Reconnaissance and Targeted Flora and Vegetation Survey

Shaddicks Road Gravel Pit

(CPS 8496/1)

Cuballing

Prepared for the Shire of Cuballing
June 2020

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Executive Summary

Ecoedge was engaged by the Shire of Cuballing in September of 2019 to undertake a Reconnaissance and Targeted flora and vegetation survey of approximately 2.21 hectares (ha) of land comprising approximately 2.1 ha of vegetation on the west side of Shaddicks Road approximately 13 km east of the town of Popanyinning in the Shire of Cuballing.

The Shire are proposing to clear this vegetation in order to source gravel to support road construction projects in the region and required the survey to inform environmental approvals that may be associated with the proposal.

The flora and vegetation survey was undertaken on the 9 October 2019 in accordance with the Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016).

The Survey Area contained:

- Forty-five native flora and no introduced flora
- One Priority 1 listed taxon; *Hemigenia* sp. Newdegate (E. Bishop 75)
- Two vegetation units both in Excellent condition.

The Wheatbelt Wandoo Woodland vegetation unit which comprises 0.76 ha of the Survey Area is an occurrence of the State Priority 3 'Eucalypt Woodlands of the Western Australian Wheatbelt' ecological community and the Federal Critically Endangered 'Eucalypt Woodlands of the Western Australian Wheatbelt' threatened ecological community.

The Survey Area vegetation is a partial match for Beard vegetation association 1023 'Medium woodland; York gum, wandoo and salmon gum', which is mapped for the Survey Area. The extent remaining of this association at State (10.79%), IBRA region (10.84%), IBRA sub-region (12.32%) and local government (18.87%) levels is significantly below the Commonwealth's 30% retention target and it is also poorly represented within the Department of Biodiversity Conservation and Attractions estate (1.18%).

The 2.1 ha Survey Area vegetation forms part of larger 32 ha patch of bushland which is loosely connected via narrow corridors of road side vegetation to other generally isolated and loosely connected patches of vegetation on mostly cleared, agricultural land. Clearing of the Survey Area vegetation will not break, or disconnect the existing corridor of vegetation but will reduce the area of the remaining vegetation and reduce its value to the corridor.

There are no ESAs within or in close proximity to the Survey Area. The nearest is located approximately 11.8 km South East of the Survey Area and is associated with the East Yornaning Nature Reserve.

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Statement of Limitations

Reliance on Data

In the preparation of this report, Ecoedge has relied on data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report. Unless stated otherwise in the report, Ecoedge has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report are based in whole or in part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Ecoedge will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, unavailable, misrepresented or otherwise not fully disclosed to Ecoedge.

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1 Introduction

Ecoedge was engaged by the Shire of Cuballing to undertake a Reconnaissance and Targeted flora and vegetation survey of a proposed 2.21 ha gravel pit extension on Shaddicks Road approximately 13 kilometres (km) east of the Town of the Popanyinning in the Shire of Cuballing. The proposed gravel pit is located in a predominantly cleared agricultural landscape within a larger patch of vegetation on the west side of the road approximately 1.25 km north of the Bunmulling Road intersection (the Survey Area) (**Figure 1** and **Figure 2**).

The proposed extension to the gravel pit, is to provide raw material for the future ongoing road maintenance works within the Shire.

The survey was required to identify whether there were any conservation significant flora or vegetation within the survey area that will need to be considered as a part of the Shire's request to the Department of Water and Environmental Regulation for a strategic purpose clearing permit CPS8496/1, and any Federal environmental approval processes that may also be required with the project.

The survey's methodology was aligned with State and Federal requirements for the bioregion and species and communities present, including the Western Australian Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016) and Commonwealth survey guidelines for relevant threatened species.

The flora and vegetation survey was undertaken on the 9th October 2019. The total area surveyed was approximately 2.21 in size and comprised of mostly of native vegetation.

This report compiles findings of the survey.

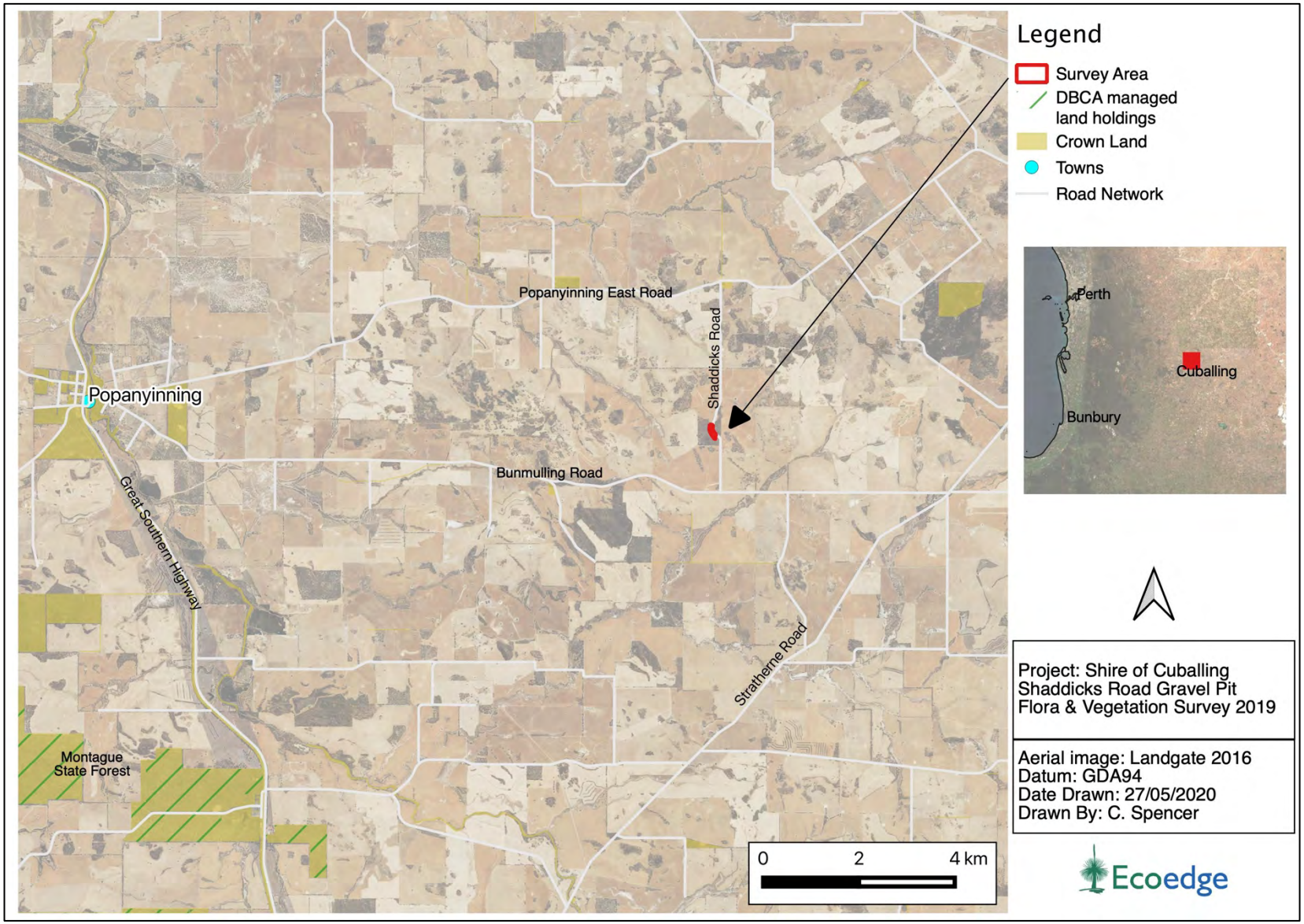

Figure 1. Aerial photograph showing the location of the Survey Area.

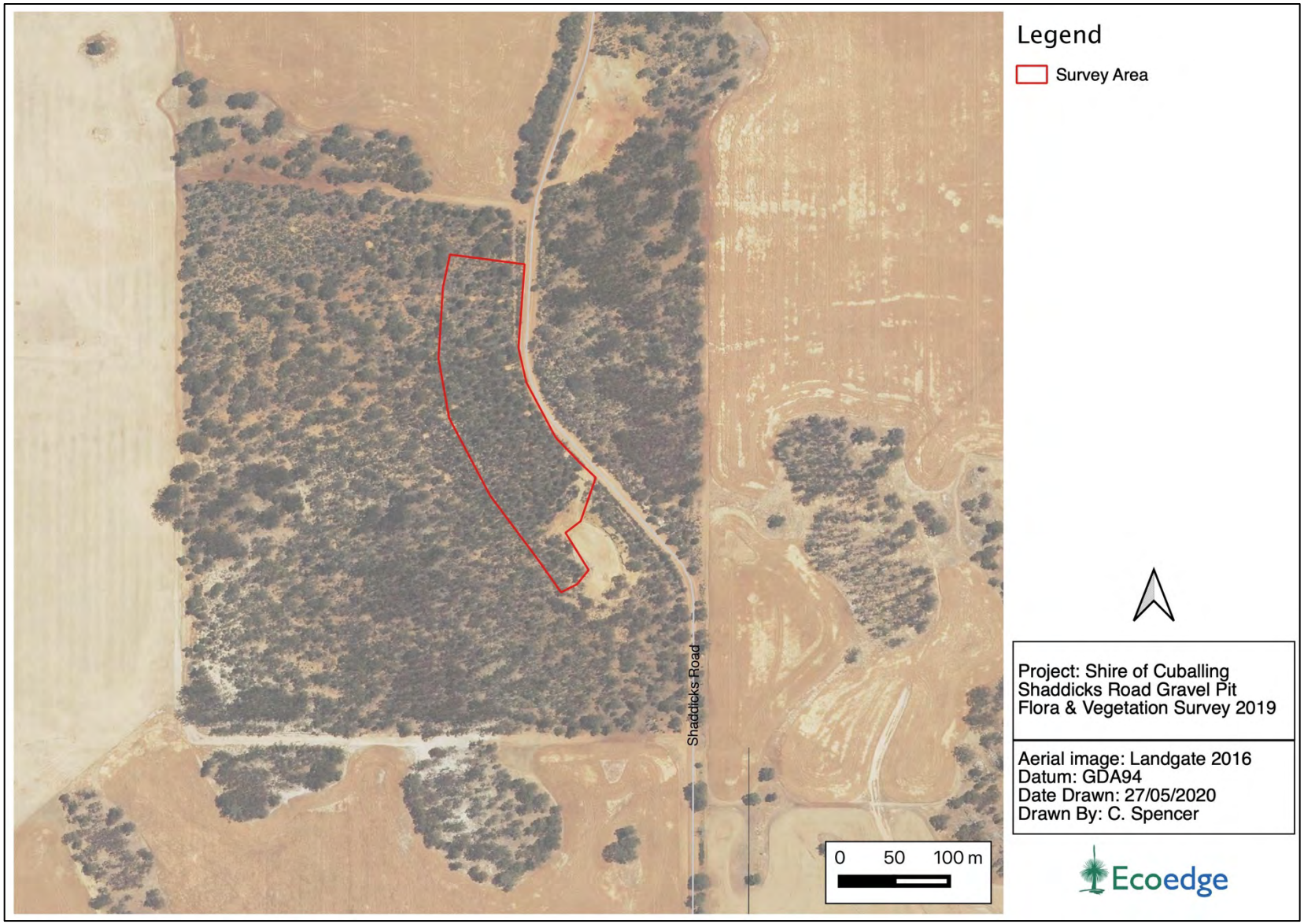

Figure 2. The Survey Area

1.1 Scope and Objectives

The objective of the Survey was to undertake a Targeted and Reconnaissance Flora and Vegetation Survey of approximately 2.21 ha of a proposed gravel pit extension on Shaddicks Road within the Shire of Cuballing.

The scope of work for this survey included:

- Recording the date(s) of the survey
- Recording all flora species present within the application area
- Noting any limitations for identifying species present, noting that the survey was required to be undertaken at an appropriate time for recording the majority of the species present.
- Recording the presence of threatened and priority ecological communities, especially the potential presence of the 'Eucalypt Woodlands of the Western Australian Wheatbelt Threatened Ecological Community' (TEC). The assessment of this TEC must be undertaken against the Commonwealth Department of the Environment and Energy's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Approved Conservation Advice (including listing advice) for this community.

  If a TEC or PEC is present, a map must be provided delineating the patch(es) of the TEC identified and its size (in hectares) and condition (using the Keighery scale).

- Undertaking multiple visits as required to confirm the identification of particular species if there is a risk those species could be declared rare or priority flora species.

  If declared rare or priority flora were identified, additional surveys of any adjacent remnant vegetation was undertaken to determine the species' population size and distribution.

- Recording and provision of the GPS location of all declared rare or priority flora species identified.

2 Desktop Assessment

2.1 Biogeographic Region

The Survey Area is situated within the Avon Wheatbelt P2 (AW2) sub-region of the Avon Wheatbelt biogeographic region as defined in the Interim Biogeographical Regionalisation for Australia (IBRA) (Commonwealth of Australia, 2016).

2.2 Geology

The Survey Area occurs within the Southern Zone of Rejuvenated Drainage (SZRD). The SZRD generally comprises an erosional surface of gently undulating rises to low hills with continuous stream channels that flow in most years. Colluvial process are active with soils formed in colluvium or in-situ from weathered rock (Sawkins, 2010). The SZRD has been divided into landscape systems and subsystems. Within the SZRD, the Survey Area is situated on soils of the Dryandra soil landscape System, and within that on the 257DyNO - Norrine Subsystem, as shown in **Figure 3** (McArthur *etal.* 1977). These are are described in **Table 1**.

Table 1. Soil Mapping Units for the Survey Area (McArthur et al. 1977)

Zone	Landscape System	Soil Subsystem
257 - Southern Zone of Rejuvenated Drainage	257Dy - Dryandra System Gently undulating granitic terrain, in the central Zone of Rejuvenated Drainage, with deep sandy duplex, loamy duplex and brown loamy earth.	257 DyNO – Norrine Subsystem A complex of lateritic residuals and associated pediment; gravely sand, sand, duplex yellow soils and duricrust

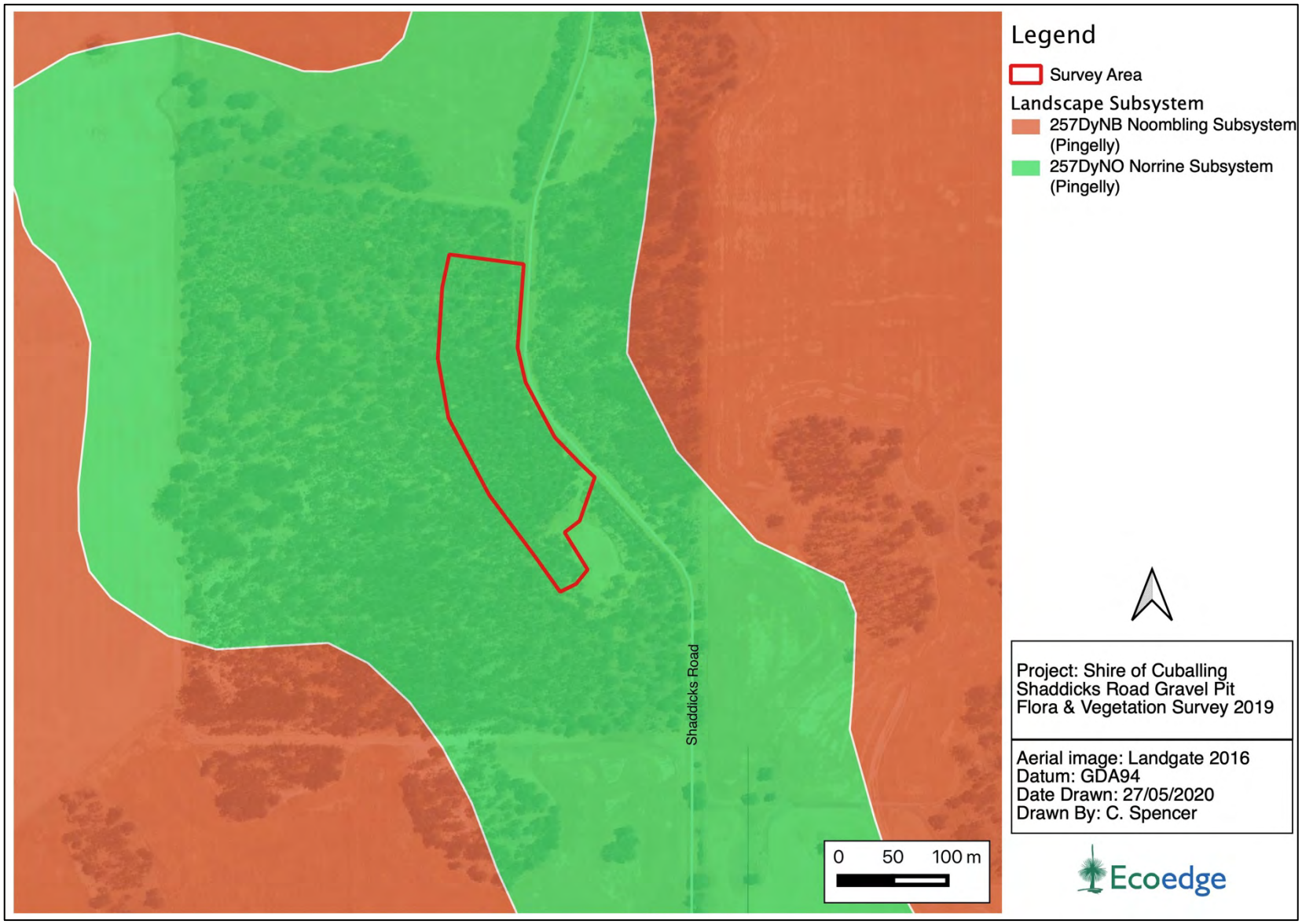

Figure 3. Soil subsystems mapped for the Survey Area (McArthur *et al.* 1977).

2.3 Vegetation Description according to pre-European Mapping Datasets

The 2.2 ha Survey Area contains approximately 2.1 ha of remnant native vegetation.

2.3.1 Vegetation Associations

A systematic survey of native vegetation in Western Australia was undertaken by J. S. Beard (along with others) during the 1970s, which described vegetation systems in the south-west of Western Australia at a scale of 1:250,000. Beard's vegetation maps attempted to depict the vegetation as it might have been prior to European settlement in terms of type and extent (Beeston *et al.*, 2001). The Beard Vegetation Association dataset, also referred to as the pre-European native vegetation extent dataset, was digitised by Shepherd *et al.* (2002).

Beard vegetation associations have been described to a minimum standard of Level 3 "Broad Floristic Formation" for the National Vegetation Inventory System (NVIS) (state-wide to regional scale)[1]. One Beard vegetation association is mapped across the Survey Area: Association 1023 'Medium woodland; York gum, wandoo and salmon gum'(Beard, 1980) **Figure 4.**

2.3.2 Assessment of Remaining Extent against Pre-European Extent

In 2001, the Commonwealth of Australia stated National Targets and Objectives for Biodiversity Conservation, which recognised that the retention of 30%, or more, of the pre-clearing extent of each ecological community was necessary if Australia's biological diversity was to be protected (Environment Australia, 2001).

In its report on the Statewide Vegetation Statistics incorporating the Comprehensive, Adequate and Representative (CAR) Reserve Analysis, the Government of Western Australia provides information on the pre-European and current extent of the ecological communities of Western Australia and reports on the status of the CAR reserve system for WA (Government of Western Australia, 2018). This system is also based on the National retention targets of 30% overall. Only reserves managed by DBCA under the *Conservation and Land Management Act 1984* are considered for inclusion in the "CAR Reserve Analysis".

An assessment of Beard's vegetation association 1023 against the *Statewide Vegetation Statistics* is presented in **Table 2.**

[1] Beard's vegetation mapping units are referred to as 'associations' however these do not correspond to the NVIS Level 5 'Associations'. The NVIS system was developed long after Beard's work was completed, and while both classification systems use the same term, NVIS 'Associations' describe vegetation in more detail than do Beard's.

The red, orange and yellow shading in the tables indicates the status of the Commonwealth 30% retention target.

Colour indicator	>30%	<30%	<10%

Table 2. Beard vegetation association 1023 assessed against the Statewide Vegetation Statistics (Government of Western Australia, 2018).

Beard Vegetation Association	Pre-European (ha)	Current Extent (ha)	% Remaining	% remaining in DBCA Managed Land
Association 1023				
State-wide	1,601,605.76	172,875.16	10.79%	1.18%
IBRA region:	1,522,680.40	165,123.59	10.84%	1.13%
IBRA sub-region	1,123,736.23	138,408.96	12.32%	1.27%
Shire of Cuballing	97,360.06	18,370.50	18.87%	4.77%

* Excludes Crown Freehold Department Interest Lands that are managed under Section 8(a) of the CALM Act.

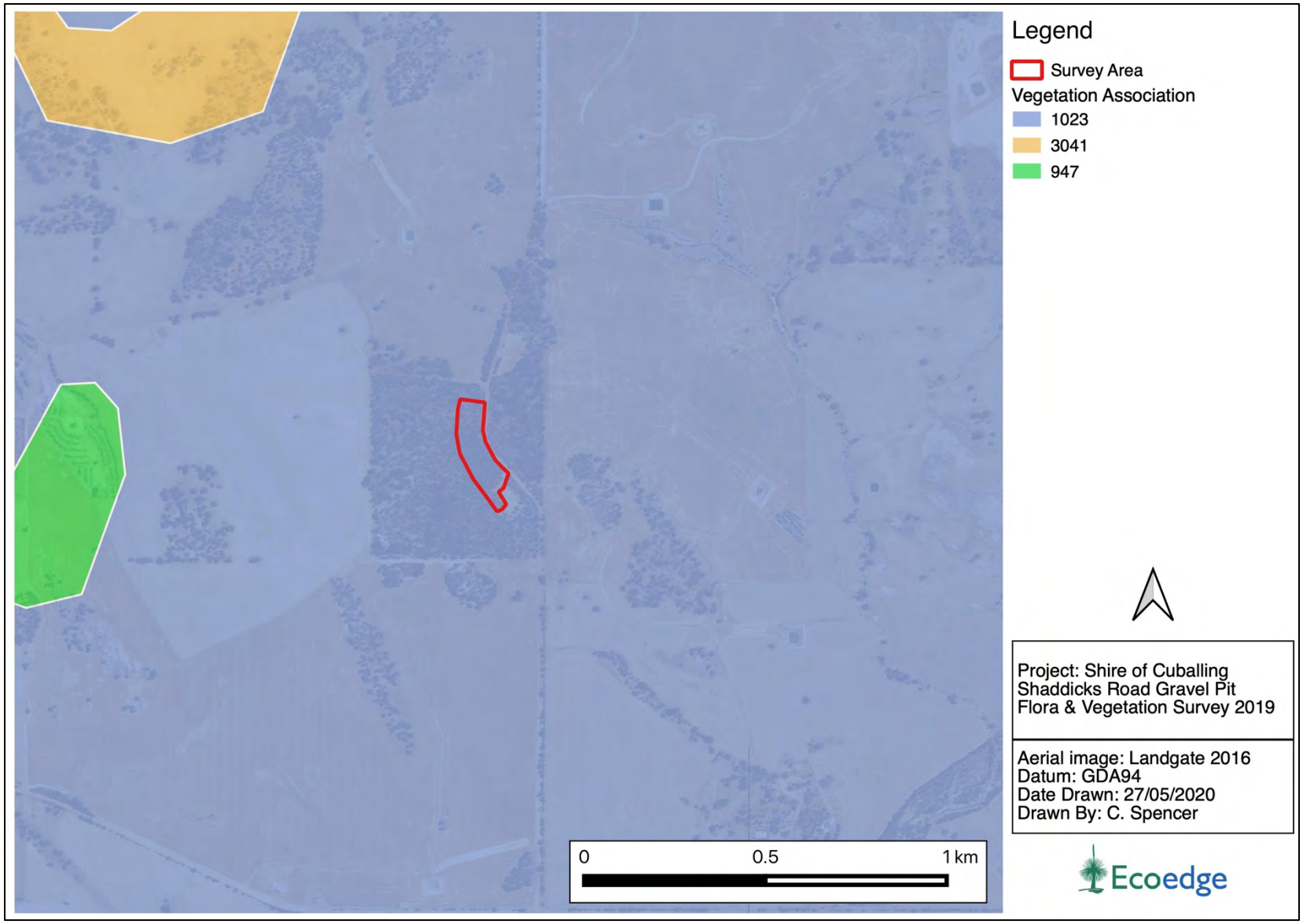

Figure 4. Vegetation associations mapped within and nearby the Survey Area (Beard, 1980).

2.4 Threatened and Priority Ecological Communities

Ecological communities are defined by Western Australia's DBCA (previously DPaW and the Department of Environment and Conservation (DEC)) as "...naturally occurring biological assemblages that occur in a particular type of habitat. They are the sum of species within an ecosystem and, as a whole, they provide many of the processes which support specific ecosystems and provide ecological services." (DEC, 2013).

Under Section 27 of the *Biodiversity Conservation Act 2016* (BC Act) the Western Australian Minister for Environment may list communities that are considered to be under significant threat as a Threatened ecological communities (TEC). These TECs can be listed under one of three conservation categories; critically endangered (CE), endangered (EN), vulnerable (V). The BC Act also provides for listing communities as collapsed ecological communities.

Possible TECs that do not meet survey criteria are added to the DBCA's Priority ecological community lists under Priorities 1, 2 or 3 (referred to as P1, P2, P3). 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 (P4). These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5 (P5) (DEC, 2013).

The current listing of Threatened and Priority ecological communities is specified in DBCA (2018a, 2019a). The conservation categories for these Threatened and Priority ecological communities are defined in **Appendix 1**.

Threatened ecological communities can also be listed under the Commonwealth *Environment and Biodiversity Conservation Act 1999* (EPBC Act) (Department of the Environment and Energy (DotEE) 2018a, Department of Environment, Water, Heritage and the Arts (DEWHA) 1999). There are three categories of TEC under the EPBC Act: Critically Endangered (CE), Endangered (E) and Vulnerable (V). These are defined in **Appendix 2** (DotEE, 2018b).

Under both the State (BC Act) and Federal Act (EPBC Act) ministerial authorisation is required where significant permanent modification to a TEC will occur.

A Protected Matters Search Tool report for communities listed under the EPBC Act occurring within a 10 km radius of the Survey Area was undertaken (DotEE 2019a, **Appendix 3**), and the current DBCA TEC and PEC listings were consulted (DBCA 2018a, DBCA 2019a). Outcomes of these searches are presented in **Table 3.**

Noting that if an occurrence of a threatened ecological community is found during a survey conducted under the auspices of the *Environmental Protection Act 1986* (EP Act) it must be mandatorily reported to the Chief Executive Officer of the DBCA under Section 49 of the BC Act.

Table 3. TECs and PECs occurring within 10 km of the Survey Area (DBCA, 2018a, 2019a; DotEE, 2019a).

Community Name	Status (WA)	Status (EPBC Act)
'Eucalypt Woodlands of the Western Australian Wheatbelt'; a federally listed TEC consisting of numerous State-listed communities	P3	CR

Note: This table only includes formally recognised TECs that are known of and mapped by DBCA and are included in their database.

2.5 Threatened and Priority Flora

Species of flora and fauna are defined as having a Threatened or Priority conservation status where their extant populations are restricted geographically and or under threat of possible extinction. The Department of Biodiversity, Conservation and Attractions recognises these threats and consequently applies regulations towards population and species protection.

Threatened extant flora species are listed under Section 19 of the BC Act and are ranked according to their level of threat using the International Union for Conservation of Nature (IUCN) Red List categories and criteria of; critically endangered (CE), endangered (EN), vulnerable (VU). It is an offence to "take" or damage threatened flora without Ministerial approval. Section 5 of the Act defines "to take" as "… to gather, pluck, cut, pull up, destroy, dig up, remove, harvest or damage flora by any means".

Priority flora are under consideration for future declaration as "Threatened flora", dependent on more information. Species classified as Priority One to Three (referred to as P1, P2 and P3) are in need of further survey to determine their status, while Priority Four (P4) species are adequately known rare or threatened species that require regular monitoring.

Threatened flora lists are formally reviewed on an annual basis, whilst the priority flora list is subject to a less formal ongoing review. The current listing of Threatened and Priority flora was updated on the 5th December 2018 (DBCA 2018b).

Categories of Threatened and Priority flora as defined by the BC Act are presented in **Appendix 4**, (DBCA 2019b).

Threatened flora may also be protected under the Commonwealth EPBC Act and be listed in one of six categories; the definitions of these categories are summarised in **Appendix 5** (DotEE 2018b).

Threatened or Priority flora occurring within 10 km of the Survey Area generated from a NatureMap search within 10 km of the Survey Area (DBCA 2019c) are listed in **Table 4.** Taxa listed under the EPBC Act (based on results of the Protected Matters Search Tool query (DotEE 2019a)) were also considered in the preparation of the table. Several of the species listed in

Table 4 could potentially occur within the Survey Area, based on an assessment of their preferred habitats.

Noting that if any threatened flora species are found during a survey conducted under the auspices of the EP Act that they must be mandatorily reported to the CEO of the DBCA under Section 43 of the BC Act.

Table 4.Threatened and Priority List flora known to occur within 10 km of the Survey Area (DBCA, 2019c; DotEE, 2019a.)

Species	Cons Status*	Flowering	Habitat	**Likelihood of Occurrence
Guichenotia seorsiflora	T (CR)	Jul to Sep	Multi-stemmed shrub, to 0.6 m high. Fl. pink/pink-cream. Sandy clay with lateritic gravel. Breakaways.	Possible
Acacia lanuginophylla	T (EN)	Jul to Oct	Dense shrub, 0.5-1.2 m high. Fl. yellow. White/grey sand, clayey sand, gravelly soils. Flats, along drainage lines.	Possible
Banksia oligantha	T (EN)	Oct-Nov	Non-lignotuberous shrub, to 3 m high. Fl. red & cream/orange-brown. Yellow or yellow-brown sand.	Possible
Boronia capitata subsp. *capitata*	T (EN)	Aug to Dec or Feb	Slender shrub, 0.3-1.3 m high. Fl. pink. Sand, often over laterite. Sandplains.	Possible
Caladenia hoffmanii	T (EN)	Aug-Oct	Tuberous, perennial, herb, 0.13-0.3 m high. Fl. green & yellow & red. Clay, loam, laterite, granite. Rocky outcrops and hillsides, ridges, swamps and gullies.	Unlikely
Grevillea dryandroides subsp. *hirsuta*	T (EN)	May or Sep to Nov	Prostrate, vigorously suckering shrub, 0.05-0.3 m high. Fl. red/pink-red. White or yellow sand, laterite.	Possible
Grevillea scapigera	T (EN)	Feb or Oct to Nov	Suckering, prostrate to weakly ascending shrub, 0.15-0.4 m high, up to 1.8 m wide. Fl. white/yellow-green. Sandy or gravelly lateritic soils.	Possible
Roycea pycnophylloides	T (EN)	Sep	Perennial, herb, forming densely branched, silvery mats to 1 m wide. Fl. Sandy soils, clay. Saline flats.	Unlikely
Symonanthus bancroftii	T (EN)	Sep	Shrub, 0.15-0.25 m high. Fl. white.	Possible
Verticordia staminosa var. *cylindracea*	T (EN)	Jul to Oct	Spreading shrub, 0.3-0.8 m high. Fl. green-yellow/yellow-brown. Soil pockets. Granite outcrops.	Unlikely
Jacksonia debilis	P1	Sep to Oct	Prostrate shrub. Fl. yellow & red. White or grey clayey sand.	Possible
Leucopogon audax	P2	Aug-Oct	Erect open shrub to 150 cm high x 120 cm wide. Leaves helically arranged. Corolla tube white, lobes white, partially pink - longer than tube. Lateritic uplands.	Possible

Species	Cons Status*	Flowering	Habitat	**Likelihood of Occurrence
Stylidium exappendiculatum	P3			Possible
Caladenia integra	P4	Sep to Oct	Tuberous, perennial, herb, 0.2-0.5 m high. Fl. green & red. Clayey loam. Granite outcrops, rocky slopes.	Possible
Eucalyptus loxophleba x *wandoo*	P4	Sep to Oct, Dec - Feb	(Mallee) or tree, 4-20 m high, bark rough black-brown on trunk. Sandy clay or loam.	Possible
Gastrolobium stipulare	P4	Sep	Erect, leafy shrub, to 0.5 m high. Fl. Yellow & red & brown. Yellow-grey sand, gravelly clay loam, laterite. Slopes, ridges.	Possible
Stylidium tenuicarpum	P4	Sep to Nov	Rosetted perennial, herb, 0.1-0.5 m high, Leaves broadly linear to narrowly oblanceolate, 1-7 cm long, 1-2.5 mm wide, apex mucronate, margin hyaline, glabrous. Scape hoary. Inflorescence racemose. Fl. yellow/orange. Sandy loam over laterite or granite. Rock outcrops, hillslopes, breakaways. Shrubland, open woodland.	Possible

*Note: The BC Act Conservation Status is shown, EPBC Act status, where relevant, is in brackets.
**

Likely – Known to occur within ten kilometres of the Survey Area with Suitable habitat within the Survey Area

Possible –Suitable habitat within the Survey Area but not known to occur within ten kilometres of the Survey Area

Unlikely – No suitable habitat present within the Survey Area

Unknown – Data deficient.

2.6 Ecological Corridors and Connectivity

The 2.21 ha Survey Area occurs within a larger patch of isolated bushland within a mostly cleared and fragmented agricultural landscape. This larger patch of bushland is approximately 32 ha in size and, according to aerial photography, is one of the larger patches of vegetation within the area. It is loosely connected via narrow corridors of roadside vegetation to other generally isolated and loosely connected patches of vegetation, most of which occur on managed agricultural land.

2.7 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are protected under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 and are selected for their environmental values at state or national levels (Government of Western Australia, 2005). They include;

- Defined wetlands and riparian vegetation within 50 m;
- Areas covered by Threatened Ecological Communities;
- Area of vegetation within 50 m of Threatened flora;
- Bush Forever sites; and
- Declared World Heritage property sites.

There are no ESAs in close proximity to the Survey Area. The nearest is located approximately 11.8 km south east of the Survey Area and is associated with the East Yornaning Nature Reserve.

3 Methods

3.1 Desktop Assessment

Prior to the field survey, a "desktop assessment" was carried out by downloading a NatureMap report listing all flora (including Threatened flora) occurring within 10 km of the Survey Area (DBCA 2019c) (**Appendix 3**). A Protected Matters Search report was also generated to provide information regarding Matters of National Environmental Significance (MNES) known or potentially occurring within 10 km of the Survey Area (DotEE, 2019a) (**Appendix 3**). This data was used to establish the list of Threatened and Priority flora to target during the survey, as well as providing a list of what other plant taxa might be encountered during the survey.

3.2 Field Survey

The field survey was undertaken by Russell Smith (SL flora permit FB62000192) on 9th October 2019. The Survey Area covered a total of approximately 2.21 ha of which about 2.1 ha was native vegetation (the remainder comprising a cleared gravel pit area). A comprehensive list was made of the native flora and information on vegetation structure, dominant species and vegetation condition was collected at 24 assessment points through the Survey Area.

Flora species that were not identified in the field were photographed for later identification. Taxonomy and conservation status of flora species was checked against DBCA databases (MAX download, 26/09/2019, DBCA, 2019d).

Vegetation condition was assessed against the method of the EPA (2016) (**Appendix 6**).

3.3 Survey Limitations

Potential limitations with regard to the assessment are addressed in **Table 5.**

Table 5. Limitations of the field survey with regard to assessment adequacy and accuracy.

Aspect	Constraint	Comment
Scope	No	The survey scope was prepared in consultation with the client and was designed to comply with EPA requirements.
Proportion of flora identified	Minor	The survey was carried out in only one visit in October which is within the optimal survey time.
Climatic and seasonal effects	Minor	The survey area recorded about 70-80% of the average rainfall during the 2019 wet season (Apr-Nov). Herbaceous species germination may have been reduced.
Availability of contextual information	Minor	Some regional surveys have been carried out in the wheatbelt, and some contextual information is available.
Completeness of the survey	Negligible	All of the Survey Area vegetation was easily accessible.
Skill and knowledge of the botanists	No	The botanist has over 25 years' experience working in south west of WA, including 10 years' experience in the Avon Wheatbelt IBRA region.

4 Results

4.1 Flora

Forty-five species of flora were identified within the Survey Area – there were no introduced taxa. The list of vascular flora recorded during the field survey is included in **Appendix 7**.

One plant of the priority one (P1) listed taxon was identified; *Hemigenia* sp. Newdegate (E. Bishop 75) **Figure 5** and **Figure 6**. The location of this plant is shown in **Figure 9.** The Threatened and Priority Flora Report Form for this P1 species is included in **Appendix 9**.

No other conservation-significant species were found.

No introduced flora, including Declared Pest Plants or Weeds of National Significance were identified within the Survey Area.

Figure 5. *Hemigenia* sp. Newdegate (E. Bishop 75) flower.

Figure 6. *Hemigenia* sp. Newdegate (E. Bishop 75).

4.2 Vegetation Units

Two vegetation units were recognised and mapped for the Survey Area: Wheatbelt Wandoo woodland and Rock Sheoak woodland. These are described below with accompanying pictures (**Figure 7** and **Figure 8)** and shown in **Figure 9.**

Figure 7. Wheatbelt Wandoo woodland TEC (CR) and PEC (P3).

Wheatbelt Wandoo woodland: *Eucalyptus capillosa* subsp. *capillosa* woodland over *Adenanthos cygnorum* subsp. *cygnorum*, *Banksia armata*, *B. sphaerocarpa* var. *caesia*, *Calothamnus quadrifidus* subsp. *quadrifidus*, *Daviesia incrassata* subsp. *incrassata*, *Hakea prostrata*, *Leptospermum erubescens*, *Melaleuca tuberculata*, *Xanthorrhoea drummondii* shrubland over *Conostylis setigera*, *Glischrocaryon aureum*, *Lagenophora huegelii*, *Pterochaeta paniculata* very open herbland and *Lepidosperma costale*, *L. resinosum* very open sedgeland on yellow-brown gravelly sandy-loam.

Figure 8. Rock Sheoak woodland

Rock Sheoak woodland*:* *Allocasuarina huegeliana* woodland over *Astroloma epacridis*, *Banksia nobilis*, *Gastrolobium calycinum*, *Grevillea leptobotrys*, *Leptospermum erubescens*, *Melaleuca tuberculata* shrubland over *Dampiera lavandulacea*, *Hemigenia sericea*, *Lechenaultia biloba*, *Leucopogon* sp. Wandering (F. Hort 419), *Thryptomene australis* subsp. *australis* low shrubland over *Conostylis setigera*, *Glischrocaryon aureum*, *Lagenophora huegelii*, *Pterochaeta paniculata* very open herbland and *Lepidosperma costale*, *L. resinosum* very open sedgeland on yellow-brown gravelly sandy-loam.

4.3 Vegetation Condition

Table 7 shows that almost all of the Survey Area was in Excellent condition according to the Keighery Vegetation Unit Condition Scale (EPA, 2016). A copy of this scale is provided in **Appendix 6.** The only part that was not in Excellent condition was a small amount of clearing adjacent to the existing gravel pit at the south end. This area was mapped as 'Cleared'.

The area of the vegetation unit together with a breakdown of its vegetation condition per unit is provided in **Table 6.** Vegetation condition is mapped in **Figure 10.**

Table 6. Summary of vegetation condition classes within the Survey Area.

Vegetation Unit	Conservation Status*	Vegetation Condition	Area (Ha)	%
Wheatbelt Wandoo woodland	P3 (CR)	Excellent	0.76	34.39
Rock Sheoak woodland	P3 (CR)	Excellent	1.33	60.18
Cleared			0.12	5.43
Totals			2.21	100.00

*Note: EPBC Act status is in brackets.

6 Threatened and Priority Ecological Communities

The Wheatbelt Wandoo woodland unit, which is dominated by *Eucalyptus capillosa,* meets the key diagnostic traits (minimum vegetation condition and patch size criteria) for the Federally-listed Critically Endangered Federally-listed TEC "Eucalypt Woodlands of the Western Australian Wheatbelt" (DotEE, 2015). **Table 7** shows how this community meets the key diagnostic criteria and **Table 8** shows how it meets the condition and minimum area thresholds for this EPBC listed community (DotEE, 2015). The occurrence of this TEC within the Survey Area is shown in the vegetation unit map **Figure 9.**

A completed Threatened Ecological Community Report form is provided at **Appendix 8**.

Table 7.Comparison of Wheatbelt Wandoo Woodland vegetation unit with Eucalypt Woodlands of the Western Australian Wheatbelt TEC key diagnostic characteristics criteria (DotEE, 2015).

Condition Category	Comment
It occurs in one of the appropriate IBRA regions.	Yes, it occurs in the Avon Wheatbelt IBRA region
The structure of the ecological community is a woodland in which the minimum crown cover of the tree canopy in a mature woodland is 10% (crowns measured as if they are opaque).	Yes, criteria met, canopy >10%.
The key species of the tree canopy are species of Eucalyptus (typically with a single trunk).	Yes, it contains *Eucalyptus capillosa*.
A native understorey is present but is of variable composition, being a combination of grasses, other herbs and shrubs.	Yes, criteria met, mostly in excellent condition.

Table 8. Comparison of the Wheatbelt Wandoo woodland vegetation unit with the Eucalypt Woodlands of the Western Australian Wheatbelt TEC condition and area criteria adapted from DotEE, 2015.

Cover of exotic plants	Mature trees	Minimum Patch Size (non-roadside)	Comment
Category A: patches likely to correspond to a condition of Pristine / Excellent / Very good (Keighery, 1994)			
Exotic species account for 0 – 30% of total vegetation cover in understorey layer	Mature trees may be present or absent	2 hectares or more	0.76 ha of Wheatbelt Wandoo woodland in the Survey Area but a further 3 ha in similar condition is contiguous to it. Almost no weeds.
Category B: Patches likely to correspond to a condition of Good (Keighery, 1994) AND retains important habitat features			
Exotic plant species account for more than 30, to 50% of total vegetation cover in the understorey layers (i.e. below the tree canopy)	Mature trees are present with at least 5 trees per 0.5 ha.	2 hectares or more	N/A
Category C: Patches likely to correspond to a condition of Good (Keighery, 1994).			
Exotic plant species account for more than 30, to 50% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	Mature trees either absent or less than 5 trees per 0.5 ha are present.	5 hectares or more	N/A
Category D: Patches likely to correspond to a condition of Degraded to Good (Keighery, 1994).			
Exotic plant species account for more than 50 to 70% of total vegetation cover in the understorey layers (i.e. below the tree canopy).	Mature trees are present with at least 5 trees per 0.5 ha.	5 hectares or more	N/A

The Wheatbelt Wandoo woodland vegetation unit also fits the description of the State-listed Priority 3 'Eucalypt Woodlands of the Western Australian Wheatbelt' ecological community.

The Rock Sheoak woodland vegetation unit is not considered to meet the definition of the TEC or the PEC because it does not have Eucalypt species in the overstory. It is also not considered to be part of any other conservation significant ecological community.

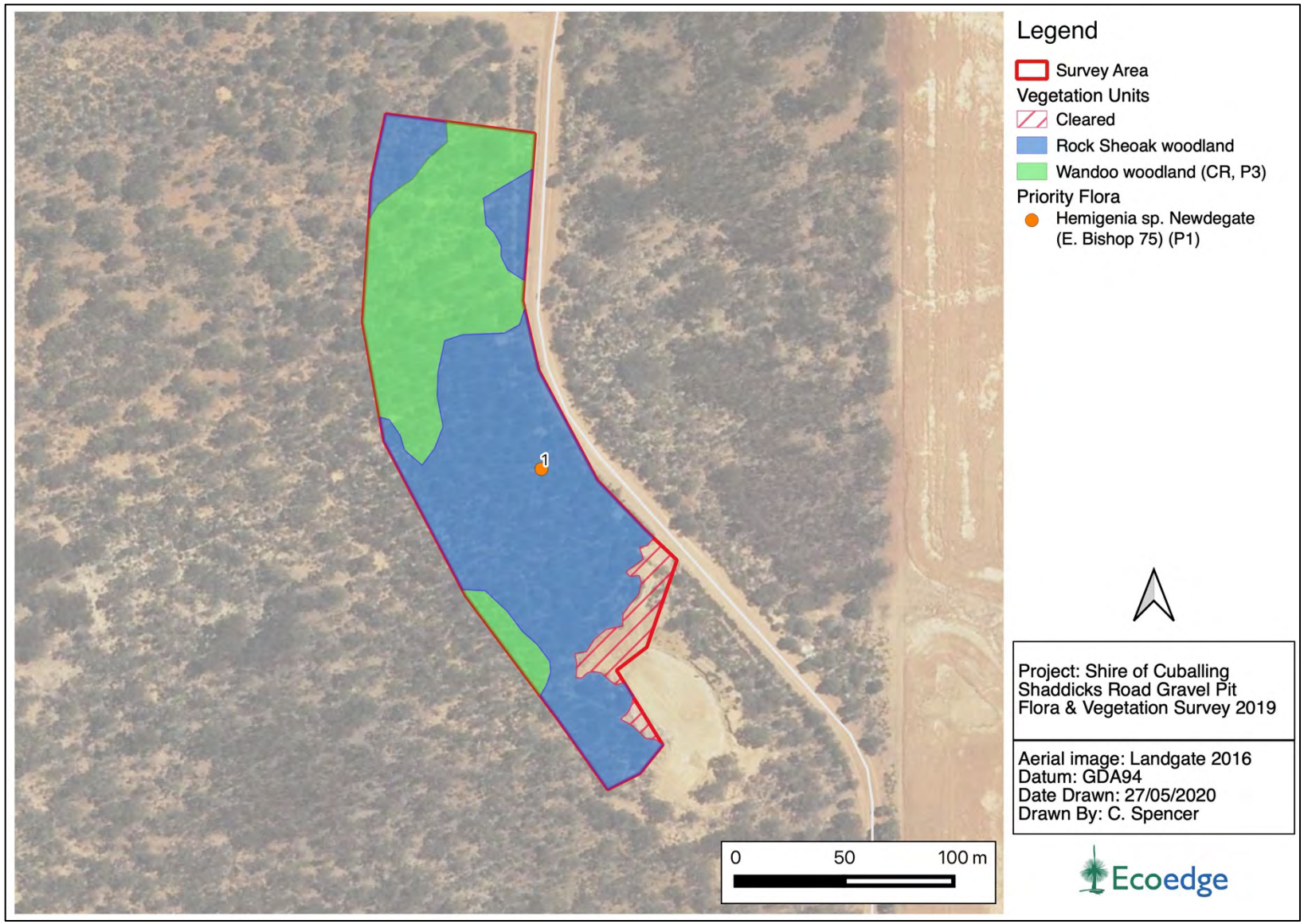

Figure 9. Vegetation units mapped within the Survey Area.

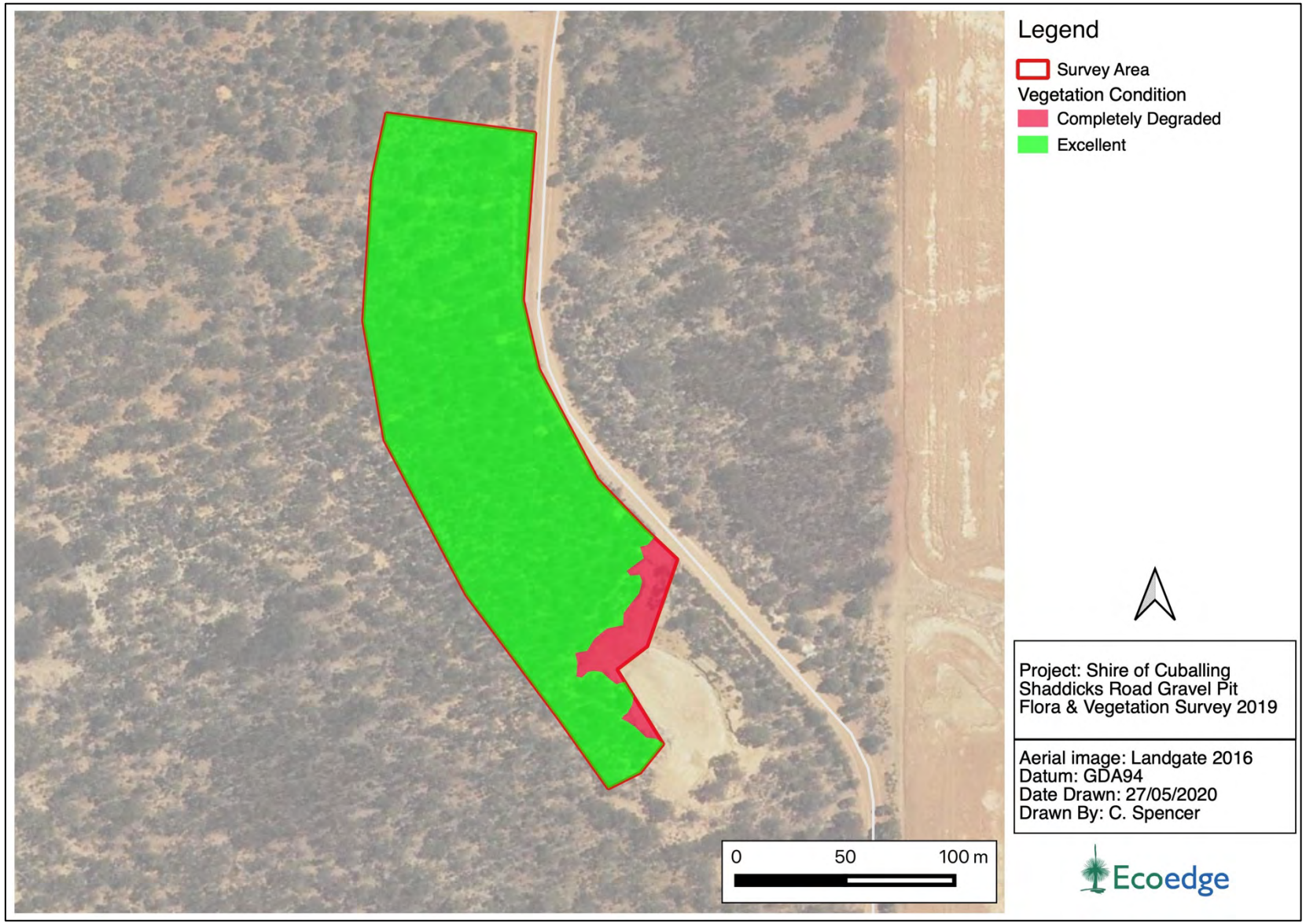

Figure 10. Condition of vegetation within the Survey Area.

7 Discussion and conclusions

7.1 Significance of the Flora

One species of priority one flora *Hemigenia* sp. Newdegate (E. Bishop 75) was identified within the Survey Area. This occurrence was within the Rock Sheoak woodland vegetation unit.

Hemigenia sp. Newdegate (E. Bishop 75) is represented by only nine records in DBCA databases. It is a spindly, erect to spreading shrub, 0.2-0.45 m high, to 0.5 m wide, with blue-purple flowers, which appear in September and October. It is found from near Jitarning (in the shire of Kulin) to near Southern Cross. The discovery of this taxon at Shaddicks Road represents a westward extension of the known range.

7.2 Declared Pest Plants and Environmental Weeds

There were no introduced species including Declared Pest Plants or Weeds of National Significance within the Survey Area.

7.3 Significance of the Vegetation

7.3.1 Vegetation Units

The Wheatbelt Wandoo woodland vegetation unit is an occurrence of the State priority three (P3) 'Eucalypt Woodlands of the Western Australian Wheatbelt' ecological community (PEC) and the Federal Critically Endangered 'Eucalypt Woodlands of the Western Australian Wheatbelt' threatened ecological community (TEC). This unit is in Excellent condition and is 0.76 ha in size.

According to the Federally approved conservation advice for this TEC, any areas meeting the 'Eucalypt Woodlands of the Western Australian Wheatbelt' criteria (i.e. the Wheatbelt Wandoo woodland vegetation unit), are critical to the survival of the TEC (DotEE, 2015). This is because this ecological community occurs in a landscape that has been very heavily cleared and modified, and now exists as mostly very small and highly fragmented patches.

The remainder of the Survey Area vegetation comprising 1.33 ha of Rock Sheoak woodland, whilst also in Excellent condition, is not a TEC or PEC.

7.3.2 Vegetation Associations

The Wheatbelt Wandoo Woodland vegetation unit is a partial match for Beard, (1980) vegetation association 1023 'Medium woodland; York gum, wandoo and salmon gum', which is mapped for the Survey Area. The extent remaining of this association at State (10.79%), IBRA region (10.84%) and IBRA sub-region (12.32%) and local government (18.87%) levels is significantly below the Commonwealth government's 30% retention threshold and it is also poorly represented within the DBCA estate (1.18%).

7.3.3 Ecological Corridors and Connectivity

The 2.21 ha survey Area vegetation forms part of larger 32 ha patch of bushland which is loosely connected via narrow corridors of road side vegetation to other generally isolated and loosely connected patches of vegetation, most of which occur on managed agricultural land.

Potential clearing of the Survey Area vegetation will not break, or disconnect the existing corridor of vegetation but will reduce the area of the remaining vegetation and its contribution to the value of corridor. For example, clearing will increase the perimeter to surface area ratio of the remaining vegetation increasing the area for potential degrading impacts such as weed invasion, dust and wind. The largely cleared nature of the region increases the value of remaining bushland and the vegetated corridors of which they are a part. Quantification of the clearing impacts to these corridors is challenging and beyond the scope of this report.

7.3.4 Environmentally Sensitive Areas

There are no ESAs within or in close proximity to the Survey Area. The nearest is located approximately 11.8 km South East of the Survey Area and is associated with the East Yornaning Nature Reserve.

8 Recommendations

It is recommended that clearing be confined to the 1.33 ha of Rock Sheoak Woodland with minimal disturbance to the State and Federally protected Wheatbelt Wandoo Woodland which is recognised as an occurrence of both the Federally protected 'Eucalypt Woodlands of the Western Australian Wheatbelt' TEC and State protected 'Eucalypt Woodlands of the Western Australian Wheatbelt' Priority three ecological community.

It is recommended that a 'no clear zone' be installed around the priority one (P1) flora *Hemigenia* sp. Newdegate (E. Bishop 75), to help protect this plant.

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9 References

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Appendix 1. Categories of threatened and priority ecological communities (DEC 2013).

Conservation code	Category
(T) Threatened ecological community pursuant to Sect 27 of the *Biodiversity Conservation Act 2016.*	
T	(T) CR – Critically endangered 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.
	(T) EN - Endangered An ecological community that has been adequately surveyed and found to have been subject to a major contraction in 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.
	(T) VU - Vulnerable 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.
(P) Priority species – possible threatened communities.	
P1	Poorly known communities Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha). 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.

Conservation code	Category
P2	Poorly known communities Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). 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.
P3	Poorly known communities a) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: b) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or; c) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc. 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.
P4	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. 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.

Conservation code	Category
P5	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.

Appendix 2. Categories of Threatened Ecological Communities under Section 182 of the Federal EPBC Act (DotEE 2018b).

Category	Definition
Critically endangered	If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).
Endangered	If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).
Vulnerable	If, at that time, an ecological, community is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).

Appendix 3. Protected Matters Search Tool and NatureMap report.

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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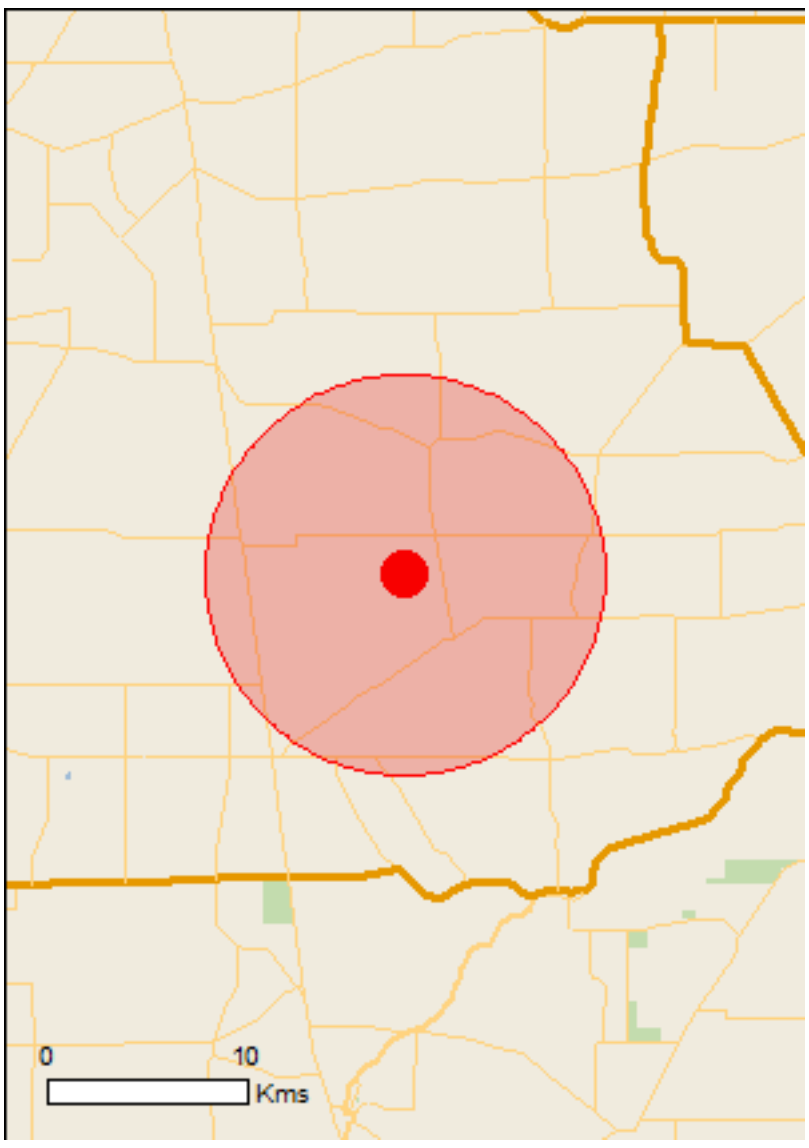

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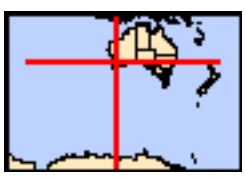

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	15
Listed Migratory Species:	6

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	4
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Eucalypt Woodlands of the Western Australian Wheatbelt	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
Phascogale calura Red-tailed Phascogale, Red-tailed Wambenger, Kenngoor [316]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Acacia lanuginophylla Woolly Wattle [55575]	Endangered	Species or species habitat may occur within area
Banksia oligantha Wagin Banksia [20697]	Endangered	Species or species habitat may occur within area
Boronia capitata subsp. capitata a shrub [29156]	Endangered	Species or species habitat likely to occur within area
Caladenia hoffmanii Hoffman's Spider-orchid [56719]	Endangered	Species or species habitat may occur within area
Grevillea dryandroides subsp. hirsuta Hairy Phalanx Grevillea [64577]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Grevillea scapigera Corrigin Grevillea [12195]	Endangered	Species or species habitat likely to occur within area
Guichenotia seorsiflora [82693]	Critically Endangered	Species or species habitat may occur within area
Roycea pycnophylloides Saltmat [21161]	Endangered	Species or species habitat likely to occur within area
Symonanthus bancroftii Bancrofts Symonanthus [12837]	Endangered	Species or species habitat may occur within area
Verticordia staminosa var. cylindracea Granite Featherflower [55823]	Endangered	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Sparks Road	WA
Unnamed WA16281	WA
Unnamed WA16479	WA
Unnamed WA16560	WA

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Austrocylindropuntia spp. Prickly Pears [85132]		Species or species habitat likely to occur within area
Carrichtera annua Ward's Weed [9511]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-32.66611 117.92889

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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NatureMap
Mapping Western Australia's biodiversity

Shaddicks GP Report

Created By Guest user on 02/10/2019

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	117° 15' 44" E,32° 39' 58" S
Buffer	10km
Group By	Kingdom

Kingdom	Species	Records
Animalia	47	87
Plantae	258	413
TOTAL	**305**	**500**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Animalia					
1.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
2.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
3.	24262	*Acanthiza inornata (Western Thornbill)*			
4.	24312	*Anas gracilis (Grey Teal)*			
5.	24561	*Anthochaera carunculata (Red Wattlebird)*			
6.	24285	*Aquila audax (Wedge-tailed Eagle)*			
7.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
8.		*Barnardius zonarius*			
9.	24161	*Bettongia lesueur subsp. graii (Boodie (inland), Burrowing Bettong (inland))*		X	
10.	24319	*Biziura lobata (Musk Duck)*			
11.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
12.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
13.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
14.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
15.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
16.	25592	*Corvus coronoides (Australian Raven)*			
17.	25595	*Cracticus tibicen (Australian Magpie)*			
18.	24322	*Cygnus atratus (Black Swan)*			
19.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
20.		*Eolophus roseicapillus*			
21.	24959	*Gehyra variegata*			
22.	25530	*Gerygone fusca (Western Gerygone)*			
23.	24443	*Grallina cyanoleuca (Magpie-lark)*			
24.	42408	*Hesperoedura reticulata*			
25.	24491	*Hirundo neoxena (Welcome Swallow)*			
26.	24511	*Larus novaehollandiae subsp. novaehollandiae (Silver Gull)*			
27.	24557	*Leipoa ocellata (Malleefowl)*		T	
28.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
29.	24598	*Merops ornatus (Rainbow Bee-eater)*			
30.	25240	*Morelia spilota subsp. imbricata (Carpet Python)*			
31.	24146	*Myrmecobius fasciatus (Numbat, Walpurti)*		T	
32.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
33.	25682	*Pardalotus striatus (Striated Pardalote)*			
34.	48060	*Petrochelidon ariel (Fairy Martin)*			
35.	48061	*Petrochelidon nigricans (Tree Martin)*			
36.	24659	*Petroica goodenovii (Red-capped Robin)*			
37.	24409	*Phaps chalcoptera (Common Bronzewing)*			
38.	24098	*Phascogale calura (Red-tailed Phascogale, Kenngoor)*		S	
39.	24745	*Platycercus icterotis subsp. icterotis (Western Rosella)*			
40.	24843	*Plegadis falcinellus (Glossy Ibis)*		IA	
41.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
42.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
43.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
44.	25614	*Rhipidura leucophrys (Willie Wagtail)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
45.	25597	*Strepera versicolor (Grey Currawong)*			
46.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
47.	24983	*Underwoodisaurus milii (Barking Gecko)*			
Plantae					
48.	3257	*Acacia chrysocephala*			
49.	11661	*Acacia drummondii subsp. drummondii*			
50.	3324	*Acacia erinacea*			
51.	3408	*Acacia lasiocalyx (Silver Wattle, Wilyurwur)*			
52.	11519	*Acacia lasiocarpa var. bracteolata*			
53.	15721	*Acacia lasiocarpa var. sedifolia*			
54.	11448	*Acacia leptospermoides subsp. leptospermoides*			
55.	15484	*Acacia sphacelata subsp. sphacelata*			
56.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
57.	44513	*Acacia thieleana*			
58.	11837	*Adenanthos cygnorum subsp. cygnorum (Common Woollybush)*			
59.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
60.	1731	*Allocasuarina huegeliana (Rock Sheoak, Kwowl)*			
61.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
62.	1116	*Aphelia brizula*			
63.	43548	*Aphelia sp. Albany (B.G. Briggs 596)*			
64.	7850	*Asteridea nivea*			
65.	42140	*Astroloma acervatum*			
66.	6324	*Astroloma compactum*			
67.	6326	*Astroloma epacridis*			
68.	6336	*Astroloma serratifolium (Kondrung)*			
69.	17237	*Austrostipa elegantissima*			
70.	17241	*Austrostipa hemipogon*			
71.	17255	*Austrostipa trichophylla*			
72.	17257	*Austrostipa variabilis*			
73.	233	*Avena barbata (Bearded Oat)*	Y		
74.	32523	*Banksia fraseri var. fraseri*			
75.	32203	*Banksia nivea subsp. nivea*			
76.	32142	*Banksia proteoides (King Dryandra)*			
77.	11868	*Banksia sphaerocarpa var. caesia*			
78.	32041	*Banksia stuposa*			
79.	32315	*Barbula calycina*			
80.	5385	*Beaufortia incana (Grey-leaved Beaufortia)*			
81.	7856	*Blennospora drummondii*			
82.	4406	*Boronia busselliana*			
83.	11502	*Boronia capitata subsp. clavata*			
84.	1269	*Borya laciniata*			
85.	1273	*Borya sphaerocephala (Pincushions)*			
86.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
87.	7882	*Brachyscome perpusilla*			
88.	244	*Briza maxima (Blowfly Grass)*	Y		
89.	245	*Briza minor (Shivery Grass)*	Y		
90.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
91.	1276	*Caesia micrantha (Pale Grass Lily)*			
92.	29439	*Caesia sp. Wongan (K.F. Kenneally 8820)*			
93.	11165	*Caladenia falcata*			
94.	15348	*Caladenia flava subsp. flava*			
95.	15502	*Caladenia footeana*			
96.	1598	*Caladenia integra (Mantis Orchid, Smooth-lipped Spider Orchid)*		P4	
97.	15363	*Caladenia longicauda subsp. eminens*			
98.	2846	*Calandrinia calyptrata (Pink Purslane)*			
99.	35162	*Calothamnus planifolius var. planifolius*			
100.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
101.	5465	*Calytrix leschenaultii*			
102.	32334	*Campylopus australis*			
103.	6542	*Centaurium tenuiflorum*	Y		
104.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
105.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
106.	7924	*Ceratogyne obionoides (Wingwort)*			
107.	11299	*Chamaescilla corymbosa var. corymbosa*			
108.	764	*Chorizandra multiarticulata*			
109.	16524	*Cicendia quadrangularis*	Y		
110.	4566	*Comesperma volubile (Love Creeper)*			
111.	1447	*Conostylis pusilla*			
112.	1454	*Conostylis setigera (Bristly Cottonhead)*			
113.	7944	*Cotula bipinnata (Ferny Cotula)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
			Y		
114.	17701	*Crassula closiana*			
115.	11349	*Crassula decumbens var. decumbens*			
116.	20271	*Crassula extrorsa*			
117.	13470	*Cryptandra arbutiflora var. arbutiflora*			
118.	4804	*Cryptandra nutans*			
119.	15114	*Cyanicula gemmata*			
120.	6750	*Cyanostegia lanceolata (Tinsel Flower)*			
121.	815	*Cyperus tenellus (Tiny Flatsedge)*	Y		
122.	7438	*Dampiera eriocephala (Woolly-headed Dampiera)*			
123.	7451	*Dampiera lavandulacea*			
124.	7453	*Dampiera lindleyi*			
125.	12326	*Daviesia hakeoides subsp. subnuda*			
126.	3819	*Daviesia longifolia*			
127.	17663	*Desmocladus asper*			
128.	17846	*Desmocladus parthenicus*			
129.	1288	*Dichopogon fimbriatus (Chocolate Lily)*			
130.	1289	*Dichopogon preissii*			
131.	20367	*Dillwynia laxiflora*			
132.	15268	*Diplolaena graniticola*			
133.	15436	*Diuris porrifolia*			
134.	4775	*Dodonaea pinifolia*			
135.	11247	*Dodonaea viscosa subsp. angustissima*			
136.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
137.	3109	*Drosera menziesii (Pink Rainbow)*			
138.		*Drosera sp.*			
139.	49090	*Drosera sp. Branched styles (S.C. Coffey 193)*			
140.	3133	*Drosera subhirtella (Sunny Rainbow)*			
141.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
142.	45243	*Ericomyrtus parviflora*			
143.	45244	*Ericomyrtus serpyllifolia*			
144.	5548	*Eucalyptus albida (White-leaved Mallee)*			
145.	5675	*Eucalyptus incrassata (Lerp Mallee)*			
146.	12697	*Eucalyptus latens (Narrow-leaved Red Mallee)*			
147.	11295	*Eucalyptus loxophleba subsp. loxophleba (York Gum)*			
148.	16886	*Eucalyptus loxophleba x wandoo*		P4	
149.	5735	*Eucalyptus pachyloma (Kalgan Plains Mallee)*			
150.	12892	*Eucalyptus phaenophylla subsp. phaenophylla*			
151.	19666	*Eucalyptus phenax subsp. phenax*			
152.	12906	*Eucalyptus wandoo subsp. wandoo*			
153.	901	*Gahnia australis*			
154.	7323	*Galium murale (Small Goosegrass)*	Y		
155.	3909	*Gastrolobium microcarpum (Sandplain Poison)*			
156.	3910	*Gastrolobium obovatum (Boat-leaved Poison)*			
157.	10981	*Gastrolobium parviflorum*			
158.	3926	*Gastrolobium stipulare*		P4	
159.	3927	*Gastrolobium stowardii*			
160.	3930	*Gastrolobium trilobum (Bullock Poison)*			
161.	1523	*Gladiolus tristis (Largeflower Gladiolus)*	Y		
162.	6143	*Glischrocaryon aureum (Common Popflower)*			
163.	7991	*Gnephosis drummondii*			
164.	8002	*Gnephosis tenuissima*			
165.	3951	*Gompholobium marginatum*			
166.	6159	*Gonocarpus nodulosus*			
167.	7495	*Goodenia berardiana*			
168.	17805	*Goodenia drummondii subsp. megaphylla*			
169.	7538	*Goodenia pulchella*			
170.	19051	*Goodenia scapigera subsp. scapigera*			
171.	2788	*Gyrostemon subnudus*			
172.	16907	*Hakea hastata*			
173.	2172	*Hakea lehmanniana (Blue Hakea)*			
174.	2175	*Hakea lissocarpha (Honey Bush)*			
175.	16900	*Hakea petiolaris subsp. petiolaris*			
176.	2203	*Hakea ruscifolia (Candle Hakea)*			
177.	6855	*Hemigenia humilis*			
178.	6865	*Hemigenia podalyrina*			
179.	5114	*Hibbertia commutata*			
180.	5124	*Hibbertia exasperata*			
181.	20059	*Hibbertia hemignosta*			
182.	5144	*Hibbertia microphylla*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
183.	6222	*Homalosciadium homalocarpum*			
184.	12742	*Hyalosperma demissum*			
185.	6226	*Hydrocotyle callicarpa (Small Pennywort)*			
186.	11546	*Hydrocotyle pilifera var. glabrata*			
187.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
188.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
189.	3992	*Isotropis cuneifolia (Granny Bonnets)*			
190.	3997	*Jacksonia alata*			
191.	14749	*Jacksonia debilis*		P1	
192.	14739	*Jacksonia epiphyllum*			
193.	4025	*Jacksonia restioides*			
194.	1180	*Juncus capitatus (Capitate Rush)*	Y		
195.	11528	*Labichea lanceolata subsp. brevifolia*			
196.	18585	*Lagenophora huegelii*			
197.	13284	*Lawrencella rosea*			
198.	1305	*Laxmannia omnifertilis*			
199.	7568	*Lechenaultia biloba (Blue Leschenaultia)*			
200.	1073	*Lepidobolus chaetocephalus (Bristle-headed Chaff Rush)*			
201.	41620	*Lepidosperma asperatum*			
202.	930	*Lepidosperma costale*			
203.		*Lepidosperma sp.*			
204.	949	*Lepidosperma tuberculatum*			
205.	5847	*Leptospermum erubescens (Roadside Teatree)*			
206.		*Lethocolea pansa*			
207.	44220	*Leucopogon audax*		P2	
208.	19371	*Leucopogon sp. Wandering (F. Hort 419)*			
209.	19364	*Leucopogon tamminensis var. australis*			
210.	7676	*Levenhookia pusilla (Midget Stylewort)*			
211.	31877	*Lobelia cleistogamoides*			
212.	15835	*Loxocarya striata*			
213.	18049	*Lyginia imberbis*			
214.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
215.	19421	*Marianthus bicolor (Painted Marianthus)*			
216.	15603	*Melaleuca fulgens subsp. fulgens*			
217.	19486	*Melaleuca hamata*			
218.	5958	*Melaleuca radula (Graceful Honeymyrtle)*			
219.	5975	*Melaleuca subtrigona*			
220.	15673	*Melaleuca tuberculata*			
221.	18232	*Melaleuca tuberculata var. tuberculata*			
222.	6888	*Microcorys capitata*			
223.	485	*Microlaena stipoides (Weeping Grass)*			
224.	14344	*Millotia tenuifolia var. tenuifolia (Soft Millotia)*			
225.	1535	*Moraea fugax*	Y		
226.	492	*Neurachne alopecuroidea (Foxtail Mulga Grass)*			
227.	6978	*Nicotiana rotundifolia (Round-leaved Tobacco)*			
228.	18255	*Opercularia vaginata (Dog Weed)*			
229.	30375	*Oxalis exilis*			
230.	4355	*Oxalis perennans*			
231.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
232.	1551	*Patersonia pygmaea (Pygmy Patersonia)*			
233.	2297	*Petrophile heterophylla (Variable-leaved Cone Bush)*			
234.	19825	*Petrorhagia dubia*	Y		
235.	16825	*Phyllangium divergens*			
236.	16824	*Phyllangium sulcatum*			
237.	4675	*Phyllanthus calycinus (False Boronia)*			
238.	4	*Phylloglossum drummondii (Pigmy Clubmoss)*			
239.	45237	*Podolepis aristata subsp. aristata*			
240.	8175	*Podolepis gracilis (Slender Podolepis)*			
241.	8177	*Podolepis lessonii*			
242.	8182	*Podotheca angustifolia (Sticky Longheads)*			
243.	16688	*Prasophyllum gracile*			
244.	13255	*Pterochaeta paniculata*			
245.	1698	*Pterostylis vittata (Banded Greenhood)*			
246.	2716	*Ptilotus declinatus (Curved Mulla Mulla)*			
247.	8195	*Quinetia urvillei*			
248.	13294	*Rhodanthe laevis*			
249.	13234	*Rhodanthe manglesii*			
250.	14924	*Romulea rosea var. communis*	Y		
251.	32426	*Rosulabryum campylothecium*			
252.	40431	*Rytidosperma acerosum*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
253.	40425	*Rytidosperma caespitosum*			
254.	40427	*Rytidosperma setaceum*			
255.	972	*Schoenus armeria*			
256.	1002	*Schoenus nanus (Tiny Bog Rush)*			
257.	1013	*Schoenus sculptus (Gimlet Bog-rush)*			
258.	6544	*Sebaea ovata (Yellow Sebaea)*			
259.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
260.	14583	*Siloxerus multiflorus*			
261.	7034	*Solanum simile (Oondoroo)*			
262.	8230	*Sonchus asper (Rough Sowthistle)*	Y		
263.	28250	*Sonchus asper subsp. asper*	Y		
264.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
265.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
266.	9070	*Stackhousia pubescens (Downy Stackhousia)*			
267.	4735	*Stackhousia scoparia*			
268.	7698	*Stylidium caricifolium (Milkmaids)*			
269.	7708	*Stylidium crassifolium (Thick-leaved Triggerplant)*			
270.	19251	*Stylidium eriopodum*			
271.	40945	*Stylidium exappendiculatum*		P3	
272.	7773	*Stylidium petiolare (Horn Triggerplant)*			
273.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
274.	7804	*Stylidium tenuicarpum*		P4	
275.	1260	*Stypandra glauca (Blind Grass)*			
276.	16761	*Synaphea interioris*			
277.	46437	*Tetrapora preissiana*			
278.	35579	*Tetraria sp. Jarrah Forest (R. Davis 7391)*			
279.	4528	*Tetratheca confertifolia*			
280.	4546	*Tetratheca virgata*			
281.	5080	*Thomasia foliosa*			
282.	5086	*Thomasia macrocalyx*			
283.	19698	*Thryptomene australis subsp. australis*			
284.	1338	*Thysanotus manglesianus (Fringed Lily)*			
285.	1343	*Thysanotus patersonii*			
286.	1348	*Thysanotus rectantherus*			
287.	1354	*Thysanotus tenellus*			
288.	1357	*Thysanotus thyrsoideus*			
289.	6279	*Trachymene ornata (Spongefruit)*			
290.	6280	*Trachymene pilosa (Native Parsnip)*			
291.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
292.	4295	*Trifolium dubium (Suckling Clover)*	Y		
293.	18587	*Triglochin nana*			
294.	15144	*Trymalium ledifolium var. lineare*			
295.	9008	*Urodon dasyphyllus (Mop Bushpea)*			
296.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
297.	7656	*Velleia cycnopotamica*			
298.	7665	*Velleia trinervis*			
299.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
300.	6082	*Verticordia grandiflora (Claw Featherflower)*			
301.	7389	*Wahlenbergia preissii*			
302.	9247	*Westringia rigida (Stiff Westringia)*			
303.	1252	*Xanthorrhoea drummondii*			
304.	6283	*Xanthosia atkinsoniana*			
305.	6289	*Xanthosia huegelii*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

Appendix 4. Definitions of Conservation Codes for Threatened and Priority flora (DBCA, 2019b).

Conservation code	Category
(T) Threatened species pursuant to Sect 19 of the BC Act 2016.	
T	(T) CR – Critically endangered Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".
	(T) EN - Endangered Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".
	(T) VU - Vulnerable Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".
(P) Priority species – possible Threatened 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.
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.

Conservation code	Category
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.
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.

Appendix 5. Categories of Threatened Species under the EPBC Act (DotEE, 2018b).

Category	Definition
Extinct (Ex)	A native species is eligible to be included in the ***extinct*** category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild (ExW)	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered (CE)	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered (EN)	A native species is eligible to be included in the endangered category at a particular time if, at that time (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (VU)	A native species is eligible to be included in the vulnerable category at a particular time if, at that time (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.
Conservation Dependent (CD)	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Appendix 6. Vegetation condition scale (EPA, 2016).

Vegetation Condition	South West and Interzone Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
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 7. List of Vascular Flora found within the Survey Area.

	FAMILY_NAME	SPECIES	CONSV_CODE
1	Fabaceae	*Acacia stenoptera*	
2	Proteaceae	*Adenanthos cygnorum* subsp. *cygnorum*	
3	Casuarinaceae	*Allocasuarina huegeliana*	
4	Ericaceae	*Astroloma epacridis*	
5	Proteaceae	*Banksia armata*	
6	Proteaceae	*Banksia nivea* subsp. *nivea*	
7	Proteaceae	*Banksia nobilis*	
8	Proteaceae	*Banksia sessilis*	
9	Proteaceae	*Banksia sphaerocarpa* var. *caesia*	
10	Proteaceae	*Banksia squarrosa*	
11	Myrtaceae	*Beaufortia incana*	
12	Myrtaceae	*Beaufortia puberula*	
13	Myrtaceae	*Calothamnus quadrifidus* subsp. *quadrifidus*	
14	Polygalaceae	*Comesperma scoparium*	
15	Haemodoraceae	*Conostylis setigera*	
16	Goodeniaceae	*Dampiera lavandulacea*	
17	Fabaceae	*Daviesia incrassata* subsp. *incrassata*	
18	Droseraceae	*Drosera spilos*	
19	Myrtaceae	*Ericomyrtus serpyllifolia*	
20	Myrtaceae	*Eucalyptus capillosa subsp. capillosa*	
21	Fabaceae	*Gastrolobium calycinum*	
22	Fabaceae	*Gastrolobium stowardii*	
23	Haloragaceae	*Glischrocaryon aureum*	
24	Fabaceae	*Gompholobium marginatum*	
25	Proteaceae	*Grevillea leptobotrys*	
26	Proteaceae	*Grevillea pulchella*	
27	Proteaceae	*Hakea prostrata*	
28	Lamiaceae	*Hemigenia incana*	
29	Lamiaceae	*Hemigenia sericea*	
30	Lamiaceae	*Hemigenia* sp. Newdegate (E. Bishop 75)	P1
31	Fabaceae	*Jacksonia epiphyllum*	
32	Fabaceae	*Jacksonia lehmannii*	
33	Asteraceae	*Lagenophora huegelii*	
34	Goodeniaceae	*Lechenaultia biloba*	
35	Cyperaceae	*Lepidosperma costale*	
36	Cyperaceae	*Lepidosperma resinosum*	
37	Myrtaceae	*Leptospermum erubescens*	
38	Ericaceae	*Leucopogon fimbriatus*	
39	Ericaceae	*Leucopogon* sp. Wandering (F. Hort 419)	

40	Restionaceae	*Loxocarya striata*	
41	Myrtaceae	*Melaleuca tuberculata*	
42	Fabaceae	*Phyllota gracilis*	
43	Asteraceae	*Pterochaeta paniculata*	
44	Myrtaceae	*Thryptomene australis* subsp. *australis*	
45	Xanthorrhoeaceae	*Xanthorrhoea drummondii*	

Appendix 8. TEC Occurrence Report Form_ Shaddicks Road, Cuballing.

Department of Parks and Wildlife

Threatened and Priority Ecological Community (TEC/PEC) Occurrence Report Form

Version 6.0 July 2013

COMMUNITY: Eucalypt Woodlands of the Western Australian Wheatbelt **OBSERVATION DATE:** 9/10/2019

New occurrence ☐ **Site ID:** _____ **CONS STATUS:** TEC/PEC

OBSERVER/S: Russell Smith **PHONE:** 0447809124

ROLE: botanists **ORGANISATION:** Ecoedge

EMAIL: russell@ecoedge.com.au

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place)**:**

Shire of Cuballing; Shaddicks Road, 1.3 km north of Bunmulling Road

Reserve No: 12344

DISTRICT: **LGA:** Cuballing Land manager present: ☐

DATUM:

GDA94 / MGA94 ☒
AGD84 / AMG84 ☐
WGS84 ☐
Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required)

DecDegrees ☐ DegMinSec ☐ UTMs ☒

Lat / Northing: 6385590

Long / Easting: 524676

Zone: 50

METHOD USED:

GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured: ☐ Map used:

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☐
National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☐ Other Crown reserve ☒
Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole _____ to _____ Specify other: _____

AREA ASSESSMENT: Edge survey ☐ Partial survey ☐ Full survey ☐ Area observed (m²): 7600

EFFORT: Time spent surveying (minutes): _____ No. of minutes spent / 100 m²: _____

THREATS - type, and supporting information: e.g. clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents.	**Cause/Agent:** e.g. weed type, grazing species, recreation type	Area affected	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
•		%			
•		%			
•		%			
•		%			
•		%			
•		%			
•		%			
•		%			
•		%			

*Rate current and potential threat impact: **N=Nil, L=Low, M=Medium, H=High, E=Extreme**

*Estimate time to potential impact: **S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)**

CONDITION OF OCCURRENCE: (Bush Forever Scale) (estimate % of area in each)

Pristine ☐ _____% Very Good ☐ _____% Degraded ☐ _____%

Excellent ☐ 100% Good ☐ _____% Completely Degraded ☐ _____%

Please return form to:

communities.data@dpaw.wa.gov.au

or Species and Communities Branch, Department of Parks and Wildlife, Locked Bag 104, Bentley Delivery Centre WA 6983

*Record entered by:*_____ *Date entered:*_____ *Database no:*_____

Department of Parks and Wildlife

Threatened and Priority Ecological Community (TEC/PEC) Occurrence Report Form

Version 6.0 July 2013

RECOMMENDED MANAGEMENT ACTIONS: e.g. roadside markers, weed control, etc.

ACTIONS IMPLEMENTED (include date):

HABITAT INFORMATION: (Check more than one box for combinations or where necessary)

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest ☐	Granite ☐	(on soil surface; e.g. gravel, quartz fields)	Sand ☐	Red ☐	Well drained ☒
Hill ☐	Dolerite ☐		Sandy loam ☒	Brown ☒	Seasonally inundated ☐
Ridge ☐	Laterite ☐	0-10% ☐	Loam ☐	Yellow ☐	Permanently inundated ☐
Outcrop ☐	Ironstone ☐	10-30% ☒	Clay loam ☐	White ☐	Tidal ☐
Slope ☐	Limestone ☐	30-50% ☐	Light clay ☐	Grey ☒	
Flat ☐	Quartz ☐	50-100% ☐	Peat ☐	Black ☐	
Open depression ☐					
Drainage line ☐	Specify other:		Specify other:	Specify other:	Specify other:
Closed depression ☐					
Wetland ☐					

Specific Landform Element: (Refer to field manual for additional values)

CONDITION OF SOIL:

Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐ Cracked ☐ Saline ☐ Other:

VEGETATION CLASSIFICATION:	1. Woodland
	2.
	3.
	4.

FIRE HISTORY:

Last Fire: Season/Month: Year: **Fire Intensity:** High ☐ Medium ☐ Low ☐ No evidence of fire ☒

Actual Occurrence Landuse:

Please return form to:

communities.data@dpaw.wa.gov.au

or Species and Communities Branch, Department of Parks and Wildlife, Locked Bag 104, Bentley Delivery Centre WA 6983

*Record entered by:*_____ *Date entered:*_____ *Database no:*_____

Department of Parks and Wildlife

Threatened and Priority Ecological Community (TEC/PEC) Occurrence Report Form

Version 6.0 July 2013

Adjacent Landuse:

Associated Flora Species:

Eucalyptus capillosa subsp. capillosa woodland over Adenanthos cygnorum subsp. cygnorum, Banksia armata, B. sphaerocarpa var. caesia, Calothamnus quadrifidus subsp. quadrifidus, Daviesia incrassata subsp. incrassata, Hakea prostrata, Leptospermum erubescens, Melaleuca tuberculata, Xanthorrhoea drummondii shrubland over Conostylis setigera, Glischrocaryon aureum, L agenophora huegelii, Pterochaeta paniculata very open herbland and Lepidosperma costale, L. resinosum

Associated Fauna Species:

OTHER COMMENTS:

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐

Other:

COPY SENT TO: Regional Office ☐ District Office ☐ Other:

Submitter of record: **Russell Smith** **Role:** **botanist**

Signature: **Russell Smith** **Date submitted:** **28/03/2020**

Please return form to:

communities.data@dpaw.wa.gov.au

or Species and Communities Branch, Department of Parks and Wildlife, Locked Bag 104, Bentley Delivery Centre WA 6983

*Record entered by:*_____ *Date entered:*_____ *Database no:*_____

Appendix 9. Threatened and Priority Flora report form_ Shaddicks Road, Cuballing.

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at http://dpaw.wa.gov.au/ under *Standard Report Forms*

TAXON: Hemigenia sp. Newdegate (E. Bishop 75) **TPFL Pop. No:**

OBSERVATION DATE: 9/10/2019 **CONSERVATION STATUS:** P1 New population ☒

OBSERVER/S: Russell Smith **PHONE:**

ROLE: Botanist **ORGANISATION:** Ecoedge

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place)**:**

Shire of Cuballing; Shaddicks Road, 1.3 km north of Bunmulling Road; gravel pit reserve524698

Reserve No:

DBCA DISTRICT: **LGA:** Land manager present: ☐

DATUM:
GDA94 / MGA94 ☒
AGD84 / AMG84 ☐
WGS84 ☐
Unknown ☐

COORDINATES: (If UTM coords provided, **Zone** is also required)
DecDegrees ☐ DegMinSec ☐ UTMs ☒

Lat / Northing: 6385556

Long / Easting: 524698

ZONE: 50

METHOD USED:
GPS ☒ Differential GPS ☐ Map ☐

No. satellites: ___ Map used: _____

Boundary polygon captured: ☐ Map scale: _____

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☐
National park ☐	State forest ☐	Pastoral lease ☐	MRWA road reserve ☐	Other Crown reserve ☒
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole _____ to _____	Specify other: _____

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m²): _____

EFFORT: Time spent surveying (minutes): _____ No. of minutes spent / 100 m²: _____

POP'N COUNT ACCURACY: Actual ☐ Extrapolation ☐ Estimate ☐ Count method: _____ (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive	1			1
Dead				

Area of pop (m²): 3

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. ___ Size _____ Data attached ☐ Total area of quadrats (m²): _____

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒
Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: 100%

CONDITION OF PLANTS: Healthy ☐ Moderate ☐ Poor ☐ Senescent ☐

COMMENT:

THREATS - type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. **Specify agent** where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	**Current impact (N-E)**	**Potential Impact (L-E)**	**Potential Threat Onset (S-L)**
•			
•			
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer,** Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ❑

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:
Crest ☐
Hill ☐
Ridge ☐
Outcrop ☐
Slope ☐
Flat ☐
Open depression ☐
Drainage line ☐
Closed depression ☐
Wetland ☐

ROCK TYPE:
Granite ☐
Dolerite ☐
Laterite ☐
Ironstone ☐
Limestone ☐
Quartz ☐
Specify other: _____

LOOSE ROCK:
(on soil surface; eg gravel, quartz fields)
0-10% ☐
10-30% ☒
30-50% ☐
50-100% ☐

SOIL TYPE:
Sand ☐
Sandy loam ☒
Loam ☐
Clay loam ☐
Light clay ☐
Peat ☐
Specify other: _____

SOIL COLOUR:
Red ☐
Brown ☒
Yellow ☒
White ☐
Grey ☐
Black ☐
Specify other: _____

DRAINAGE:
Well drained ☒
Seasonally inundated ☐
Permanently inundated ☐
Tidal ☐

Specific **Landform** Element: _____
(Refer to field manual for additional values)

CONDITION OF SOIL: Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:
Eg: **1**. Banksia woodland (B. attenuata, B. ilicifolia); **2**. Open shrubland (Hibbertia sp., Acacia spp.) ; **3**. Isolated clumps of sedges (Mesomelaena tetragona)

1. Allocasuarina huegelliana woodland
2.
3.
4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 *Australian Soil and Land Survey Field Handbook* guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☐ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: **Last Fire:** Season/Month: _____ Year: _____ **Fire Intensity:** High ☐ Medium ☐ Low ☐ No signs of fire ☐

FENCING: Not required ☐ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☐ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.)

DRF PERMIT/ LICENCE No: Note if only observing plants (i.e. no specimens or plant matieral is taken) then no permit/licence is required. For further information on permit and licening requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other: _____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other:

Submitter of Record: _R.Smith Role: botanist Signed: _____ Date: 28/03/2020

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer,** Species and Communities Branch.

Record entered by:_____ **Sheet No.:**_____ **Record Entered in Database** ❑