaleuca conothamnoides</i>			X
	<i>Melaleuca hamulosa</i>			X
	<i>Melaleuca leuropoma</i>			X
	<i>Melaleuca longistaminea</i>			X
	<i>Melaleuca raphiophylla</i>			X
	<i>Melaleuca ryeae</i>			X
	<i>Melaleuca tinkeri</i>			X
	<i>Melaleuca urceolaris</i>			X
	<i>Micromyrtus obovata</i>			X
	<i>Micromyrtus uniovulum</i>	P2	X	X
	<i>Pileanthus filifolius</i>		X	X
	<i>Scholtzia brevistylis</i> subsp. <i>brevistylis</i>	P1		X
	<i>Scholtzia involucrata</i>		X	
	<i>Thryptomene hyporhytis</i>		X	
	<i>Thryptomene mucronulata</i>		X	X
	<i>Thryptomene racemulosa</i>			X
	<i>Verticordia brachypoda</i>		X	X
	<i>Verticordia chrysanthella</i>		X	X
	<i>Verticordia densiflora</i> ?var. <i>densiflora</i>			X
	<i>Verticordia densiflora</i> var. <i>cespitosa</i>			X
	<i>Verticordia eriocephala</i>		X	
	<i>Verticordia grandis</i>			X
	<i>Verticordia laciniata</i>			X
	<i>Verticordia luteola</i> var. <i>luteola</i>	P3	X	X
	<i>Verticordia luteola</i> var. <i>rosea</i>	P1	X	
	<i>Verticordia penicillaris</i>	P4		X
	<i>Verticordia picta</i>		X	X
Olacaceae	<i>Olax benthamiana</i>			X
Orchidaceae	<i>Caladenia denticulata</i> ?subsp. <i>denticulata</i>		X	
	<i>Caladenia denticulata</i> subsp. <i>denticulata</i>		X	X
	<i>Cyanicula gemmata</i>			X
	<i>Diuris drummondii</i>	T		X
	<i>Diuris eburnea</i>	P1		X
	<i>Diuris longifolia</i>		X	
	<i>Elythranthera brunonis</i>			X
	<i>Eriochilus dilatatus</i>			X
	<i>Leporella fimbriata</i>			X
	<i>Microtis media</i> subsp. <i>media</i>			X
	<i>Microtis orbicularis</i>		X	
	<i>Pterostylis pyramidalis</i>			X



Family	Taxon	Significance	Survey Area	Additional Area
	<i>Pterostylis sargentii</i>			X
	<i>Pyrorchis nigricans</i>		X	
	<i>Thelymitra fuscolutea</i>		X	
Plantaginaceae	* <i>Plantago coronopus</i> subsp. <i>commutata</i>	Alien to Western Australia		X
Proteaceae	<i>Banksia attenuata</i>		X	X
	<i>Banksia bipinnatifida</i> subsp. <i>multifida</i>			X
	<i>Banksia candolleana</i>			X
	<i>Banksia carlinoides</i>			X
	<i>Banksia cypholoba</i>	P3		X
	<i>Banksia dallanneyi</i> subsp. <i>media</i>			X
	<i>Banksia fraseri</i> var. <i>crebra</i>	P3		X
	<i>Banksia glaucifolia</i>			X
	<i>Banksia hookeriana</i>		X	
	<i>Banksia lanata</i>			X
	<i>Banksia leptophylla</i>		X	X
	<i>Banksia leptophylla</i> ?var. <i>leptophylla</i>			X
	<i>Banksia leptophylla</i> var. <i>melletica</i>			X
	<i>Banksia menziesii</i>			X
	<i>Banksia nivea</i> subsp. <i>nivea</i>			X
	<i>Banksia prionotes</i>			X
	<i>Banksia sessilis</i> var. <i>flabellifolia</i>			X
	<i>Conospermum boreale</i> ?subsp. <i>boreale</i>			X
	<i>Conospermum glumaceum</i>			X
	<i>Conospermum incurvum</i>			X
	<i>Conospermum nervosum</i>		X	
	<i>Conospermum triplinervium</i>			X
	<i>Conospermum unilaterale</i>			X
	<i>Conospermum wycherleyi</i> subsp. <i>glabrum</i>			X
	<i>Grevillea amplexans</i> subsp. <i>amplexans</i>			X
	<i>Grevillea exposita</i>			X
	<i>Hakea anadenia</i>		X	X
	<i>Hakea baxteri</i>		X	
	<i>Hakea brownii</i>		X	
	<i>Hakea gilbertii</i>			X
	<i>Hakea incrassata</i>		X	
	<i>Hakea platysperma</i>			X
	<i>Hakea polyanthema</i>			X
	<i>Hakea prostrata</i>			X
	<i>Hakea psilorrhyncha</i>		X	
	<i>Hakea smilacifolia</i>		X	
	<i>Isopogon adenanthoides</i>		X	X



Family	Taxon	Significance	Survey Area	Additional Area
	<i>Isopogon divergens</i>			X
	<i>Isopogon panduratus</i> subsp. <i>panduratus</i>			X
	<i>Lambertia multiflora</i> var. <i>multiflora</i>			X
	<i>Petrophile brevifolia</i> ?subsp. <i>brevifolia</i>			X
	<i>Petrophile megalostegia</i>			X
	<i>Petrophile pilostyla</i> subsp. <i>austrina</i>			X
	<i>Petrophile scabriuscula</i>		X	
	<i>Petrophile septemfida</i>	P3	X	
	<i>Petrophile shuttleworthiana</i>			X
	<i>Stirlingia latifolia</i>		X	X
	<i>Synaphea oulopha</i>	P3		X
Restionaceae	<i>Chaetanthus aristatus</i>		X	X
	<i>Desmocladius lateriflorus</i>			X
	<i>Desmocladius lateriticus</i>			X
	<i>Lepidobolus densus</i>	P4	X	
Rhamnaceae	<i>Cryptandra pungens</i>			X
Rutaceae	<i>Boronia cymosa</i>		X	X
	<i>Cyanothamnus coerulescens</i>			X
	<i>Cyanothamnus coerulescens</i> ?subsp. <i>spinescens</i>			X
	<i>Cyanothamnus ramosus</i> ?subsp. <i>ramosus</i>		X	
	<i>Diplolaena eneabbensis</i>			X
	<i>Diplolaena ferruginea</i>			X
	<i>Geleznovia verrucosa</i>		X	
	<i>Philotheca pinoides</i>		X	X
	<i>Philotheca spicata</i> ?subsp. Moore River National Park (G. & D. Woodman Op 47)			X
Stylidiaceae	<i>Levenhookia leptantha</i>		X	
	<i>Stylidium calcaratum</i>		X	
	<i>Stylidium despectum</i>		X	
	<i>Stylidium dichotomum</i>			X
	<i>Stylidium drummondianum</i>	P3		X
	<i>Stylidium miniatum</i>			X
	<i>Stylidium petiolare</i>			X
	<i>Stylidium ponticulus</i>			X
	<i>Stylidium stenosepalum</i>			X
	<i>Stylidium tinkeri</i>	P2	X	X
Thymelaeaceae	<i>Pimelea sulphurea</i>			X



Appendix C Likelihood of Occurrence

SENSITIVE



Likelihood of Occurrence of Conservation Significant Threatened and Priority Flora species in the Survey Area based on surveys completed for the Project, previous surveys completed by others, and database searches/survey reports from the wider area.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
Threatened										
<i>Eucalyptus crispata</i>	VU	T	Sand, loam with lateritic gravel. Lateritic breakaways.	Low woodland	<i>Allocasuarina campestris</i> , <i>Eucalyptus arachnaea.</i> , <i>Melaleuca</i> sp.	March to June	0.00	A, B, C, D, H	Confirmed	Confirmed: Recorded from the Survey
<i>Hakea megalosperma</i>	VU	T	Grey sand, loam. Lateritic hills & rocks.	Low heath	<i>Hakea</i> spp., <i>Xanthorrhoea</i> sp., <i>Drosera</i> sp.	May to June	1.73	A, B, C, D, H	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Acacia wilsonii</i>	EN	T	White/yellow sand & lateritic gravel, sandy clay over laterite.	Open woodland	<i>Adenanthos</i> sp., <i>Banksia serratuloides</i> , <i>Hakea undulata</i> , <i>Melaleuca</i> sp., <i>Petrophile</i> sp., <i>Spirogardnera rubescens</i>	January, March, May and November to December	3.68	A, B, C, D, H	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Eucalyptus leprophloia</i>	EN	T	White or grey sand over laterite. Valley slopes.	Heath	<i>Calothamnus</i> sp., <i>Eucalyptus</i> sp., <i>Hakea trifurcata</i> , <i>Acacia alata</i> , <i>Macrozamia riedlei</i>	August to October	3.32	A, B, C, D, H	Likely	Unlikely: Although the species has been recorded within proximity to the Survey Area, suitable habitat is not present.
<i>Paracaleana dixonii</i>	EN	T	Grey sand over granite.	Low shrubland	<i>Melaleuca aspalathoides</i>	October to December or January	4.48	A, B	Likely	Confirmed: Recorded from the Survey
<i>Thelymitra stellata</i>	EN	T	Sand, gravel, lateritic loam.	Woodland	<i>Banksia armata</i> , <i>Xanthorrhoea</i> sp.	October to November	3.79	A, B, C, D, H	Likely	Confirmed: Recorded from the Survey
<i>Styphelia longissima</i>	CR	T	Slopes, sand plains.	Heath	<i>Banksia</i> spp., <i>Xylomelum angustifolium</i> , <i>Darwinia pauciflora</i> , <i>Styphelia xerophylla</i>	March, June to July and September	3.25	A, B, C,	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.
<i>Drakaea concolor</i>	VU	T	Sand.	Open sedgeland, closed heath	<i>Ecdeiocolea</i> sp., <i>Leporella fimbriata</i> , <i>Synaphea</i> sp.	August to September	12.0	A, C, D	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.
<i>Eleocharis keigheryi</i>	VU	T	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	Sedgeland	<i>Chorizandra enodis</i> , <i>Stylidium asymmetricum</i> , <i>Myriocephalus occidentalis</i> ,	August to November	17.00	A, B, C, D, H	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, suitable habitat is not present and none of the associated species occur.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>Amphibromus nervosus</i> , <i>Gratiola pubescens</i> .					
<i>Eucalyptus johnsoniana</i>	VU	T	White/grey sand with lateritic gravel. Sandplains, lateritic breakaways.	Low heath	<i>Banksia</i> spp., <i>Adenanthos</i> sp., <i>Xanthorrhoea</i> sp.	July or August to December or January to May	8.06	A, B, C, D, H	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this mallee, which forms dense clumps up to 1-3.5 m tall, would have gone undetected during the Survey.
<i>Eucalyptus suberea</i>	VU	T	Grey sand. Near or on lateritic breakaways.	Heath	<i>Eucalyptus</i> spp., <i>Banksia</i> spp., <i>Adenanthos</i> sp., <i>Petrophile</i> sp.	November to December or January	18.80	A, B, C, D, H	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this mallee, which grows 1-4 m tall, would have gone undetected during the Survey.
<i>Hensmania chapmanii</i>	VU	T	Yellow-grey or lateritic sand.	Open woodland	<i>Grevillea</i> sp.	December or January	10.28	A, B, C, D	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Conostylis micrantha</i>	EN	T	White/grey sand. Sandplains	Low heath	<i>Allocasuarina humilis</i> , <i>Hakea trifurcate</i> , <i>Hibbertia hypericoides</i> , <i>Banksia fraseri</i> .	July to August	50.4	H	Possible	Unlikely:
<i>Daviesia speciosa</i>	EN	T	Gravelly lateritic soils. Undulating plains, rises.	Heath	<i>Gastrolobium spinosum</i> , <i>Geleznovia</i> sp., <i>Calothamnus longissimus</i> , <i>Gastrolobium</i> sp., <i>Melaleuca</i> sp., <i>Banksia carlinoides</i> <i>Allocasuarina</i> sp., <i>Hibbertia</i> sp.	April to May	11.67	A, B, C, D	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Eremophila glabra</i> subsp. <i>chlorella</i>	EN	T	Sandy clay. Winter-wet depressions.	Open shrubland, open heathland	<i>Patersonia occidentalis</i> , <i>Grevillea thelemanniana</i> subsp. <i>thelemanniana</i> <i>Acacia</i> sp., <i>Hibbertia</i> sp., <i>Grevillea</i> sp.	July to November	16.61	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Eucalyptus pruiniramis</i>	EN	T	Skeletal soils over sandstone or laterite. Rocky hillslopes.	Low open woodland	<i>Waitzia</i> sp., <i>Hakea</i> sp., <i>Eucalyptus</i> sp.	December	16.77	A, B, C, D	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this mallee or tree, which grows to 2.5-7 m would have gone undetected during the Survey.
<i>Eucalyptus rhodantha</i> var. <i>rhodantha</i>	EN	T	Grey/yellow/red sand over laterite. Undulating country, hillslopes.	Low woodland	<i>Allocasuarina campestris</i> , <i>Hakea invaginata</i> ,	July or September to December or January	8.36	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this mallee, which grows 1.5-4 m tall, would have gone undetected during the Survey.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>Eucalyptus tottiana</i>					
<i>Grevillea christineae</i>	EN	T	Clay loam, sandy clay, often moist. Drainage lines and outcropping granite.	Tall shrubland, low open woodland	<i>Eucalyptus</i> spp., <i>Acacia acuminata</i> , <i>Allocasuarina campestris</i> , <i>Melaleuca radula</i> , <i>Drosera</i> spp., <i>Tribonanthes</i> spp.	July to September	78.18	H	Possible	Unlikely:
<i>Hemiandra gardneri</i>	EN	T	Deep yellow to yellow-white sand. Sandplains and hills.	Low woodland, open heath with mallee scrub nearby	<i>Banksia</i> spp., <i>Xylomelum angustifolium</i> , <i>Actinostrobilus pyramidalis</i> , <i>Jacksonia eremodendron</i> , <i>Conospermum stoechadis</i> , <i>Verticordia</i> spp.	September and October	31.80	H	Possible	Unlikely:
<i>Styphelia marginata</i>	EN	T	Undulating plains, sandy plains, upper hillslopes. Sand, gravel, laterite.	Closed heath	<i>Allocasuarina campestris</i> , <i>Acacia guinetii</i> , <i>Banksia fraseri</i> var. <i>ashbyi</i> , <i>Hibbertia</i> sp.	May to July and September	12.56	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Styphelia obtecta</i>	EN	T	Grey-white or pale yellow sand. Sandy plains, slopes, dunes.	Open woodland, low open heath	<i>Melaleuca leuropoma</i> , <i>Petrophile macrostachya</i> , <i>Andersonia heterophylla</i> , <i>Jacksonia floribunda</i> , <i>Xylomelum angustifolium</i> , <i>Xanthorrhoea preissii</i>	January, August and October to November	9.06	A, B, H	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Verticordia albida</i>	EN	T	Grey-yellow sand. Road verges.	Heath	<i>Banksia prionotes</i> , <i>Acacia</i> spp., <i>Hakea</i> spp., <i>Verticordia grandis</i> , <i>Calothamnus</i> sp., <i>Glischrocaryon</i> sp.	November to December or January	8.01	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Daviesia bursarioides</i>	CR	T	Gravelly lateritic soils. Slopes.	Heath	<i>Allocasuarina campestris</i> , <i>Acacia</i> spp., <i>Eucalyptus</i> sp., <i>Hakea</i> sp.,	August	13.01	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.



Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>Grevillea</i> sp., <i>Olearia</i> sp.					
<i>Eremophila subangustifolia</i>	CR	T	Sandstone gullies, lakes. Sand, clay.	Open shrubland	<i>Allocasuarina</i> sp., <i>Enchylaena</i> sp., <i>Melaleuca</i> sp.	March, September and December	19.19	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Eucalyptus impensa</i>	CR	T	Yellow sand. Lateritic hills.	Low heath	<i>Banksia</i> spp., <i>Xanthorrhoea drummondii</i> , <i>Hibbertia hypericoides</i> , <i>Gastrolobium polystachyum</i> , <i>Hakea incrassata</i>	June to July	13.51	A	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this mallee, which grows 1.5 m tall, would have gone undetected during the Survey.
<i>Eucalyptus ×impensa</i>	CR	T	Yellow sand, lateritic hills.	Low heath	<i>Banksia</i> spp., <i>Xanthorrhoea drummondii</i> , <i>Hibbertia hypericoides</i> , <i>Gastrolobium polystachyum</i> , <i>Hakea incrassata</i>	June to July	13.51	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this mallee, which grows 1.5 m tall, would have gone undetected during the Survey.
<i>Grevillea althoferorum</i> subsp. <i>althoferorum</i>	CR	T	Crests and rises. Sand, gravel and loam.	Low heath	<i>Banksia</i> sp., <i>Verticordia grandis</i> , <i>Stirlingia</i> sp., <i>Hakea prostrata</i> , <i>Jacksonia floribunda</i> , <i>Lambertia multiflora</i> , <i>Actinostrobos</i> sp., <i>Hibbertia</i> sp., <i>Grevillea</i> sp.	September and November	14.28	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Grevillea curviloba</i>	CR	T	Grey sand, sandy loam. Winter-wet heath.	Tall open shrubland	<i>Corynotheca micrantha</i> , <i>Burchardia congesta</i> , <i>Jacksonia furcellata</i> , <i>Stirlingia latifolia</i> , <i>Avena</i> sp., <i>Briza</i> spp., <i>Lolium</i> sp., <i>Cenchrus clandestinus</i> , <i>Zantedeschia aethiopica</i> .	August to October	8.28	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Grevillea phanerophlebia</i>	CR	T	Sand.	Shrubland	<i>Acacia</i> spp., <i>Allocasuarina</i>	September	13.87	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					sp., <i>Grevillea</i> sp.					that this noticeable perennial would have gone undetected during the Survey.
<i>Gyrostemon reticulatus</i>	CR	T	Plains, flats, road verges. Brown or yellow sand.	Open shrubland	<i>Dampiera wellsi</i> ana, <i>Calothamnus</i> sp., <i>Melaleuca</i> sp., <i>Actinotus humilis</i>	September to October	17.47	A, B, C, D	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Tetratheca nephelioides</i>	CR	T	White-grey sand, yellow-brown clayey sand, gravel, laterite. Outcrops, undulating hills, ridges.	Heath	<i>Allocasuarina humilis</i> , <i>Calothamnus</i> sp., <i>Eremaea</i> sp., <i>Eucalyptus</i> sp., <i>Hakea incrassata</i> , <i>Lambertia multiflora</i> , <i>Xanthorrhoea</i> sp.	September	18.30	A, B, C, D,	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Acacia recurvata</i>		T	Sandy clay, granitic clay-loam. Creeklines, plains, breakaways, low hills.	Heath	<i>Acacia flabellifolia</i> , <i>Eucalyptus wandoo</i> , <i>Hakea</i> sp., <i>Melaleuca</i> spp., <i>Gastrolobium callistachys</i> , <i>Acacia flabellifolia</i> , <i>Olearia axillaris</i> .	July	8.57	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
Priority 1										
<i>Diuris eburnea</i>		P1	Information not available.	Information not available	Information not available.	Information not available	0.00	A, B, C	Likely	Possible: Despite searches in suitable habitat, it is possible that species would have gone undetected during surveys.
<i>Scholtzia brevistylis</i> subsp. <i>brevistylis</i>		P1	Hillslope, loamy soil.	Shrubland	<i>Grevillea</i> spp., <i>Allocasuarina</i> spp., <i>Calothamnus</i> spp., <i>Glischrocaryon aureum</i> , <i>Melaleuca</i> spp.	May	0.00	A	Likely	Possible: Despite searches in suitable habitat, it is possible that species would have gone undetected during surveys.
<i>Verticordia luteola</i> var. <i>rosea</i>		P1	White sand. Flats.	Low heath, closed shrubland	<i>Acacia</i> spp., <i>Nuytsia floribunda</i> , <i>Banksia</i> spp., <i>Verticordia</i> spp.	December or January	0.00	A, B, C,	Confirmed	Confirmed: Previously recorded in Survey Area
<i>Caladenia denticulata</i> subsp. <i>albicans</i>		P1	Clay riverbank, limestone, sand.	Low woodland	<i>Eucalyptus erythrocorys</i> , <i>Banksia</i> spp., <i>Adenanthos cygnorum</i> , <i>Jacksonia</i> sp., <i>Acacia</i> spp.	August to September	0.23	A, B, C	Likely	Likely: Despite searches in suitable habitat, it is possible that this inconspicuous herb would have gone undetected during surveys.



Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
<i>Acacia congesta</i> subsp. <i>cliftoniana</i>		P1	Rocky or lateritic loam.	Low open shrubland	<i>Dodonaea</i> sp., <i>Eucalyptus</i> spp., <i>Grevillea</i> sp., <i>Melaleuca</i> sp.	August to September	16.12	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Beyeria apiculata</i>		P1	Flat to undulating plains, rocky hillslope.	Low open woodland	<i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i> , <i>Eucalyptus wandoo</i> subsp. <i>pulverea</i> , <i>Acacia</i> spp., <i>Rhagodia drummondii</i> , <i>Ehrharta longiflora</i>	September	19.25	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Drosera pedicellaris</i>		P1	Deep beige sand.	Open woodland, heath	<i>Eucalyptus todtiana</i> , <i>Banksia</i> spp., <i>Jacksonia</i> spp., <i>Conospermum</i> spp., <i>Verticordia</i> spp., <i>Calytrix</i> spp.	October to November	11.69	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.
<i>Grevillea amplexans</i> subsp. <i>adpressa</i>		P1	Yellow sand, loam. Dunes, road verges.	Open woodland	<i>Eucalyptus todtiana</i> , <i>Eremaea microphylla</i> , <i>Adenanthos stictus</i> , <i>Banksia leptophylla</i> subsp. <i>leptophylla</i>	August to October	6.74	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Korthalsella arthroclada</i>		P1	Sandy clay around lake edges. On <i>Melaleuca lanceolata</i> .	Woodland	<i>Melaleuca lanceolata</i> , <i>Casuarina obesa</i>	December	16.85	A, B, C	Unlikely	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Lasiopetalum ogilvieanum</i>		P1	Undulating plains, lateritic rises.	Open woodland	<i>Eucalyptus todtiana</i> , <i>Melaleuca</i> spp., <i>Pimelea</i> spp., <i>Dampiera</i> spp., <i>Lobelia spinosa</i>	July to October	9.92	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Micromyrtus rogeri</i>		P1	Yellow-brown sandy soils, gravel, laterite. Breakaways.	Low heath	<i>Melaleuca</i> spp., <i>Hakea invaginata</i> , <i>Grevillea biformis</i> subsp. <i>cymbiformis</i> , <i>Gastrolobium plicatum</i> , <i>Petrophile chrysantha</i>	July to October	14.42	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.



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<i>Poranthera asybosca</i>		P1	Sandy soil.	Woodland	<i>Banksia</i> spp.	October	10.76	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.
<i>Stylidium carnosum</i> subsp. Narrow leaves (J.A. Wege 490)		P1	Hillslope, gravel.	Heath	<i>Banksia kippistiana</i> var. <i>paenepeccata</i> , <i>Melaleuca</i> spp., <i>Hakea</i> spp., <i>Stylidium</i> spp., <i>Lasiopetalum</i> spp., <i>Petrophile</i> spp.	September to October	8.86	A, B	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.
<i>Thomasia ×formosa</i>		P1	Laterite.	Open shrubland	<i>Acacia</i> spp., <i>Hibbertia</i> spp., <i>Lysiosepalum rugosum</i>	September to October	8.22	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Verticordia dasystylis</i> subsp. <i>oestopoia</i>		P1	Gritty soils over granite outcrops.	Low shrubland	<i>Allocasuarina campestris</i> , <i>Melaleuca</i> spp., <i>Borya</i> spp., <i>Grevillea dielsii</i> , <i>Leptospermum</i> spp., <i>Darwinia purpurea</i> , <i>Styphelia serratifolia</i>	October	1.96	A, B, C,	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.
Priority 2										
<i>Guichenotia quasicalva</i>		P2	Sandy clay over laterite. Drainage line.	Tall shrubland	<i>Melaleuca raphiophylla</i> , <i>Actinostrobos pyramidalis</i> , <i>Baumea juncea</i> , <i>Labichea lanceolata</i> , <i>Melaleuca</i> spp., <i>Acacia saligna</i> , <i>Dampiera lavandulacea</i> , <i>Hibbertia subvaginata</i> , <i>Banksia leptophylla</i> , <i>Banksia strictifolia</i> , <i>Banksia</i> sp., <i>Hypocalymma</i> sp., <i>Labichea</i> sp., <i>Scholtzia</i> sp.	September to October	0.00	A, B, C	Likely	Possible: Despite searches in suitable habitat, it is possible that species would have gone undetected during surveys.
<i>Homalocalyx chapmanii</i>		P2	Yellow or grey/brown sand. Undulating plains, weathered granite.	Open heath	<i>Acacia</i> spp., <i>Allocasuarina campestris</i> , <i>Avena fatua</i> ,	September to October	0.00	A, B, C	Confirmed	Confirmed: Previously recorded in Survey Area

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					<i>Raphanus raphanistrum</i> , <i>Waitzia acuminata</i>					
<i>Micromyrtus uniovulum</i>		P2	Lateritic rises.	Heath, open shrubland	<i>Allocasuarina campestris</i> , <i>Isopogon divergens</i> , <i>Melaleuca aspalathoides</i> , <i>Hakea</i> spp., <i>Petrophile</i> sp., <i>Restionaceae</i> spp.	September to October	0.00	A, B, C	Confirmed	Confirmed: Previously recorded in the Survey Area
<i>Millotia jacksonii</i>		P2	Shallow sandy soils. In depressions on sandstone.	Tall closed shrubland	<i>Melaleuca</i> spp., <i>Verticordia</i> spp., <i>Scholtzia</i> sp., <i>Homalocalyx aureus</i>	September	0.00	A, B, C	Confirmed	Confirmed: Previously recorded in Survey Area
<i>Stylidium tinkeri</i>		P2	Grey sandy soil. Seasonal wetlands.	Wetland, tall shrubland	<i>Acacia</i> sp., <i>Kunzea</i> sp., <i>Melaleuca</i> sp., <i>Stylidium</i> spp.	October	0.00	A, B, C,	Confirmed	Confirmed: Previously recorded in Survey Area
<i>Caladenia longicauda</i> subsp. <i>minima</i>		P2	Ironstone outcrops, creeklines.	Woodland, low heath	<i>Eucalyptus</i> spp., <i>Casuarina</i> spp., <i>Acacia</i> spp	August	0.31	A, B, C	Likely	Unlikely: Although the species has been recorded within proximity to the Survey Area, suitable habitat is not present.
<i>Calothamnus arcuatus</i>		P2	Breakaways, creek banks. Sandy loam soil.	Open shrubland	<i>Acacia</i> sp., <i>Allocasuarina</i> sp., <i>Borya</i> sp., <i>Melaleuca</i> spp., <i>Grevillea</i> spp., <i>Verticordia</i> spp	April, June, August and October	0.03	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.
<i>Daviesia debilior</i> subsp. <i>debilior</i>		P2	Sand over lateritic gravel.	Low open heath	<i>Information not available.</i>	May to July	4.33	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Schoenus</i> sp. Eneabba (F. Obbens & C. Godden I154)		P2	Grey, yellow or white sand. Undulating sandplains, mid slopes, tops of rises.	Heath	<i>Eucalyptus todtiana</i> , <i>Xylomelum angustifolium</i> , <i>Banksia</i> spp., <i>Verticordia grandis</i> , <i>Calothamnus blepharospermus</i> , <i>Ecdeiocolea monostachya</i> , <i>Eremaea beaufortioides</i> , <i>Scholtzia laxiflora</i>	November to December	5.89	A, B, F	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.

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<i>Stylidium cornuatum</i>		P2	Hillslope, clay loam.	Low shrubland	<i>Myrtaceae</i> spp., <i>Proteaceae</i> spp., <i>Allocasuarina</i> spp., <i>Stylidium</i> spp.	September	0.33	A, B, C	Likely	Confirmed: Recorded from the Survey
<i>Stylidium</i> sp. Three Springs (J.A. Wege & C. Wilkins JAW 600)		P2	Quartzite outcropping, upper slopes, orange/brown soil.	Open woodland, low shrubland	<i>Hakea</i> spp., <i>Melaleuca</i> spp., <i>Ericomyrtus tenuior</i> , <i>Verticordia nobilis</i> , <i>Mirbelia trichocalyx</i> , <i>Lepidosperma tenue</i> , <i>Styphelia serratifolia</i> , <i>Dampiera oligophylla</i> , <i>Borya sphaerocephala</i> .	July and September	5.29	A, B	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Styphelia pallens</i>		P2	Breakaways. Dry loamy sand.	Low heath	<i>Banksia splendida</i> , <i>Daviesia daphnoides</i> , <i>Calytrix</i> spp., <i>Verticordia</i> spp., <i>Hakea incrassata</i> , <i>Tetratheca confertifolia</i>	October to December	1.50	A, B	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Synaphea sparsiflora</i>		P2	Sandy loam over laterite.	Low heath	<i>Allocasuarina humilis</i> , <i>Banksia carlinoides</i> , <i>Calothamnus sanguineus</i> , <i>Cassytha racemosa</i> , <i>Caustis dioica</i> , <i>Gastrolobium polystachyum</i> , <i>Hakea</i> spp., <i>Hibbertia</i> spp., <i>Hypocalymma xanthopetalum</i> , <i>Melaleuca trichophylla</i> , <i>Patersonia occidentalis</i> var. <i>occidentalis</i> , <i>Petrophile brevifolia</i> , <i>Stylidium repens</i> ,	August to September	2.65	A, B, C,	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.

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					<i>Synaphea interioris</i>					
<i>Synaphea xela</i>		P2	Red-brown gravelly sand, white-pink, grey-brown clayey sand and loam, over laterite. Undulating sites.	Low heath	<i>Leucopogon inflexus</i> , <i>Pileanthus filifolius</i> , <i>Scholtzia laxiflora</i> , <i>Mesomelaena pseudostygia</i> , <i>Schoenus clandestinus</i> , <i>Stylidium flagellum</i> , <i>Grevillea</i> sp., <i>Melaleuca</i> sp., <i>Hakea</i> sp., <i>Dampiera</i> sp., <i>Daviesia</i> sp., <i>Boronia</i> sp.	August and October	3.08	A, B, C,	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the associated species that it usually occurs with are present in the Survey Area. The potential remains for it to occur.
<i>Acacia chapmanii</i> subsp. <i>chapmanii</i>		P2	Yellow/brown sand, laterite, clay loam. Plains, depressions, saline flats.	Low woodland, heath	<i>Banksia</i> spp., <i>Grevillea</i> spp., <i>Verticordia</i> spp.	August to September	13.53	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i> Cockleshell Gully variant (E.A. Griffin 2039)		P2	Grey-yellow sand with laterite. Low open heath.	Low open heath	<i>Eucalyptus todtiana</i> , <i>Banksia attenuata</i> , <i>Banksia</i> spp., <i>Calothamnus sanguineus</i>	August	16.86	A, B	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Acacia vittata</i>		P2	Grey sand, sandy clay. Margins of seasonal lakes.	Open shrubland	<i>Allocasuarina</i> spp., <i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i> , <i>Melaleuca</i> spp., <i>Verticordia</i> spp., <i>Austrodanthonia</i> sp., <i>Austrostipa</i> sp.	August	18.63	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Babingtonia peteriana</i>		P2	Creek banks, undulating hills. Brown sandy clay.	Low shrubland	<i>Eucalyptus accedens</i> , <i>Melaleuca sclerophylla</i> , <i>Baeckea</i> sp., <i>Calothamnus</i> sp.,	August and October to December	8.83	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>Chamaescilla corymbosa</i> , <i>Enchylaena tomentosa</i> , <i>Rhagodia drummondii</i> , <i>Waitzia acuminata</i>					
<i>Beyeria similis</i>		P2	Yellow or red clayey sand. Sandplains.	Low open heath	Information not available.	August to September	13.36	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Calectasia browneana</i>		P2	White-grey sand, laterite. Adjacent to wet areas of creekline.	Low heath	<i>Allocasuarina campestris</i> , <i>Eucalyptus todtiana</i> , <i>Acacia spathulifolia</i> , <i>Banksia</i> spp., <i>Calothamnus</i> sp., <i>Grevillea</i> sp., <i>Melaleuca</i> sp. <i>Restionaceae</i> spp., <i>Isopogon</i> spp.	June to August	10.57	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Calectasia palustris</i>		P2	White or grey sand. Seasonally inundated swamplands.	Low open heath	<i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i> , <i>Banksia telmatiaea</i> , <i>Melaleuca seriata</i> , <i>Hakea obliqua</i> subsp. <i>parviflora</i> , <i>Regelia ciliata</i> , <i>Verticordia densiflora</i> , <i>Hemiandra</i> spp., <i>Conostylis</i> spp	July to October	10.81	A	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Calytrix purpurea</i>		P2	White, grey or yellow sand, often over laterite. Sandplains, sand dunes.	Low heath	<i>Verticordia chrysantha</i> , <i>Myrtaceae</i> sp.	September to October or December	16.86	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Chordifex reseminans</i>		P2	Dry sand.	Low heath	<i>Xanthorrhoea preissii</i> , <i>Verticordia</i> spp., <i>Hakea</i> sp., <i>Melaleuca clavifolia</i> , <i>Verticordia densiflora</i> , <i>Stirlingia</i>	March to May	10.39	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.

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					<i>latifolia</i> , <i>Mesomelaena pseudostygia</i>					
<i>Comesperma griffinii</i>		P2	Yellow or grey sand. Plains.	Heath, woodland	<i>Allocasuarina campestris</i> , <i>Melaleuca leuropoma</i> , <i>Verticordia</i> spp., <i>Daviesia physodes</i> , <i>Hibbertia hypericoides</i> , <i>Lepidosperma</i> sp., <i>Gastrolobium capitatum</i> , <i>Haemodorum laxum</i> , <i>Levenhookia stipitata</i> , <i>Neurachne alopecuroidea</i> , <i>Hydrocotyle callicarpa</i>	October	18.31	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Cristonia biloba</i> subsp. <i>pubescens</i>		P2	Hillside, white sand. Ridges.	Low shrubland	<i>Casuarina</i> sp., <i>Acacia lullfitziorum</i> , <i>Banksia grossa</i> , <i>Conospermum nervosum</i> , <i>Hakea conchifolia</i> , <i>Hibbertia</i> sp.	June to July	13.36	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Darwinia</i> sp. Strawberry (M.G. Corrick 8279)		P2	Breakaways, grey sand.	Open shrubland	<i>Drosera</i> sp., <i>Eucalyptus</i> sp., <i>Hibbertia</i> sp., <i>Hakea</i> sp., <i>Conostylis</i> sp., <i>Eremaea</i> sp., <i>Verticordia</i> sp., <i>Darwinia</i> sp., <i>Calytrix</i> sp.	September	11.87	A, B	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Eucalyptus abdita</i>		P2	Laterite, sandy clay with gravel over laterite. Slopes, breakaways.	Woodland	<i>Eucalyptus</i> spp.	February, July and September	8.36	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this mallee or shrub, which grows up to 2-3 m tall, would have gone undetected during the Survey.
<i>Hemigenia diadela</i>		P2	Lateritic hillslopes.	Open woodland	<i>Eucalyptus accedens</i> , <i>Allocasuarina campestris</i> , <i>Proteaceae</i> spp., <i>Lysiosepalum rugosum</i> ,	October	16.17	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.



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					<i>Acacia lanceolata</i> , <i>Gastrolobium polystachyum</i> , <i>Banksia</i> spp.					
<i>Hemigenia pimeleifolia</i>		P2	Sandstone shale, road verges. Rocky brown loam, sand.	Open shrubland	<i>Melaleuca</i> spp., <i>Verticordia</i> spp., <i>Calytrix depressa</i> , <i>Leucopogon cordata</i> , <i>Styphelia</i> sp., <i>Calytrix</i> spp., <i>Cryptandra</i> sp., <i>Ericaceae</i> sp.	August, October	10.60	A	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Lyginia excelsa</i>		P2	Sand.	Low open woodland	<i>Eucalyptus todtiana</i> , <i>Banksia</i> spp., <i>Adenanthos</i> spp., <i>Nuytsia floribunda</i> , <i>Lyginia barbata</i> , <i>Stirlingia latifolia</i> , <i>Hibbertia</i> spp., <i>Conospermum</i> sp., <i>Dasypogon obliquifolius</i> , <i>Restionaceae</i> spp.	March to November	11.01	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Ptilotus clivicola</i>		P2	Sandy slopes, laterite.	Low shrubland	<i>Melaleuca trichophylla</i> , <i>Banksia armata</i> , <i>Xanthorrhoea drummondii</i> , <i>Allocasuarina microstachya</i> , <i>Caustis dioica</i> , <i>Daviesia epiphyllum</i>	January	16.16	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Scaevola eneabba</i>		P2	Low plains, hillslopes. Sand.	Low heathland	<i>Callitris pyramidalis</i> , <i>Gahnia trifida</i> , <i>Chordifex sinuosus</i> , <i>Mesomelaena pseudostygia</i> , <i>Eremaea pauciflora</i> , <i>Verticordia densiflora</i> , <i>Conospermum stoechadis</i> , <i>Calytrix</i> spp.,	February	8.05	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.



Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>Leucopogon</i> spp., <i>Melaleuca</i> spp., <i>Jacksonia</i> spp., <i>Goodenia</i> spp., <i>Lechenaultia</i> spp., <i>Daviesia</i> spp.					
<i>Schoenus badius</i>		P2	Grey sand. Moist areas.	Open heath, closed shrubland	<i>Banksia telmatiaea</i> , <i>Melaleuca viminea</i> subsp. <i>viminea</i> , <i>Isolepis marginata</i> , <i>Chordifex sinuosus</i> , <i>Schoenus clandestinus</i> , <i>Trachymene pilosa</i> , <i>Melaleuca concreta</i> , <i>Hyalosperma cotula</i> , <i>Isotoma hypocrateriformis</i>	September to October	14.53	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Scholtzia calcicola</i>		P2	Undulating sandy plains.	Low open woodland	<i>Banksia</i> spp., <i>Hibbertia hypericoides</i> , <i>Acacia scirpifolia</i> , <i>Gompholobium tomentosum</i> , <i>Scaevola canescens</i>	June to July and November	17.99	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Stylidium pseudocaespitosum</i>		P2	White, grey or yellow sand over laterite. Breakaways and hillslopes.	Low shrubland	<i>Banksia</i> spp., <i>Allocasuarina humilis</i> , <i>Eremaea beaufortioides</i> var. <i>beaufortioides</i> , <i>Hibbertia hypericoides</i> , <i>Banksia fraseri</i> var. <i>fraseri</i> , <i>Dampiera lindleyi</i>	September to November	10.62	A, B, C,	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Styphelia carolineae</i>		P2	Undulating sandplains. Sandy clay.	Tall shrubland	<i>Hakea</i> spp., <i>Banksia candolleana</i> , <i>Conostylis androstemma</i> , <i>Daviesia angulata</i> ,	May to July	17.36	A, B	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.



Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>Allocasuarina humilis</i> , <i>Banksia armata</i>					
<i>Thelymitra pulcherrima</i>		P2	Gravel.	Heath	<i>Banksia telmatiaea</i> , <i>Regelia ciliata</i> , <i>Melaleuca seriata</i> , <i>Petrophile seminuda</i> , <i>Hakea obliqua</i>	July to September	11.34	A, B, C,	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Thryptomene spicata</i>		P2	Lateritic sandy gravel.	Open shrubland	<i>Acacia blakelyi</i> , <i>Banksia sphaerocarpa</i> , <i>Conostylis neocymosa</i> , <i>Gompholobium tomentosum</i>	September, November and February	13.80	A, B, C,	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Tricoryne</i> sp. Wongan Hills (B.H. Smith 794)		P2	Yellow to grey sand, gravelly clay quartz, laterite, limestone. Midslopes and uplands.	Heath, open shrubland	<i>Verticordia</i> spp., <i>Pileanthus filifolia</i> , <i>Xanthorrhoea</i> sp., <i>Adenanthos</i> sp., <i>Leptospermum</i> sp., <i>Banksia carlinoides</i>	September to November	7.01	A, B	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Verticordia argentea</i>		P2	White, grey or yellow sand. Sand ridges, undulating plains.	Heath	<i>Verticordia aurea</i> , <i>Xylomelum angustifolium</i> , <i>Eremaea beaufortioides</i>	November to December or January to April	10.26	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Walteranthus erectus</i>		P2	Sand over limestone. Coastal limestone ridges.	Information not available.	Information not available.	February	8.05	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
Priority 3										
<i>Banksia fraseri</i> var. <i>crebra</i>		P3	Hilltops, lateritic soil.	Low heath	<i>Calothamnus longissimus</i> , <i>Allocasuarina humilis</i> , <i>Allocasuarina campestris</i> , <i>Hibbertia hypericoides</i> , <i>Melaleuca radula</i> , <i>Ecdeiocolea monostachya</i> , <i>Petrophile macrostachya</i> , <i>Mesomelaena pseudostygia</i>	June to August	0.00	A, B, C, G	Likely	Confirmed: Recorded from Survey

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<i>Petrophile septemfida</i>		P3	Upper hillslope, lateritic plains. Grey sand.	Tall shrubland	<i>Hakea</i> spp., <i>Banksia</i> , <i>Nuytsia floribunda</i> , <i>Eucalyptus todtiana</i>	June to September	0.00	A, B, C	Confirmed	Confirmed: Recorded from the Survey
<i>Stylidium drummondianum</i>		P3	Sand or clayey sand over laterite. Upper hillslopes, breakaways.	Low heath	<i>Nuytsia floribunda</i> , <i>Eucalyptus</i> spp., <i>Hemiandra rubriflora</i> , <i>Scaevola phlebopetala</i> , <i>Hibbertia subvaginata</i>	August to October	0.00	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Styphelia hyalina</i>		P3	Lateritic breakaways, hilltop.	Heath	<i>Gastrolobium plicatum</i> , <i>Dampiera lindleyana</i> , <i>Dodonaea ericoides</i>	November to December	0.00	A, B	Confirmed	Confirmed: Previously recorded in Survey Area
<i>Synaphea oulopha</i>		P3	Grey sand, gravelly loam, clay. Lateritic breakaways & rises.	Low heath	<i>Eucalyptus todtiana</i> , <i>Casuarina</i> sp., <i>Hakea trifurcata</i> , <i>Hibbertia</i> sp., <i>Caladenia</i> sp.	July to October	0.00	A, B, C,	Likely	Possible: Despite searches in suitable habitat, it is possible that species would have gone undetected during surveys.
<i>Verticordia luteola</i> var. <i>luteola</i>		P3	Grey sand over gravel. Flats.	Heath	<i>Schoenus</i> sp., <i>Mesomelaena</i> sp., <i>Amphipogon</i> sp., <i>Dampiera</i> sp., <i>Ecdeiocolea</i> sp., <i>Banksia</i> sp.	November to December	0.00	A, B, C,	Confirmed	Confirmed: Previously recorded in Survey Area
<i>Acacia flabellifolia</i>		P3	Rocky loam, lateritic gravelly soils. Low hills & ridges.	Open woodland	<i>Eucalyptus loxophleba</i> , <i>Melaleuca</i> spp., <i>Eremophila glabra</i> , <i>Conostylis prolifera</i> .	May and September	1.38	A, B, C	Likely	Unlikely: Although the species has been recorded within very close proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Allocasuarina ramosissima</i>		P3	Lateritic soils, gravel.	Low shrubland	<i>Acacia</i> sp., <i>Gastrolobium</i> sp., <i>Xanthorrhoea</i> sp., <i>Casuarina</i> sp., <i>Eucalyptus</i> sp., <i>Hibbertia</i> sp., <i>Hypocalymma</i> sp.	June and September	0.93	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.

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<i>Austrostipa nunaginensis</i>		P3	Hillslope, limestone, yellow brown sand.	Low woodland, closed heath	<i>Nuytsia floribunda</i> , <i>Banksia attenuata</i> , <i>Acacia blakelyi</i> , <i>Raphanus raphanistrum</i> <i>Echium plantagineum</i> , <i>Scholtzia involucrata</i>	Information not available	5.08	A, B	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Banksia borealis</i> subsp. <i>elator</i>		P3	Lateritic gravelly soils, yellow sand. Hillslopes.	Open woodland	<i>Acacia</i> sp., <i>Calothamnus quadrifidus</i> , <i>Banksia prionotes</i> , <i>Grevillea amplexans</i> , <i>Gastrolobium</i> sp.	July to November	0.77	A, B, C	Likely	Unlikely: Although the species has been recorded within very close proximity to the Survey Area, it is unlikely that this noticeable perennial, which grows 1-2.5 m tall, would have gone undetected during the Survey.
<i>Banksia cypholoba</i>		P3	Sand & gravelly loam.	Open woodland	<i>Melaleuca leuropoma</i> , <i>Hakea smilacifolia</i> , <i>Banksia glaucifolia</i> and <i>Allocasuarina humilis</i> , <i>Petrophile ensifolia</i> , <i>Conospermum stoechadis</i>	August	0.25	A, B, C	Likely	Confirmed: Recorded from the Survey
<i>Banksia splendida</i> subsp. <i>macrocarpa</i>		P3	Lateritic gravel.	Heath	<i>Daviesia speciosa</i> , <i>Banksia sessilis</i> , <i>Banksia</i> spp., <i>Eucalyptus</i> sp., <i>Calothamnus</i> sp., <i>Hakea</i> sp.	July to August	5.54	A, B, C	Likely	Unlikely: Although the species has been recorded within very close proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Calytrix ecalycata</i> subsp. <i>ecalycata</i>		P3	Yellow or white sand, sandy gravel, clay loam, granite, sandstone. Uplands, valley flats, ridges, hills, road verges.	Open woodland	<i>Banksia</i> spp., <i>Eucalyptus todtiana</i> , <i>Xanthorrhoea</i> sp., <i>Conostylis</i> sp., <i>Jacksonia</i> sp., <i>Acacia pulchella</i> .	September to October	5.29	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Drosera prophylla</i>		P3	Hillsides, ridges. Sandy loam, laterite.	Heath	<i>Daviesia epiphyllum</i> , <i>Petrophile</i> sp., <i>Hakea</i> sp., <i>Hibbertia</i> sp., <i>Allocasuarina humilis</i>	June to August	1.82	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.

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<i>Grevillea biformis</i> subsp. <i>cymbiformis</i>		P3	White sand.	Low heath	<i>Daviesia divaricata</i> , <i>Conospermum unilaterale</i> , <i>Eucalyptus todtiana</i> , <i>Eremaea beaufortioides</i> , var. <i>lachnosanthe</i> , <i>Lambertia multiflora</i> , <i>Grevillea shuttleworthiana</i> subsp. <i>canarina</i>	January to March, August to September and November	2.87	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Grevillea erinacea</i>		P3	White, grey or yellow sand, often with lateritic gravel.	Open shrubland	<i>Callitris arenaria</i> , <i>Ecdeiocolea monostachya</i> , <i>Hakea trifurcata</i> , <i>Calothamnus</i> sp.	July to December	3.56	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Grevillea leptopoda</i>		P3	Loam & lateritic gravel, sand, clay.	Low open heath	<i>Grevillea paniculata</i> , <i>Acacia chapmanii</i> subsp. <i>chapmanii</i> , <i>Ptilotus</i> sp., <i>Brachysema aphylla</i>	August to September	2.80	A, B, C, G	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Grevillea makinsonii</i>		P3	White, grey or yellow sand over laterite, loam, gravel, clay. Rocky hills, sandplains.	Open woodland, low heath	<i>Acacia</i> sp., <i>Banksia</i> sp., <i>Gastrolobium</i> sp., <i>Calothamnus</i> sp., <i>Hakea auriculata</i> , <i>Eremaea</i> sp., <i>Hibbertia</i> sp.	July or September to October	1.50	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Guichenotia alba</i>		P3	Sandy & gravelly soils. Low-lying flats, depressions.	Low heath	<i>Allocasuarina</i> sp., <i>Hibbertia</i> sp., <i>Patersonia</i> sp., <i>Hakea</i> sp., <i>Calytrix</i> sp., <i>Drosera</i> sp.	July to August	3.23	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Hemiandra</i> sp. Eneabba (H. Demarz 3687)		P3	Sand. Disturbed sites.	Low heath	<i>Eucalyptus todtiana</i> , <i>Conospermum triplinervium</i> , <i>Eremaea</i> sp.	February	0.02	A, B, F, G	Likely	Confirmed: Recorded from the Survey

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<i>Hensmania stoniella</i>		P3	White, grey or lateritic sand, often winter wet.	Low open woodland, low heath	<i>Stirlingia latifolia</i> , <i>Daviesia incrassata</i> , <i>Ursinia anthemoides</i>	September to November	5.08	A, B, C	Likely	Confirmed: Recorded from the Survey
<i>Hibbertia subvillosa</i>		P3	Undulating hills.	Low heath	<i>Allocasuarina</i> sp., <i>Conospermum</i> sp.	April to May and August to September	0.12	A, B	Likely	Confirmed: Recorded from the Survey
<i>Hopkinsia anoectocolea</i>		P3	White or grey sand, often saline. Winter-wet depressions, floodplains, salt lakes.	Low open woodland	<i>Banksia attenuata</i> , <i>Scholtzia</i> sp., <i>Melaleuca</i> sp., <i>Darwinia</i> sp.	September to December	8.75	A, B, C, F	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Lechenaultia juncea</i>		P3	White, grey or yellow sand, sandy gravel.	Low shrubland	<i>Allocasuarina humilis</i> , <i>Styphelia xerophyllum</i> , <i>Calothamnus sanguineus</i> , <i>Cassutha racemosa</i> , <i>Caustis dioica</i> , <i>Conospermum wycherleyi</i> subsp. <i>glabrum</i> , <i>Conostephium pendulum</i> , <i>Conostylis aurea</i> , <i>Dasypogon obliquifolius</i> , <i>Hibbertia huegelii</i> , <i>Lepidosperma calcicola</i> , <i>Leucopogon conostephioides</i> , <i>Petrophile macrostachya</i> , <i>Stirlingia latifolia</i>	November to December	3.86	A, B, C, F	Confirmed	Confirmed: Recorded from the Survey
<i>Leucopogon grammatus</i>		P3	Breakaway, hillcrests. sandy loam.	Heath	<i>Banksia</i> spp., <i>Hibbertia hypericoides</i> , <i>Gastrolobium plicatum</i> , <i>Daviesia daphnoides</i>	June to August	4.73	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>		P3	White, grey or lateritic sand, clay, gravel.	Heath	<i>Verticordia drummondii</i> , <i>Ehrharta longiflora</i> , <i>Hypochaeris</i>	March to October	5.12	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.



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					<i>glabra</i> , <i>Melaleuca</i> spp., <i>Petrophile brevifolia</i>					
<i>Petrophile globifera</i>		P3	Top of slope, sand plains. yellow sand.	Heath	<i>Eucalyptus todtiana</i> , <i>Calothamnus quadrifidus</i> , <i>Banksia shuttleworthiana</i> , <i>Lepidobolus preissianus</i>	September	0.93	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Stylidium torticarpum</i>		P3	Sandy clay and clay loam over laterite. Adjacent to creeklines, depressions, and beneath breakaways.	Open woodland	<i>Acacia saligna</i> , <i>Calothamnus</i> sp., <i>Corymbia calophylla</i> , <i>Daviesia</i> sp., <i>Eucalyptus wandoo</i> , <i>Hakea lissocarpa</i> , <i>Petrophile</i> sp., <i>Verticordia</i> sp., <i>Viminaria juncea</i> , <i>Xanthorrhoea</i> sp.	September to November	0.13	A, B, C, G	Likely	Likely: Despite searches in suitable habitat, it is possible that this inconspicuous herb would have gone undetected during surveys.
<i>Thysanotus vernalis</i>		P3	Sandy loam.	Open low forest	<i>Acacia latipes</i> subsp. <i>latipes</i> , <i>Adenanthos cygnorum</i> , <i>Alexgeorgea nitens</i> , <i>Bossiaea eriocarpa</i> , <i>Cassytha racemosa</i> , <i>Conostephium preissii</i> , <i>Conostylis aculeata</i> subsp. <i>preissii</i> , <i>Hypocalymma xanthopetalum</i> , <i>Leucopogon propinquus</i> , <i>Macrozamia fraseri</i> , <i>Melaleuca leuropoma</i> , <i>Patersonia occidentalis</i> var. <i>occidentalis</i> , <i>Petrophile macrostachya</i>	September to October	3.48	A, B, C,	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.

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<i>Verticordia densiflora</i> var. <i>roseostella</i>		P3	Sandy gravelly soils.	Shrubland	<i>Verticordia monadelph</i> a, <i>Hakea trifurcata</i> , <i>Calytrix purpurea</i> , <i>Platysace</i> sp.	September to December	0.13	A, B, C,	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Acacia epacantha</i>		P3	Lateritic gravelly loam or clay.	Low shrubland	<i>Acacia</i> spp., <i>Calothamnus</i> sp., <i>Eucalyptus</i> spp., <i>Hypocalymma</i> sp., <i>Jacksonia</i> sp., <i>Melaleuca radula</i>	July to August	13.25	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Acacia isoneura</i> subsp. <i>isoneura</i>		P3	Yellow/brown sand. Flats, low rises.	Tall open shrubland	<i>Acacia</i> spp., <i>Allocasuarina</i> spp., <i>Lechenaultia linarioides</i> , <i>Thomasia</i> sp., <i>Grevillea biformis</i> , <i>Dianella revoluta</i>	August to September	10.96	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Acacia lanceolata</i>		P3	Lateritic hills & breakaways.	Low open woodland	<i>Melaleuca nesophila</i> , <i>Melaleuca cardiophylla</i> , <i>Hibbertia</i> sp., <i>Banksia</i> sp., <i>Dampiera</i> sp.	July to August	10.03	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Acacia latipes</i> subsp. <i>licina</i>		P3	White sand, granitic soils. Limestone hills, sandplains.	Heath	<i>Acacia</i> sp., <i>Banksia</i> sp., <i>Calothamnus</i> sp., <i>Conospermum</i> sp., <i>Eucalyptus todtiana</i> , <i>Melaleuca</i> sp., <i>Restionaceae</i> sp.	June to September	11.52	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, suitable habitat is not present.
<i>Allocasuarina grevilleoides</i>		P3	Sand over laterite, gravel.	Open shrubland	<i>Hakea incrassata</i> , <i>Melaleuca aspalathoides</i> , <i>Banksia armata</i> , <i>Leucopogon</i> sp., <i>Hibbertia</i> sp., <i>Schoenus</i> sp.	October	12.51	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
<i>Amocrinum gracillimum</i>		P3	White, grey, yellow or lateritic sand.	Open woodland	<i>Adenanthos cygnorum</i> , <i>Hakea obliqua</i> , <i>Xylomelum angustifolium</i> , <i>Eucalyptus todtiana</i> , <i>Andersonia</i> sp., <i>Synaphea</i> sp., <i>Loxocarya</i> sp., <i>Conospermum</i> sp., <i>Eremaea</i> sp.	October to November	17.21	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Banksia fraseri</i> var. <i>oxycedra</i>		P3	Lateritic gravel. Hillslopes and breakaways.	Tall shrubland	<i>Eucalyptus</i> sp., <i>Allocasuarina campestris</i> , <i>Banksia borealis</i> subsp. <i>elatior</i>	July to September	14.00	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>		P3	Lateritic gravelly soils.	Heath	<i>Hakea spathulata</i> , <i>Hakea trifurcata</i> , <i>Calothamnus torulosus</i> , <i>Banksia dallanneyi</i> , <i>Leucopogon oliganthus</i> , <i>Lambertia multiflorus</i> , <i>Synaphea spinulosa</i> , <i>Calothamnus sanguineus</i> , <i>Leucopogon sprengelioides</i> , <i>Hakea ruscifolia</i> , <i>Hakea stenocarpa</i>	October to November	8.05	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Banksia subulata</i>		P3	White/grey or yellow sand over laterite, gravelly laterite.	Low open heath	<i>Eucalyptus todtiana</i>	September	12.29	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Banksia trifontinalis</i>		P3	Laterite.	Open woodland	<i>Eucalyptus pruiniramis</i> , <i>Allocasuarina</i> spp., <i>Petrophile shuttleworthiana</i> , <i>Banksia fraseri</i> var. <i>oxycedra</i> , <i>Isopogon divergens</i> ,	August to October	15.15	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>Hakea spathulata</i> , <i>Ecdeiocolea monostachya</i>					
<i>Beyeria gardneri</i>		P3	Yellow sand.	Low open woodland, heath	<i>Eucalyptus todtiana</i> , <i>Banksia</i> sp., <i>Calothamnus cupularis</i> , <i>Calytrix brevifolia</i> , <i>Hibbertia hypericoides</i> , <i>Melaleuca leuropoma</i> , <i>Conospermum wycherleyi</i> subsp. <i>glabrum</i> , <i>Xanthorrhoea drummondii</i>	August to September	8.77	A, B, C, F	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Blackallia nudiflora</i>		P3	Clay or sandy clay with granite. On hills or breakaways, plains.	Low open heath	<i>Grevillea</i> sp., <i>Borya</i> sp., <i>Thelymitra antennifera</i> , <i>Caladenia footeana</i> , <i>Scaevola spinescens</i> , <i>Diuris recurva</i> , <i>Caladenia elegans</i> , <i>Borya</i> sp., <i>Dampiera</i> sp., <i>Prasophyllum ringens</i>	July to September	17.42	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Centrolepis milleri</i>		P3	Undulating plains, loamy sand.	Open shrubland	<i>Centrolepis caespitosa</i> , <i>Centrolepis aristata</i> , <i>Drosera glanduligera</i> , <i>Aphelia cyperoides</i> , <i>Juncus capitatus</i>	October	11.96	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Comesperma rhadinocarpum</i>		P3	Sandy soils.	Low woodland, heath	<i>Banksia</i> spp., <i>Eucalyptus pleurocarpa</i> , <i>Hibbertia hypericoides</i>	October to November	13.36	A, B, C, F	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Daviesia pteroclada</i>		P3	Sandy or clay gravelly soils over laterite. Hills.	Open woodland, heath	<i>Acacia</i> sp., <i>Calothamnus</i> sp., <i>Corymbia calophylla</i> , <i>Eucalyptus</i>	July to August	17.81	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>wandoo</i> , <i>Gastrolobium</i> sp., <i>Isopogon</i> sp., <i>Xanthorrhoea</i> sp.					
<i>Desmocladus biformis</i>		P3	Sand, sandy clay, lateritic soils. Dry sites.	Heath	<i>Melaleuca systema</i> , <i>Jacksonia hakeoides</i> , <i>Hibbertia spicata</i> , <i>Astartea scoparia</i> , <i>Acacia blakelyi</i> , <i>Banksia sphaerocarpa</i>	September to October	15.47	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Eucalyptus macrocarpa</i> x <i>pyriformis</i>		P3	Lateritic sandy soils, Hills, rocky ironstone ridges, sandplains.	Open woodland, heath	<i>Callitris</i> sp., <i>Allocasuarina campestris</i> , <i>Melaleuca</i> sp.	April or August to October	14.82	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this mallee, which grows to 1.2-6 m tall would have gone undetected during the Survey.
<i>Gastrolobium rotundifolium</i>		P3	Heavy clay or loam soils, granite, sandstone, quartzite. Low rises, breakaways.	Low open woodland	<i>Melaleuca radula</i> , <i>Drosera macrophylla</i> , <i>Grevillea</i> sp.	August to September	7.41	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Grevillea thyrsoidea</i> subsp. <i>thyrsoidea</i>		P3	Sand or sandy lateritic gravel.	Heath	<i>Leptospermum oligandrum</i> , <i>Conospermum triplinervium</i> , <i>Scholtzia laxiflora</i> , <i>Hakea costata</i> , <i>Grevillea rudis</i> , <i>Gastrolobium spinosum</i> , <i>Allocasuarina humilis</i> , <i>Verticordia</i> sp., <i>Petrophile</i> sp., <i>Scholtzia teretifolia</i>	February or August to September	10.79	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Grevillea uniformis</i>		P3	Sand or sandy loam on sandstone, lateritic gravel. Sandstone outcrops, creeklines.	Heath	<i>Allocasuarina</i> sp., <i>Verticordia</i> sp., <i>Hibbertia</i> sp., <i>Calothamnus</i> sp., <i>Corymbia calophylla</i> , <i>Banksia sessilis</i>	July or September to November	10.95	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Haemodorum loratum</i>		P3	Grey or yellow sand, gravel.	Open woodland	<i>Haemodorum venosum</i> , <i>Conostylis androstemma</i> ,	November	10.89	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.

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					<i>Macropidia fuliginosa</i>					
<i>Hakea longiflora</i>		P3	White sand, loam, gravel, laterite. Breakaways.	Low heath	<i>Lambertia multiflora</i> , <i>Isopogon</i> sp., <i>Hakea conchifolia</i> , <i>Daviesia</i> sp., <i>Calothamnus</i> sp.	June to September	17.04	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Hibbertia subglabra</i>		P3	Slopes, brown clay, gravel.	Open woodland	<i>Eucalyptus drummondii</i> , <i>Adenanthos cygnorum</i> , <i>Hakea</i> spp., <i>Petrophile</i> spp., <i>Banksia carlinoides</i> , <i>Hibbertia</i> spp.	September to October	13.36	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Hypocalymma gardneri</i>		P3	Grey-brown sand, laterite. Sandplains, upper slopes.	Heath	<i>Xylomelum angustifolium</i> , <i>Eucalyptus todtiana</i> , <i>Banksia</i> spp., <i>Calytrix</i> spp., <i>Verticordia</i> spp.	August to September	10.19	A, B, C, F, G	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Jacksonia anthoclada</i>		P3	White or grey sand. Sandplains.	Heath	<i>Banksia</i> spp., <i>Hakea smilacifolia</i> , <i>Adenanthos</i> spp., <i>Banksia</i> spp., <i>Leucopogon</i> sp., <i>Daviesia chapmanii</i> , <i>Hibbertia</i> sp.	April	12.19	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Lepidobolus quadratus</i>		P3	Lateritic gravel, grey/white sand.	Heath	<i>Allocasuarina humilis</i> , <i>Banksia carlinoides</i> , <i>Calothamnus sanguineus</i> , <i>Cassytha racemosa</i> , <i>Caustis dioica</i> , <i>Gastrolobium polystachyum</i> , <i>Hakea</i> spp., <i>Hibbertia</i> spp., <i>Hypocalymma xanthopetalum</i> , <i>Melaleuca trichophylla</i> , <i>Patersonia occidentalis</i>	August to September	13.36	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					var. <i>occidentalis</i> , <i>Petrophile brevifolia</i> , <i>Stylidium repens</i> , <i>Synaphea interioris</i>					
<i>Melaleuca sclerophylla</i>		P3	Gravelly sand, clayey sand. Granite outcrops, rises.	Heath	<i>Melaleuca</i> spp., <i>Kunzea</i> sp.	June to September	12.04	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Persoonia chapmaniana</i>		P3	White sandy clay, yellow sand. Vicinity of salt lakes.	Open shrubland	<i>Casuarina</i> sp., <i>Calytrix</i> sp., <i>Banksia</i> sp.	September to November	18.69	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, suitable habitat is not present.
<i>Persoonia filiformis</i>		P3	Yellow or white sand over laterite.	Heath	<i>Allocasuarina humilis</i> , <i>Banksia shuttleworthiana</i> , <i>Conospermum stoechadis</i> subsp. <i>stoechadis</i> , <i>Austrostipa</i> spp., <i>Ecdeiocolea monostachya</i>	November to December	7.14	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Persoonia rudis</i>		P3	White, grey or yellow sand, often over laterite.	Open woodland	<i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i> , <i>Synaphea grandis</i> , <i>Hibbertia hypericoides</i> , <i>Acacia pulchella</i> , <i>Daviesia</i> sp.	September to December or January	8.78	A, B, C, F, G	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>		P3	White or grey sand, lateritic gravel.	Low open woodland	<i>Eucalyptus todtiana</i> , <i>Banksia</i> sp., <i>Dasypogon</i> sp., <i>Conostylis</i> spp.	August to October	12.55	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Platysace ramosissima</i>		P3	Sandy soils.	Open woodland	<i>Stirlingia latifolia</i> , <i>Daviesia physodes</i> , <i>Allocasuarina humilis</i>	October to November	14.86	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Podotheca uniseta</i>		P3	White/grey sand, sandy loam. Samphire flats.	Tall open shrubland, low heath	<i>Rhagodia drummondii</i> , <i>Roepera fruticulosa</i> , <i>Sclerolaena</i>	September to December	11.36	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, suitable habitat is not present.



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					<i>eurotioides</i> , <i>Acanthocarpus canaliculatus</i> , <i>Maireana amoena</i>					
<i>Stylidium nonscandens</i>		P3	Sand over laterite. Hillslopes and crests.	Low woodland	<i>Eucalyptus tottiana</i> , <i>Banksia</i> spp.	September to November	14.79	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Stylidium ricae</i>		P3	Sandy loam and lateritic gravel, granite. Rock outcrops.	Shrubland	<i>Allocasuarina</i> sp., <i>Melaleuca</i> sp., <i>Eremophila</i> sp., <i>Baeckea</i> sp., <i>Asteraceae</i> sp.	August to October	18.87	A, B, C,	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Styphelia filamentosa</i>		P3	Sandy plains, slopes.	Heath	<i>Adenanthos cygnorum</i> , <i>Calothamnus sanguineus</i> , <i>Banksia</i> spp.	January, April and October to November	11.54	A, B, C,	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Styphelia filifolia</i>		P3	Sandplains.	Open woodland	<i>Banksia</i> spp., <i>Kunzea glabrescens</i> , <i>Xanthorrhoea preissii</i> , <i>Phlebocarya ciliata</i> , <i>Dasypogon bromeliifolius</i> , <i>Patersonia occidentalis</i>	January to February or April	10.11	A, B, C, G	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Styphelia williamsiorum</i>		P3	Sandy plains, slopes, hills. Laterite, loamy sand.	Low heath	<i>Banksia</i> spp., <i>Gastrolobium ilicifolia</i> , <i>Petrophile shuttleworthiana</i> , <i>Spirogardnera rubescens</i> , <i>Acacia wilsonii</i> , <i>Eucalyptus eudesmioides</i>	January and November	19.52	A, B, C,	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Synaphea endothrix</i>		P3	Gravelly loam, sand. Lateritic rises.	Closed heath	<i>Allocasuarina humilis</i> , <i>Banksia carlinoides</i> , <i>Calothamnus sanguineus</i> , <i>Cassytha racemosa</i> , <i>Caustis dioica</i> , <i>Gastrolobium polystachyum</i> , <i>Hakea</i> spp., <i>Hibbertia</i> spp.,	August to September	15.83	A, B, C,	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.

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					<i>Hypocalymma xanthopetalum</i> , <i>Melaleuca trichophylla</i> , <i>Patersonia occidentalis</i> var. <i>occidentalis</i> , <i>Petrophile brevifolia</i> , <i>Stylidium repens</i> , <i>Synaphea interioris</i>					
<i>Thryptomene nitida</i>		P3	Hillslope, plains, creeklines. Sandy clay, loamy sand.	Low heath	<i>Allocasuarina</i> sp., <i>Eucalyptus</i> sp., <i>Melaleuca</i> sp.	January, June and October	12.07	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Triglochin protuberans</i>		P3	Red loam, grey mud over clay. Winter-wet sites, claypans, near salt lakes, margins of pools.	Low forest	<i>Eucalyptus</i> sp., <i>Acacia</i> sp.	October	16.91	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, suitable habitat is not present.
<i>Verticordia amphigia</i>		P3	Sandy loam, clay & rocky loam. Winter-wet depressions.	Open heath	<i>Viminaria</i> sp., <i>Melaleuca rhapsiophylla</i> , <i>Calothamnus</i> sp., <i>Verticordia densiflora</i>	October to November	15.78	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Verticordia fragrans</i>		P3	White, grey or yellow sand, clay loam. Low-lying areas, sandplains.	Low open woodland	<i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i> , <i>Eremaea beaufortioides</i> var. <i>lachnosanthe</i> , <i>Melaleuca leuropoma</i> , <i>Nuytsia floribunda</i> , <i>Hibbertia hypericoides</i> , <i>Eucalyptus todtiana</i>	September to November	8.05	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Verticordia insignis</i> subsp. <i>eomagis</i>		P3	Sandy soils over laterite. Sandplains, rocky rises.	Shrubland	<i>Banksia kippistiana</i> , <i>Calothamnus longissimus</i> , <i>Grevillea</i> sp., <i>Hibbertia</i> sp., <i>Poaceae</i> sp.	August to November	17.48	A, B, C,	Possible	Unlikely: Although the species has been recorded within relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Verticordia muelleriana</i> subsp. <i>muelleriana</i>		P3	White/grey or yellow sand. Sandplains.	Closed heath	<i>Eremaea</i> sp., <i>Jacksonia</i> sp., <i>Isopogon</i> sp.,	September to December or January	10.99	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely

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					<i>Thryptomene</i> sp. Eneabba (R.J. Cranfield 8433), <i>Hakea eneabba</i>					that this noticeable perennial would have gone undetected during the Survey.
Priority 4										
<i>Calothamnus accedens</i>		P4	Sandy soils over laterite. Road verge.	Closed heath	<i>Allocasuarina campestris</i> , <i>Chorizema humile</i> , <i>Melaleuca</i> sp., <i>Acacia cochlocarpa</i> , <i>Gastrolobium hamulosum</i>	January, April to May, July, August and October to December	0.00	A, B, C	Likely	Possible: Despite searches in suitable habitat, it is possible that species would have gone undetected during surveys.
<i>Calytrix chrysantha</i>		P4	White, grey or yellow/brown sand. Flats.	Heath	<i>Calothamnus</i> sp., <i>Banksia</i> sp., <i>Melaleuca</i> sp., <i>Banksia</i> spp., <i>Conospermum</i> sp., <i>Eremaea</i> sp., <i>Verticordia densiflora</i>	December or January	0.00	A, B, C, G	Confirmed	Confirmed: Previously recorded in the Survey Area.
<i>Eucalyptus zopherophloia</i>		P4	Grey/white sand with limestone rubble. Coastal areas.	Low woodland	<i>Eucalyptus erythrocorys</i> , <i>Melaleuca</i> spp., <i>Grevillea argyrophylla</i> , <i>Acacia xanthina</i> , <i>Dodonaea aptera</i> , <i>Guichenotia ledifolia</i>	October to December or January	0.00	A, B, C, E	Likely	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Verticordia penicillaris</i>		P4	Shallow gritty soils. Granite outcrops.	Open shrubland	<i>Dodonaea amplisemina</i> , <i>Acacia</i> spp., <i>Ptilotus obovatus</i> , <i>Solanum lasiophyllum</i>	September to October	0.00	A, B, C,	Likely	Possible: Despite searches in suitable habitat, it is possible that species would have gone undetected during surveys.
<i>Banksia chamaephyton</i>		P4	Grey or white sand over laterite.	Open shrubland	<i>Calectasia narragara</i> , <i>Hakea incrassata</i> , <i>Allocasuarina humilis</i> , <i>Xanthorrhoea drummondii</i> , <i>Banksia sessilis</i> , <i>Daviesia nudiflora</i>	October to December	5.39	A, B, C	Likely	Confirmed: Recorded from the Survey

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
<i>Diuris recurva</i>		P4	Loam. Winter-wet areas.	Closed low shrubs, open shrubland	<i>Acacia</i> sp., <i>Lepidosperma</i> sp., <i>Thysanotus manglesianus</i> , <i>Caesia micrantha</i> , <i>Clematicissus angustissima</i> , <i>Comesperma volubile</i> , <i>Lepidosperma tenue</i> , <i>Laxmannia sessiliflora</i> subsp. <i>sessiliflora</i> , <i>Neurachne alopecuroidea</i> , <i>Aristida contorta</i> , <i>Brachyscome cheilocarpa</i>	July to August	0.39	A, B, C	Likely	Likely: Despite searches in suitable habitat, it is possible that this inconspicuous species would have gone undetected during surveys.
<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>		P4	White or grey sand over laterite. Hillslopes, ridges, sandplains.	Heath	<i>Acacia blakelyi</i> , <i>Banksia hookeriana</i> , <i>Melaleuca</i> spp., <i>Eucalyptus pleurocarpa</i> , <i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i> , <i>Lambertia multiflora</i> var. <i>multiflora</i>	August to September or November to December	1.47	A, B, C, H	Likely	Confirmed
<i>Grevillea rudis</i>		P4	White, grey, yellow or red sand, often with gravel & over laterite.	Low shrubland	<i>Banksia nivea</i> , <i>Eucalyptus pleurocarpa</i> , <i>Mesomelaena pseudostygia</i> , <i>Gastrolobium spinosum</i> , <i>Xanthorrhoea drummondii</i> , <i>Melaleuca trichophylla</i>	January or April or June to September or November to December	1.82	A, B, C	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Hemiandra</i> sp. <i>Watheroo</i> (S. Hancocks 4)		P4	Sandy plain. White grey sand.	Low open woodland	<i>Eucalyptus todtiana</i> , <i>Nuytsia floribunda</i> , <i>Xylomelum angustifolium</i> , <i>Banksia prionotes</i> , <i>Leptospermum</i> sp., <i>Banksia</i>	October to January	0.05	A, B	Confirmed	Confirmed: Previously recorded in the Survey Area.



Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>platycarpa</i> , <i>Verticordia densiflora</i> , <i>Eremaea</i> sp.					
<i>Lepidobolus densus</i>		P4	Yellow lateritic sand, lateritic gravel.	Closed shrubland	<i>Acacia oldfieldii</i> , <i>Malleostemon peltiger</i> , <i>Allocasuarina campestris</i> , <i>Ecdeiocolea monostachya</i> , <i>Lepidobolus preissianus</i> subsp. <i>preissianus</i> , <i>Austrostipa macalpinei</i>	August	5.37	A, B, C	Confirmed: Recorded from the Survey.	Confirmed: Recorded from the Survey.
<i>Pityrodia viscida</i>		P4	Lateritic sand.	Closed heath	<i>Calothamnus quadrifidus</i> , <i>Centrolepis polygyna</i> , <i>Schoenus nanus</i>	September to December or January to February	5.84	A, B, C	Likely	Confirmed: Recorded from the Survey.
<i>Schoenus griffinianus</i>		P4	White sand.	Heath, open woodland	<i>Eucalyptus todtiana</i> , <i>Melaleuca preissiana</i> , <i>Stirlingia latifolia</i> , <i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i> , <i>Jacksonia hakeoides</i> , <i>Hibbertia huegelii</i> , <i>Hibbertia crassifolia</i> , <i>Conostylis aculeata</i> , <i>Lechenaultia floribunda</i> , <i>Xanthorrhoea preissii</i>	September to October	4.80	A, B, C, F, G	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Schoenus natans</i>		P4	Winter-wet depressions.	Shrubland	<i>Pogonolepis stricta</i> , <i>Centrolepis polygyna</i> , <i>Schoenus</i> sp., <i>Astartea affinis</i> , <i>Amphibromus nervosus</i> , <i>Leptocarpus canus</i> , <i>Cynnogeton lineare</i> , <i>Aponogeton</i>	October	0.53	A, B, C	Likely	Likely: Despite searches in suitable habitat, it is possible that this inconspicuous species would have gone undetected during surveys.



Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>hexatepalus</i> , <i>Wurmbea dioica</i> subsp. <i>alba</i> , <i>Liparophyllum capitatum</i>					
<i>Stawellia dimorphantha</i>		P4	White, grey, yellow sand.	Low open woodland	<i>Scaevola</i> sp., <i>Verticordia grandis</i> , <i>Melaleuca</i> sp., <i>Eremaea</i> sp., <i>Lechenaultia linarioides</i> , <i>Comesperma</i> sp., <i>Conospermum stoechadis</i>	June to November	5.71	A, B, C, F	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Stylidium striatum</i>		P4	Brown clay loam over laterite. Hillslopes.	Open woodland	<i>Hibbertia</i> spp., <i>Xanthorrhoea preissii</i> , <i>Eucalyptus marginata</i> , <i>Hakea ruscifolia</i> , <i>Adenanthos</i> sp., <i>Stirlingia latifolia</i> , <i>Daviesia</i> sp.	October to November	5.79	A, B, C,	Likely	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Banksia elegans</i>		P4	Yellow, white or red sand. Sandplains, low consolidated dunes.	Open tall shrubland, heath	<i>Banksia attenuata</i> , <i>Banksia hookeriana</i> , <i>Banksia menziesii</i> , <i>Conospermum</i> sp., <i>Conostylis</i> sp., <i>Hakea</i> sp., <i>Hibbertia</i> sp., <i>Macrozamia</i> sp., <i>Stirlingia latifolia</i> , <i>Verticordia</i> sp.	October to November	7.23	A, B, C, F, G	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Banksia scabrella</i>		P4	White, grey or yellow sand, sometimes with lateritic gravel. Sandplains, lateritic ridges.	Low heath	<i>Allocasuarina humilis</i> , <i>Drosera</i> spp., <i>Hakea</i> spp., <i>Acacia</i> spp., <i>Banksia</i> spp., <i>Adenanthos cygnorum</i>	September to December or January	10.26	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Calytrix eneabbensis</i>		P4	White, grey or yellow sand over laterite. Sandplains.	Open woodland	<i>Eremaea pauciflora</i> , <i>Eremaea asterocarpa</i> subsp.	July to October	8.71	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>asterocarpa</i> , <i>Hibbertia hypericoides</i> , <i>Hypocalymma</i> sp. Nambung (R. Spjut & R. Smith s.n. 22/09/1992), <i>Hibbertia</i> sp. Gnangara (J.R. Wheeler 2329), <i>Petrophile linearis</i>					
<i>Calytrix superba</i>		P4	Sand over laterite. Flats.	Heath, woodland	<i>Jacksonia floribunda</i> , <i>Melaleuca leuropoma</i> , <i>Banksia shuttleworthiana</i> , <i>Banksia candolleana</i> , <i>Melaleuca leuropoma</i> , <i>Banksia shuttleworthiana</i> , <i>Scholtzia laxiflora</i> , <i>Banksia dallanneyi</i> subsp. <i>dallanneyi</i> var. <i>dallanneyi</i>	December or January to February	8.05	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Conostephium magnum</i>		P4	White-grey sands sometimes associated with laterite gravels. Sand dunes, swampland, disturbed roadside, drainage channels, open woodland.	Heath	<i>Xanthorrhoea drummondii</i> , <i>Adenanthos cygnorum</i> , <i>Nuytsia floribunda</i> , <i>Eucalyptus todtiana</i> , <i>Lambertia multiflora</i> , <i>Jacksonia</i> sp.	July to September	9.78	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Desmocladius elongatus</i>		P4	White or grey sand.	Low heath	<i>Hibbertia</i> spp., <i>Calothamnus torulosus</i> , <i>Banksia carlinoides</i> , <i>Gastrolobium plicatum</i> , <i>Banksia sphaerocarpa</i> .	August to December	6.65	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Eucalyptus ebbanoensis</i> subsp. <i>photina</i>		P4	Lateritic breakaways, sandplains.	Open shrubland	<i>Eucalyptus</i> sp., <i>Acacia</i> sp., <i>Gastrolobium</i> sp.	September to December or Jan to March	16.27	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this mallee, which grows to 2-6 m tall would have gone undetected during the Survey.



Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
<i>Eucalyptus rhodantha</i> var. <i>xpetiolaris</i>		P4	Undulating country, hillslopes.	Open shrubland	<i>Eucalyptus</i> spp., <i>Banksia</i> spp.	October to December or January	11.50	A, B	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this mallee, which grows to 2-3 m tall would have gone undetected during the Survey.
<i>Frankenia glomerata</i>		P4	White sand.	Low shrubland	<i>Disphyma crassifolium</i> , <i>Frankenia pauciflora</i> , <i>Lomandra effusa</i> , <i>Darwinia</i> sp. Karonie, <i>Dianella revoluta</i> , <i>Sclerolaena eurotioides</i> , <i>Acacia</i> sp., <i>Eucalyptus</i> sp., <i>Hakea preissii</i> , <i>Carpobrotus modestus</i>	November	12.17	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Hibbertia propinqua</i>		P4	Sandstone outcrops, breakaway slopes, gullies. Sand, loam, laterite.	Open woodland	<i>Melaleuca haplantha</i> , <i>Hypocalymma suave</i>	August to September	15.78	A, B, C	Possible	Unlikely: Although the species has been recorded relatively nearby to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Hydrocotyle lemnoides</i>		P4	Swamps.	Low shrubland	<i>Melaleuca lateritia</i> , <i>Leptocarpus cana</i> , <i>Amphibromus nervosus</i> , <i>Astartea affinis</i> , <i>Crassula</i> sp.	August to October	16.88	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Liparophyllum congestiflorum</i>		P4	Creek beds, low plains, drainage lines, sandstone outcrops. Grey sand.	Shrubland	<i>Acacia</i> sp., <i>Asteraceae</i> spp., <i>Melaleuca</i> sp.	March and September to October	15.62	A, B, C, F, G	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Scaevola kallophylla</i>		P4	Creek beds, low plains, drainage lines, sandstone outcrops. Grey sand.	Low heath	<i>Acacia</i> spp., <i>Conospermum</i> sp. and <i>Calothamnus</i> sp.	May or August to December	7.14	A, B, C	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Stylidium inversiflorum</i>		P4	White or grey sand over laterite. Sandplains, hillslopes and gullies.	Open heath	<i>Hakea</i> sp., <i>Gastrolobium</i> sp., <i>Melaleuca</i> sp., <i>Banksia</i> sp., <i>Baeckea</i> sp., <i>Lambertia</i> sp., <i>Kingia australis</i>	September to November	19.10	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Stylidium longitubum</i>		P4	Sandy clay, clay. Seasonal wetlands.	Low woodland	<i>Melaleuca seriata</i> , <i>Verticordia densiflora</i> ,	October to December	16.98	A, B, C	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.

Scientific Name	EPBC	WA	Broad Habitat	Vegetation Type	Associated Species	Flowering Period	Nearest Record (km)	Databases / Survey Report	Pre-survey Likelihood of Occurrence	Post-survey Likelihood of Occurrence
					<i>Brachyscome pusilla</i>					
<i>Thelymitra apiculata</i>		P4	Grey sand, lateritic gravel.	Low heath	<i>Allocasuarina humilis</i> , <i>Daviesia decurrens</i> , <i>Lambertia multiflora</i> , <i>Calothamnus torulosus</i> , <i>Grevillea thyrsoides</i> subsp. <i>thyrsoides</i>	May to July	6.16	A, C,	Possible	Possible: Despite searches in suitable habitat, the species has been recorded in close proximity to the Survey Area and the potential remains for it to occur.
<i>Verticordia aurea</i>		P4	Deep sand. Sandplains.	Heath	<i>Melaleuca trichophylla</i> , <i>Melaleuca leuropoma</i> , <i>Adenanthos</i> spp., <i>Verticordia</i> spp., <i>Conospermum</i> spp., <i>Stirlingia latifolia</i> , <i>Banksia menziesii</i> , <i>Eremaea beaufortioides</i>	September to December	8.01	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.
<i>Xanthosia tomentosa</i>		P4	Lateritic soils. gravelly	Heath	<i>Banksia</i> sp., <i>Lambertia multiflora</i> , <i>Allocasuarina humilis</i> , <i>Hakea auriculata</i>	September to December	8.05	A, B, C,	Possible	Unlikely: Although the species has been recorded within proximity to the Survey Area, it is unlikely that this noticeable perennial would have gone undetected during the Survey.

Source of species record for the area: A= DBCA threatened and Priority Flora, B=Western Australia Herbarium Specimen database, C=Atlas of Living Australia, D=Infinite Green Energy (2021) Arrowsmith Hydrogen Project Vegetation Management Plan, E= Mattiske Consulting Pty Ltd (2022a) Flora & Vegetation Assessment: Arrowsmith North Survey Area 22, FMattiske Consulting Pty Ltd (2022b) Flora & Vegetation Assessment: Arrowsmith Central Survey Area, G= ENV Australia (2013) Preliminary Flora and Vegetation and Fauna Assessment of Twin Hills and One Tree Hill, Eneabba and H=Protected Matters Search Tool (PMST).

Appendix D Quadrat Summary

SENSITIVE



Appendix E Vegetation classification matrix

Stratum	Canopy Cover (%)				
	70-100%	30-70%	10-30%	2-10%	<2%
Trees >30 m	Tall Closed Forest	Tall Open Forest	Tall Woodland	Tall Open Woodland	Scattered Tall Trees
Trees 10-30 m	Closed Forest	Open Forest	Woodland	Open Woodland	Scattered Trees
Trees <10 m	Low Closed Forest	Low Open Forest	Low Woodland	Low Open Woodland	Scattered Low Trees
Shrubs >2 m	Tall Closed Scrub	Tall Open Scrub	Tall Shrubland	Tall open Shrubland	Scattered Tall Shrubs
Shrubs 1-2 m	Closed Heath	Open Heath	Shrubland	Open Shrubland	Scattered Shrubs
Shrubs <1 m	Low Closed Heath	Low Open Heath	Low Shrubland	Low Open Shrubland	Scattered Low Shrubs
Hummock Grasses	Closed Hummock Grassland	Hummock Grassland	Open Hummock Grassland	Very Open Hummock Grassland	Scattered Hummock Grasses
Grasses, Sedges, Herbs	Closed Tussock Grassland / Bunch Grassland / Sedgeland / Herbland	Tussock Grassland / Bunch Grassland / Sedgeland / Herbland	Open Tussock Grassland / Bunch Grassland / Sedgeland / Herbland	Very Open Tussock Grassland / Bunch Grassland / Sedgeland / Herbland	Scattered Tussock Grasses / Bunch Grasses / Sedges / Herbs

Note: Based on Muir (1977), and Aplin's (1979) modification of the vegetation classification system of Specht (1970); Aplin T.E.H. (1979). The Flora. Chapter 3 In O'Brien, B.J. (ed.) (1979). Environment and Science. University of Western Australia Press; Muir B.G. (1977). Biological Survey of the Western Australian Wheatbelt. Part II: Vegetation and habitat of Bendering Reserve. Records of the Western Australian Museum, Suppl. No. 3; Specht R.L. (1970). Vegetation. In: The Australian Environment. 4th edn (Ed. G.W. Leeper). Melbourne.



Appendix F Vegetation Condition Scale

Rating	Description
Pristine	Pristine or nearly so; no obvious signs of 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.
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.
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.
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.
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.



Appendix G Significant Flora Records

Priority Flora Species	Representative Photograph / Specimen Image.
*All photographs taken by Stantec unless otherwise acknowledged.	
<i>Banksia chamaephyton</i>	
<i>Banksia cypholoba</i>	
<i>Banksia fraseri</i> var. <i>crebra</i>	



Priority Flora Species	Representative Photograph / Specimen Image.
<i>Eucalyptus crispata</i>	*All photographs taken by Stantec unless otherwise acknowledged. 
<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	



Priority Flora Species	Representative Photograph / Specimen Image.
<i>Hemiandra</i> sp. Eneabba (H. Demarz 3687)	*All photographs taken by Stantec unless otherwise acknowledged. 
<i>Hensmania stoniella</i>	

Priority Flora Species	Representative Photograph / Specimen Image.
<i>Hibbertia subvillosa</i>	*All photographs taken by Stantec unless otherwise acknowledged. 
<i>Lechenaultia juncea</i>	



Priority Flora Species	Representative Photograph / Specimen Image.
<i>Lepidobolus densus</i> Photography by K.A. Meney. Image used with the permission of the Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions (https://florabase.dbca.wa.gov.au/help/copyright).	*All photographs taken by Stantec unless otherwise acknowledged. 
<i>Micromyrtus uniovulum</i>	
<i>Millotia dimorpha</i>	

Priority Flora Species	Representative Photograph / Specimen Image.
<i>Paracaleana dixonii</i>	*All photographs taken by Stantec unless otherwise acknowledged. 
<i>Petrophile septemfida</i>	
<i>Pityrodia viscida</i>	



Priority Flora Species	Representative Photograph / Specimen Image.
<i>Stylidium cornuatum</i>	*All photographs taken by Stantec unless otherwise acknowledged. 
<i>Stylidium drummondianum</i>	



Priority Flora Species	Representative Photograph / Specimen Image.
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*All photographs taken by Stantec unless otherwise acknowledged.

Thelymitra stellata



Appendix H Vascular Flora List

SENSITIVE



Family	Taxon	Survey Area	Additional Area
Aizoaceae	<i>Gunnera septifraga</i>	X	
Amaranthaceae	<i>Ptilotus ?divaricatus</i>	X	
	<i>Ptilotus divaricatus</i>	X	
	<i>Ptilotus drummondii</i> ?var. <i>minor</i>		X
	<i>Ptilotus polystachyus</i>	X	
Anarthriaceae	<i>Lyginia imberbis</i>	X	X
Apiaceae	<i>Actinotus leucocephalus</i>	X	
	<i>Centella asiatica</i>	X	
	<i>Daucus glochidiatus</i>	X	X
	<i>Homalosciadium ?homalocarpum</i>	X	
	<i>Platysace cirrosa</i>	X	X
	<i>Verticordia monadelpha</i> var. <i>monadelpha</i>	X	
	<i>Xanthosia ?kochii</i>	X	
	<i>Hydrocotyle ?callicarpa</i>	X	X
	<i>Trachymene ?cyanopetala</i>		X
	<i>Trachymene ?pilosa</i>	X	
	<i>Trachymene cyanopetala</i>	X	X
	<i>Trachymene pilosa</i>	X	X
Asparagaceae	<i>Acanthocarpus canaliculatus</i>		X
	<i>Acanthocarpus</i> sp. <i>Ajana</i> (C.A. Gardner 8596)	X	X
	<i>Laxmannia omnifertilis</i>	X	
	<i>Laxmannia sessiliflora</i> subsp. <i>drummondii</i>	X	X
	<i>Lomandra hastilis</i>	X	X
	<i>Lomandra micrantha</i> subsp. <i>micrantha</i>	X	X
	<i>Sowerbaea ?laxiflora</i>	X	
	<i>Sowerbaea laxiflora</i>	X	
	<i>Thysanotus ?rectantherus</i>	X	
	<i>Thysanotus patersonii</i>	X	X
	<i>Thysanotus</i> sp.	X	X
	<i>Thysanotus spiniger</i>	X	X
	<i>Thysanotus thyrsoideus</i>	X	X
Asteraceae	* <i>Arctotheca calendula</i>	X	X
	* <i>Cotula bipinnata</i>		X
	* <i>Cotula coronopifolia</i>	X	
	* <i>Hypochaeris glabra</i>	X	X
	* <i>Sonchus oleraceus</i>	X	X
	* <i>Ursinia anthemoides</i> subsp. <i>anthemoides</i>	X	X
	<i>Actinobole uliginosum</i>	X	
	<i>Blennospora drummondii</i>	X	X
	<i>Brachyscome ?pusilla</i>	X	
	<i>Brachyscome iberidifolia</i>	X	



Family	Taxon	Survey Area	Additional Area
	<i>Brachyscome perpusilla</i>	X	
	<i>Brachyscome pusilla</i>	X	
	<i>Cotula cotuloides</i>	X	
	<i>Gnephosis</i> sp.	X	
	<i>Hyalosperma demissum</i>	X	
	<i>Millotia dimorpha</i>	X	
	<i>Olearia</i> ?sp. <i>Eremicola</i> (Diels & Pritzel s.n. PERTH 00449628)	X	
	<i>Olearia rudis</i>	X	X
	<i>Olearia</i> sp. Kennedy Range	X	X
	<i>Panaetia lessonii</i>	X	
	<i>Podolepis aristata</i> subsp. <i>aristata</i>	X	
	<i>Podotheca gnaphalioides</i>	X	
	<i>Pterochaeta paniculata</i>	X	
	<i>Quinetia urvillei</i>	X	
	<i>Rhodanthe laevis</i>	X	X
	<i>Rhodanthe manglesii</i>	X	
	<i>Rhodanthe stricta</i>	X	
	<i>Siemssenia capillaris</i>	X	X
	<i>Siloxerus multiflorus</i>	X	
	<i>Trichocline spathulata</i>		X
	<i>Waitzia acuminata</i> var. <i>acuminata</i>	X	X
	<i>Waitzia acuminata</i> var. <i>albicans</i>	X	
Boryaceae	<i>Borya sphaerocephala</i>	X	X
Brassicaceae	* <i>Brassica tournefortii</i>	X	
	* <i>Raphanus raphanistrum</i>	X	X
	<i>Phlegmatospermum</i> ? <i>drummondii</i>	X	
Caryophyllaceae	* <i>Petrorhagia dubia</i>	X	
	* <i>Spergularia rubra</i>	X	
	<i>Spergularia</i> ? <i>marina</i>	X	
	<i>Spergularia marina</i>	X	
Casuarinaceae	<i>Allocasuarina campestris</i>	X	X
	<i>Allocasuarina huegeliana</i>	X	
	<i>Allocasuarina humilis</i>	X	X
	<i>Allocasuarina microstachya</i>	X	X
	<i>Allocasuarina thuyoides</i>	X	
Celastraceae	<i>Stackhousia dielsii</i>	X	
Centrolepidaceae	? <i>Centrolepis</i> sp.	X	
	<i>Centrolepis drummondiana</i>	X	
	<i>Centrolepis pilosa</i>	X	
Colchicaceae	<i>Burchardia</i> ? <i>multiflora</i>		X
	<i>Burchardia congesta</i>	X	X



Family	Taxon	Survey Area	Additional Area
	<i>Wurmbea dioica</i> subsp. <i>alba</i>	X	
	<i>Wurmbea</i> sp.		X
Crassulaceae	* <i>Crassula</i> ? <i>natans</i>	X	
	* <i>Crassula natans</i> var. <i>minor</i>	X	
	<i>Crassula colorata</i> ?var. <i>colorata</i>		X
	<i>Crassula colorata</i> var. <i>colorata</i>	X	X
Cupressaceae	<i>Callitris arenaria</i>	X	
Cyperaceae	* <i>Ficinia marginata</i>	X	
	<i>Caustis dioica</i>	X	X
	<i>Chaetospira curvifolia</i>	X	
	<i>Gahnia</i> ? <i>australis</i>	X	X
	<i>Gahnia australis</i>		X
	<i>Isolepis</i> sp.	X	
	<i>Lepidosperma</i> ? <i>apricola</i>	X	
	<i>Lepidosperma</i> ? <i>squamatum</i>	X	X
	<i>Lepidosperma</i> ? <i>tenua</i>		X
	<i>Lepidosperma fimbriatum</i>	X	
	<i>Lepidosperma scabrum</i>	X	
	<i>Lepidosperma</i> sp.	X	X
	<i>Lepidosperma</i> sp. Bandalup Scabrid (N. Eveleigh 10798)	X	X
	<i>Lepidosperma</i> sp. P1 small head (M.D. Tindale 166A)	X	X
	<i>Lepidosperma squamatum</i>	X	X
	<i>Lepidosperma tenua</i>	X	X
	<i>Mesomelaena preissii</i>	X	X
	<i>Mesomelaena pseudostygia</i>	X	X
	<i>Mesomelaena tetragona</i>	X	
	<i>Morelotia microcarpa</i>	X	
	<i>Schoenus</i> ? <i>pleiostemoneus</i>	X	
	<i>Schoenus armeria</i>	X	X
	<i>Schoenus brevisetis</i>	X	X
	<i>Schoenus clandestinus</i>	X	X
	<i>Schoenus latitans</i>	X	X
	<i>Schoenus pleiostemoneus</i>	X	
	<i>Schoenus rigens</i>		X
	<i>Schoenus</i> sp.	X	X
	<i>Schoenus subflavus</i> subsp. <i>subflavus</i>		X
Dasypogonaceae	<i>Calectasia narragara</i>	X	
Dilleniaceae	<i>Hibbertia</i> ? <i>desmophylla</i>		X
	<i>Hibbertia</i> ? <i>glabrisepala</i>	X	
	<i>Hibbertia crassifolia</i>	X	X
	<i>Hibbertia desmophylla</i>		X



Family	Taxon	Survey Area	Additional Area
	<i>Hibbertia hypericoides</i> ?subsp. <i>hypericoides</i>		X
	<i>Hibbertia hypericoides</i> subsp. <i>hypericoides</i>	X	X
	<i>Hibbertia pubens</i>		X
	<i>Hibbertia spicata</i>		X
	<i>Hibbertia striata</i>	X	
	<i>Hibbertia subvillosa</i>	X	
Dioscoreaceae	<i>Dioscorea hastifolia</i>	X	X
Droseraceae	<i>Drosera bulbosa</i> subsp. <i>bulbosa</i>	X	X
	<i>Drosera glanduligera</i>	X	X
	<i>Drosera heterophylla</i>	X	X
	<i>Drosera hirsuta</i>	X	X
	<i>Drosera humilis</i>	X	
	<i>Drosera macrantha</i>	X	X
	<i>Drosera magna</i>	X	X
	<i>Drosera pallida</i>	X	X
	<i>Drosera porrecta</i>	X	X
	<i>Drosera ramellosa</i>	X	
	<i>Drosera</i> sp. Branched styles (S.C. Coffey 193)	X	
	<i>Drosera pilos</i>	X	X
	<i>Drosera thysanosepala</i>	X	
Ecdeiocoleaceae	<i>Ecdeiocolea monostachya</i>	X	X
	<i>Georgeantha hexandra</i>		X
Elaeocarpaceae	<i>Tetratheca confertifolia</i>	X	
Ericaceae	<i>Andersonia heterophylla</i>	X	
	<i>Andersonia lehmanniana</i> subsp. <i>pubescens</i>	X	
	<i>Conostephium preissii</i>	X	
	<i>Leucopogon simulans</i>	X	
	<i>Leucopogon</i> sp. Northern ciliate (R. Davis 3393)	X	X
	<i>Lissanthe powelliae</i>		X
	<i>Lysinema pentapetalum</i>	X	
	<i>Styphelia microdonta</i>	X	X
	<i>Styphelia serratifolia</i>	X	
	<i>Styphelia</i> sp.	X	
	<i>Styphelia</i> sp. Eneabba (N. Marchant s.n. PERTH 01291777)	X	X
	<i>Styphelia stomarrhena</i>	X	
	<i>Styphelia tortifolia</i>	X	
	<i>Styphelia xerophylla</i>	X	X
Euphorbiaceae	<i>Monotaxis bracteata</i>	X	X
Fabaceae	* <i>Lupinus angustifolius</i>		X
	* <i>Lupinus cosentinii</i>	X	X
	* <i>Medicago polymorpha</i>		X



Family	Taxon	Survey Area	Additional Area
	<i>*Medicago</i> sp.	X	
	<i>*Ornithopus compressus</i>		X
	<i>*Trifolium subterraneum</i>	X	X
	<i>Acacia assimilis</i> ?subsp. <i>assimilis</i>		X
	<i>Acacia auronitens</i>	X	X
	<i>Acacia barbinervis</i> subsp. <i>borealis</i>	X	X
	<i>Acacia blakelyi</i>	X	
	<i>Acacia dielsii</i>	X	
	<i>Acacia dilatata</i>	X	
	<i>Acacia erinacea</i>	X	X
	<i>Acacia fagonioides</i>	X	
	<i>Acacia idiomorpha</i>	X	
	<i>Acacia jacksonioides</i>	X	X
	<i>Acacia lasiocarpa</i> ?var. <i>bracteolata</i>		X
	<i>Acacia lasiocarpa</i> ?var. <i>lasiocarpa</i>	X	X
	<i>Acacia lasiocarpa</i> var. <i>bracteolata</i>	X	X
	<i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i>	X	X
	<i>Acacia latipes</i> subsp. <i>latipes</i>	X	X
	<i>Acacia pulchella</i> var. <i>reflexa</i>		X
	<i>Acacia rostellifera</i>	X	
	<i>Acacia saligna</i> ?subsp. <i>Wheatbelt</i>	X	X
	<i>Acacia</i> sp.		X
	<i>Bossiaea eriocarpa</i>	X	X
	<i>Chorizema aciculare</i> subsp. <i>laxum</i>	X	
	<i>Cristonia stenophylla</i>	X	X
	<i>Daviesia angulata</i>	X	
	<i>Daviesia daphnoides</i>	X	
	<i>Daviesia decurrens</i> subsp. <i>decurrens</i>	X	
	<i>Daviesia divaricata</i> subsp. <i>divaricata</i>	X	X
	<i>Daviesia hakeoides</i> subsp. <i>subnuda</i>	X	
	<i>Daviesia incrassata</i> subsp. <i>teres</i>		X
	<i>Daviesia nudiflora</i> subsp. <i>hirtella</i>	X	X
	<i>Daviesia oxyclada</i>	X	X
	<i>Daviesia podophylla</i>	X	
	<i>Daviesia quadrilatera</i>	X	
	<i>Gastrolobium plicatum</i>	X	X
	<i>Gastrolobium polystachyum</i>	X	X
	<i>Gastrolobium spinosum</i>	X	
	<i>Gompholobium</i> ? <i>tomentosum</i>	X	
	<i>Gompholobium glutinosum</i>	X	
	<i>Gompholobium marginatum</i>	X	



Family	Taxon	Survey Area	Additional Area
	<i>Gompholobium</i> sp.	X	
	<i>Gompholobium tomentosum</i>		X
	<i>Isotropis cuneifolia</i> ?subsp. <i>cuneifolia</i>	X	
	<i>Jacksonia</i> ? <i>floribunda</i>	X	
	<i>Jacksonia angulata</i>		X
	<i>Jacksonia floribunda</i>	X	
	<i>Jacksonia hakeoides</i>	X	
	<i>Jacksonia restioides</i>	X	X
	<i>Jacksonia sternbergiana</i>	X	
	<i>Labichea lanceolata</i> ?subsp. <i>lanceolata</i>	X	
	<i>Labichea lanceolata</i> subsp. <i>lanceolata</i>	X	X
	<i>Leptosema aphyllum</i>	X	
	<i>Mirbelia floribunda</i>	X	X
	<i>Mirbelia trichocalyx</i>	X	
Gentianaceae	*? <i>Centaurium</i> sp.	X	
Geraniaceae	* <i>Erodium botrys</i>		X
	* <i>Erodium cicutarium</i>	X	
	<i>Erodium cygnorum</i>	X	
	<i>Erodium</i> sp.	X	
Goodeniaceae	? <i>Dampiera</i> sp.		X
	<i>Dampiera</i> ? <i>altissima</i>	X	
	<i>Dampiera</i> ? <i>lavandulacea</i>	X	
	<i>Dampiera lavandulacea</i>	X	
	<i>Dampiera lindleyi</i>		X
	<i>Dampiera oligophylla</i>		X
	<i>Dampiera</i> sp. Wongan Hills (R.D. Royce 6637)	X	X
	<i>Dampiera spicigera</i>	X	X
	<i>Dampiera teres</i>	X	X
	<i>Goodenia</i> ? <i>berardiana</i>	X	
	<i>Goodenia berardiana</i>		X
	<i>Goodenia caerulea</i>		X
	<i>Goodenia mimuloides</i>	X	
	<i>Goodenia reinwardtii</i>		X
	<i>Goodenia trinervis</i>		X
	<i>Lechenaultia floribunda</i>	X	
	<i>Lechenaultia juncea</i>	X	
	<i>Scaevola canescens</i>		X
	<i>Scaevola phlebopetala</i>	X	
Gyrostemonaceae	<i>Gyrostemon ramulosus</i>	X	X
Haemodoraceae	<i>Anigozanthos humilis</i> ?subsp. <i>humilis</i>	X	
	<i>Anigozanthos humilis</i> subsp. <i>humilis</i>	X	X



Family	Taxon	Survey Area	Additional Area
	<i>Anigozanthos pulcherrimus</i>	X	
	<i>Conostylis aculeata</i> ?subsp. <i>aculeata</i>	X	
	<i>Conostylis aculeata</i> subsp. <i>breviflora</i>	X	X
	<i>Conostylis androstemma</i>	X	X
	<i>Conostylis aurea</i>		X
	<i>Conostylis canteriata</i>	X	
	<i>Conostylis dielsii</i> subsp. <i>dielsii</i>	X	
	<i>Conostylis neocymosa</i>	X	
	<i>Conostylis teretifolia</i> subsp. <i>teretifolia</i>	X	
	<i>Conostylis aurea</i>	X	
	<i>Haemodorum simulans</i>	X	
	<i>Haemodorum</i> sp.	X	X
	<i>Haemodorum spicatum</i>		X
	<i>Tribonanthes australis</i>	X	
Haloragaceae	<i>Glischrocaryon</i> ? <i>aureum</i>		X
	<i>Glischrocaryon aureum</i>	X	X
	<i>Gonocarpus confertifolius</i> ?var. <i>confertifolius</i>	X	
	<i>Gonocarpus nodulosus</i>	X	
Hemerocallidaceae	<i>Caesia</i> ? <i>micrantha</i>	X	
	<i>Chamaescilla maculata</i>	X	
	<i>Chamaescilla versicolor</i>	X	X
	<i>Corynotheca micrantha</i>	X	
	<i>Dianella revoluta</i> var. <i>divaricata</i>	X	X
	<i>Hensmania stoniella</i>	X	
	<i>Tricoryne elatior</i>		X
	<i>Tricoryne humilis</i>	X	
	<i>Tricoryne</i> sp.	X	X
Hypoxidaceae	<i>Pauridia glabella</i> ?var. <i>glabella</i>	X	
Iridaceae	* <i>Romulea rosea</i> var. <i>australis</i>		X
	<i>Patersonia occidentalis</i> var. <i>occidentalis</i>	X	
Juncaginaceae	<i>Triglochin mucronata</i>	X	
	<i>Triglochin nana</i>	X	
Lamiaceae	<i>Hemiandra rubriflora</i>	X	
	<i>Hemiandra</i> sp. Eneabba (H. Demarz 3687)	X	X
	<i>Hemigenia barbata</i>	X	X
	<i>Hemiphora bartlingii</i>	X	
	<i>Lachnostachys eriobotrya</i>	X	
	<i>Pityrodia hemigenioides</i>	X	
	<i>Pityrodia viscida</i>	X	
	<i>Quoya verbascina</i>	X	
Lauraceae	<i>Cassytha</i> ? <i>aurea</i>	X	



Family	Taxon	Survey Area	Additional Area
	<i>Cassytha ?flava</i>	X	
	<i>Cassytha ?glabella</i>	X	
	<i>Cassytha ?racemosa</i>		X
	<i>Cassytha flava</i>	X	X
	<i>Cassytha glabella ?forma glabella</i>	X	
	<i>Cassytha racemosa ?forma pilosa</i>		X
Loganiaceae	<i>Orianthera spermacoea</i>		X
Loranthaceae	<i>Amyema ?preissii</i>	X	
	<i>Amyema miquelii</i>	X	X
	<i>Nuytsia floribunda</i>	X	
Malvaceae	<i>Guichenotia micrantha</i>	X	X
	<i>Guichenotia sarotes</i>	X	
	<i>Lasiopetalum erectifolium</i>	X	X
	<i>Seringia hermanniifolia</i>	X	
	<i>Thomasia grandiflora</i>		X
Montiaceae	<i>Calandrinia baccata</i>	X	
	<i>Calandrinia calytrata</i>	X	X
	<i>Calandrinia granulifera</i>	X	
	<i>Calandrinia</i> sp.	X	X
	<i>Calandrinia</i> sp. Kenwick	X	
Myrtaceae	<i>?Eremaea</i> sp.	X	
	<i>Apectospermum spinescens</i>	X	X
	<i>Babingtonia erecta</i>	X	X
	<i>Babingtonia</i> sp.	X	
	<i>Beaufortia ?elegans</i>	X	
	<i>Beaufortia elegans</i>	X	
	<i>Beaufortia kwongkanicola</i>	X	
	<i>Calothamnus ?quadrifidus</i>		X
	<i>Calothamnus longissimus</i>	X	X
	<i>Calothamnus quadrifidus ?subsp. quadrifidus</i>	X	X
	<i>Calothamnus quadrifidus subsp. angustifolius</i>	X	X
	<i>Calothamnus sanguineus</i>	X	X
	<i>Calytrix ?depressa</i>		X
	<i>Calytrix depressa</i>	X	
	<i>Calytrix flavescens</i>	X	
	<i>Calytrix oldfieldii</i>	X	
	<i>Calytrix sapphirina</i>	X	
	<i>Calytrix</i> sp.	X	
	<i>Darwinia neildiana</i>	X	
	<i>Darwinia speciosa</i>	X	
	<i>Eremaea beaufortoides ?var. lachnosanthe</i> Hnatiuk	X	



Family	Taxon	Survey Area	Additional Area
	<i>Eremaea beaufortioides</i> var. <i>microphylla</i>	X	X
	<i>Eremaea ectadioclada</i>		X
	<i>Eremaea pauciflora</i> ?var. <i>pauciflora</i>	X	
	<i>Eremaea pauciflora</i> var. <i>lonchophylla</i>	X	X
	<i>Ericomyrtus serpyllifolia</i>		X
	<i>Eucalyptus accedens</i>	X	X
	<i>Eucalyptus arachnaea</i> subsp. <i>arachnaea</i>	X	X
	<i>Eucalyptus camaldulensis</i> subsp. <i>obtus</i>	X	
	<i>Eucalyptus conveniens</i>		X
	<i>Eucalyptus crispata</i>	X	X
	<i>Eucalyptus drummondii</i>	X	
	<i>Eucalyptus horistes</i>	X	
	<i>Eucalyptus loxophleba</i> subsp. <i>supralaevis</i>	X	
	<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	X	X
	<i>Eucalyptus opimiflora</i>	X	
	<i>Eucalyptus todtiana</i>	X	X
	<i>Hypocalymma hirsutum</i>	X	
	<i>Leptospermopsis</i> ? <i>oligandra</i>		X
	<i>Leptospermopsis erubescens</i>	X	
	<i>Leptospermopsis oligandra</i>	X	X
	<i>Leptospermum</i> sp.	X	
	<i>Melaleuca</i> ? <i>leuropoma</i>	X	
	<i>Melaleuca</i> ? <i>sclerophylla</i>	X	
	<i>Melaleuca</i> ? <i>tinkeri</i>	X	
	<i>Melaleuca</i> ? <i>viminea</i>	X	
	<i>Melaleuca aspalathoides</i>	X	X
	<i>Melaleuca concreta</i>	X	X
	<i>Melaleuca hamulosa</i>	X	
	<i>Melaleuca leuropoma</i>	X	X
	<i>Melaleuca marginata</i>	X	X
	<i>Melaleuca radula</i>	X	X
	<i>Melaleuca raphiophylla</i>		X
	<i>Melaleuca seriata</i>	X	
	<i>Melaleuca</i> sp.	X	
	<i>Melaleuca tinkeri</i>	X	X
	<i>Melaleuca trichophylla</i>	X	X
	<i>Melaleuca viminea</i> ?subsp. <i>viminea</i>	X	
	<i>Micromyrtus uniovulum</i>		X
	<i>Myrtaceae</i> sp.	X	
	<i>Pileanthus</i> ? <i>filifolius</i>	X	
	<i>Pileanthus filifolius</i>	X	X



Family	Taxon	Survey Area	Additional Area
	<i>Scholtzia ?laxiflora</i>	X	
	<i>Scholtzia involucrata</i>	X	
	<i>Scholtzia laxiflora</i>	X	X
	<i>Thryptomene hyporhytis</i>	X	X
	<i>Thryptomene mucronulata</i>	X	
	<i>Thryptomene racemulosa</i>	X	
	<i>Thryptomene</i> sp.	X	
	<i>Verticordia ?brachypoda</i>	X	
	<i>Verticordia ?densiflora</i>	X	
	<i>Verticordia ?ovalifolia</i>	X	
	<i>Verticordia chrysanthella</i>	X	
	<i>Verticordia densiflora</i> var. <i>densiflora</i>	X	
	<i>Verticordia eriocephala</i>	X	
	<i>Verticordia grandis</i>	X	X
	<i>Verticordia huegelii</i> var. <i>decumbens</i>	X	
	<i>Verticordia laciniata</i>	X	
	<i>Verticordia pennigera</i>	X	X
	<i>Verticordia</i> sp.	X	
Orchidaceae	<i>Caladenia ?flava</i>	X	X
	<i>Caladenia denticulata</i> ?subsp. <i>denticulata</i>	X	
	<i>Caladenia flava</i> ?subsp. <i>flava</i>	X	X
	<i>Caladenia reptans</i> ?subsp. <i>reptans</i>	X	
	<i>Caladenia</i> sp.	X	
	<i>Cyanicula gemmata</i>	X	X
	<i>Diuris ?laxiflora</i>	X	
	<i>Diuris refracta</i>	X	
	<i>Diuris setacea</i>	X	
	<i>Diuris tinkeri</i>	X	
	<i>Drakaea</i> sp.		X
	<i>Elythranthera ?brunonis</i>		X
	<i>Eriochilus dilatatus</i> ?subsp. <i>dilatatus</i>	X	X
	<i>Eriochilus dilatatus</i> ?subsp. <i>brevifolius</i>		X
	<i>Eriochilus dilatatus</i> subsp. <i>brevifolius</i>		X
	<i>Eriochilus dilatatus</i> subsp. <i>dilatatus</i>	X	X
	<i>Eriochilus scaber</i> ?subsp. <i>scaber</i>	X	
	<i>Eriochilus scaber</i> subsp. <i>scaber</i>	X	
	<i>Leporella fimbriata</i>	X	X
	<i>Paracaleana dixonii</i>	X	
	<i>Pheladenia deformis</i>	X	X
	<i>Pterostylis platypetala</i>	X	X
	<i>Pterostylis sanguinea</i>	X	X



Family	Taxon	Survey Area	Additional Area
	<i>Pterostylis sargentii</i>	X	
	<i>Pterostylis</i> sp.		X
	<i>Pterostylis vittata</i>	X	X
	<i>Pyrorchis nigricans</i>		X
	<i>Thelymitra</i> ? <i>antennifera</i>	X	
	<i>Thelymitra</i> ? <i>benthamiana</i>	X	
	<i>Thelymitra stellata</i>	X	
Phyllanthaceae	<i>Lysiandra calycina</i>	X	
	<i>Poranthera drummondii</i>	X	
Plantaginaceae	* <i>Plantago coronopus</i> ?subsp. <i>commutata</i>	X	
Poaceae	*? <i>Ehrharta</i> sp.	X	X
	* <i>Avena barbata</i>		X
	* <i>Briza maxima</i>	X	X
	* <i>Briza minor</i>		X
	* <i>Bromus diandrus</i>		X
	* <i>Cynodon dactylon</i>		X
	* <i>Ehrharta calycina</i>	X	
	* <i>Ehrharta longiflora</i>	X	X
	* <i>Ehrharta</i> sp.	X	
	* <i>Eragrostis curvula</i>		X
	* <i>Hordeum glaucum</i>		X
	* <i>Hordeum leporinum</i>		X
	* <i>Lolium perenne</i>		X
	* <i>Lolium rigidum</i>	X	
	* <i>Lolium</i> sp.	X	
	* <i>Pentameris airoides</i> subsp. <i>airoides</i>		X
	<i>Amphipogon caricinus</i> var. <i>caricinus</i>	X	
	<i>Amphipogon strictus</i>		X
	<i>Amphipogon turbinatus</i>	X	X
	<i>Austrostipa</i> ? <i>elegantissima</i>		X
	<i>Austrostipa elegantissima</i>	X	X
	<i>Austrostipa macalpinei</i>	X	
	<i>Lachnagrostis plebeia</i>	X	
	<i>Lolium</i> sp.	X	
	<i>Neurachne alopecuroidea</i>	X	X
	<i>Neurachne</i> sp.	X	
Polygalaceae	<i>Comesperma acerosum</i>	X	
	<i>Comesperma integerrimum</i>	X	
	<i>Comesperma volubile</i>	X	X
Polygonaceae	<i>Muehlenbeckia adpressa</i>	X	
Primulaceae	* <i>Lysimachia arvensis</i>	X	



Family	Taxon	Survey Area	Additional Area
Proteaceae	<i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i>	X	
	<i>Banksia attenuata</i>	X	X
	<i>Banksia bipinnatifida</i> subsp. <i>multifida</i>	X	
	<i>Banksia candolleana</i>	X	X
	<i>Banksia carlinoides</i>	X	X
	<i>Banksia chamaephyton</i>	X	
	<i>Banksia cypholoba</i>	X	X
	<i>Banksia dallanneyi</i> subsp. <i>media</i>	X	X
	<i>Banksia fraseri</i> var. <i>crebra</i>	X	X
	<i>Banksia fraseri</i> var. <i>fraseri</i>	X	X
	<i>Banksia glaucifolia</i>	X	
	<i>Banksia incana</i> var. <i>incana</i>	X	
	<i>Banksia kippistiana</i> var. <i>kippistiana</i>	X	X
	<i>Banksia lanata</i>		X
	<i>Banksia leptophylla</i> ?var. <i>leptophylla</i>	X	
	<i>Banksia leptophylla</i> var. <i>leptophylla</i>	X	
	<i>Banksia leptophylla</i> var. <i>melletica</i>	X	
	<i>Banksia platycarpa</i>	X	
	<i>Banksia sessilis</i> var. <i>flabellifolia</i>	X	
	<i>Banksia shuttleworthiana</i>	X	X
	<i>Banksia sphaerocarpa</i> ?var. <i>sphaerocarpa</i>	X	
	<i>Banksia sphaerocarpa</i> var. <i>pumilio</i>	X	
	<i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i>	X	
	<i>Conospermum</i> ? <i>canaliculatum</i>	X	
	<i>Conospermum</i> ? <i>wycherleyi</i>		X
	<i>Conospermum boreale</i> ?subsp. <i>boreale</i>		X
	<i>Conospermum boreale</i> subsp. <i>ascendens</i>		X
	<i>Conospermum</i> sp.	X	
	<i>Grevillea bitermata</i>	X	X
	<i>Grevillea candelabroides</i>	X	
	<i>Grevillea eriostachya</i>	X	X
	<i>Grevillea exposita</i>	X	X
	<i>Grevillea polybotrya</i>	X	
	<i>Grevillea shuttleworthiana</i> ?subsp. <i>shuttleworthiana</i>	X	
	<i>Hakea anadenia</i>		X
	<i>Hakea auriculata</i>	X	X
	<i>Hakea brownii</i>	X	
	<i>Hakea circumalata</i>	X	
	<i>Hakea conchifolia</i>	X	X
	<i>Hakea erinacea</i>	X	X
	<i>Hakea gilbertii</i>	X	X



Family	Taxon	Survey Area	Additional Area
	<i>Hakea incrassata</i>	X	X
	<i>Hakea lissocarpa</i>	X	X
	<i>Hakea meisneriana</i>	X	
	<i>Hakea neospathulata</i>	X	X
	<i>Hakea obliqua</i> subsp. <i>parviflora</i>	X	
	<i>Hakea preissii</i>	X	
	<i>Hakea psilorrhyncha</i>	X	
	<i>Hakea scoparia</i> ?subsp. <i>scoparia</i>		X
	<i>Hakea scoparia</i> subsp. <i>scoparia</i>		X
	<i>Hakea stenocarpa</i>	X	
	<i>Hakea trifurcata</i>	X	X
	<i>Lambertia multiflora</i> ?var. <i>multiflora</i>	X	X
	<i>Lambertia multiflora</i> var. <i>multiflora</i>	X	X
	<i>Petrophile</i> ? <i>brevifolia</i>		X
	<i>Petrophile brevifolia</i> ?subsp. <i>rosea</i>	X	X
	<i>Petrophile drummondii</i>		X
	<i>Petrophile macrostachya</i>	X	X
	<i>Petrophile pilostyla</i> subsp. <i>austrina</i>	X	
	<i>Petrophile scabriuscula</i>	X	
	<i>Petrophile seminuda</i>	X	
	<i>Petrophile septemfida</i>	X	X
	<i>Petrophile shuttleworthiana</i>	X	X
	<i>Stirlingia latifolia</i>	X	
	<i>Synaphea spinulosa</i> subsp. <i>spinulosa</i>	X	
	<i>Xylomelum angustifolium</i>	X	
Pteridaceae	<i>Cheilanthes adiantoides</i>	X	
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	X	X
Restionaceae	<i>Alexgeorgea nitens</i>	X	X
	<i>Chordifex sinuosus</i>	X	X
	<i>Desmocladius asper</i>	X	
	<i>Desmocladius lateriflorus</i>	X	
	<i>Desmocladius lateriticus</i>	X	X
	<i>Desmocladius parthenicus</i>	X	X
	<i>Desmocladius</i> sp.	X	
	<i>Lepidobolus chaetocephalus</i>	X	
	<i>Lepidobolus densus</i>	X	X
	<i>Lepidobolus preissianus</i> ?subsp. <i>preissianus</i>	X	
	<i>Lepidobolus preissianus</i> subsp. <i>preissianus</i>	X	X
Rhamnaceae	<i>Cryptandra myriantha</i>	X	
	<i>Cryptandra pungens</i>	X	X
	<i>Cryptandra spyridioides</i>	X	



Family	Taxon	Survey Area	Additional Area
	<i>Polianthion wichurae</i>	X	
	<i>Stenanthemum</i> sp.	X	
	<i>Trymalium ledifolium</i> var. <i>rosmarinifolium</i>		X
Rubiaceae	<i>Opercularia vaginata</i>	X	X
Rutaceae	<i>Boronia cymosa</i>	X	X
	<i>Cyanothamnus ramosus</i> subsp. <i>anethifolius</i>	X	
	<i>Diplolaena eneabbensis</i>		X
	<i>Diplolaena ferruginea</i>	X	
	<i>Diplolaena velutina</i>	X	
	<i>Geleznovia</i> ? <i>verrucosa</i>	X	
	<i>Geleznovia calycina</i>	X	X
Santalaceae	<i>Santalum acuminatum</i>	X	X
Sapindaceae	<i>Diplopeltis huegelii</i> subsp. <i>subintegra</i>		X
	<i>Dodonaea ericoides</i>	X	X
	<i>Dodonaea pinifolia</i>	X	
Scrophulariaceae	* <i>Zaluzianskya</i> ? <i>divaricata</i>	X	
	* <i>Zaluzianskya divaricata</i>	X	X
Solanaceae	* <i>Solanum nigrum</i>	X	
Stylidiaceae	? <i>Stylidium</i> sp.		X
	<i>Levenhookia pusilla</i>	X	X
	<i>Stylidium</i> ? <i>drummondianum</i>	X	
	<i>Stylidium</i> ? <i>rigidulum</i>	X	
	<i>Stylidium caricifolium</i>	X	
	<i>Stylidium cornuatum</i>	X	
	<i>Stylidium crosssocephalum</i>	X	
	<i>Stylidium dichotomum</i>	X	
	<i>Stylidium drummondianum</i>	X	X
	<i>Stylidium ecorne</i>	X	
	<i>Stylidium flagellum</i>	X	X
	<i>Stylidium miniatum</i>	X	
	<i>Stylidium petiolare</i>	X	
	<i>Stylidium repens</i>	X	
	<i>Stylidium</i> sp.	X	X
	<i>Stylidium udusicola</i>	X	
Thymelaeaceae	<i>Pimelea</i> ? <i>argentea</i>	X	
	<i>Pimelea angustifolia</i>	X	X
	<i>Pimelea argentea</i>	X	
	<i>Pimelea microcephala</i> subsp. <i>microcephala</i>	X	
Urticaceae	<i>Parietaria debilis</i>		X
Xanthorrhoeaceae	<i>Xanthorrhoea drummondii</i>	X	X
Zamiaceae	<i>Macrozamia fraseri</i>	X	



Appendix I Site inspection Vascular Flora List

Family	Taxon	Significance	Survey Area	Additional Area
Asparagaceae	<i>Acanthocarpus preissii</i>		X	
	<i>Lomandra hastilis</i>		X	X
Casuarinaceae	<i>Allocasuarina campestris</i>		X	X
	<i>Allocasuarina humilis</i>		X	X
Dilleniaceae	<i>Hibbertia polystachya</i>		X	
	<i>Hibbertia hypericoides</i> ?subsp. <i>hypericoides</i>		X	X
Ecdeiocolaceae	<i>Ecdeiocola monostachya</i>		X	X
Loranthaceae	<i>Nuytsia floribunda</i>		X	X
Myrtaceae	<i>Aptospermum spinescens</i>		X	
	<i>Babingtonia grandiflora</i>		X	
	<i>Calothamnus gilesii</i>		X	X
	<i>Calytrix strigosa</i>		X	
	<i>Eremaea beaufortoides</i> var. <i>microphylla</i>		X	
	<i>Eucalyptus accedens</i>		X	
	<i>Eucalyptus diminuta</i>			X
	<i>Eucalyptus loxophleba</i> subsp. <i>supralaevis</i>			X
	<i>Eucalyptus pyriformis</i>		X	X
	<i>Eucalyptus tottiana</i>		X	X
	<i>Leptospermopsis erubescens</i>		X	
	<i>Melaleuca caeca</i>		X	
	<i>Melaleuca calyptroides</i>			X
	<i>Melaleuca concreta</i>		X	
	<i>Melaleuca dichroma</i>		X	X
	<i>Melaleuca marginata</i>		X	
	<i>Melaleuca radula</i>		X	X
	<i>Melaleuca raphiophylla</i>			X
	<i>Melaleuca ryeae</i>		X	X
	<i>Melaleuca seriata</i>		X	
	<i>Scholtzia laxiflora</i>			X
	<i>Verticordia densiflora</i> var. <i>roseostella</i>	P3		X
	<i>Verticordia drummondii</i>			X
	<i>Verticordia grandis</i>			X
	<i>Verticordia ovalifolia</i>		X	
	<i>Eremaea pauciflora</i> ?subsp. <i>pauciflora</i>		X	X
	<i>Eucalyptus eudesmioides</i>			X
	<i>Eucalyptus macrocarpa</i> subsp. <i>macrocarpa</i>			X
Poaceae	<i>Austrostipa elegantissima</i>		X	
	<i>Neurachne alopecuroides</i>		X	
Proteaceae	<i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i>		X	



Family	Taxon	Significance	Survey Area	Additional Area
	<i>Banksia attenuata</i>		X	X
	<i>Banksia cypholoba</i>	P3	X	
	<i>Banksia fraseri</i> var. <i>crebra</i>	P3	X	X
	<i>Banksia nivea</i> subsp. <i>nivea</i>			X
	<i>Banksia sessilis</i> var. <i>flabellifolia</i>		X	X
	<i>Banksia shuttleworthiana</i>			X
	<i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i>		X	
	<i>Grevillea polybotrya</i>			X
	<i>Hakea auriculata</i>		X	X
	<i>Hakea brownii</i>		X	
	<i>Hakea conchifolia</i>		X	
	<i>Hakea erinacea</i>		X	X
	<i>Petrophile brevifolia</i> subsp. <i>rosea</i>			X
	<i>Petrophile drummondii</i>			X
	<i>Petrophile shuttleworthiana</i>		X	
	<i>Stirlingia latifolia</i>		X	
	<i>Synaphea spinulosa</i> subsp. <i>spinulosa</i>		X	
	<i>Banksia leptophylla</i> var. <i>leptophylla</i>		X	
	<i>Conospermum boreale</i> subsp. <i>ascendens</i>			X
	<i>Lambertia multiflora</i> var. <i>multiflora</i>			X
Fabaceae	<i>Acacia acuaria</i>		X	
	<i>Acacia stenoptera</i>			X
	<i>Chorizema aciculare</i> subsp. <i>laxum</i>		X	
Malvaceae	<i>Alyogyne hakeifolia</i>			X
Anarthriaceae	<i>Anarthria laevis</i>		X	
	<i>Lyginia imberbis</i>			X
Cyperaceae	<i>Caustis dioica</i>		X	
Haemodoraceae	<i>Conostylis aculeata</i> subsp. <i>breviflora</i>			X
Rutaceae	<i>Diplolaena eneabensis</i>		X	
Aizoaceae	<i>Gunniopsis quadrifida</i>			X
Juncaceae	* <i>Juncus acutus</i> subsp. <i>acutus</i>	Alien to Western Australia	X	
Zamiaceae	<i>Macrozamia fraseri</i>			X
Stylidiaceae	<i>Stylidium maitlandianum</i>			X
Chenopodiaceae	<i>Tecticornia lepidosperma</i>		X	X
Xanthorrhoeaceae	<i>Xanthorrhoea drummondii</i>		X	X



Appendix J Introduced Flora

SENSITIVE



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
* <i>Arctotheca calendula</i>	Capeweed, Cape Weed	23	30	High	Rapid	 *All photographs taken by Stantec unless otherwise acknowledged
* <i>Avena barbata</i>			1			



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
* <i>Brassica tournefortii</i>	Prickly Turnip, Mediterranean Turnip	6		High	Rapid	
* <i>Briza maxima</i>	Blowfly grass	1	9	Unknown	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Briza minor</i> Photography by L. Fontanini. Image used with the permission of the Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions. https://florabase.dbca.wa.gov.au/help/copyright	Shivery Grass		1	Unknown	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Bromus diandrus</i>	Great Brome		1	High	Rapid	
<i>*Cotula bipinnata</i>	Fern Cotula, Ferny Cotula		1	Unknown	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
* <i>Cotula coronopifolia</i>	Waterbuttons	1		High	Rapid	
* <i>Crassula natans</i> var. <i>minor</i> Photography by B.A. Fuhrer. Image used with the permission of the Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions. https://florabase.dbca.wa.gov.au/help/copyright	Pond Stonecrop	2		Unknown	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
* <i>Cynodon dactylon</i>	Couch		1	High	Rapid	
* <i>Ehrharta calycina</i> Photography by S.M. Armstrong. Image used with the permission of the Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions. https://florabase.dbca.wa.gov.au/help/copyright	Perennial Veldtgrass, Perennial Veldt Grass	2		High	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Ehrharta longiflora</i>	Annual Veldtgrass, Annual Veldt Grass	2	5	Unknown	Rapid	
<i>*Eragrostis curvula</i>	African Love Grass, African Lovegrass		1	High	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
* <i>Erodium botrys</i>	Long Storksbill		2	Low	Rapid	
* <i>Erodium cicutarium</i> Photography by K.C. Richardson. Image used with the permission of the Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions. https://florabase.dbca.wa.gov.au/help/copyright	Common Storksbill	1		Low	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Ficinia marginata</i>		3				 *All photographs taken by Stantec unless otherwise acknowledged
<i>*Hordeum glaucum</i>	Northern Barley Grass		1	Unknown	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Hordeum leporinum</i>	Barley Grass		1	Unknown	Rapid	
<i>*Hypochaeris glabra</i>	Flatweed, Smooth Catsear	43	34	Low	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
* <i>Lolium perenne</i>	Perennial Ryegrass		2	Unknown	Rapid	 *All photographs taken by Stantec unless otherwise acknowledged



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
* <i>Lolium rigidum</i>	Annual Ryegrass, Wimmera Ryegrass	1		Unknown	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Lupinus angustifolius</i> Photography by J.F. Smith. Image used with the permission of the Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions. https://florabase.dbca.wa.gov.au/help/copyright	Slender Birdsfoot Trefoil, Narrowleaf Trefoil		1	Unknown	Moderate	*All photographs taken by Stantec unless otherwise acknowledged 



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Lupinus cosentinii</i>	Sandplain Lupin	1	1	Medium	Moderate	
<i>*Lysimachia arvensis</i>	Scarlet Pimpernel, Blue Pimpernel	9		Low	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Medicago polymorpha</i>	Burr Medic		1	Unknown	Rapid	 
<i>*Ornithopus compressus</i>	Yellow Serradella		1	Low	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Pentameris airoides</i> subsp. <i>airoides</i> Photograph extracted from Atlas of the Living Australia. Image used with the permission according to ALA Terms of Use: https://www.ala.org.au/terms-of-use/	False Hairgrass		2	Unknown	Rapid	*All photographs taken by Stantec unless otherwise acknowledged 



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Petrorhagia dubia</i>	Velvet Pink	1		Low	Rapid	 *All photographs taken by Stantec unless otherwise acknowledged



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
* <i>Plantago coronopus</i> ?subsp. <i>commutata</i>	Buckshorn Plaintain	1		Unknown	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Raphanus raphanistrum</i>	Wild Radish	1	2	High	Rapid	
<i>*Romulea rosea</i> var. <i>australis</i>	Guildford Grass		5	High	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Solanum nigrum</i>	Black Berry Nightshade	1		Unknown	Rapid	
<i>*Sonchus oleraceus</i>	Common Sowthistle	12	7	Unknown	Rapid	



Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
* <i>Spergularia rubra</i>	Red Sand Spurrey, Sand Spurry	1		Low	Rapid	
* <i>Trifolium subterraneum</i>	Sub Clover, Subterranean Clover	1	5	Unknown	Moderate	



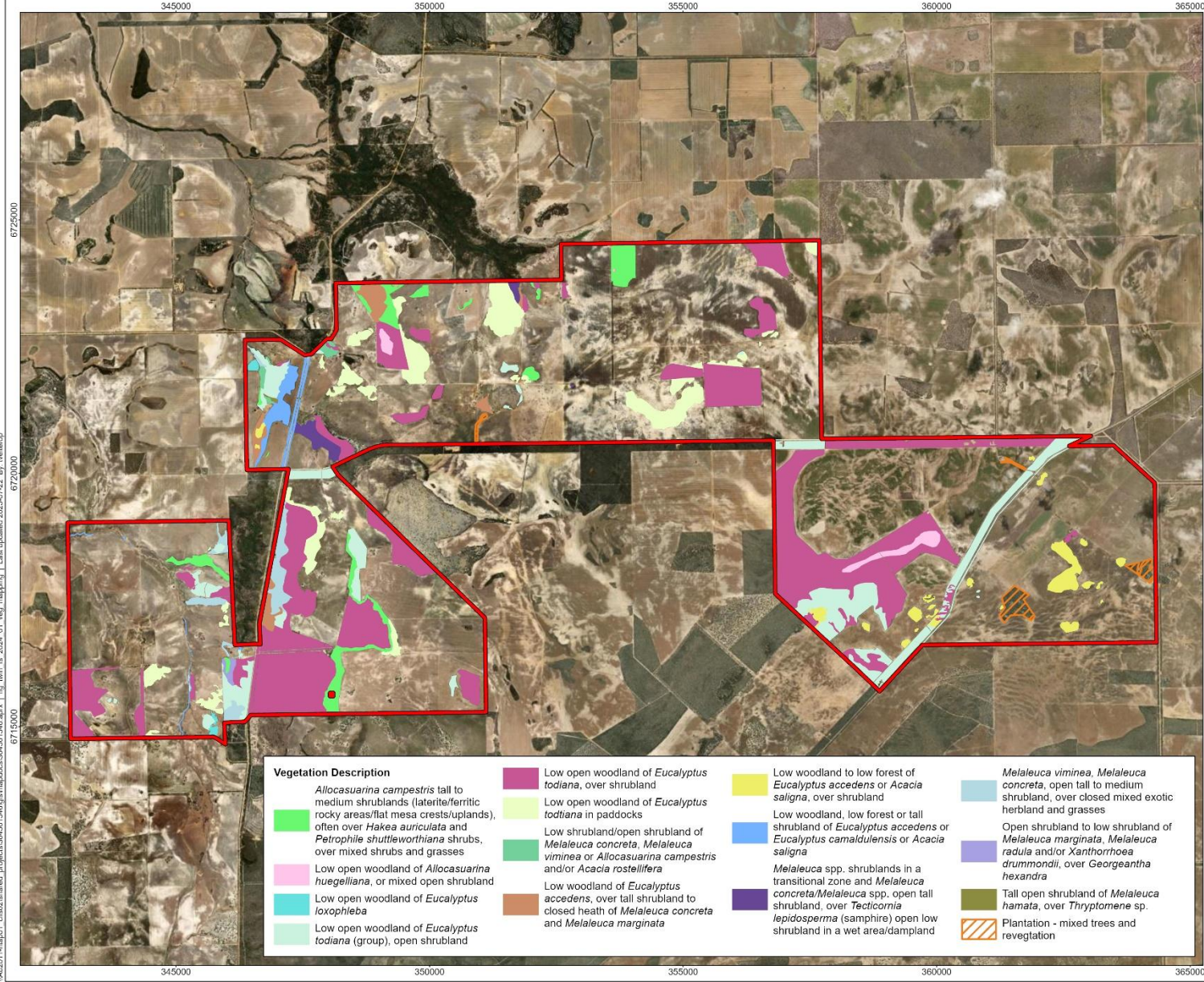
Taxon	Common name	No. of records		DPaW impact and invasiveness ratings		Representative Photograph/ Specimen Image
		Survey Area	Additional Area	Ecological impact	Invasiveness	
<i>*Ursinia anthemoides</i> subsp. <i>anthemoides</i> Photography by K.C. Richardson. Image used with the permission of the Western Australian Herbarium, Department of Biodiversity, Conservation and Attractions (https://florabas.e.dbca.wa.gov.au/help/copyright).	Ursinia	21	26	High	Rapid	*All photographs taken by Stantec unless otherwise acknowledged 
<i>*Zaluzianskya divaricata</i>	Zedweed, Spreading Night Phlox	3	4	Unknown	Rapid	



Appendix K Vegetation Mapping

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Vegetation Mapping
Twin Hills Wind Farm: Detailed and Targeted Flora Survey Draft Report
Client: Twin Hills Wind Farm Pty Ltd
Project: 304501546
Project Code: twin_va_2024_01
Drawn By: TV, Checked By: JP, JS
Date: 2025-07-22

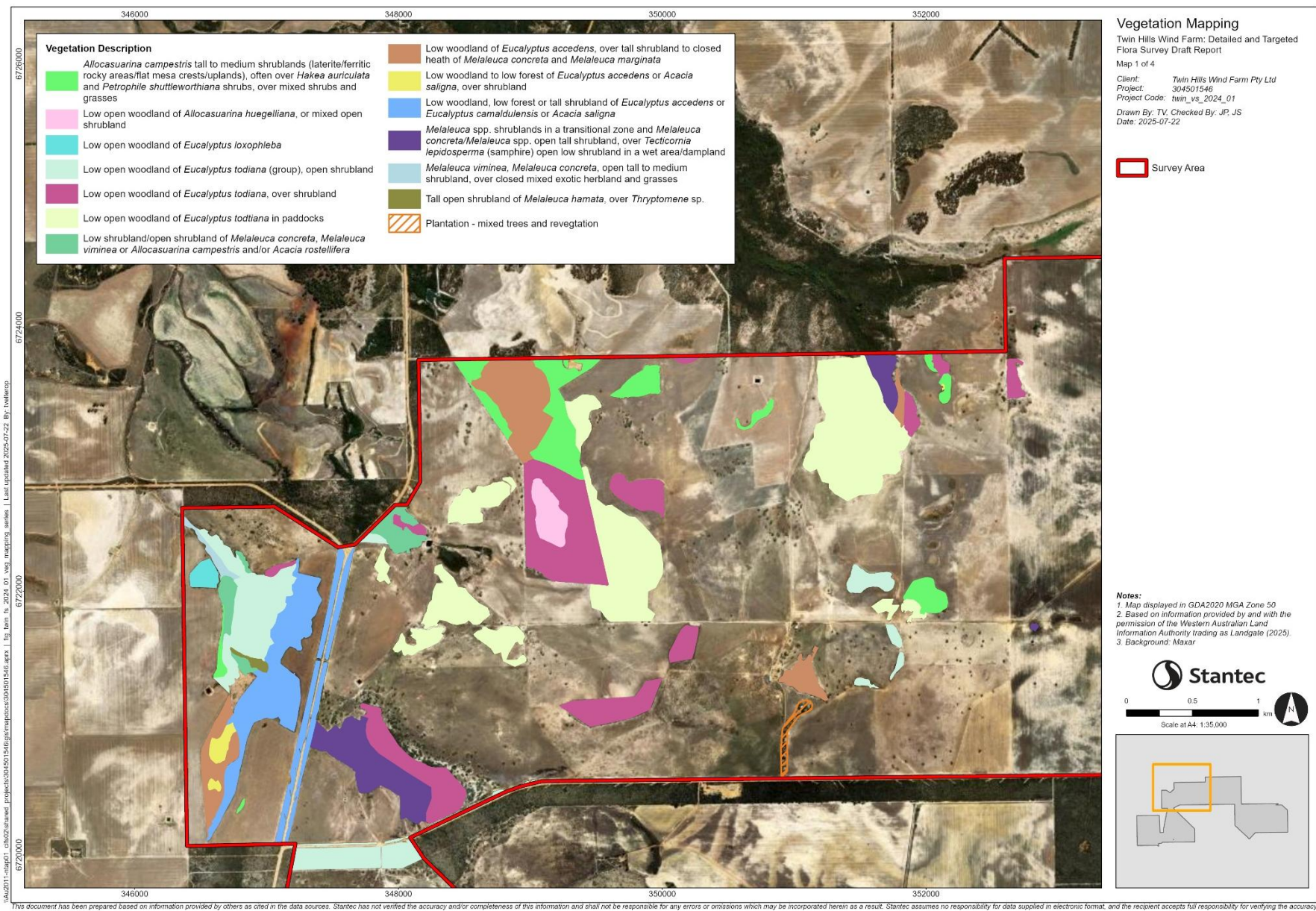
Survey Area

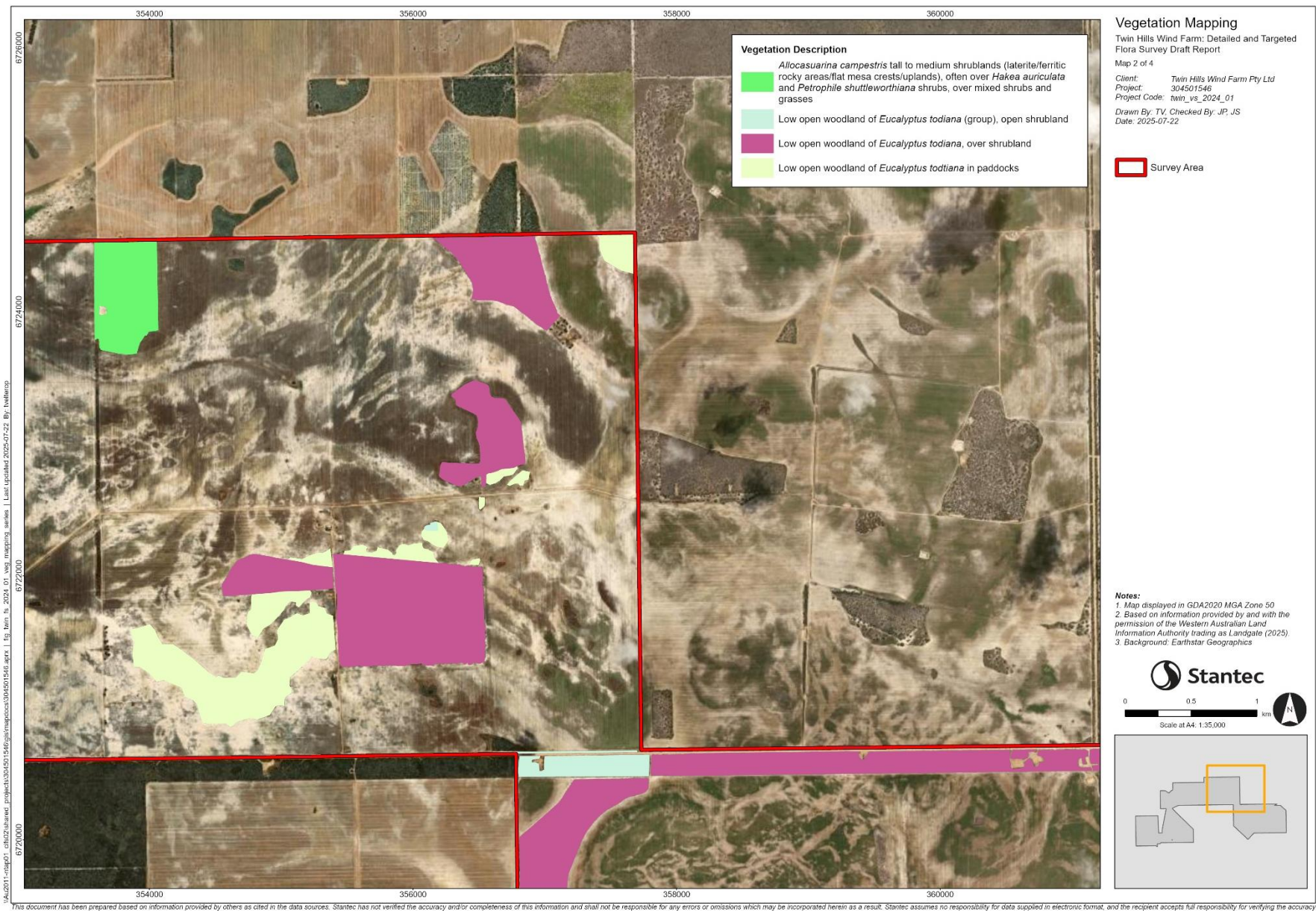
Notes:
1. Map displayed in GDA2020 MGA Zone 50
2. Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2025).
3. Background: Earthstar Geographics



\\AU201-r1aj01_cfu02shared_projects\304501546\gis\maps\doc\304501546_apr_1_fig_twin_va_2024_01_veg_mapping | Last updated: 2025-07-22 By: tveterop

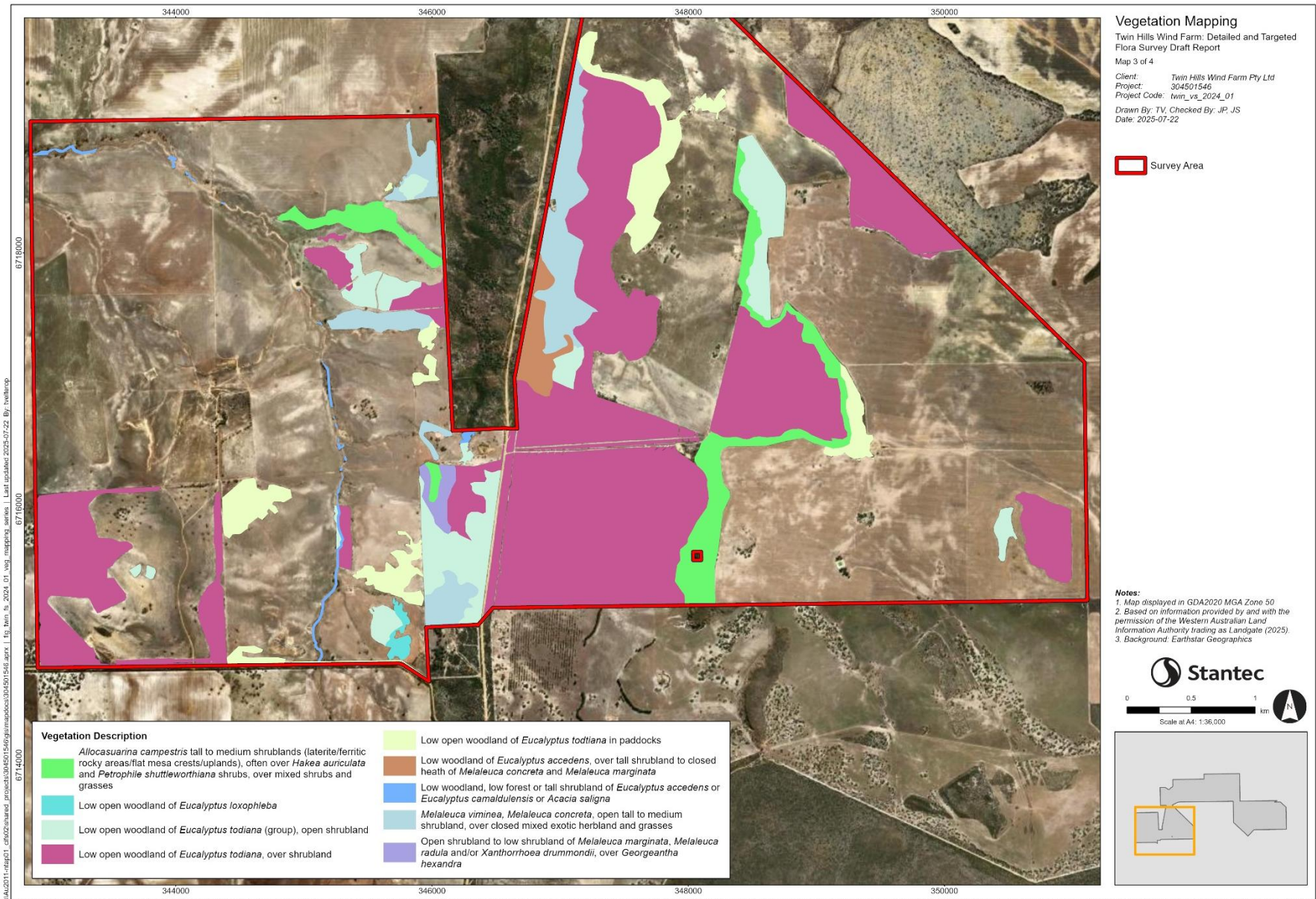
This document has been prepared based on information provided by others as cited in the data sources. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

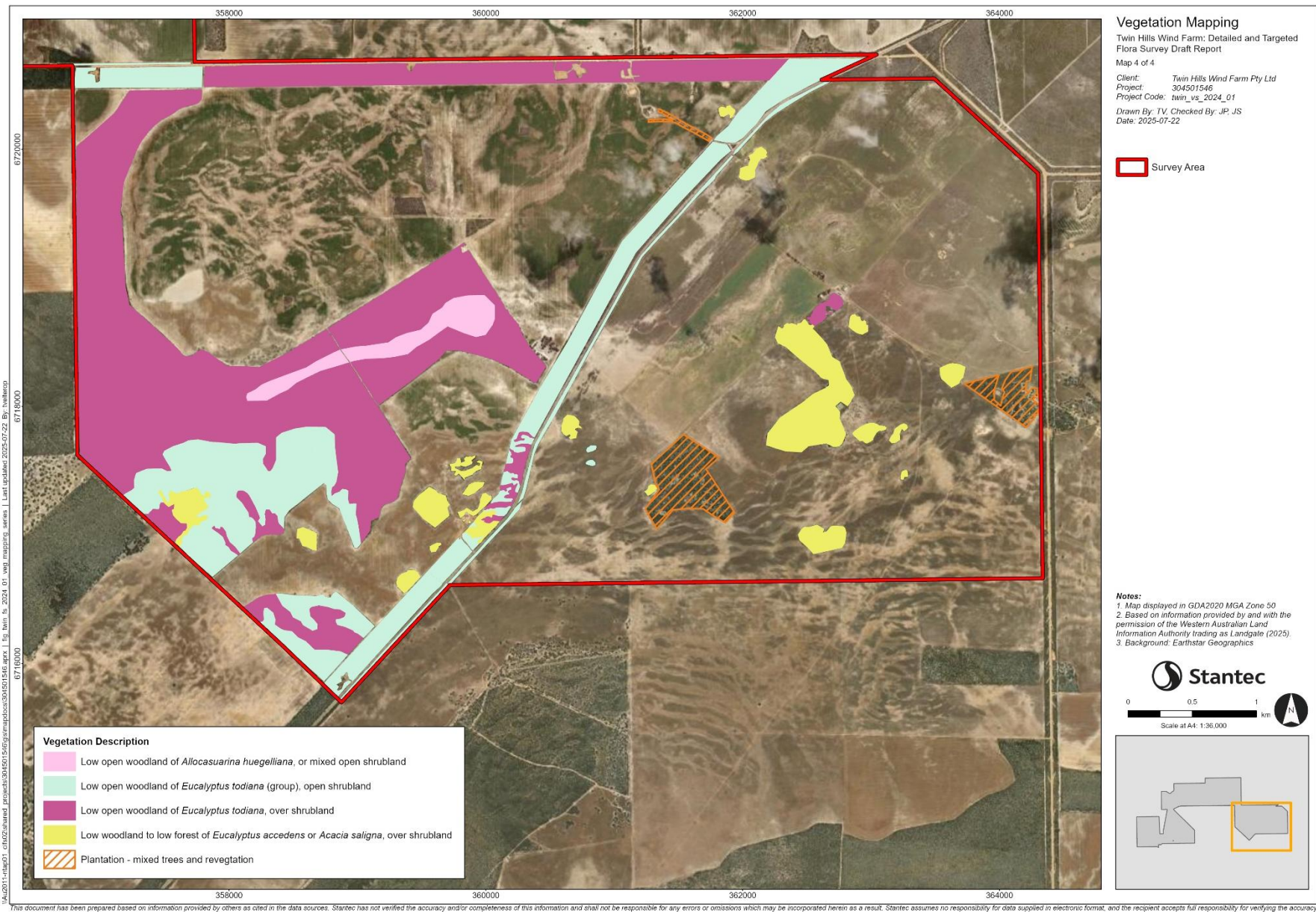




This document has been prepared based on information provided by others as cited in the data sources. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.







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Appendix L Site-by-species Matrix

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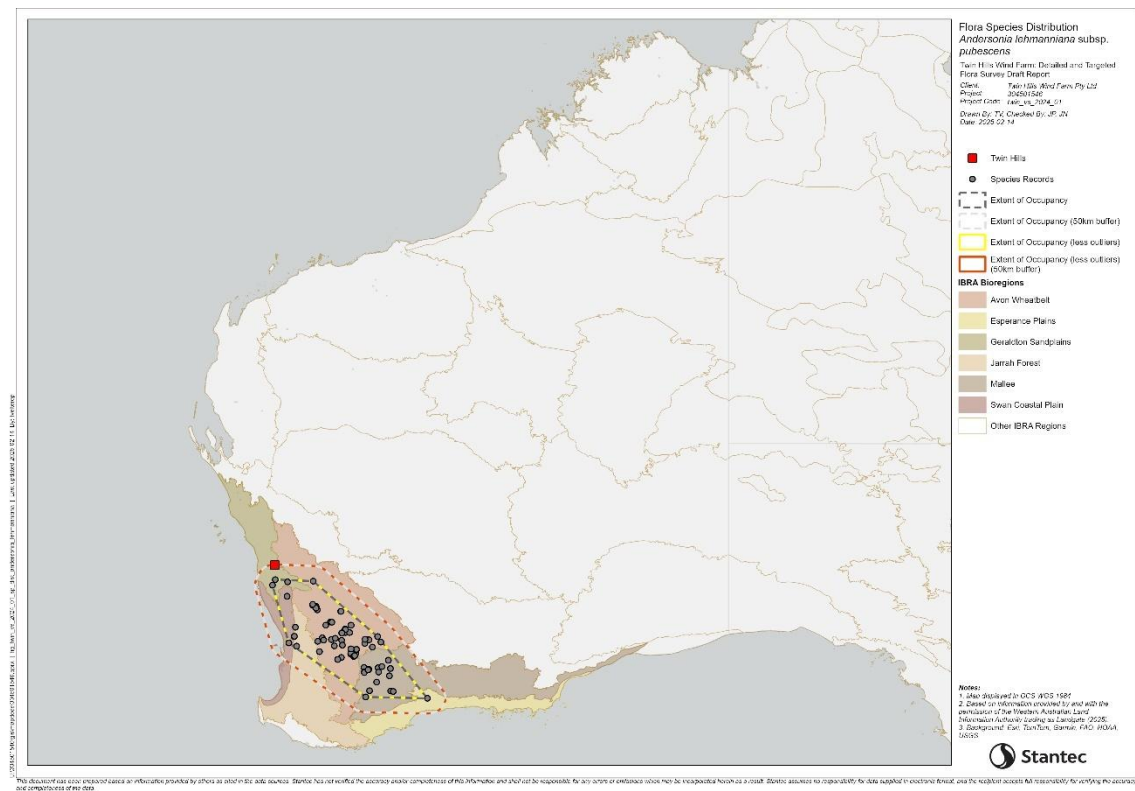


Appendix M Species Range Extension Figures

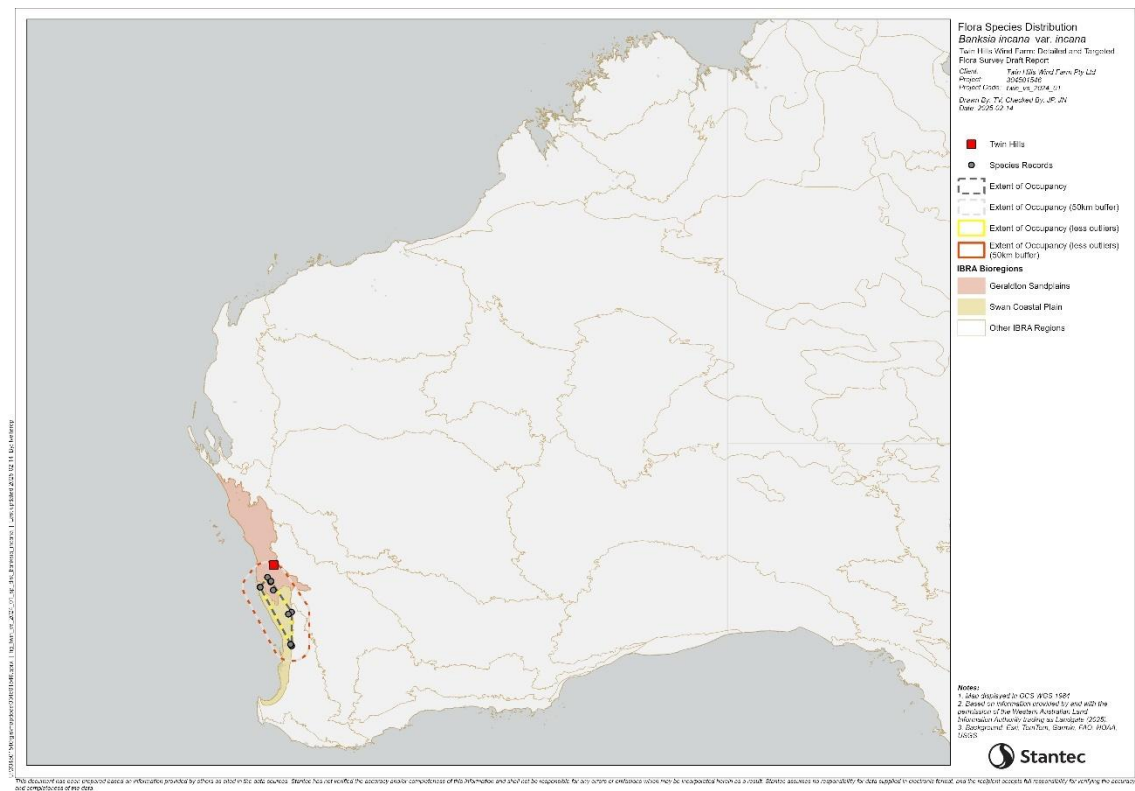
SENSITIVE



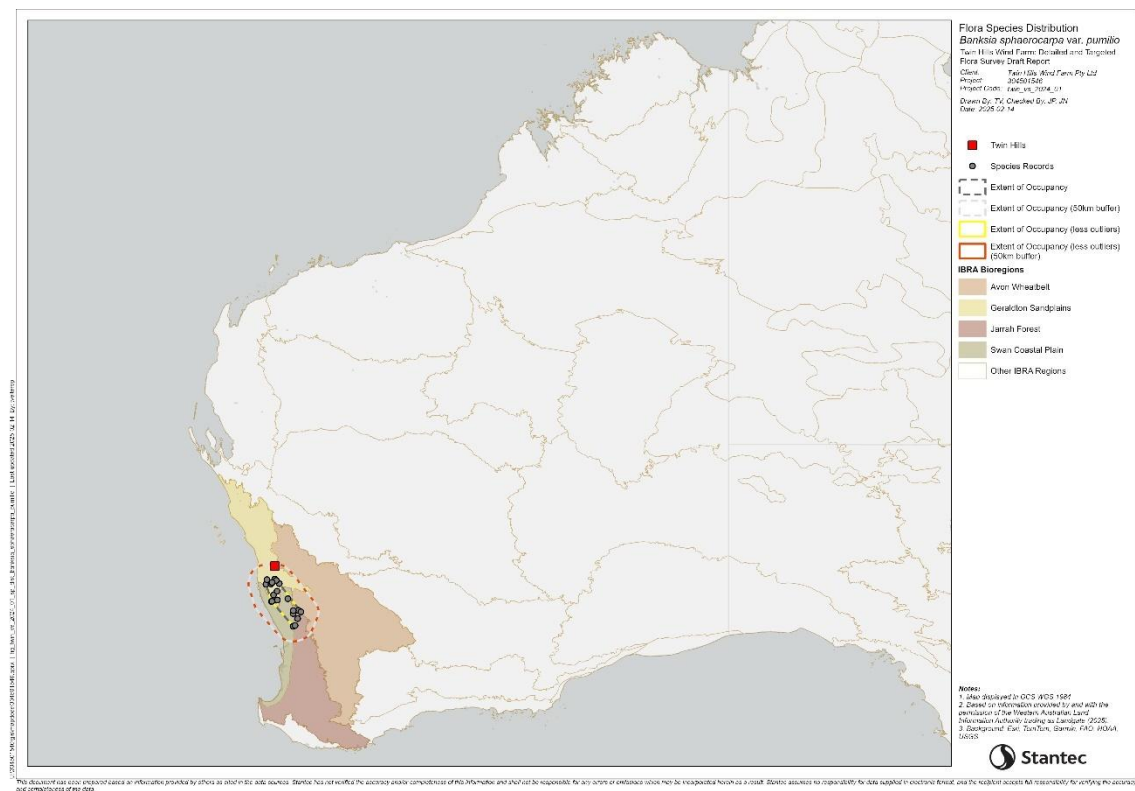
Andersonia lehmanniana subsp. pubescens distribution



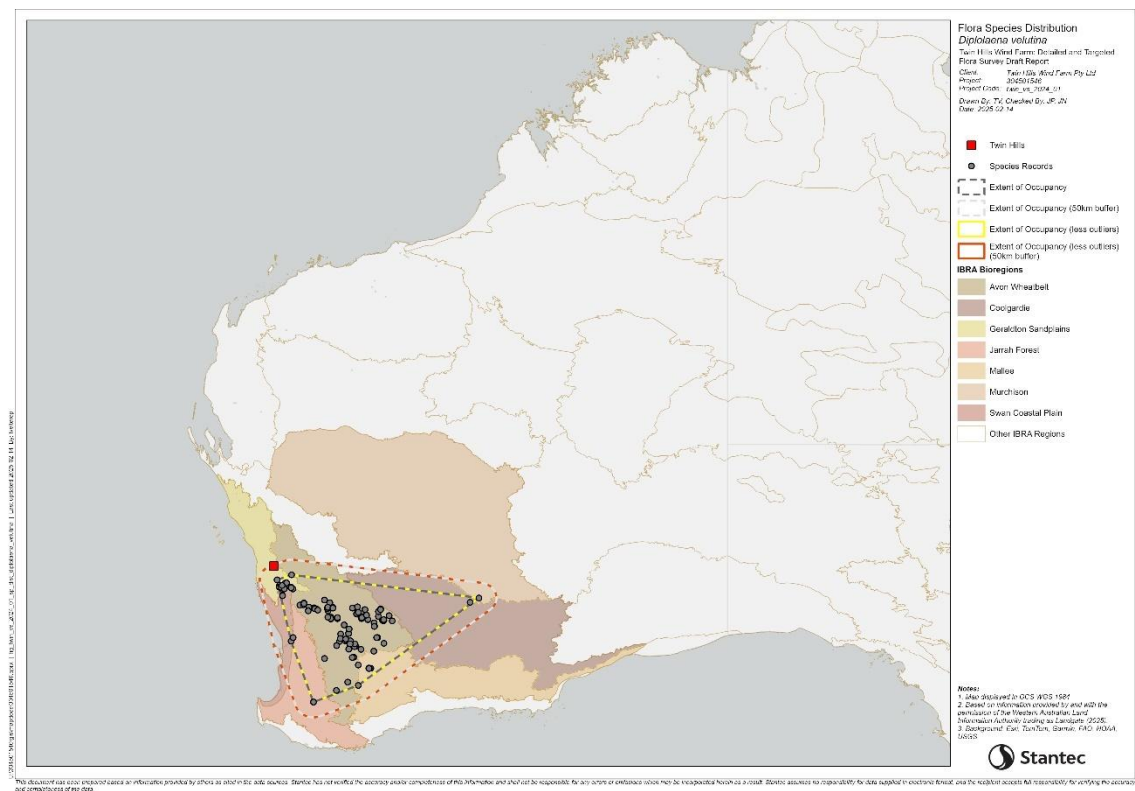
Banksia incana var. incana distribution



Banksia sphaerocarpa var. pumilio distribution

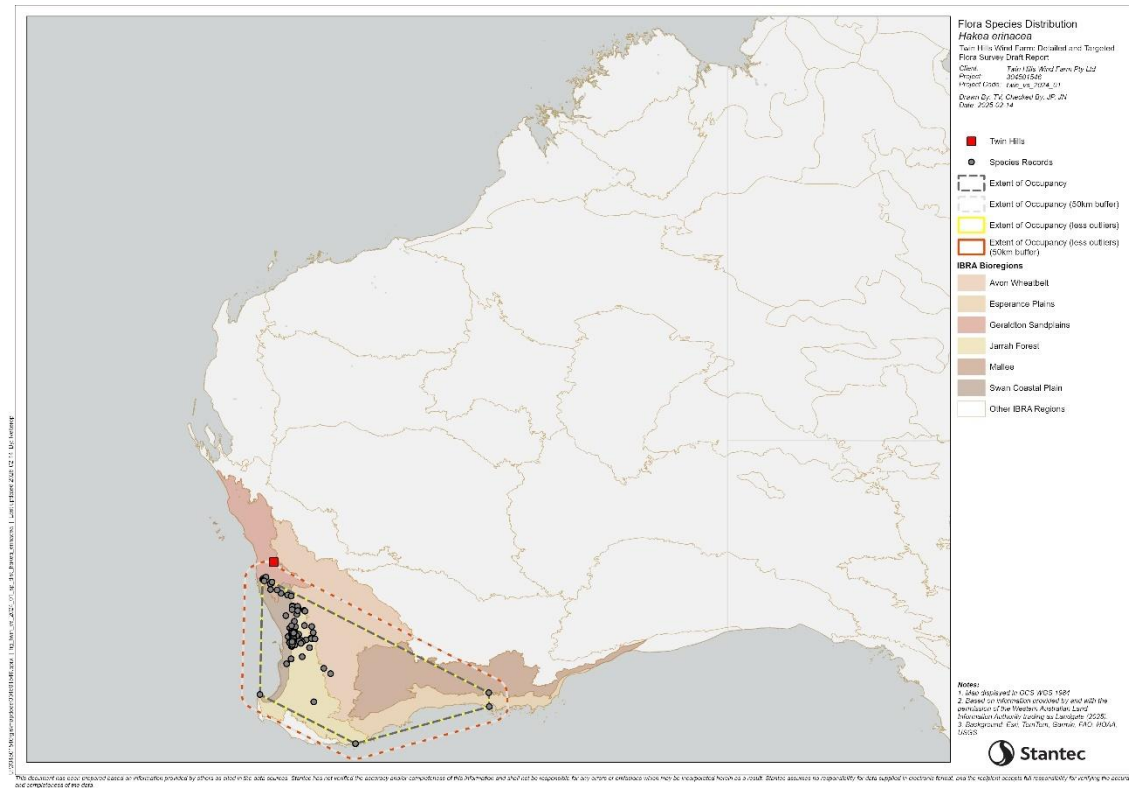
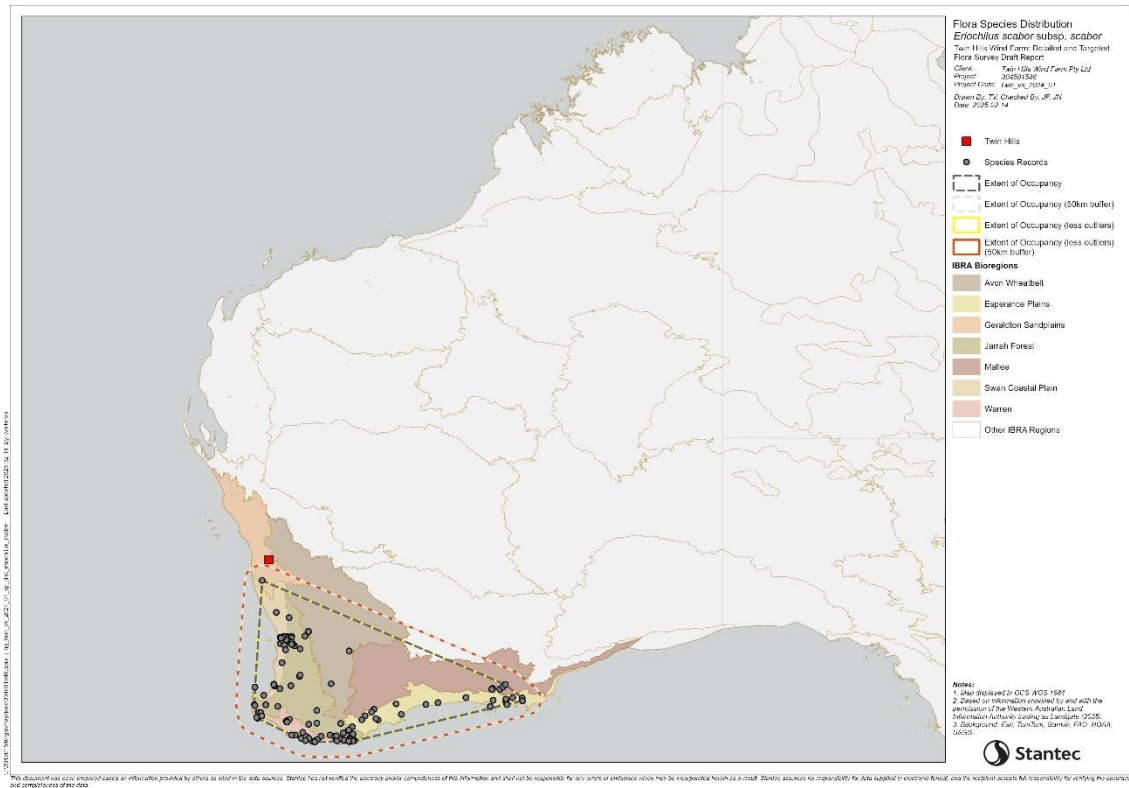


Diplolaena velutina distribution

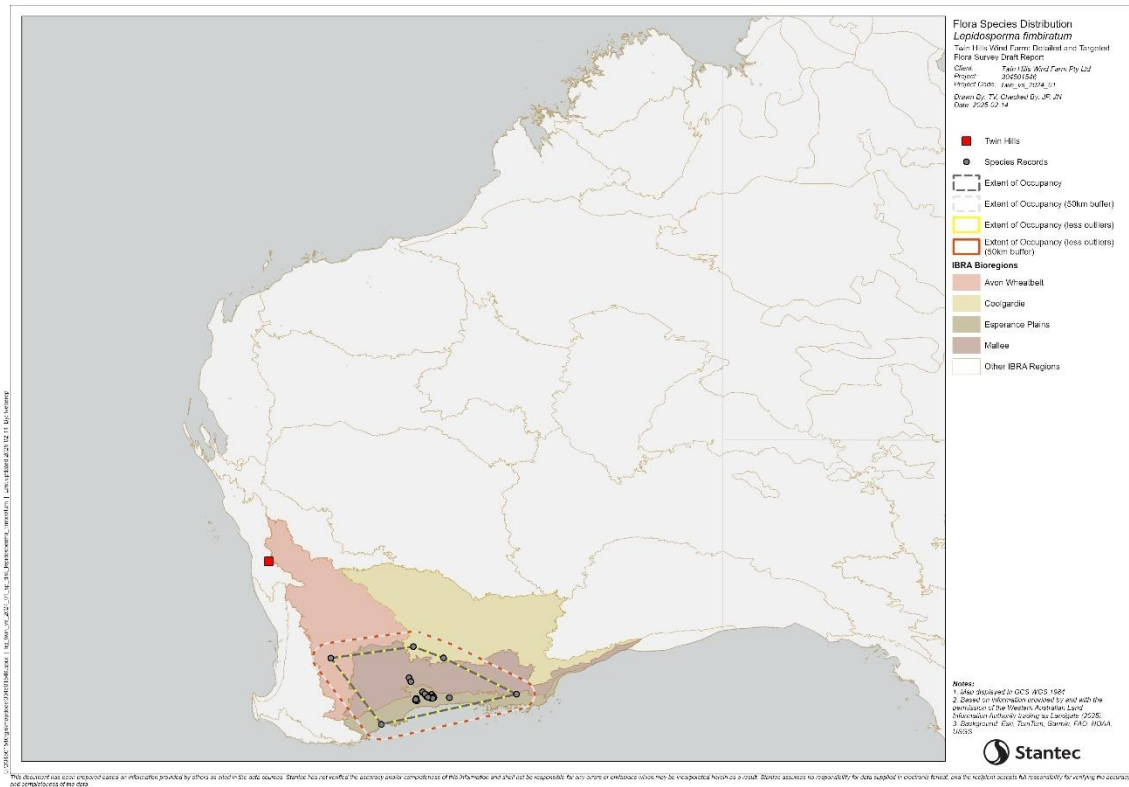


Eriochilus scaber subsp. scaber distribution

Hakea erinacea distribution



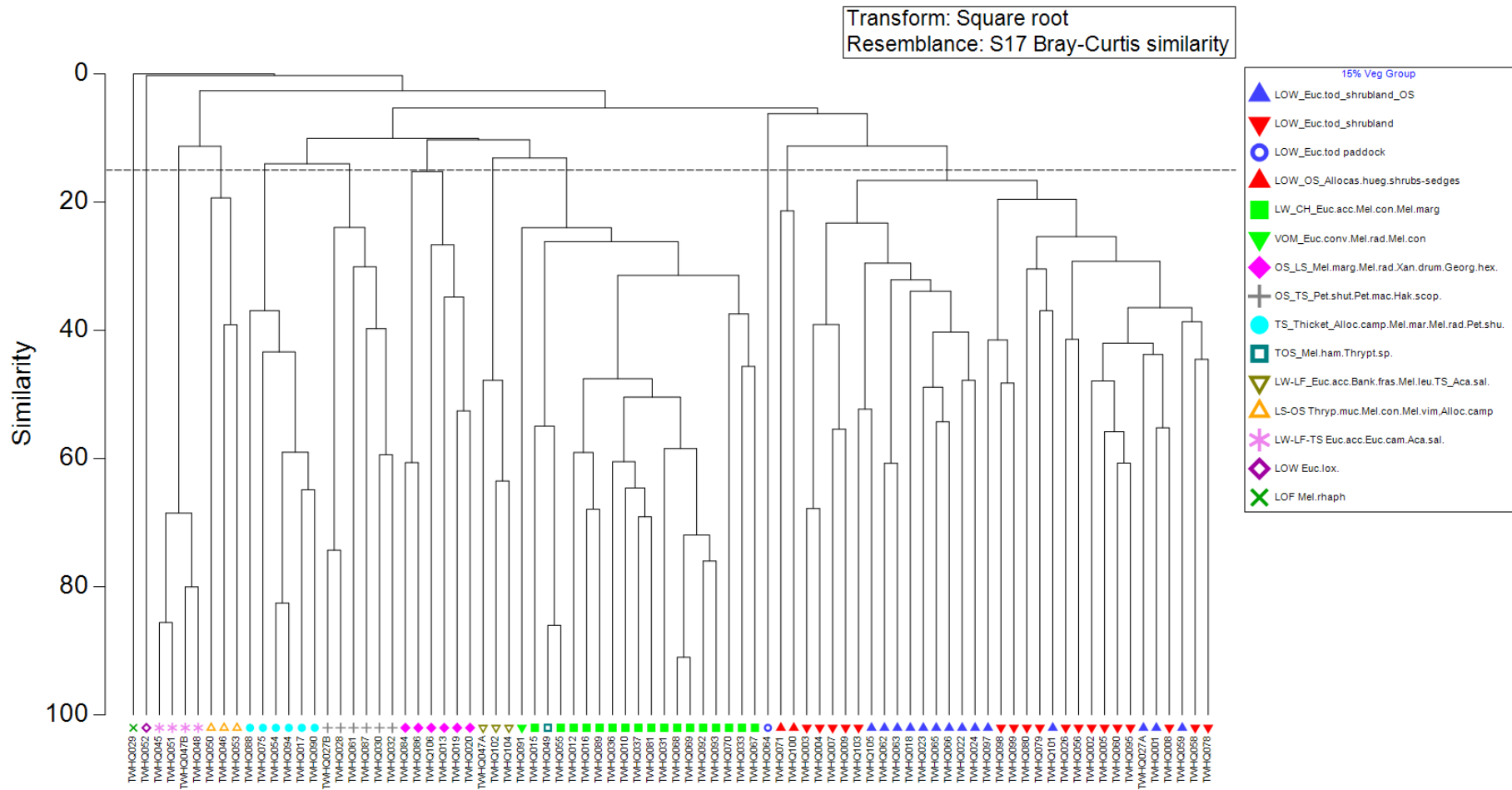
Lepidosperma fimbriatum distribution



Appendix N Floristic Analysis Dendrogram: Survey and Additional Area

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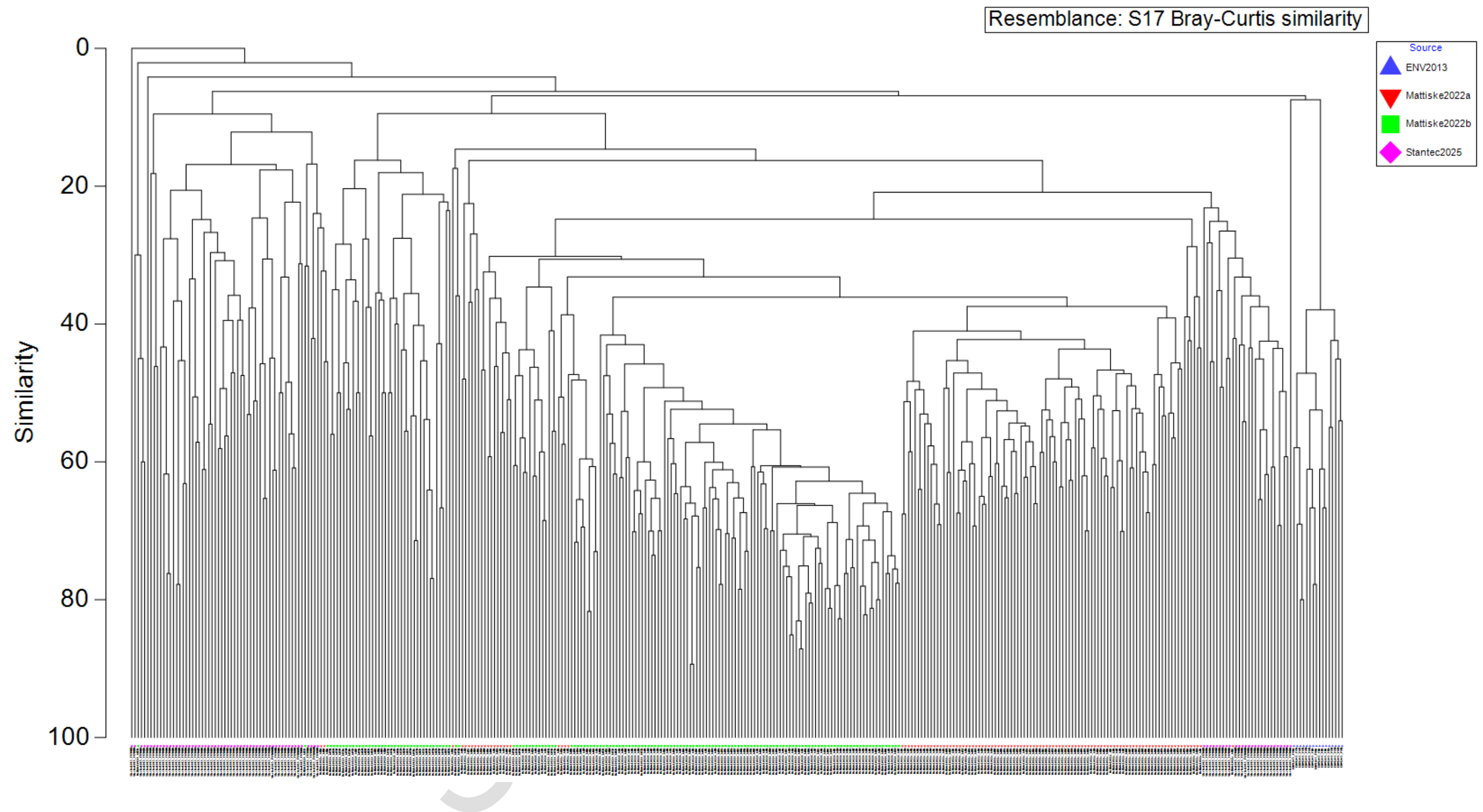




Appendix O Floristic Analysis Dendrogram: Regional Contextual Analysis

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Appendix P Site Visit of Adjacent Land Parcel

Following completion of the Detailed and Targeted Flora Survey, an adjacent land parcel ('Adjacent Land Parcel') was added to the proposed Survey Area (**Figure P-1**). Twin Hills Wind Farm Pty Ltd, care of Wind Prospect Pty Ltd (Wind Prospect) commissioned Stantec to undertake a site visit of the Development Envelope (**Figure P-1**) within the Adjacent Land Parcel, upon which non-turbine infrastructure may be installed for the Project.

During the Q2 2025 and Q3 2025 BBUSs, Stantec zoologists Jasmine Ridley, Jasmin Pratt, Lachlan Wild and Joey Laugharne conducted two single-day site visits to the development envelope of the Adjacent Land Parcel. During these visits, the team completed four habitat assessments (Stantec 2025), and photographed flora species to assist with identification. This resulting vegetation mapping was subsequently reviewed by Principal Botanist Alice Bott.

Within the Development Envelope of the adjacent land parcel, four vegetation types were identified (**Table P-1; Figure P-1**). Vegetation was assessed as 'Very Good' or 'Degraded' condition.

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Table P-1: Vegetation Types in the Development Envelope of Adjacent Land Parcel.

Vegetation Code	Vegetation Description	Vegetation Condition	Extent within development envelope of Adjacent Land Parcel	
			ha	% of vegetation
Low Woodland, Low Forest or Tall Shrubland of <i>Eucalyptus accedens</i> or <i>Eucalyptus camaldulensis</i> or <i>Acacia saligna</i>	LW-LF-TS Euc.acc.Euc.cam.Aca.sal.	Degraded	13.70	60.54
Low Woodland to Low Forest of <i>Eucalyptus accedens</i> or <i>Acacia saligna</i> , over Shrubland	LW-LF_Euc.acc.Bank.fras.Mel.leu.TS_Aca.sal.	Very Good	4.89	21.61
Low Open Woodland of <i>Eucalyptus tottiana</i> in paddocks	LOW_Euc.tod paddock	Degraded	2.73	12.06
Low Open Woodland of <i>Eucalyptus tottiana</i> , over shrubland	LOW_Euc.tod_shrubland	Very Good	1.31	5.79
Total			22.63	100





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