

# Reconnaissance and Targeted Flora and Vegetation Survey

Stratherne Road 4.04-5.04 SLK

Cuballing

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Prepared for the Shire of Cuballing  
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## Executive Summary

Ecoedge was engaged by the Shire of Cuballing to undertake a Reconnaissance and Targeted flora and vegetation survey of approximately 1.0 kilometres of road reserve vegetation along both sides of Stratherne Road, approximately 5.3 kilometres NE of the town of Cuballing.

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).

26 flora taxa (including 8 introduced species) were identified.

No threatened flora, priority flora or other flora of conservation significance were found.

None of the introduced species were Declared Pest Plants or could be regarded as serious environmental weeds.

0.09 hectares of the Survey Area meets the criteria for the Federally-listed Threatened Ecological Community (TEC) 'Eucalypt Woodlands of the Western Australian Wheatbelt'. This is the Good Condition portion of Vegetation Unit C2.

0.12 ha of the Survey Area meets the criteria for the State listed Priority 3 listed 'Eucalypt Woodlands of the Western Australian Wheatbelt' ecological community. This comprises the Degraded and better parts of Vegetation Unit C2.

The Survey Area vegetation units (Wandoo woodlands) provide a reasonable match for the Beard, (1980) vegetation association 1023 'Medium woodland; York gum, wandoo and salmon gum'. The extent remaining of this association (at 10.85 %) is significantly below the Commonwealth government's 30% retention threshold, with only 10.93% represented within the DBCA estate.

There are no Environmentally Sensitive Areas within or in close proximity to the Survey Area.

The Survey Area occurs within a narrow and mostly degraded corridor of native roadside vegetation that provides a low level of connectivity between remnant vegetation on private and government managed lands. This corridor is perceived to have some conservation value, at least at a local level, due to its occurrence within a predominantly cleared agricultural landscape.

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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.

### Report for Benefit of Client

The report has been prepared for the benefit of the Client and for no other party. Ecoedge assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including, without limitation, matters arising from any negligent act or omission of Ecoedge or for any loss or damage suffered by any other party relying on the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions, and should make their own enquiries and obtain independent advice in relation to such matters.

## 1 Introduction and Desktop Assessment

Ecoedge was engaged by the Shire of Cuballing to undertake a Reconnaissance and Targeted flora and vegetation survey of approximately 1.0 kilometres (km) of road reserve vegetation along both sides of Statherne Road (SLK 4.04 – 5.04), approximately 1.7 km northeast of the Taylors Road intersection (Survey Area) (**Figure 1** and **Figure 2**).

The Shire of Cuballing is applying for a permit to clear areas of native vegetation along approximately 1km of Stratherne Road. The Department of Water Environment and Regulation (DWER) requires a survey to ascertain the presence of threatened and priority flora and threatened and priority ecological communities within the subject area.

The flora and vegetation survey was undertaken on the 9 October 2019. Its methodology was aligned with State and Commonwealth requirements for the bioregion and species and communities present, and was consistent with State guidelines and Technical Guides (including Environmental Protection Authority (EPA) Technical Guidance (2016)) and Commonwealth survey guidelines for any relevant threatened species.

The total area surveyed was approximately 2.4 hectares in size and comprised of approximately 0.6 hectares (ha) of native vegetation.

This report compiles findings of the survey.

### 1.1 Scope and Objectives

Carry out a Targeted and Reconnaissance Flora and Vegetation Survey of approximately 0.2 ha of road reserve on Stratherne Road. This will involve surveying both sides of the road (2-5m) over a distance of 1.0 km.

The survey is required to document:

- the date(s) of the survey.
- all flora species present within the application area.
- any limitations for identifying species present, noting that the survey should be undertaken at an appropriate time for recording the majority of the species present.
- the presence of threatened and priority ecological communities, especially potential presence of 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 the Eucalypt Woodlands of the Western Australian Wheatbelt.
- 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).

Multiple visits may be required to confirm the identification of particular species if there is a risk those species could be declared rare or priority flora species. Should declared rare or priority flora be identified, additional surveys of any adjacent remnant vegetation will also be required to determine the species' population size and distribution.

If declared rare or priority flora species are recorded, GPS locations (i.e. eastings and northings or decimal degrees) of all plants of those species must be recorded and provided.

### Reporting

The draft reports will be provided in MS Word format. The final reports, after receipt and addressing of any comments from the Shire, will be provided in Portable Document Format (PDF). Ecoedge will supply the Shire an Index of Biodiversity Surveys for Assessments (IBSA) package as per the standards required by DWER.

## **1.2 Biogeographic Region and Location**

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). It occurs within the road reserve along both sides of Stratherne Road, approximately 5.3 km NE of the town of Cuballing (**Figure 2**). The Survey Area is surrounded by privately managed cleared agricultural land.

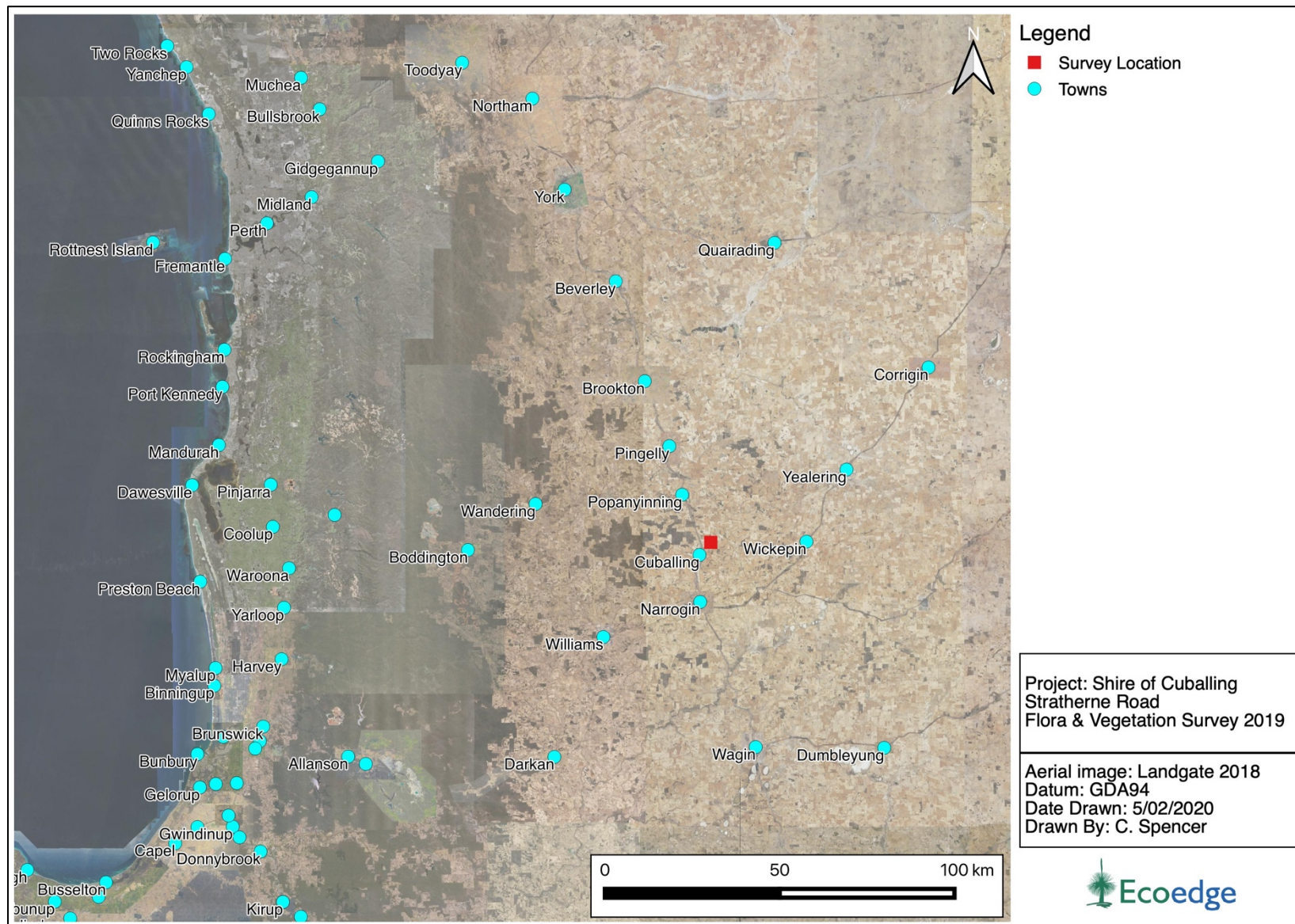


Figure 1. Aerial photograph showing the location of the Survey Area.



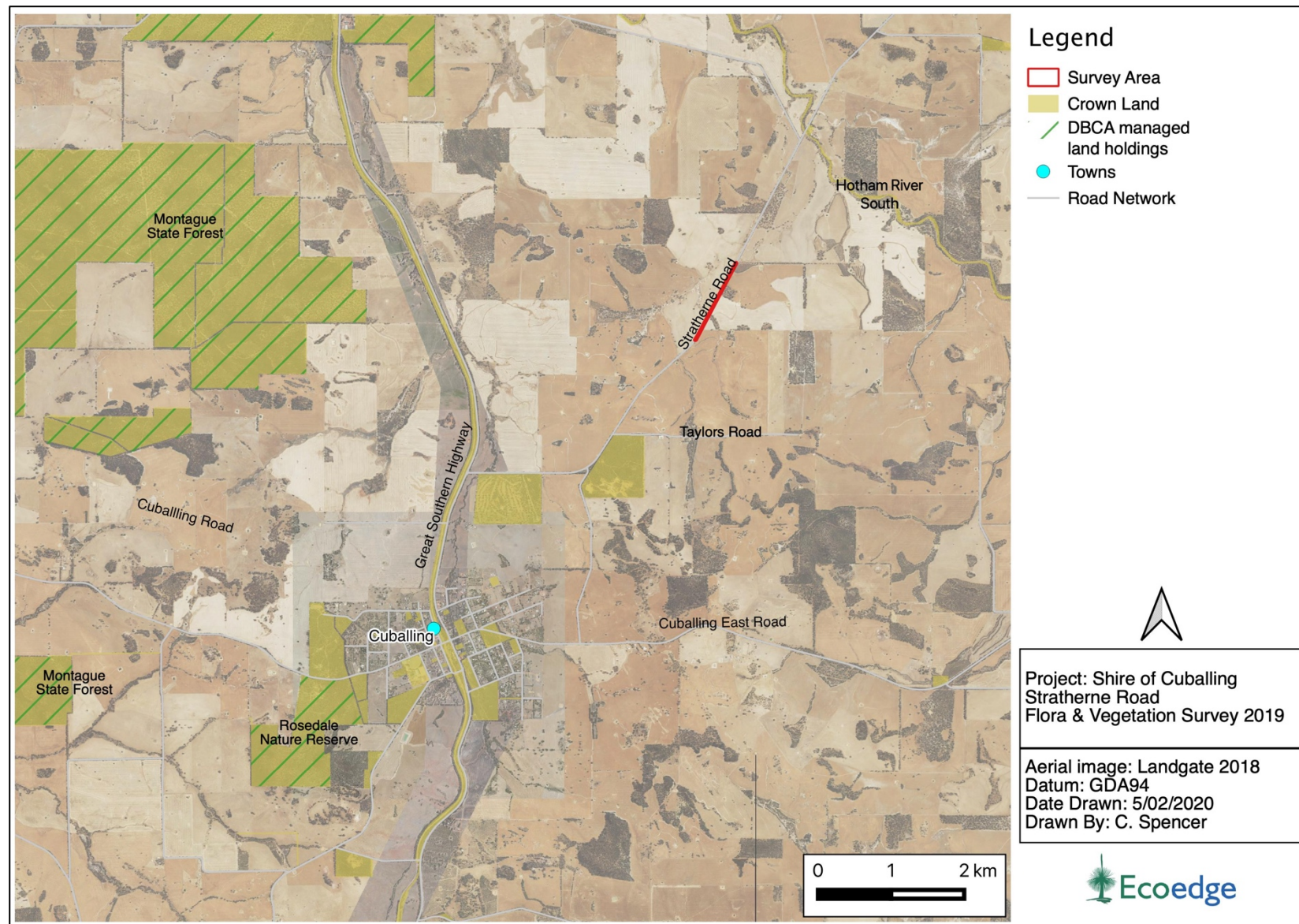


Figure 2. The Survey Area in context of surrounding land uses.

### 1.3 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 257DyNB, 257DyNO and 257DyPG subsystems, as shown in **Figure 3** (McArthur, *et al.* 1977). These 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.	257DyNB - Noombaling Subsystem  Long gentle and undulating hillslopes and divides. Colluvium / weathered granite, gneiss and some dolerite. Yellow/brown and grey deep sandy duplexes, brown deep loamy duplexes, sandy gravels and shallow duplexes. Marri-Wandoo / Jam-Sheoak.
		257 DyNO – Norrine Subsystem  A complex of lateritic residuals and associated pediment; gravely sand, sand, duplex yellow soils and duricrust
		257DyPG – Popanyinning Subsystem  Broad valley floor; yellow duplex soils and a narrow lower sandy terrace, sporadic sand dunes



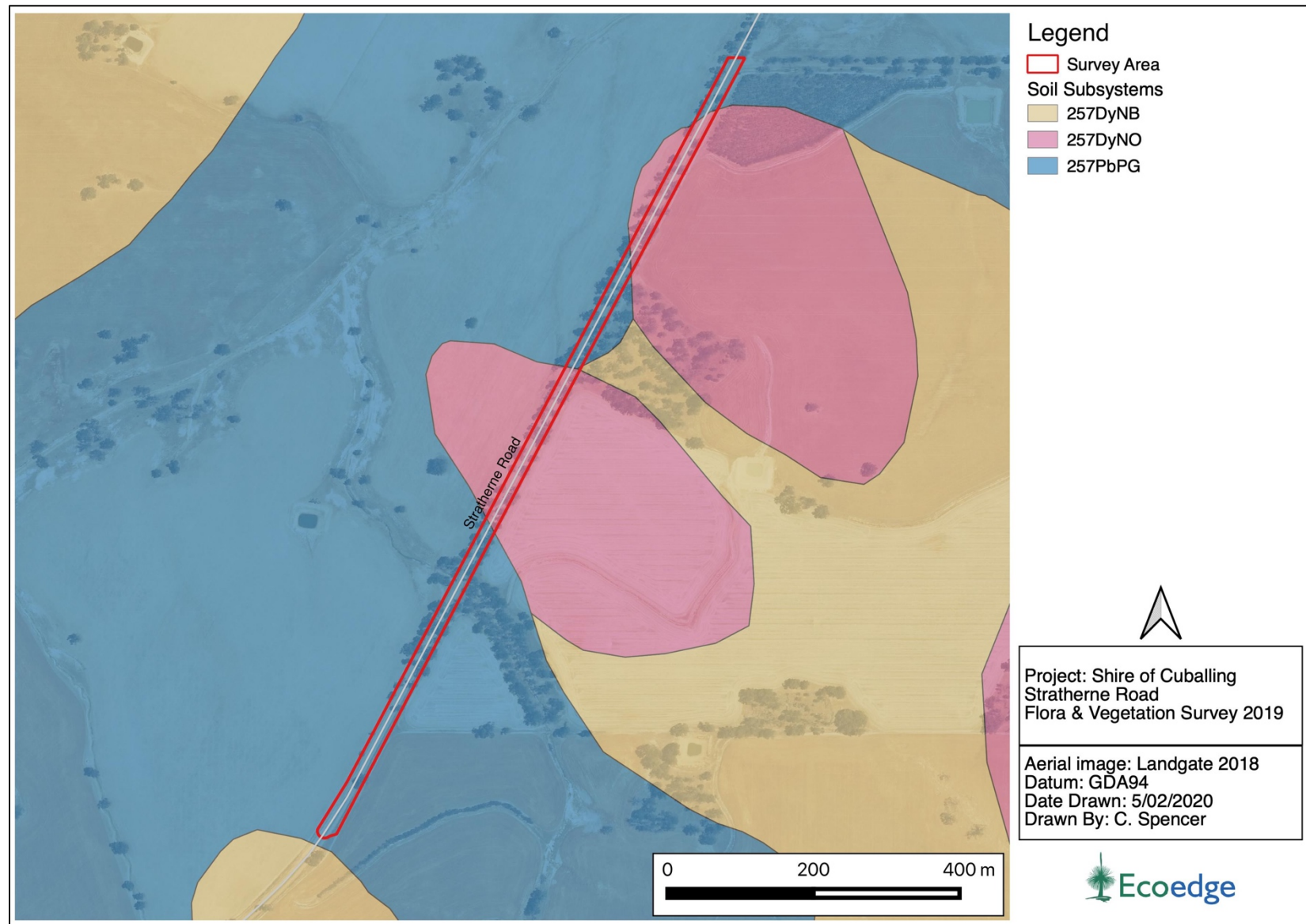


Figure 3. Soil subsystems mapped for the Survey Area (McArthur, *et al.* 1977).

## 1.4 Vegetation Description according to pre-European Mapping Datasets

The Survey Area contains approximately 0.6 ha of remnant native vegetation.

### 1.4.1 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)<sup>1</sup>. One Beard vegetation association was mapped as occurring within the Survey Area: association 1023 'Medium woodland; York gum, wandoo and salmon gum' (Beard, 1980).

### 1.4.2 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* for the Avon Wheatbelt biogeographic region is presented in **Table 2**. The extent remaining of association 1023 falls well below the 30% retention target.

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<sup>1</sup> 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.

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

Beard Vegetation Association	Current extent (ha)	% Remaining of pre-European extent (total)	% of current extent in all DBCA managed land (total)
Association 1023 'Medium woodland; York gum, wandoo and salmon gum'	172,944.3	10.85%	10.93%

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

### 1.5 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 (2018c, 2019c). 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) State	Status (EPBC Act) Federal
'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.

## 1.6 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, 2018d).

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	Description and Habitat	Likelihood
<i>Acacia insolita subsp. recurva</i>	T (EN)	Sep	Spindly shrub, 0.6-1.2 m high. Fl. yellow-cream. Lateritic ridges.	Low / Moderate
<i>Banksia oligantha</i>	T (EN)	Oct-Nov	Non-lignotuberous shrub, to 3 m high. Fl. red & cream/orange-brown. Yellow or yellow-brown sand.	Moderate
<i>Boronia capitata subsp. capitata</i>	T (EN)	Aug to Dec or Feb	Slender shrub, 0.3-1.3 m high. Fl. pink. Sand, often over laterite. Sandplains.	Moderate
<i>Darwinia carnea</i>	T (EN)	Oct to Dec	Spreading shrub, 0.2-0.45 m high. Fl. green & red. Lateritic loam & gravel.	Low / Moderate
<i>Verticordia fimbrialepis subsp. fimbrialepis</i>	T (EN)	Oct-Dec, Jan	Shrub, 0.3-0.7 m high. Fl. pink-white. Gravelly sandy or clayey soils. Flats, road verges.	Moderate
<i>Diuris micrantha</i>	T (VU)	Sep-Oct	Tuberous, perennial, herb, 0.3–0.6 m high. Fl. yellow, brown. Brown loamy clay. Winter-wet swamps, in shallow water.	Low
<i>Pultenaea pauciflora</i> (Narrogin Pea)	T (VU)	Oct - Nov	Dense, much-branched shrub, to 0.8 m high. Fl. yellow. Sandy & clay lateritic soils. Undulating country.	Low / Moderate
<i>Stylidium exappendiculatum</i>	P3		No information available	Moderate?
<i>Caladenia integra</i>	P4	Sep to Oct	Tuberous, perennial, herb, 0.2-0.5 m high. Fl. green & red. Clayey loam. Granite outcrops, rocky slopes.	Low
<i>Eucalyptus loxophleba x wandoo</i>	P4	No info avail	(Mallee) or tree, 4-20 m high, bark rough black-brown on trunk. Sandy clay or loam.	Moderate
<i>Stylidium tenuicarpum</i>	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.	Moderate

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

## 1.7 Ecological Corridors and Connectivity

Vegetation within the Survey Area does not form part of a recognised ecological linkage. The Survey Area does however occur within one of the few corridors of native vegetation that provides a level of connectivity between parcels of native bushland on both privately and crown managed land within the predominantly cleared agricultural landscape (**Figure 4**). The vegetation within the Survey Area occurs within the most degraded and fragmented portion of the corridor, based on an assessment of the aerial imagery.

## 1.8 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 4.75 km west of the Survey Area and is associated with a reserve forming part of the Montague State Forest.

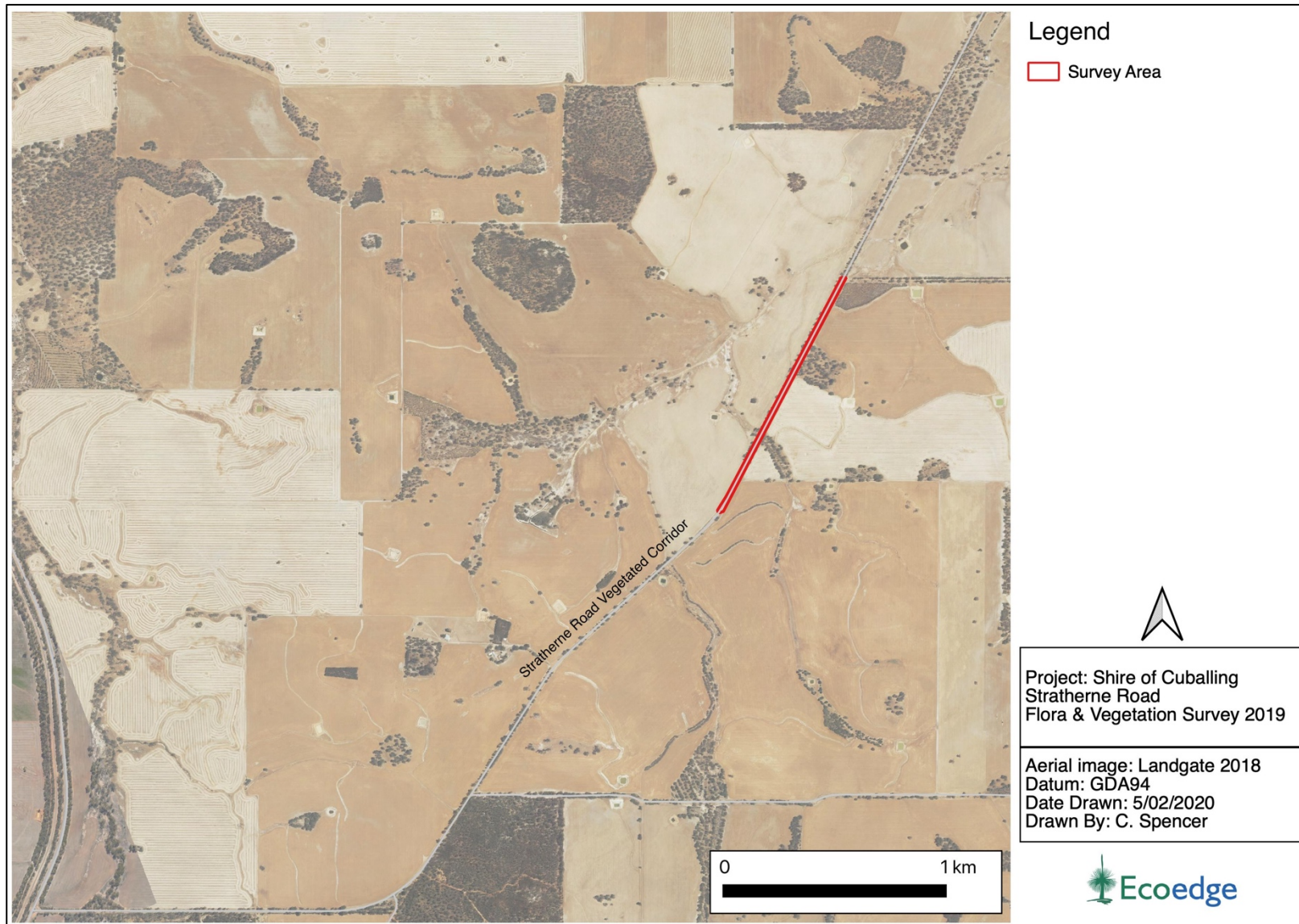


Figure 4. Vegetated corridor along Stratherne Road.



## 2 Methods

### 2.1 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.

### 2.2 Field Survey

The field survey was undertaken by Russell Smith (SL flora permit FB62000192) on 9 October 2019. The Survey Area covered a total of approximately 2.4 ha of which about 0.6 ha was remnant vegetation (the remainder comprising cleared verge with scattered trees and the roadway itself). A comprehensive list was made of native and introduced flora and information on vegetation structure, dominant species and vegetation condition at regular intervals 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**).

### 2.3 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 Western Australia.

### 3 Results

#### 3.1 Flora

Twenty-six flora taxa were identified within the Survey Area, of which eight species were introduced. No Threatened flora, Priority flora or other flora of conservation significance were found.

None of the introduced species were Declared Pest Plants or could be regarded as serious environmental weeds.

The list of vascular flora recorded during the field survey is included in **Appendix 7**.

### 3.2 Vegetation Units

Two vegetation units (C1, C2) were recognised within the Survey Area. They are described below with accompanying pictures (**Figure 5** and **Figure 6**) and mapped in **Figure 7**. Vegetation unit C2 is a less degraded variant of unit C1. Based on a comparison of species composition they probably belong to the regionally widespread Wandoo-Sheoak woodland on gravelly soils (Harvey and Keighery, 2012).

The area mapped as “Cleared” includes verge with isolated trees. Areas covered by each of the units are provided in **Table 6**.



Figure 5 typical unit C1 vegetation

Vegetation Unit C1. Woodland of *Eucalyptus wandoo* over open low woodland of *Allocasuarina huegeliana* over scattered shrubs including *Hibbertia exasperata* over grassland of *\*Bromus diandrus*, *\*Ehrharta calycina* and herbland of *\*Hypochaeris glabra* and *\*Raphanus raphanistrum* on gravelly yellow-brown loam. [Completely Degraded].





Figure 6 typical unit C2 vegetation

Vegetation Unit C2. Woodland of *Eucalyptus wandoo* over scattered shrubs of *Gastrolobium ovatum* and *Xanthorrhoea drummondii*, grassland of *Austrostipa elegantissima*, *A. variabilis*, \**Avena fatua*, \**Bromus hordeaceus*, \**Ehrharta longiflora* and herbland of *Dampiera lavandulacea*, *Dianella revoluta* and *Loxocarya cinerea* on gravelly yellow-brown loam. [Degraded].

The extent in hectares of each unit within the Survey Area is provided in **Table 6**.

Table 6. Area of each vegetation unit within the Survey Area.

Vegetation Unit	Area (ha)	%
C1	0.49	20.6
C2	0.12	5.0
Cleared	1.77	74.4
<b>Total</b>	<b>2.38</b>	<b>100</b>

### 3.3 Vegetation Condition

The great majority of the Survey Area (75%) was assessed as “cleared” or Completely Degraded. As noted above the Cleared area includes isolated trees on verges (**Table 7**). Vegetation condition is mapped in **Figure 9** and **Figure 10**.

Table 7. Summary of vegetation condition classes within the Survey Area.

Vegetation Unit	Cons Status*	Vegetation Condition	Area (Ha)	%
Unit C1	N/A	Completely Degraded	0.49	20.6
Unit C2	P3 (CR)	Good	0.09	3.8
	P3	Degraded	0.03	1.3
		Cleared	1.77	74.3
		<b>Total</b>	2.38	100

\*Note: EPBC Act status is in brackets.





Figure 7. Vegetation units mapped within the Survey Area.



Figure 8. Vegetation units mapped within the Survey Area.





Figure 9. Vegetation condition mapped within the Survey Area.

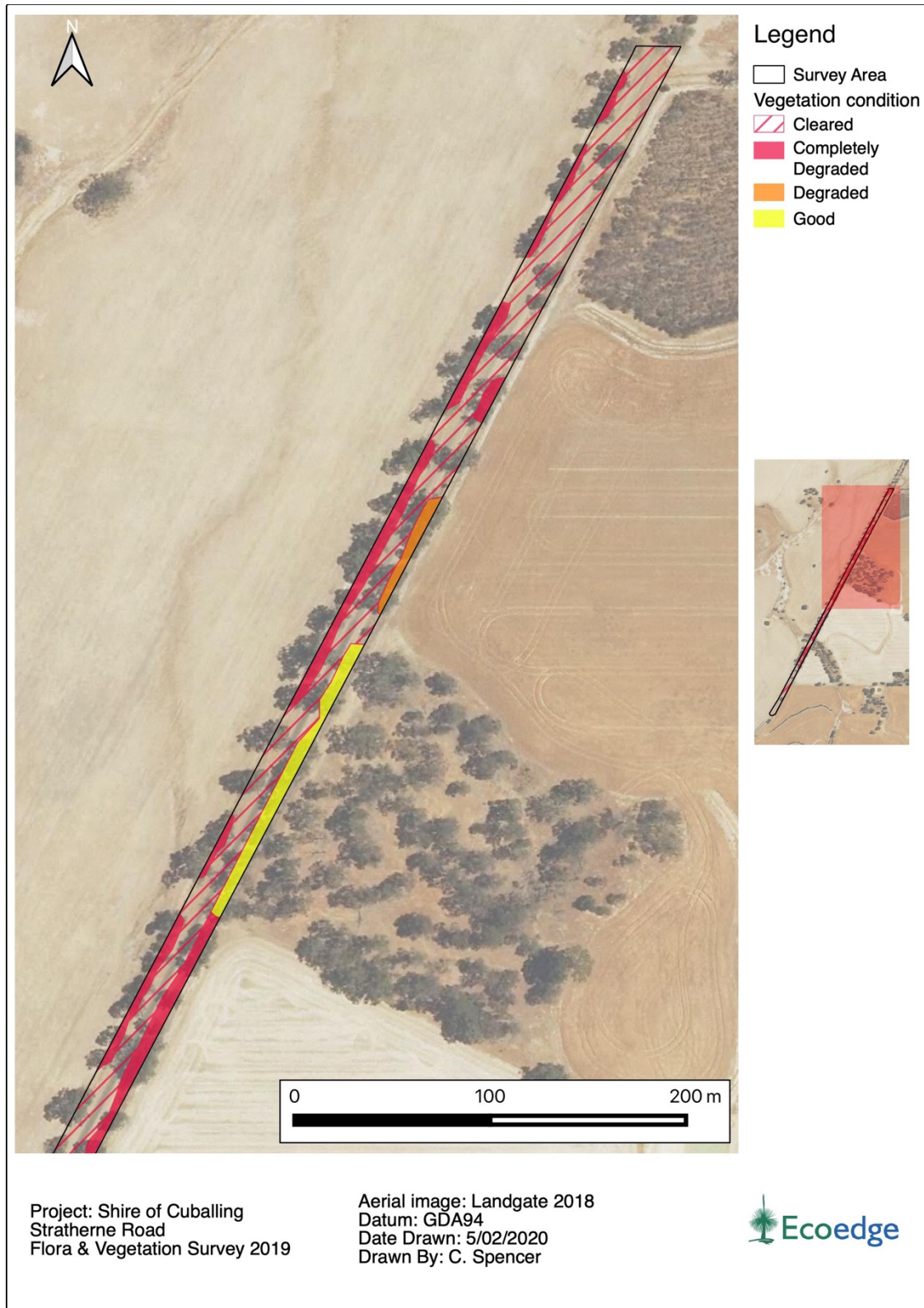


Figure 10. Vegetation condition mapped within the Survey Area.

## 4 Discussion and conclusions

There was 0.09 ha of vegetation unit C2 (the part in Good condition), which is dominated by *Eucalyptus wandoo*, meets the key diagnostic traits (minimum vegetation condition and width criteria) for the Critically Endangered Federally-listed TEC “Eucalypt Woodlands of the Western Australian Wheatbelt” (DotEE, 2015). This TEC is similar to the “Wandoo-Sheoak woodland on gravelly soils” Wheatbelt community (Harvey and Keighery, 2012). **Table 8** shows how this community meets the key diagnostic criteria and **Table 9** shows how it meets the condition and width thresholds for this EPBC listed community (DotEE, 2015). The occurrence of this TEC within the Survey Area is shown in **Figure 11**.

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

Table 8. Comparison of Veg Unit C2 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.
The key species of the tree canopy are species of Eucalyptus (typically with a single trunk).	Yes, it contains Eucalyptus wandoo.
A native understorey is present but is of variable composition, being a combination of grasses, other herbs and shrubs.	Yes, criteria met, however mostly in degraded condition.

Table 9. Comparison of Veg Unit C2 with Eucalypt Woodlands of the Western Australian Wheatbelt TEC condition and area criteria adapted from DotEE, 2015.

Condition Category	Mature trees	Minimum Patch Width (roadsides only)	Comment
Pristine, Excellent, Very Good	Mature trees may be present or absent	5 metres or more	N/A
Good	Mature trees are present with at least 5 trees per 0.5 ha.	5 metres or more	Small area (0.09 ha) meets this criterion.
Good	Mature trees either absent or less than 5 trees per 0.5 ha are present.	5 metres or more	N/A
Degraded to Good	Mature trees are present with at least 5 trees per 0.5 ha.	5 metres or more	N/A – Note no vegetation units within the Survey Area were given a ‘Degraded to Good’ Condition rating.



According to the Federally approved conservation advice for this TEC, any areas meeting the 'Eucalypt Woodlands of the Western Australian Wheatbelt' criteria, 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. This means that any clearing of native vegetation within the occurrence of the TEC within vegetation unit C2 may be regarded as having a potentially significant impact on the overall TEC.

All of Vegetation unit C2 comprising of 0.12 ha also meets the criteria of the State-listed Priority Three ecological community "Eucalypt Woodlands of the Western Australian Wheatbelt" (2019c). 0.03 ha of this community is in a Degraded condition and 0.09 ha is in a Good Condition. Noting that the State may consider Degraded Condition vegetation as part of the State listed PECs. The occurrence of this PEC is shown in **Figure 11**.

The Survey Area vegetation units (Wandoo woodlands) provide a reasonable match for the Beard, (1980) vegetation association 1023 'Medium woodland; York gum, wandoo and salmon gum' mapped across the Survey Area, in terms of one of the dominant trees, *E. wandoo*. The absence of York and salmon gum is considered reasonable as Beard's mapping was undertaken at a broad scale of 1:250,000 and would have inherent variations in species composition across the extent of mapped associations. The extent remaining of this association (at 10.85 %) is significantly below the Commonwealth government's 30% retention threshold, with only 10.93% represented within the DBCA estate.

There are no ESAs within or in close proximity to the Survey Area that will limit the proposed road upgrade. The closest is located approximately 4.75 km west of the Survey Area and is associated with a reserve forming part of the Montague State Forest.

The Survey Area occurs within a corridor of vegetation within the Stratherne Road reserve that provides a low level of connectivity between remnant vegetation on privately and government managed lands in the area. The overall level of connectivity of the corridor is perceived to be low due to its narrow, mostly degraded, and discontinuous nature. This corridor has some conservation value, at least at a local level, due to its occurrence within a predominantly cleared agricultural landscape. Vegetation within the Survey Area occurs within the most degraded and fragmented portion of the corridor. Further impacts to this native vegetation may decrease the overall connectivity of the corridor, particularly at a local level. The scale of impact is challenging to quantify and is beyond the scope of this report.



Figure 11. PEC and TEC occurrences within the Survey Area

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Appendix 1. Categories of DBCA Threatened and Priority Ecological Communities (DBCA 2018a, 2019b).

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

Appendix 3. Protected Matters Search Tool and NatureMap reports

Appendix 4. Categories of Threatened and Priority List flora (DBCA, 2019b).

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

Appendix 6. Vegetation Condition Scale (EPA, 2016).

Appendix 7. List of Vascular Flora found within the Survey Area.

Appendix 8 Threatened Ecological Community Report Form

Appendix 1. Categories of threatened and priority ecological communities under the BC Act (DEC, 2013).

Conservation code	Category
(T) Threatened ecological community pursuant to Sect 27 of the <i>Biodiversity Conservation Act 2016</i> .	
T	<p>(T) CR – Critically endangered</p> <p>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.</p>
	<p>(T) EN - Endangered</p> <p>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.</p>
	<p>(T) VU - Vulnerable</p> <p>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>
(P) Priority species – possible threatened communities.	
p1	<p>Poorly known communities</p> <p>Ecological communities that are known from very few occurrences with a very restricted distribution (generally <math>\leq 5</math> occurrences or a total area of <math>\leq 100\text{ha}</math>). 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.</p>

Conservation code	Category
P2	<p>Poorly known communities</p> <p>Communities that are known from few occurrences with a restricted distribution (generally <math>\leq 10</math> occurrences or a total area of <math>\leq 200</math>ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.</p>
P3	<p>Poorly known communities</p> <ul style="list-style-type: none"> <li>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:</li> <li>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;</li> <li>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.</li> </ul> <p>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.</p>
P4	<p>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.</p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</li> </ul>

Conservation code	Category
P5	<p>Conservation dependent ecological communities</p> <p>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.</p>

Appendix 2. Categories of Threatened Ecological Communities under the EPBC Act (DotEE, 2018a).

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).



# NatureMap Species Report

Created By Guest user on 01/10/2019

Current Names Only Yes

Core Datasets Only Yes

Method 'By Circle'

Centre 117° 16' 31" E, 32° 42' 53" S

Buffer 10km

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	3257	<i>Acacia chrysocephala</i>			
2.	11661	<i>Acacia drummondii</i> subsp. <i>drummondii</i>			
3.	14624	<i>Acacia gemina</i>			
4.	14121	<i>Acacia insolita</i> subsp. <i>recurva</i>		T	
5.	3408	<i>Acacia lasiocalyx</i> (Silver Wattle, Wilyurwur)			
6.	15721	<i>Acacia lasiocarpa</i> var. <i>sedifolia</i>			
7.	11448	<i>Acacia leptospermoides</i> subsp. <i>leptospermoides</i>			
8.	3557	<i>Acacia stenoptera</i> (Narrow Winged Wattle)			
9.	13505	<i>Acacia sulcata</i> var. <i>planoconvexa</i>			
10.	44513	<i>Acacia thieleana</i>			
11.	12674	<i>Acacia tratmaniana</i>			
12.	24260	<i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
13.	24261	<i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
14.	24262	<i>Acanthiza inornata</i> (Western Thornbill)			
15.	24265	<i>Acanthiza uropygialis</i> (Chestnut-rumped Thornbill)			
16.	25535	<i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
17.	25536	<i>Accipiter fasciatus</i> (Brown Goshawk)			
18.	11837	<i>Adenanthos cygnorum</i> subsp. <i>cygnorum</i> (Common Woollybush)			
19.	184	<i>Aira caryophyllea</i> (Silvery Hairgrass)	Y		
20.	1731	<i>Allocasuarina huegeliana</i> (Rock Sheoak, Kwowl)			
21.	1732	<i>Allocasuarina humilis</i> (Dwarf Sheoak)			
22.	1734	<i>Allocasuarina microstachya</i>			
23.	24561	<i>Anthochaera carunculata</i> (Red Wattlebird)			
24.	1116	<i>Aphelia brizula</i>			
25.	24285	<i>Aquila audax</i> (Wedge-tailed Eagle)			
26.	25566	<i>Artamus cinereus</i> (Black-faced Woodswallow)			
27.	24353	<i>Artamus cyanopterus</i> (Dusky Woodswallow)			
28.	42140	<i>Astroloma acervatum</i>			
29.	6324	<i>Astroloma compactum</i>			
30.	6326	<i>Astroloma epacridis</i>			
31.	6336	<i>Astroloma serratifolium</i> (Kondrung)			
32.	17237	<i>Austrostipa elegantissima</i>			
33.	17241	<i>Austrostipa hemipogon</i>			
34.	17255	<i>Austrostipa trichophylla</i>			
35.	17257	<i>Austrostipa variabilis</i>			
36.	233	<i>Avena barbata</i> (Bearded Oat)	Y		
37.	32203	<i>Banksia nivea</i> subsp. <i>nivea</i>			
38.	32142	<i>Banksia proteoides</i> (King Dryandra)			
39.	32041	<i>Banksia stuposia</i>			
40.		<i>Barnardius zonarius</i>			
41.	5385	<i>Beaufortia incana</i> (Grey-leaved Beaufortia)			
42.	7856	<i>Blennospora drummondii</i>			
43.	4406	<i>Boronia busselliana</i>			
44.	11502	<i>Boronia capitata</i> subsp. <i>clavata</i>			
45.	1269	<i>Borya laciniata</i>			
46.	1273	<i>Borya sphaerocephala</i> (Pincushions)			
47.	3710	<i>Bossiaea eriocarpa</i> (Common Brown Pea)			
48.	244	<i>Briza maxima</i> (Blowfly Grass)	Y		
49.	245	<i>Briza minor</i> (Shivery Grass)	Y		
50.	1385	<i>Burchardia multiflora</i> (Dwarf Burchardia)			
51.	24359	<i>Burhinus grallarius</i> (Bush Stone-curlew)			
52.	29439	<i>Caesia</i> sp. <i>Wongan</i> (K.F. Kenneally 8820)			
53.	11165	<i>Caladenia falcata</i>			

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
54.	15348	<i>Caladenia flava</i> subsp. <i>flava</i>			
55.	15502	<i>Caladenia footeana</i>			
56.	1598	<i>Caladenia integra</i> (Mantis Orchid, Smooth-lipped Spider Orchid)		P4	
57.	15363	<i>Caladenia longicauda</i> subsp. <i>eminens</i>			
58.	2846	<i>Calandrinia calyptata</i> (Pink Purslane)			
59.	45760	<i>Calectasia valida</i> (Robust Tinsel Lily)			
60.	35162	<i>Calothamnus planifolius</i> var. <i>planifolius</i>			
61.	35816	<i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i>			
62.	5465	<i>Calytrix leschenaultii</i>			
63.	1121	<i>Centrolepis aristata</i> (Pointed Centrolepis)			
64.	24086	<i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
65.	24186	<i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
66.	1217	<i>Chamaexeros serra</i> (Little Fringe-leaf)			
67.	6746	<i>Chloanthes coccinea</i>			
68.	764	<i>Chorizandra multiarticulata</i>			
69.	24980	<i>Christinus marmoratus</i> (Marbled Gecko)			
70.	16524	<i>Cicendia quadrangularis</i>	Y		
71.	25675	<i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
72.	1454	<i>Conostylis setigera</i> (Bristly Cottonhead)			
73.	11597	<i>Conostylis setigera</i> subsp. <i>setigera</i>			
74.	25568	<i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
75.	25592	<i>Corvus coronoides</i> (Australian Raven)			
76.	7944	<i>Cotula bipinnata</i> (Ferny Cotula)	Y		
77.	25595	<i>Cracticus tibicen</i> (Australian Magpie)			
78.	17701	<i>Crassula closiana</i>			
79.	20271	<i>Crassula extrorsa</i>			
80.	24918	<i>Crenadactylus ocellatus</i> subsp. <i>ocellatus</i> (Clawless Gecko)			
81.	13527	<i>Croninia kingiana</i>			
82.	4809	<i>Cryptandra pungens</i>			
83.	30893	<i>Cryptoblepharus buchananii</i>			
84.	24883	<i>Ctenophorus ornatus</i> (Ornate Crevice-Dragon)			
85.	6750	<i>Cyanostegia lanceolata</i> (Tinsel Flower)			
86.	30901	<i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
87.	7438	<i>Dampiera eriocephala</i> (Woolly-headed Dampiera)			
88.	7451	<i>Dampiera lavandulacea</i>			
89.	7453	<i>Dampiera lindleyi</i>			
90.	3819	<i>Daviesia longifolia</i>			
91.	3839	<i>Daviesia rhombifolia</i>			
92.	25766	<i>Delma fraseri</i> (Fraser's Legless Lizard)			
93.	17663	<i>Desmocladus asper</i>			
94.	1288	<i>Dichopogon fimbriatus</i> (Chocolate Lily)			
95.	1289	<i>Dichopogon preissii</i>			
96.	20367	<i>Dillwynia laxiflora</i>			
97.	41403	<i>Diplodactylus calcicolus</i> (South Coast Gecko)			
98.	24929	<i>Diplodactylus granariensis</i> subsp. <i>granariensis</i>			
99.	15268	<i>Diplolaena graniticola</i>			
100.	11247	<i>Dodonaea viscosa</i> subsp. <i>angustissima</i>			
101.	15709	<i>Drosera androsacea</i> (Cone Sundew)			
102.	3098	<i>Drosera glanduligera</i> (Pimpernel Sundew)			
103.	3109	<i>Drosera menziesii</i> (Pink Rainbow)			
104.		<i>Drosera</i> sp.			
105.	49090	<i>Drosera</i> sp. Branched styles (S.C. Coffey 193)			
106.	3133	<i>Drosera subhirtella</i> (Sunny Rainbow)			
107.	1643	<i>Elythranthera brunonis</i> (Purple Enamel Orchid)			
108.		<i>Eolophus roseicapillus</i>			
109.	25109	<i>Eremiascincus richardsonii</i> (Broad-banded Sand Swimmer)			
110.	45243	<i>Ericomyrtus parviflora</i>			
111.	5548	<i>Eucalyptus albida</i> (White-leaved Mallee)			
112.	12697	<i>Eucalyptus latens</i> (Narrow-leaved Red Mallee)			
113.	11295	<i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i> (York Gum)			
114.	16886	<i>Eucalyptus loxophleba</i> x <i>wandoo</i>		P4	
115.	5735	<i>Eucalyptus pachyloma</i> (Kalgan Plains Mallee)			
116.	12892	<i>Eucalyptus phaenophylla</i> subsp. <i>phaenophylla</i>			
117.	12906	<i>Eucalyptus wandoo</i> subsp. <i>wandoo</i>			
118.	901	<i>Gahnia australis</i>			
119.	3895	<i>Gastrolobium calycinum</i> (York Road Poison)			
120.	3909	<i>Gastrolobium microcarpum</i> (Sandplain Poison)			
121.	3910	<i>Gastrolobium obovatum</i> (Boat-leaved Poison)			
122.	10981	<i>Gastrolobium parviflorum</i>			
123.	3926	<i>Gastrolobium stipulare</i>		P4	

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
124.	3927	<i>Gastrolobium stowardii</i>			
125.	3930	<i>Gastrolobium trilobum</i> (Bullock Poison)			
126.	24959	<i>Gehyra variegata</i>			
127.	25530	<i>Gerygone fusca</i> (Western Gerygone)			
128.	6143	<i>Glischrocaryon aureum</i> (Common Popflower)			
129.	7991	<i>Gnephosis drummondii</i>			
130.	8002	<i>Gnephosis tenuissima</i>			
131.	3951	<i>Gompholobium marginatum</i>			
132.	6159	<i>Gonocarpus nodulosus</i>			
133.	7495	<i>Goodenia berardiana</i>			
134.	17805	<i>Goodenia drummondii</i> subsp. <i>megaphylla</i>			
135.	7538	<i>Goodenia pulchella</i>			
136.	19051	<i>Goodenia scapigera</i> subsp. <i>scapigera</i>			
137.	24443	<i>Grallina cyanoleuca</i> (Magpie-lark)			
138.	2029	<i>Grevillea leptobotrys</i>			
139.	15991	<i>Grevillea pulchella</i> subsp. <i>pulchella</i>			
140.	2788	<i>Gyrostemon subnudus</i>			
141.	16907	<i>Hakea hastata</i>			
142.	2172	<i>Hakea lehmanniana</i> (Blue Hakea)			
143.	2175	<i>Hakea lissocarpha</i> (Honey Bush)			
144.	16900	<i>Hakea petiolaris</i> subsp. <i>petiolaris</i>			
145.	19132	<i>Hakea pritzelii</i>			
146.	2203	<i>Hakea ruscifolia</i> (Candle Hakea)			
147.	25408	<i>Heleioporus albopunctatus</i> (Western Spotted Frog)			
148.	6855	<i>Hemigenia humilis</i>			
149.	6865	<i>Hemigenia podalyrina</i>			
150.	5114	<i>Hibbertia commutata</i>			
151.	5124	<i>Hibbertia exasperata</i>			
152.	5144	<i>Hibbertia microphylla</i>			
153.	24491	<i>Hirundo neoxena</i> (Welcome Swallow)			
154.	12742	<i>Hyalosperma demissum</i>			
155.	6226	<i>Hydrocotyle callicarpa</i> (Small Pennywort)			
156.	2238	<i>Isopogon teretifolius</i> (Nodding Coneflower)			
157.	3992	<i>Isotropis cuneifolia</i> (Granny Bonnets)			
158.	19700	<i>Isotropis cuneifolia</i> subsp. <i>cuneifolia</i>			
159.	3997	<i>Jacksonia alata</i>			
160.	14749	<i>Jacksonia debilis</i>		P1	
161.	14739	<i>Jacksonia epiphyllum</i>			
162.	4025	<i>Jacksonia restioides</i>			
163.	4029	<i>Jacksonia sternbergiana</i> (Stinkwood, Kapur)			
164.	5836	<i>Kunzea micromera</i>			
165.	11528	<i>Labichea lanceolata</i> subsp. <i>brevifolia</i>			
166.	13284	<i>Lawrencella rosea</i>			
167.	1305	<i>Laxmannia omnifertilis</i>			
168.	1306	<i>Laxmannia paleacea</i>			
169.	7568	<i>Lechenaultia biloba</i> (Blue Leschenaultia)			
170.	24557	<i>Leipoa ocellata</i> (Malleefowl)		T	
171.	930	<i>Lepidosperma costale</i>			
172.		<i>Lepidosperma</i> sp.			
173.	16284	<i>Lepidosperma</i> sp. P1 small head (M.D. Tindale 166A)			
174.	949	<i>Lepidosperma tuberculatum</i>			
175.	5847	<i>Leptospermum erubescens</i> (Roadside Teatree)			
176.	25131	<i>Lerista distinguenda</i>			
177.	44220	<i>Leucopogon audax</i>		P2	
178.	19371	<i>Leucopogon</i> sp. Wandering (F. Hort 419)			
179.	19364	<i>Leucopogon tamminensis</i> var. <i>australis</i>			
180.	25661	<i>Lichmera indistincta</i> (Brown Honeyeater)			
181.	25415	<i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
182.	41413	<i>Liopholis multiscutata</i> (Bull Skink)			
183.	15835	<i>Loxocarya striata</i>			
184.	19421	<i>Marianthus bicolor</i> (Painted Marianthus)			
185.	19486	<i>Melaleuca hamata</i>			
186.	5956	<i>Melaleuca pungens</i>			
187.	5958	<i>Melaleuca radula</i> (Graceful Honeymyrtle)			
188.	15673	<i>Melaleuca tuberculata</i>			
189.	18232	<i>Melaleuca tuberculata</i> var. <i>tuberculata</i>			
190.	25184	<i>Menetia greyii</i>			
191.	24598	<i>Merops ornatus</i> (Rainbow Bee-eater)			
192.	954	<i>Mesomelaena preissii</i>			
193.	6888	<i>Microcorys capitata</i>			

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
194.	485	<i>Microlaena stipoides</i> (Weeping Grass)			
195.	14344	<i>Millotia tenuifolia</i> var. <i>tenuifolia</i> (Soft Millotia)			
196.	1535	<i>Moraea fugax</i>	Y		
197.	25240	<i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
198.	25192	<i>Morethia obscura</i>			
199.	24223	<i>Mus musculus</i> (House Mouse)	Y		
200.	24146	<i>Myrmecobius fasciatus</i> (Numbat, Walpurti)		T	
201.	25426	<i>Neobatrachus pelobatoideus</i> (Humming Frog)			
202.	492	<i>Neurachne alopecuroides</i> (Foxtail Mulga Grass)			
203.	6978	<i>Nicotiana rotundifolia</i> (Round-leaved Tobacco)			
204.	48024	<i>Notamacropus eugenii</i> subsp. <i>derbianus</i> (Tammar Wallaby, Tammar)		P4	
205.	24407	<i>Ocyphaps lophotes</i> (Crested Pigeon)			
206.	18255	<i>Opercularia vaginata</i> (Dog Weed)			
207.	4355	<i>Oxalis perennans</i>			
208.	25680	<i>Pachycephala rufiventris</i> (Rufous Whistler)			
209.	25253	<i>Parasuta gouldii</i>			
210.	25681	<i>Pardalotus punctatus</i> (Spotted Pardalote)			
211.	25682	<i>Pardalotus striatus</i> (Striated Pardalote)			
212.	7089	<i>Parentucellia latifolia</i> (Common Bartsia)	Y		
213.	1762	<i>Parietaria debilis</i> (Pellitory)			
214.	1546	<i>Patersonia juncea</i> (Rush Leaved Patersonia)			
215.	1551	<i>Patersonia pygmaea</i> (Pygmy Patersonia)			
216.	48060	<i>Petrochelidon ariel</i> (Fairy Martin)			
217.	48061	<i>Petrochelidon nigricans</i> (Tree Martin)			
218.	24659	<i>Petroica goodenovii</i> (Red-capped Robin)			
219.	14443	<i>Petrophile ericifolia</i> subsp. <i>ericifolia</i>			
220.	2297	<i>Petrophile heterophylla</i> (Variable-leaved Cone Bush)			
221.	24409	<i>Phaps chalcoptera</i> (Common Bronzewing)			
222.	24098	<i>Phascogale calura</i> (Red-tailed Phascogale, Kenngoor)		S	
223.	16825	<i>Phyllangium divergens</i>			
224.	4675	<i>Phyllanthus calycinus</i> (False Boronia)			
225.	4	<i>Phylloglossum drummondii</i> (Pigmy Clubmoss)			
226.	24745	<i>Platycercus icterotis</i> subsp. <i>icterotis</i> (Western Rosella)			
227.	45237	<i>Podolepis aristata</i> subsp. <i>aristata</i>			
228.	8177	<i>Podolepis lessonii</i>			
229.	8182	<i>Podotrochea angustifolia</i> (Sticky Longheads)			
230.	24907	<i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
231.	25722	<i>Polytelis anthopeplus</i> (Regent Parrot)			
232.	24683	<i>Pomatostomus superciliosus</i> (White-browed Babbler)			
233.	34013	<i>Pomatostomus superciliosus</i> subsp. <i>ashbyi</i> (White-browed Babbler (western wheatbelt))			
234.	15424	<i>Praecoxanthus aphyllus</i>			
235.	16688	<i>Prasophyllum gracile</i>			
236.	25261	<i>Pseudechis australis</i> (Mulga Snake)			
237.	42416	<i>Pseudonaja mengdeni</i> (Western Brown Snake)			
238.	25433	<i>Pseudophryne guentheri</i> (Crawling Toadlet)			
239.	13255	<i>Pterochaeta paniculata</i>			
240.	1693	<i>Pterostylis recurva</i> (Jug Orchid)			
241.	1698	<i>Pterostylis vittata</i> (Banded Greenhood)			
242.	2716	<i>Ptilotus declinatus</i> (Curved Mulla Mulla)			
243.	4172	<i>Pultenaea ericifolia</i>			
244.	8195	<i>Quinetia urvillei</i>			
245.	24245	<i>Rattus rattus</i> (Black Rat)	Y		
246.	48096	<i>Rhipidura albiscapa</i> (Grey Fantail)			
247.	25614	<i>Rhipidura leucophrys</i> (Willie Wagtail)			
248.	32426	<i>Rosulabryum campylothecium</i>			
249.	40431	<i>Rytidosperma acerosum</i>			
250.	40425	<i>Rytidosperma caespitosum</i>			
251.	40427	<i>Rytidosperma setaceum</i>			
252.	972	<i>Schoenus armeria</i>			
253.	1002	<i>Schoenus nanus</i> (Tiny Bog Rush)			
254.	1013	<i>Schoenus sculptus</i> (Gimlet Bog-rush)			
255.	14583	<i>Siloxerus multiflorus</i>			
256.	25266	<i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
257.	30948	<i>Smicromis brevirostris</i> (Weebill)			
258.	1312	<i>Sowerbaea laxiflora</i> (Purple Tassels)			
259.	9070	<i>Stackhousia pubescens</i> (Downy Stackhousia)			
260.	4735	<i>Stackhousia scoparia</i>			
261.	25597	<i>Strepera versicolor</i> (Grey Currawong)			
262.	7698	<i>Stylidium caricifolium</i> (Milkmaids)			

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
263.	7708	<i>Stylidium crassifolium</i> (Thick-leaved Triggerplant)			
264.	19251	<i>Stylidium eriopodum</i>			
265.	40945	<i>Stylidium exappendiculatum</i>		P3	
266.	7773	<i>Stylidium petiolare</i> (Horn Triggerplant)			
267.	7774	<i>Stylidium piliferum</i> (Common Butterfly Triggerplant)			
268.	7804	<i>Stylidium tenuicarpum</i>		P4	
269.	1260	<i>Stypandra glauca</i> (Blind Grass)			
270.	15971	<i>Synaphea flabelliformis</i>			
271.	16761	<i>Synaphea interioris</i>			
272.	46437	<i>Tetrapora preissiana</i>			
273.	35579	<i>Tetraria</i> sp. Jarrah Forest (R. Davis 7391)			
274.	4546	<i>Tetratheca virgata</i>			
275.	5086	<i>Thomasia macrocalyx</i>			
276.	19698	<i>Thryptomene australis</i> subsp. <i>australis</i>			
277.	1348	<i>Thysanotus rectantherus</i>			
278.	1354	<i>Thysanotus tenellus</i>			
279.	1357	<i>Thysanotus thyrsoides</i>			
280.	6279	<i>Trachymene ornata</i> (Spongefruit)			
281.	6280	<i>Trachymene pilosa</i> (Native Parsnip)			
282.	24158	<i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
283.	1361	<i>Tricoryne elatior</i> (Yellow Autumn Lily)			
284.	4295	<i>Trifolium dubium</i> (Suckling Clover)	Y		
285.	18587	<i>Triglochin nana</i>			
286.	15144	<i>Trymalium ledifolium</i> var. <i>lineare</i>			
287.	24983	<i>Underwoodisaurus millii</i> (Barking Gecko)			
288.		<i>Urodacus novaehollandiae</i>			
289.	9008	<i>Urodon dasyphyllus</i> (Mop Bushpea)			
290.	38388	<i>Ursinia anthemoides</i> subsp. <i>anthemoides</i>	Y		
291.	25526	<i>Varanus tristis</i> (Racehorse Monitor)			
292.	7656	<i>Velleia cynopotamica</i>			
293.	7665	<i>Velleia trinervis</i>			
294.	6082	<i>Verticordia grandiflora</i> (Claw Featherflower)			
295.	24206	<i>Vespadelus regulus</i> (Southern Forest Bat)			
296.	24040	<i>Vulpes vulpes</i> (Red Fox)	Y		
297.	7389	<i>Wahlenbergia preissii</i>			
298.	1252	<i>Xanthorrhoea drummondii</i>			
299.	6283	<i>Xanthosia atkinsoniana</i>			
300.	25765	<i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			

#### 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

<sup>1</sup> For NatureMap's purposes, species flagged as endemic are those whose records are wholly 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	<p>(T) CR – Critically endangered</p> <p>Threatened species considered to be “<i>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</i>”.</p>
	<p>(T) EN - Endangered</p> <p>Threatened species considered to be “<i>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</i>”.</p>
	<p>(T) VU - Vulnerable</p> <p>Threatened species considered to be “<i>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</i>”.</p>
(P) Priority species – possible Threatened species.	
P1	<p>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.</p>
P2	<p>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.</p>

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	<p>(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.</p> <p>(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.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>

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 <b>extinct</b> 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 Stratherne Road Survey Area

No	FAMILY NAME	SPECIES NAME	NATURALISED	CONSV CODE
1	Asparagaceae	<i>Lomandra spartea</i>		
2	Asteraceae	<i>Hypochaeris glabra</i>	*	
3	Brassicaceae	<i>Raphanus raphanistrum</i>	*	
4	Celastraceae	<i>Stackhousia monogyna</i>		
5	Dilleniaceae	<i>Hibbertia hemignosta</i>		
6	Fabaceae	<i>Bossiaea eriocarpa</i>		
7	Fabaceae	<i>Gastrolobium obovatum</i>		
8	Goodeniaceae	<i>Dampiera lavandulacea</i>		
9	Hemerocallidaceae	<i>Dianella revoluta</i>		
10	Myrtaceae	<i>Ericomyrtus serpyllifolia</i>		
11	Myrtaceae	<i>Eucalyptus wandoo</i>		
12	Pittosporaceae	<i>Billardiera fusiformis</i>		
13	Poaceae	<i>Austrostipa elegantissima</i>		
14	Poaceae	<i>Austrostipa hemipogon</i>		
15	Poaceae	<i>Avena fatua</i>	*	
16	Poaceae	<i>Briza maxima</i>	*	
17	Poaceae	<i>Bromus diandrus</i>	*	
18	Poaceae	<i>Bromus hordeaceus</i>	*	
19	Poaceae	<i>Ehrharta calycina</i>	*	
20	Poaceae	<i>Ehrharta longiflora</i>	*	
21	Poaceae	<i>Neurachne alopecuroidea</i>		
22	Polygalaceae	<i>Comesperma scoparium</i>		
23	Proteaceae	<i>Banksia fraseri</i>		
24	Restionaceae	<i>Loxocarya cinerea</i>		
25	Rubiaceae	<i>Opercularia vaginata</i>		
26	Xanthorrhoeaceae	<i>Xanthorrhoea drummondii</i>		





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

<b>COMMUNITY:</b> Eucalypt Woodlands of the Western Australian Wheatbelt		<b>OBSERVATION DATE:</b> 9/10/2019
<b>New occurrence</b> <input checked="" type="checkbox"/>	<b>Site ID:</b> _____	<b>CONS STATUS:</b> CR
<b>OBSERVER/S:</b> Russell Smith		<b>PHONE:</b> _____
<b>ROLE:</b> botanist	<b>ORGANISATION:</b> Ecoedge	
<b>EMAIL:</b> russell@ecoedge.com.au		

<b>DESCRIPTION OF LOCATION</b> (Provide at least nearest town/named locality, and the distance and direction to that place): Shire of Cuballing. 4.6 km along Stratherne Road, and east side		
<b>Reserve No:</b> _____		
<b>DISTRICT:</b>	<b>LGA:</b> Cuballing	<b>Land manager present:</b> <input type="checkbox"/>
<b>DATUM:</b> GDA94 / MGA94 <input checked="" type="checkbox"/> AGD84 / AMG84 <input type="checkbox"/> WGS84 <input type="checkbox"/> Unknown <input type="checkbox"/>	<b>COORDINATES:</b> (If UTM coords provided, <b>Zone</b> is also required) DecDegrees <input type="checkbox"/> DegMinSec <input type="checkbox"/> UTM <input checked="" type="checkbox"/> <b>Lat / Northing:</b> 6373613 <b>Long / Easting:</b> 520581 <b>Zone:</b> 50	<b>METHOD USED:</b> GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/> No. satellites: _____ Map used: _____ Boundary polygon captured: <input checked="" type="checkbox"/> Map used: _____
<b>LAND TENURE:</b> Nature reserve <input type="checkbox"/> Timber reserve <input type="checkbox"/> Private property <input type="checkbox"/> Rail reserve <input type="checkbox"/> Shire road reserve <input checked="" type="checkbox"/> National park <input type="checkbox"/> State forest <input type="checkbox"/> Pastoral lease <input type="checkbox"/> MRWA road reserve <input type="checkbox"/> Other Crown reserve <input type="checkbox"/> Conservation park <input type="checkbox"/> Water reserve <input type="checkbox"/> UCL <input type="checkbox"/> SLK/Pole _____ to _____ Specify other: _____		

<b>AREA ASSESSMENT:</b> Edge survey <input type="checkbox"/> Partial survey <input type="checkbox"/> Full survey <input type="checkbox"/> Area observed (m <sup>2</sup> ): 5000
<b>EFFORT:</b> Time spent surveying (minutes): _____ No. of minutes spent / 100 m <sup>2</sup> : _____

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

\*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+)

<b>CONDITION OF OCCURRENCE: (Bush Forever Scale)</b> (estimate % of area in each)		
Pristine <input type="checkbox"/> _____%	Very Good <input type="checkbox"/> _____%	Degraded <input type="checkbox"/> _____%

*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: \_\_\_\_\_



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

Excellent ☐ \_\_\_\_%Good ☒ \_\_\_\_%Completely Degraded ☐ \_\_\_\_%**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:**

- 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; e.g.  
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 ☐

Specify other:

**Specific Landform Element:** (Refer to field manual for additional values)**CONDITION OF SOIL:**Dry ☒ Moist ☐ Waterlogged ☐ Inundated ☐ Cracked ☐ Saline ☐ Other:**VEGETATION  
CLASSIFICATION:**

1. Woodland of Eucalyptus wandoo over
2. scattered shrubs of Gastrolobium ovatum and Xanthorrhoea drummondii, over
3. grassland of Austrostipa elegantissima, A. variabilis, \*Avena fatua, \*Bromus hordeaceus, \*Ehrharta longiflora and
4. herbland of Dampiera lavandulacea, Dianella revoluta and Loxocarya cinerea on gravelly yellow-brown loam

**FIRE HISTORY:***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: \_\_\_\_\_



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

<b>Last Fire:</b>	Season/Month:	Year:	<b>Fire Intensity:</b>	High <input type="checkbox"/>	Medium <input type="checkbox"/>	Low <input type="checkbox"/>	No evidence of fire <input checked="" type="checkbox"/>
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<b>Actual Occurrence Landuse:</b>	road
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<b>Adjacent Landuse:</b>
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<b>Associated Flora Species:</b>

<b>Associated Fauna Species:</b>

<b>OTHER COMMENTS:</b>

<b>ATTACHED:</b>	Map <input type="checkbox"/>	Mudmap <input type="checkbox"/>	Photo <input type="checkbox"/>	GIS data <input type="checkbox"/>	Field notes <input type="checkbox"/>
Other:					

*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: \_\_\_\_\_



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

<b>COPY SENT TO:</b> Regional Office <input type="checkbox"/> District Office <input type="checkbox"/> Other: _____			
<b>Submitter of record:</b> <u>Russell Smith</u>		<b>Role:</b> <u>botanist</u>	
<b>Signature:</b> <u>Russell Smith</u>		<b>Date submitted:</b> <u>08/02/2020</u>	

*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: \_\_\_\_\_