

# Reconnaissance and Targeted Flora and Vegetation Survey, Stratherne Road, 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 Statherne Road. The area of surveyed vegetation was approximately 1.26 ha.

The Shire has applied for a permit to clear 0.2ha of road verge - CPS 8150/1.

The flora and vegetation survey was undertaken on the 11 March 2019 in accordance with the Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016).

Nineteen flora taxa (including six 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.

Two vegetation units were recognised within the Survey Area. Neither of which were regarded to be a State or Federally listed Priority or Threatened Ecological Community.

One vegetation association is mapped for the Survey Area: 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 however is very well represented within the DBCA estate.

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. Clearing within the Survey area will decrease the overall connectivity of the corridor.

There are no Environmental Sensitive Areas in close proximity to the Survey Area. The nearest is located approximately 3.9 km west of the Survey Area and is associated with a reserve forming part of the Montague State Forest.

Clearing of native vegetation requires a permit issued from the Department of Water, Environmental and Regulation.

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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 of road reserve vegetation along both sides of Statherne Road, approximately 0.7 km northeast of the Taylors Road intersection (the Survey Area) (**Figure 1** and **Figure 2**). The area of surveyed vegetation was approximately 1.26 ha.

The Shire is planning to widen this section of road for safety purposes; to inform project design and assist with associated approvals processes.

An out of season flora and vegetation survey was undertaken on 11 March 2019 in accordance with the Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016). The risk of an early autumn survey was considered acceptable by the Department of Water, Environment and Regulation, based on the overall degraded condition of the vegetation and a desktop assessment, indicating the likelihood of occurrence of known presence of Threatened and Priority flora within five kilometres of these areas, as minimal.

This report compiles findings of the field survey.

### 1.1 Scope and Objectives

The objective of the survey was to determine the conservation value of the native flora and vegetation, determine the presence of Threatened and Priority flora and vegetation communities, and assess any potential impacts to these of the proposed works.

The scope of work for the survey is detailed below.

#### Desktop survey

- Identify significant flora, vegetation/ecological communities' values and their potential sensitivity to impact;
- Identify broad pre-European vegetation type(s) (Beard various); and Matiske & Havel (1998) or Heddle et al (1980) vegetation complexes for southwest and Swan Coastal Plain areas.

#### Field survey

- Verify/ground truth the desktop assessment findings through Targeted surveys within the appropriate survey timing for any threatened flora that may occur;
- Undertake vegetation community/type mapping to a scale appropriate for the bioregion;
- Assess the survey area's plant species diversity, structure and weed cover;

- Undertake vegetation condition mapping using EPA (2016) condition scale;
- Undertake a Targeted survey for rare and priority flora based on desktop likelihood of occurrence and habitat availability. When populations are identified, survey and map extent of populations to determine number and habitat area for each population. Provide shapefiles with point data indicating the number of plants identified at each point. If more than 100, the edges of the population boundary can be mapped. If the population extends outside the survey area, the extent of the population will be mapped if on public land (e.g. road reserve). All threatened flora to be mapped with a GPS; and
- Identify the location of any Weeds of National Significance or Declared Pests.

#### Report

- Provide environmental constraints mapping using GIS mapping software (e.g. ArcMap) for flora, fauna, ecological communities, watercourse, wetlands, ESAs etc.;
- Assess flora and vegetation biological aspects likely to require referral of the project to the EPA;
- Provide justification of decision as to whether referral to DotEE is likely to be required.

### 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 Statherne Road, approximately 4.8 km NE of the town of Cuballing (**Figure 2**). The Survey Area is surrounded by privately managed cleared agricultural land.



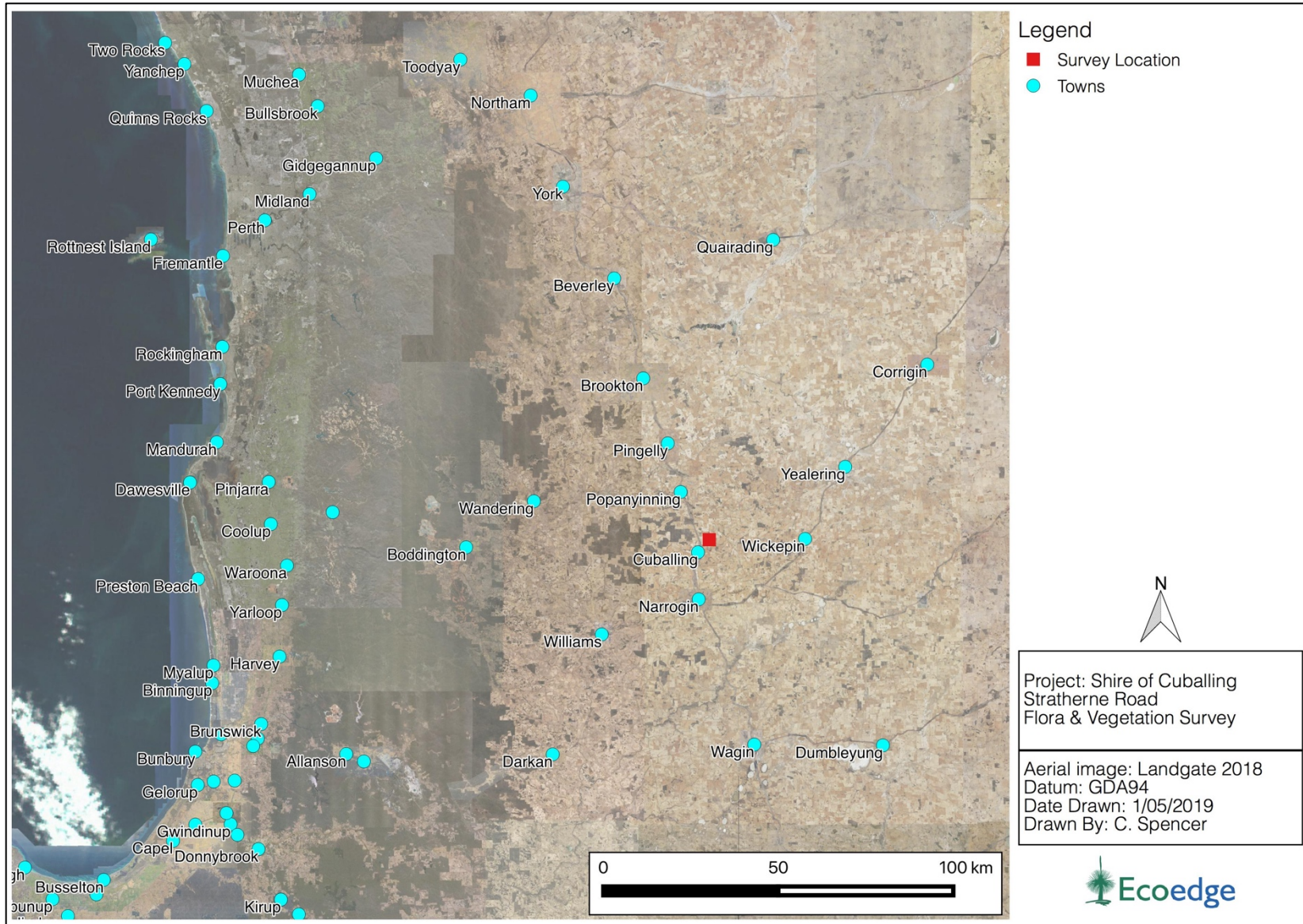


Figure 1. Aerial photograph showing the location of the Survey Area.

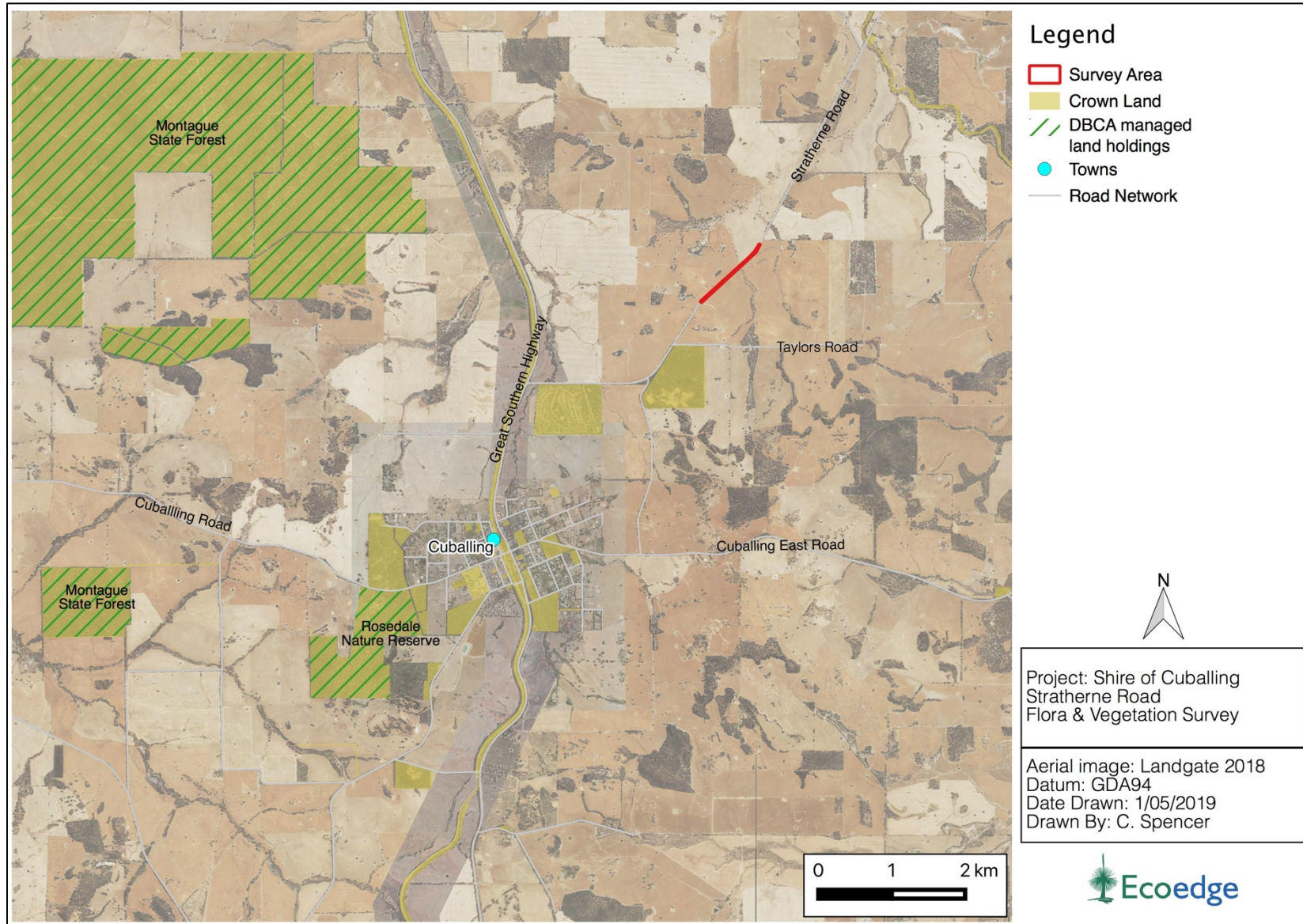


Figure 2. The Survey Area in context of surrounding land uses.

### 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 and 257DyPG subsystems, as shown in (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.
		257DyPG – Popanyinning Subsystem Broad valley floor; yellow duplex soils and a narrow lower sandy terrace, sporadic sand dunes

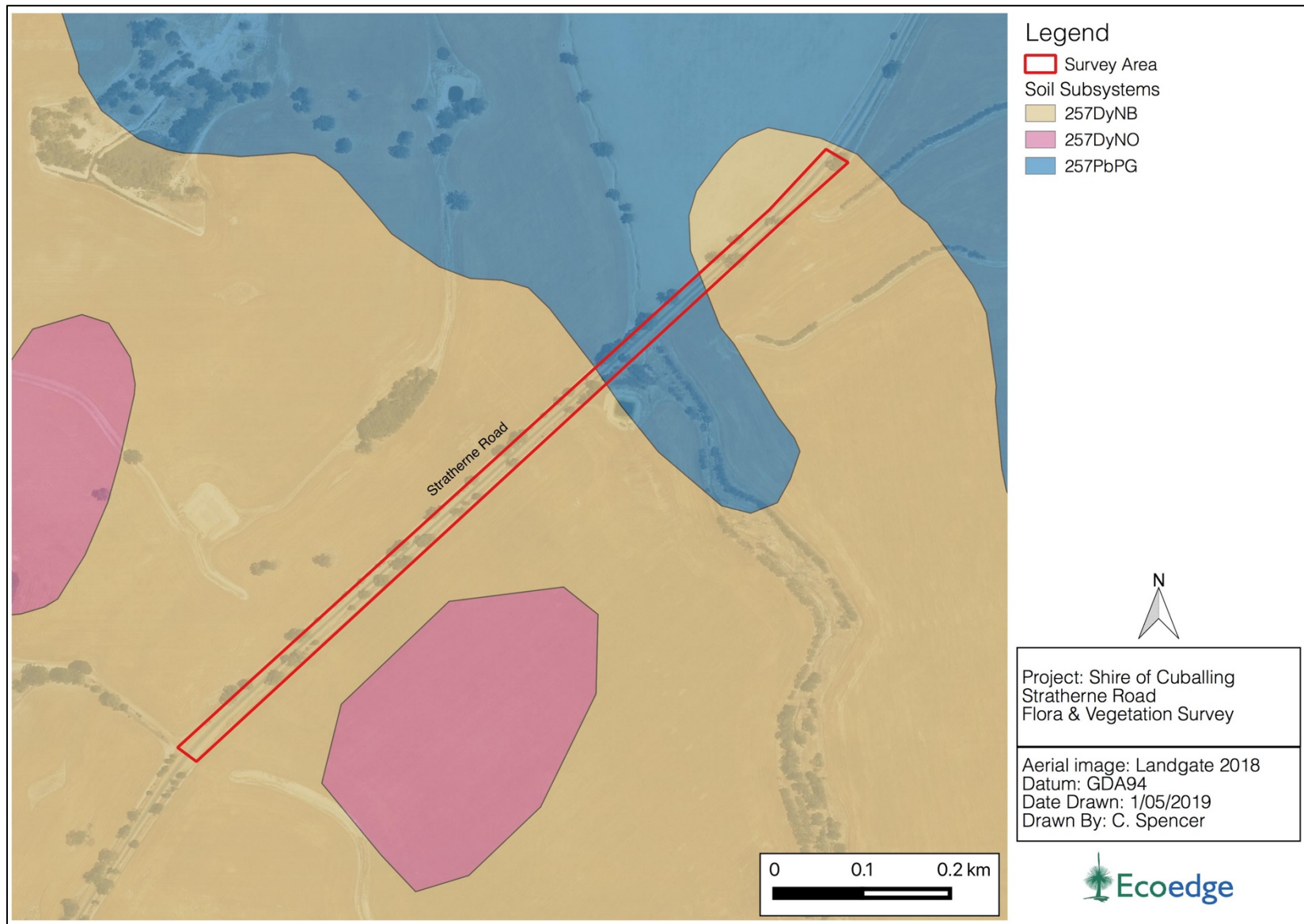


Figure 3. Soil subsystems mapped for the Survey Area (McArthur *et al.* 1977).

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

The Survey Area contains approximately 1.26 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	% Remaining of pre-European extent (total)	% of pre-European extent in all DBCA managed land (total)
Association 1023 'Medium woodland; York gum, wandoo and salmon gum'	10.85%	10.45%

\* 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 5 km radius of the Survey Area was undertaken (DotEE, 2019a, **Appendix 3**), and the current DBCA TEC and PEC listings were consulted (DBCA, 2018c; DBCA ,2019c). 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 5 km of the Survey Area (DBCA, 2018c, 2019c; 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	Various	CE

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, 2019a).

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 5 km of the Survey Area generated from a NatureMap search within 5 km of the Survey Area (DBCA, 2019b) are listed in . 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, however that there were no priority or threatened flora identified in the 5 km NatureMap search area.

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 5 km of the Survey Area (DBCA, 2019a, 2018d; DotEE, 2019a.)

<i>Species</i>	Cons Status*	Flowering	Description and Habitat	Likelihood
<i>Acacia insolita</i> subsp. <i>recurva</i>	T (EN)	Sep	Spindly shrub, 0.6-1.2 m high. Fl. yellow-cream. Lateritic ridges.	Low/Moderate
<i>Banksia cuneata</i>	T (EN)	Sep-Dec	Non-lignotuberous, small tree or shrub, 2-4 m high. Fl. pink/pink & cream & yellow. Grey, yellow or yellow-brown sand.	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</i> subsp. <i>capitata</i>	T (EN)	Aug - Dec or Feb	Slender shrub, 0.3-1.3 m high. Fl. pink. Sand, often over laterite. Sandplains.	Moderate
<i>Roycea pycnophylloides</i>	T (EN)	Sep	Perennial, herb, forming densely branched, silvery mats to 1 m wide. Fl. Sandy soils, clay. Saline flats.	Low
<i>Verticordia fimbrialepis</i> subsp. <i>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.	Low/Moderate
<i>Pultenaea pauciflora</i>	T (VU)	Oct - Nov	Dense, much-branched shrub, to 0.8 m high. Fl. yellow. Sandy & clay lateritic soils. Undulating country.	Low/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 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 overall level of connectivity of the corridor is perceived to be low due to its narrow, mostly degraded, and discontinuous nature. 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. Clearing within the Survey area will may decrease the overall connectivity of the corridor.

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

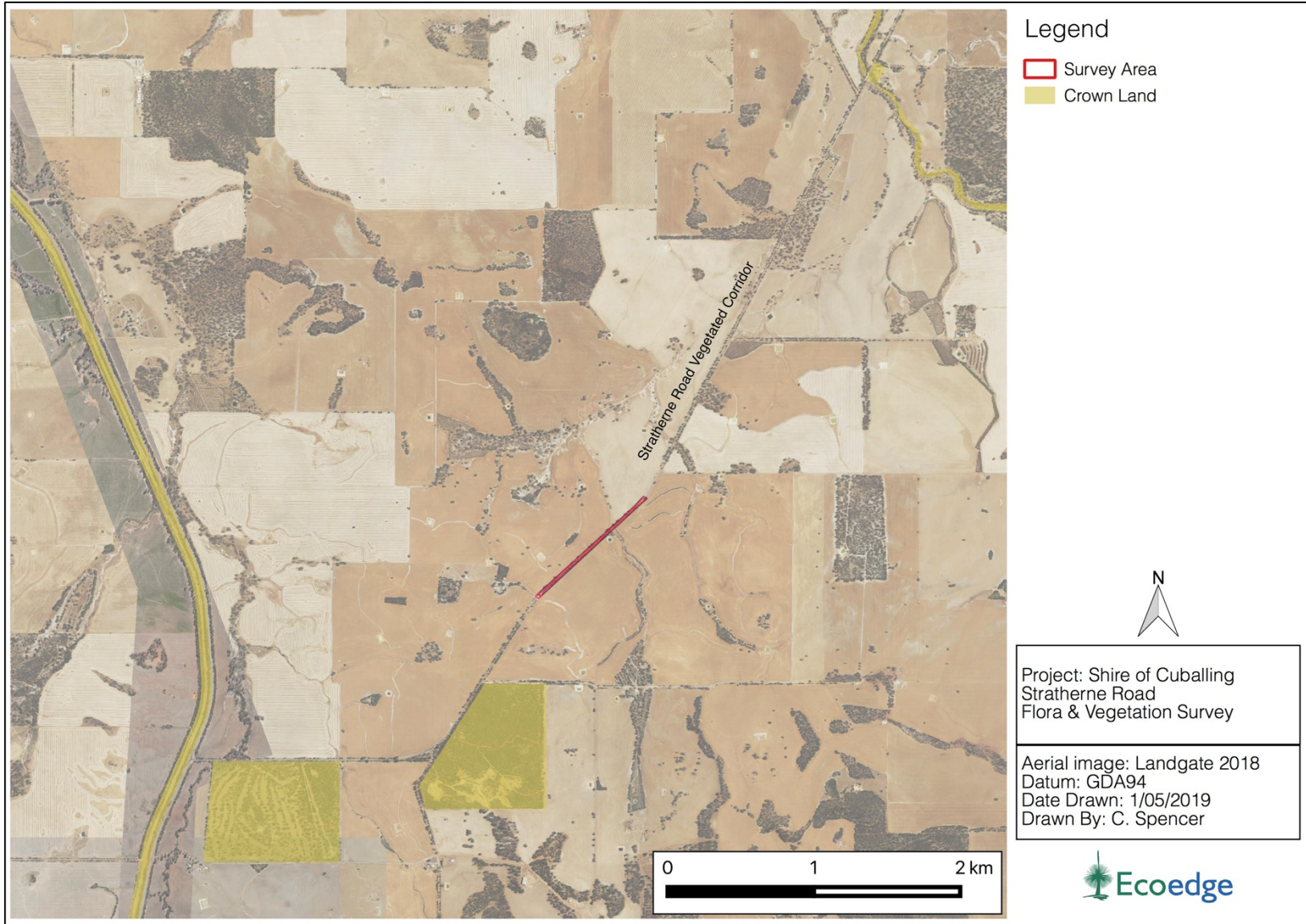


Figure 4. Vegetated corridor along Stratherne Road.

## 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 5 km of the Survey Area (DBCA 2019b) (**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 5 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 SL011843) on 11 March 2019. The Survey Area covers a total of approximately 2.37 ha comprising 1.26 ha of remnant native vegetation. 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. Because the survey was done outside of the main flowering season some annual or annually-regenerating taxa were not able to be identified.

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 (DBCA 2018a and 2018b).

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 March which is outside of the optimal survey time. However, the risk was considered to be acceptable because there was a low risk of missing rare species not able to be identified outside spring.
Climatic and seasonal effects	Minor	The survey area recorded about 70-80% of the average rainfall during the 2018 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

Nineteen 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 were recognised within the Survey Area, unit A and unit B. They are described below and mapped in **Figure 7**. Vegetation unit B is a more degraded variant of unit A and includes areas previously cleared but partly revegetated with introduced trees and shrubs.



Figure 5. Typical unit A vegetation

Vegetation unit A. Woodland of *Eucalyptus wandoo* and *Allocasuarina huegeliana* over tall open shrubland of *Acacia acuminata* over grassland of *Avena fatua* and *Bromus diandrus* and open herbland of *Dianella revoluta*, *Dittrichia graveolens*, *Hypochaeris glabra* and *Solanum nigrum* on grey-brown sandy loam



Figure 6. Typical unit B vegetation

Vegetation unit B. Scattered trees of *Eucalyptus wandoo* and *Allocasuarina huegeliana* over mainly introduced annual species of herbs and grasses on yellow-brown sandy loam

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)
A	0.12
B	1.14
Cleared	1.11
<b>Total</b>	<b>2.37</b>

### 3.3 Vegetation Condition

All of the remnant vegetation at the Stratherne Road site was classified as ‘Completely Degraded’ **Table 7**. Much of the road verge in the Survey Area appears to have been cleared in the past, especially on the north side of the road.

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

Vegetation Condition	Area (Ha)	%
Completely Degraded	1.26	53.2
Cleared	1.11	46.8
<b>Total</b>	<b>2.37</b>	<b>100.0</b>



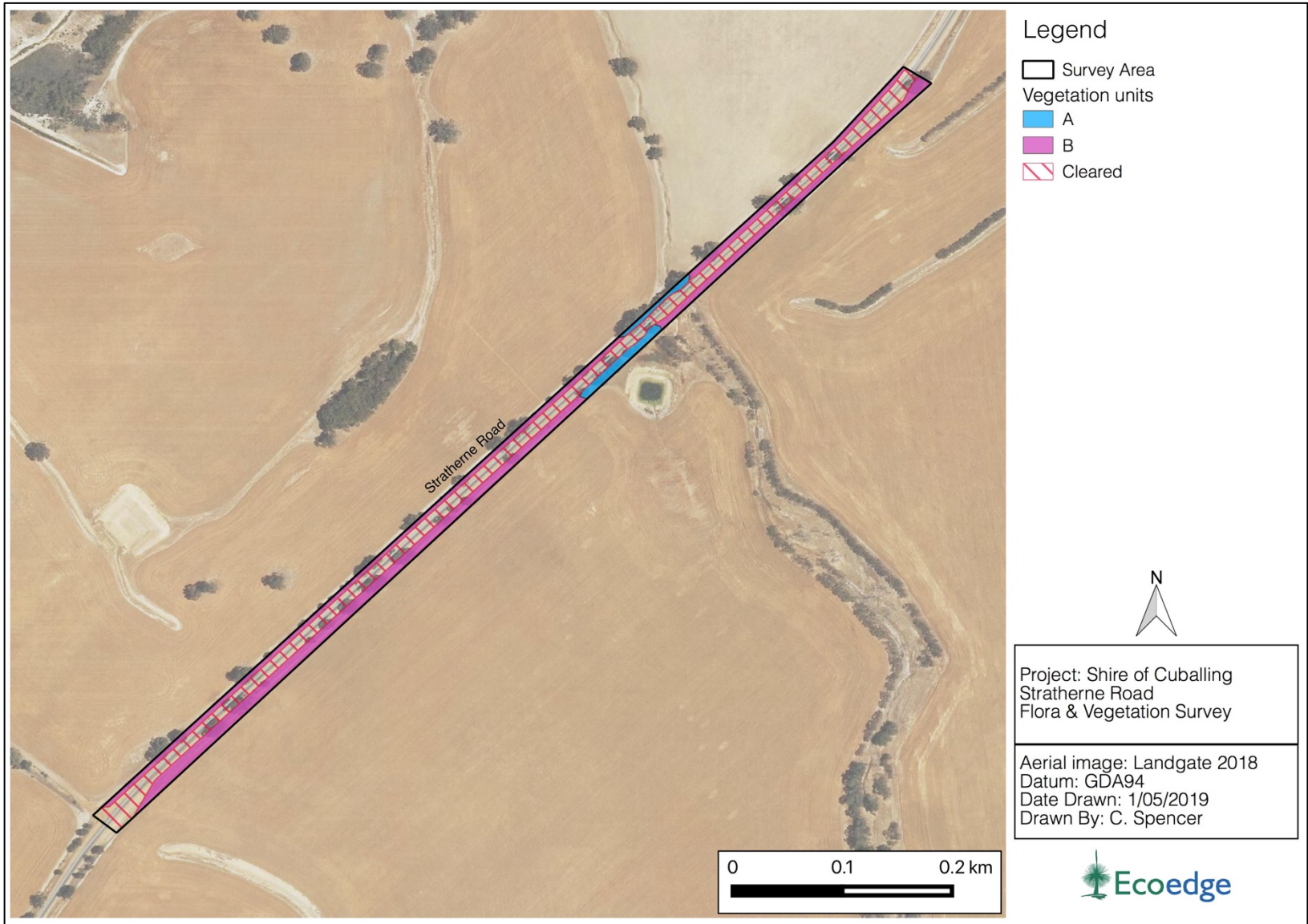


Figure 7. Vegetation units mapped within the Survey Area.

### 3.4 Priority and Threatened Ecological Communities

Vegetation unit A has *Eucalyptus wandoo* as the overstory species. If certain other criteria are met (within the Avon Wheatbelt IBRA region specificaitons) it may be implied as an occurrence of the Commonwealth-listed TEC 'Eucalypt Woodlands of the Western Australian Wheatbelt', however, these patches of vegetation are not classed as 'Degraded to Good' but rather 'cleared' and 'completely degraded'.

However, it may still constitute an occurrence of the State-listed 'Eucalypt Woodlands of the Western Australian Wheatbelt' PEC, though this is unlikely because of the extent of its degradation.

## 4 Discussion and conclusions

A survey of a 2.37 ha area (of which just over half was remnant vegetation) along part of Stratherne Road in the Shire of Cuballing resulted in only 19 plant taxa (including 8 weeds) being identified. This low number of species is attributable to the high level of degradation of the road verges, parts of which appear to have been cleared in the past.

No Threatened flora, Priority flora or other flora otherwise of conservation significance was found.

None of the introduced species is a declared pest plant or noted environmental weed.

Vegetation unit A, which has an overstorey of *Eucalyptus wandoo*, is not inferred to be an occurrence of the Commonwealth-listed TEC 'Eucalypt Woodlands of the Western Australian Wheatbelt', because it is 'Completely Degraded'. In addition, because of its degraded state it is not likely to be an occurrence of the State-listed 'Eucalypt Woodlands of the Western Australian Wheatbelt' Prior PEC.

One vegetation association is mapped for the Survey Area: Association 1023 'Medium woodland; York gum, wandoo and salmon gum' (Beard, 1980). The surveyed community provides a reasonable match for this Association. The extent remaining of this association (at 10.85 %) is significantly below the Commonwealth government's 30% retention threshold however is very well represented within the DBCA estate with most of its current extent managed by the DBCA.

There are no ESAs in close proximity to the Survey Area. The nearest is located approximately 3.9 km west of the Survey Area and is associated with a reserve forming part of the Montague State Forest.

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 privately 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. Vegetation within the Survey Area occurs within the most degraded and fragmented portion of the corridor. Clearing of native vegetation within this area may substantially decrease the overall connectivity of the corridor, having a locally significant impact on this linkage and should be avoided, or minimised where possible.

## 5 Requirement for a Referral

### 5.1 State Government

All native vegetation is protected in Western Australia under the *Environmental Protection Act 1986*. Permits are required for clearing of this vegetation unless a valid exemption applies. It is recommended that this proposal should be referred to DWER to determine

permitting requirements in respect of native vegetation removal and for any other advice they may have on the proposed clearing for this project.

## 5.2 Federal Government

No flora or vegetation, protected under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*, were identified during this Detailed and Targeted flora and Vegetation survey process, and therefore referral to the DotEE is considered unnecessary for this aspect of the project.

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## Appendices



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</math>ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.</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, 2018c).

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 reports.



# 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.

Report created: 02/05/19 15:07:22

[Summary](#)

[Details](#)

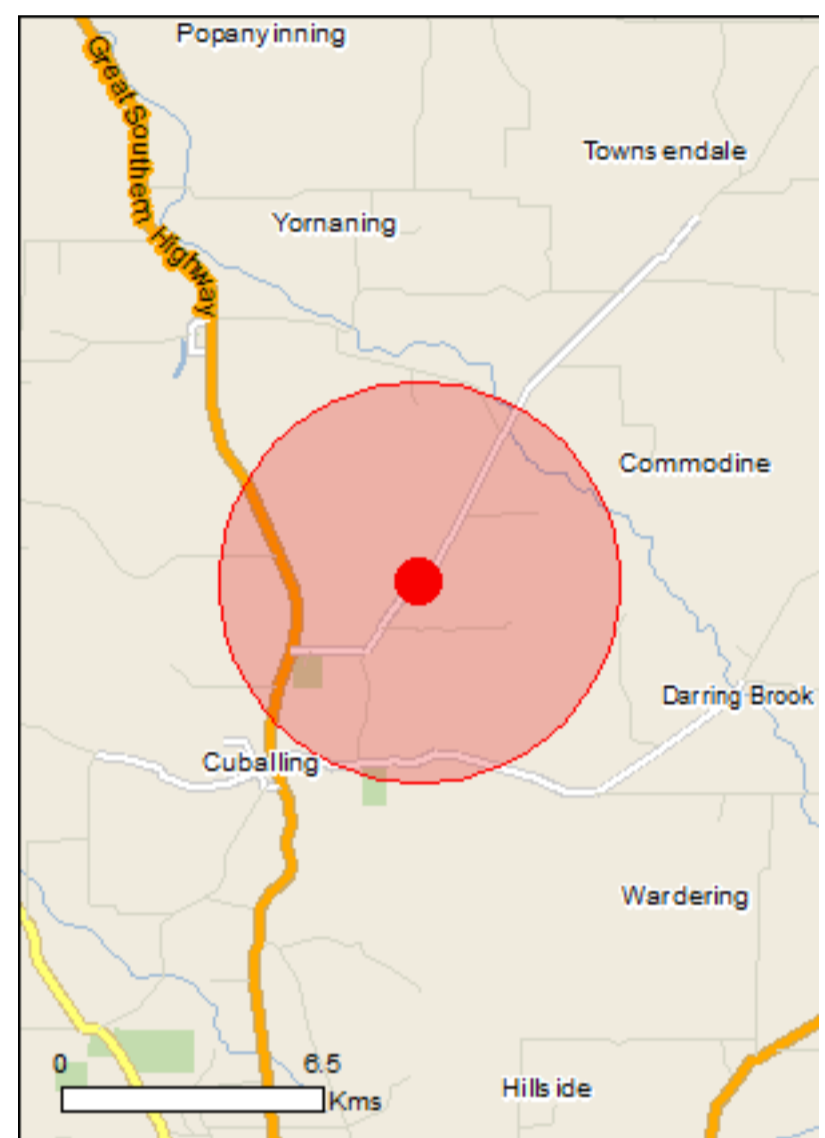
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

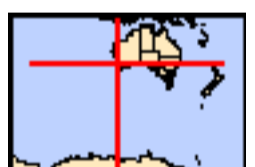
[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 5.0Km



# 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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	1
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	1
<a href="#">Listed Threatened Species:</a>	15
<a href="#">Listed Migratory Species:</a>	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.

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	11
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	1
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	19
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[ Resource Information ]
Name	Proximity
<a href="#">Peel-yalgorup system</a>	100 - 150km upstream

## 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
<a href="#">Eucalypt Woodlands of the Western Australian Wheatbelt</a>	Critically Endangered	Community likely to occur within area

## Listed Threatened Species [ Resource Information ]

Name	Status	Type of Presence
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### Birds

<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
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<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat may occur within area
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<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding likely to occur within area
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<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
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### Mammals

<a href="#">Bettongia penicillata ogilbyi</a> Woylie [66844]	Endangered	Species or species habitat likely to occur within area
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<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area
---	------------	--

<a href="#">Myrmecobius fasciatus</a> Numbat [294]	Endangered	Translocated population known to occur within area
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<a href="#">Phascogale calura</a> Red-tailed Phascogale, Red-tailed Wambenger, Kenngoor [316]	Vulnerable	Species or species habitat likely to occur within area
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### Plants

<a href="#">Acacia insolita subsp. recurva</a> Yornaning Wattle [64495]	Endangered	Species or species habitat known to occur within area
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<a href="#">Banksia cuneata</a> Matchstick Banksia, Quairading Banksia [9827]	Endangered	Species or species habitat may occur within
--	------------	---



Name	Status	Type of Presence area
<a href="#">Banksia oligantha</a> Wagin Banksia [20697]	Endangered	Species or species habitat likely to occur within area
<a href="#">Boronia capitata subsp. capitata</a> a shrub [29156]	Endangered	Species or species habitat likely to occur within area
<a href="#">Pultenaea pauciflora</a> Narrogin Pea [14013]	Vulnerable	Species or species habitat may occur within area
<a href="#">Roycea pycnophylloides</a> Saltmat [21161]	Endangered	Species or species habitat likely to occur within area
<a href="#">Verticordia fimbrialepis subsp. fimbrialepis</a> Shy Featherflower [24631]	Endangered	Species or species habitat likely to 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
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area

### Migratory Terrestrial Species

<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
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### Migratory Wetlands Species

<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> 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
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area

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

## Extra Information

State and Territory Reserves	[ Resource Information ]
Name	State
NTWA Bushland covenant (0020)	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 Resources Audit, 2001.

Name	Status	Type of Presence
<b>Birds</b>		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
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
<b>Mammals</b>		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Capra hircus Goat [2]		Species or species 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
Rattus rattus Black Rat, Ship Rat [84]		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
<b>Plants</b>		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		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
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		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

-32.7842 117.212

# 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.

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	<p>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.</p>
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, 2018c).

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	Asteraceae	<i>Dittrichia graveolens</i>	*	
2	Casuarinaceae	<i>Allocasuarina huegeliana</i>		
3	Casuarinaceae	<i>Allocasuarina humilis</i>		
4	Dilleniaceae	<i>Hibbertia microphylla</i>		
5	Fabaceae	<i>Acacia acuminata</i>		
6	Fabaceae	<i>Acacia leptospermoides</i>		
7	Fabaceae	<i>Acacia sphacelata</i>		
8	Fabaceae	<i>Acacia celastrifolia</i>		
9	Fabaceae	<i>Acacia pulchella</i> var. <i>glaberrima</i>		
10	Fabaceae	<i>Gastrolobium obovatum</i>		
11	Hemerocallidaceae	<i>Dianella revoluta</i>		
12	Myrtaceae	<i>Leptospermum erubescens</i>		
13	Myrtaceae	<i>Verticordia</i> sp.		
14	Poaceae	<i>Avena fatua</i>	*	
16	Poaceae	<i>Cynosurus echinatus</i>	*	
17	Poaceae	<i>Ehrharta longiflora</i>	*	
18	Poaceae	<i>Eragrostis curvula</i>	*	
19	Proteaceae	<i>Banksia fraseri</i>		
20	Restionaceae	<i>Desmocladus asper</i>		