

Lot 1 Payne Road Kaloorup Flora and Vegetation Survey



Prepared for Accendo Australia



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Executive Summary

Plantecology Consulting was commissioned by Accendo Australia to undertake a detailed flora and vegetation survey of a stand of vegetation at Lot 1 Payne Rd, Kaloorup in the City of Busselton. The site is approximately 1 ha in area and currently supports mostly exotic vegetation.

A field survey of the site was undertaken by a botanist from Plantecology Consulting on the 14 October 2022. A detailed survey of the vegetation was undertaken at two 100 m² sampling plots (10m x 10m quadrats), selected to adequately sample the flora within a stand. Plots were positioned to sample a representative and homogeneous area (i.e. not located in transitional areas between communities). The location of each corner of a plot was recorded with a hand-held GPS unit and a photograph of the plot taken looking inward to the quadrat. All vascular plant species were recorded and an estimate of the Foliage Projective Cover (FPC) percentage was made for each species.

A total of 11 native and 16 non-native (exotic) taxa was recorded within the site, representing 16 families and 26 genera. The dominant family containing mostly native taxa was Myrtaceae (5 native taxa).

The survey identified three vegetation types within the site (Figure 5):

Corymbia calophylla - **Acacia longifolia* Woodland (Plates 1-3, 6-8)

Woodland of *Corymbia calophylla* with *Acacia longifolia* subsp. *longifolia* on cream medium clays.

This vegetation type occupies most of the site and consists of dense overstorey over almost completely bare ground and litter.

Herbland and grassland of exotic species (Plates 4 & 5)

Mixed herbland and grassland of exotic species including **Zantedeschia aethiopica*, **Anthoxanthum odoratum*, **Echium plantagineum*, **Ehrharta longiflora* and **Arctotheca calendula*.

This community occupies the firebreak areas adjacent to fence lines and the previously cleared area on the western side of the site.

Eucalyptus globulus plantation

Planted individuals of **Eucalyptus globulus* on the western fringe of the site.

The vegetation condition of the majority of the site is rated as 'Completely Degraded' (Figure 6). Almost all of the site has lost its original vegetation structure with only a few individuals of *Corymbia calophylla*, *Eucalyptus marginata* and *Allocasuarina fraseriana* remaining in the overstorey.

No Threatened Flora pursuant to the Biodiversity Conservation Act (2016) nor the EPBC Act (1999) were recorded during the survey. No Priority Flora pursuant to the Biodiversity Conservation Act (2016) were recorded during the survey.

No communities of conservation significance (TECs or PECs) are inferred to occur within the site. The heavy soils with the presence of *Corymbia calophylla* and *Eucalyptus marginata* in the overstorey indicates that the site may have originally contained a stand of SCP1b - 'Corymbia calophylla woodlands on heavy soils of the southern Swan Coastal Plain'. An occurrence of SCP1b is recorded from the nearby native vegetation to the west and the site is within the buffer zone of this occurrence. The presence of *Melaleuca preissiana* indicates that the northern part of the site may have once supported a stand of the 'Swan Coastal Plain Paluslope Wetlands' PEC. However, the stand of vegetation within the site can no longer be considered native vegetation as it is in a 'Completely Degraded' or 'Degraded' condition.

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1 Introduction

Plantecology Consulting was commissioned by Accendo Australia to undertake a detailed flora and vegetation survey of a stand of vegetation at Lot 1 Payne Rd, Koorup in the City of Busselton (Figure 1). The site is approximately 1 ha in area and currently supports mostly exotic vegetation.

1.1 Existing Environment

The site is located on the Swan Coastal Plain near to the boundary with the southwest forest region, is currently vegetated and is fenced off from the adjacent industrial infrastructure to the east. The site is bounded by planted *Eucalyptus globulus* trees, with a stand of native vegetation further to the west. The open herbland and grassland areas indicate the site has been cleared at least partially in the past.

1.2 Climate

The Koorup area experiences a dry Mediterranean climate of hot dry summers and cool wet winters. Long-term climatic averages indicate the site is located in an area of moderate rainfall, receiving 685 mm on average annually (data for Busselton Aero, station number 9603, the nearest currently reporting station; Bureau of Meteorology 2022) with the majority of rainfall received between May and August. The area experiences rainfall on an average of 84 days per year. Mean maximum temperatures range from 16.9 °C in July to 30.2 °C in January. Mean minimum temperatures range from 6.9 °C in July, to 14.7 °C in February.

1.3 Soils

The Atlas of Australian Soils maps the soils for the site as Map Unit Mt7, which is a plain of acid earths associated with leached sands, often with a clay horizon at a depth exceeding a metre. The soil unit also contains some areas of ironstone gravels (Natural Resource Information Centre 1991).

1.4 Conservation Significant Flora

Under the Biodiversity Conservation Act 2016 ('BC Act'), the Minister for the Environment produces a gazetted list of Threatened Flora under three categories: Critically Endangered, Endangered and Vulnerable. The Parks and Wildlife Service (PWS) also produces a list of Priority Flora that have not been assigned statutory protection under the BC Act but may be under some degree of threat (PWS 2019a). The PWS recognises four Priority Flora levels. The definitions for each category of Threatened and Priority Flora are shown in Appendix E.

As well as protection under State legislation, selected flora are also afforded statutory protection at a Federal level pursuant to the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The EPBC Act provides for the protection of Threatened species, pursuant to Schedule 1 of the Act, and are defined as "Critically Endangered", "Endangered", "Vulnerable" or "Conservation Dependent" under Section 179. Definitions of these categories are shown in Appendix E. Any action likely to have a significant impact on a species listed under the EPBC Act requires approval from the Commonwealth Minister for the Environment.

Searches of the State databases identified 47 conservation significant taxa with the potential to occur within the site (Table 1). Those records within approximately 10 km of the site are shown in Figure 2. Of the identified taxa, 12 are listed as Threatened under the BC Act, of which three are orchids. *Drakaea micrantha* (Dwarf Hammer Orchid) occurs in white-grey sand and flowers from September to October. *Caladenia procera* (Carbanup King Spider Orchid) occurs on alluvial flats beneath jarrah, marri and peppermint woodlands and flowers between September and October. *Caladenia busselliana* (Bussell's Spider Orchid) occurs in sandy loams of winter-wet swamps and flowers from September to October.

Table 1: Threatened and Priority Flora potentially occurring within the survey area based on database searches. (VU = Vulnerable; EN = Endangered; CR = Critically Endangered; T = Threatened; 1 – 4 = Priority Flora Category)

Taxon	PWS Ranking	EPBC Act Category	Flowering Period
<i>Acacia flagelliformis</i>	4		Jul-Sep
<i>Acacia inops</i>	3		Oct-Nov
<i>Acacia semitrullata</i>	4		Jun-Aug
<i>Actinotus whicheranus</i>	2		Dec, Jan - Mar
<i>Andersonia ferricola</i>	1		Oct
<i>Banksia nivea</i> subsp. <i>uliginosa</i>	T	EN	Aug-Sep
<i>Banksia squarrosa</i> subsp. <i>argillacea</i>	T	VU	Jul-Aug
<i>Boronia capitata</i> subsp. <i>gracilis</i>	3		Jun-Aug
<i>Caladenia busselliana</i>	T	EN	Sep-Oct
<i>Caladenia procera</i>	T	CR	Sep-Oct
<i>Calothamnus lateralis</i> var. <i>crassus</i>	3		Oct-Nov
<i>Calothamnus quadrifidus</i> subsp. <i>teretifolius</i>	4		
<i>Chamelaucium erythrochlorum</i>	4		Nov-Feb
<i>Chamelaucium royci</i>	T		Aug - Nov
<i>Chordifex gracilior</i>	3		Sep-Oct
<i>Cyathochaeta teretifolia</i>			
<i>Daviesia elongata</i>	T		Sep, Dec - Feb
<i>Drakaea micrantha</i>	T	VU	Sep-Oct
<i>Gastrolobium modestum</i>	T	VU	Sep-Nov
<i>Grevillea brachystylis</i> subsp. <i>brachystylis</i>	3		Aug-Nov
<i>Grevillea brachystylis</i> subsp. <i>grandis</i>	T	CR	Aug, Dec
<i>Hakea oldfieldii</i>	3		Sep
<i>Isopogon formosus</i> subsp. <i>dasylepis</i>	3		Jun, Sep-Dec
<i>Johnsonia inconspicua</i>	3		Nov
<i>Lambertia rariflora</i> subsp. <i>rariflora</i>	4		Jan-Mar
<i>Lasiopetalum laxiflorum</i>	3		Oct, Nov
<i>Lepyrodia heleocharoides</i>	3		Dec
<i>Leucopogon</i> sp. Busselton (D. Cooper 243)	2		Aug-Sep
<i>Loxocarya magna</i>	3		-
<i>Loxocarya striata</i> subsp. <i>implexa</i>	1		
<i>Melaleuca incana</i> subsp. <i>Gingilup</i> (N. Gibson & M. Lyons 593)	2		May-Jun
<i>Olearia strigosa</i>	3		Dec - May
<i>Pimelea ciliata</i> subsp. <i>longituba</i>	3		Sep-Nov
<i>Pultenaea pinifolia</i>	3		Oct
<i>Schoenus benthamii</i>	3		Oct-Nov
<i>Schoenus</i> sp. <i>Jindong</i> (R.D. Royce 2485)	1		Oct-Nov
<i>Stylidium ferricola</i>	1		Oct-Nov
<i>Stylidium leeuwinense</i>	4		Feb-May
<i>Synaphea decumbens</i>	3		Sep-Oct
<i>Synaphea hians</i>	3		Sep-Oct
<i>Synaphea petiolaris</i> subsp. <i>simplex</i>	3		Sep-Oct
<i>Thysanotus formosus</i>	1		Jan

Taxon	PWS Ranking	EPBC Act Category	Flowering Period
<i>Thysanotus glaucus</i>	4		Nov-Feb
<i>Verticordia densiflora</i> var. <i>pedunculata</i>	T	EN	Dec
<i>Verticordia lehmannii</i>	4		Oct
<i>Verticordia plumosa</i> var. <i>ananeotes</i>	T	EN	Dec
<i>Verticordia plumosa</i> var. <i>vassensis</i>	T	EN	Oct

1.5 Conservation Significant Communities

The PWS defines an ecological community as “a naturally occurring assemblage that occurs in a particular type of habitat” (PWS 2019b). A Threatened Ecological Community (TEC) is one that has declined in area or was originally limited in distribution. Uncommon ecological communities that do not strictly meet TEC defined criteria, or are inadequately defined, are listed by the PWS as a Priority Ecological Community (PEC). Definitions of the categories of Threatened and Priority Ecological Communities are given in Appendix E.

As well as protection under State legislation, selected ecological communities are also afforded statutory protection at a Federal level pursuant to the EPBC Act. The EPBC Act provides for the protection of TECs, which are listed under section 181 of the Act, and are defined as “Critically Endangered”, “Endangered” or “Vulnerable” under Section 182. Similar to flora listed under the EPBC Act, any action likely to have a significant impact on a TEC listed under the EPBC Act requires Commonwealth approval.

Six terrestrial TECs endorsed under State legislation are recorded as occurring within 20 km of the site:

- SCP1b – ‘*Corymbia calophylla* woodlands on heavy soils of the southern Swan Coastal Plain’. SCP1b is listed as Vulnerable under State legislation.
- SCP10b – ‘Shrublands on southern Swan Coastal Plain Ironstones (Busselton area)’, listed as Critically Endangered under State legislation and as Endangered pursuant to the EPBC Act.
- SCP09 – ‘Dense shrublands on clay flats’, listed as Vulnerable under State legislation and as Critically Endangered pursuant to the EPBC Act.
- SCP07 – ‘Herb rich saline shrublands in clay pans’, listed as Vulnerable under State legislation and as Critically Endangered pursuant to the EPBC Act.
- SCP10a – ‘Shrublands on dry clay flats’, listed as Endangered under State legislation and as Critically Endangered pursuant to the EPBC Act.
- SCP 2 – ‘Southern wet shrublands, SCP’, listed as Endangered under State legislation

Fifteen other terrestrial Floristic Community Types (FCTs) listed as PECs are recorded as occurring within 20 km of the site:

- ‘Central Whicher Scarp Jarrah Woodland’ (Priority 1);
- ‘Central Whicher Scarp Mountain Marri woodland’ (Priority 1);
- ‘Claypans with mid dense shrublands of *Melaleuca lateritia* over herbs’ (Priority 1);
- ‘*Corymbia calophylla*, *Melaleuca raphiophylla*, *Banksia littoralis*, *Eucalyptus rudis*, *Agonis flexuosa* low open forest with seasonal subsoil moisture (Dunsborough area)’ (Priority 1);
- ‘*Eucalyptus patens*, *Corymbia calophylla*, *Agonis flexuosa* Closed Low Forest’ (Priority 1);
- ‘*Eucalyptus rudis* (flooded gum), *Corymbia calophylla*, *Agonis flexuosa* Closed Low Forest (near Busselton)’ (Priority 1);

- 'Quindalup *Eucalyptus gomphocephala* and/or *Agonis flexuosa* woodlands' (Priority 3);
- 'Shrublands of near permanent wetlands in creeklines of the Whicher Scarp (Whicher Scarp community G2)' (Priority 1);
- 'Southern *Banksia attenuata* woodlands' (Priority 3);
- 'Subtropical and Temperate Coastal Saltmarsh' (Priority 3);
- 'Swan Coastal Plain Paluslope Wetlands' (Priority 1);
- 'West Whicher Scarp *Banksia attenuata* woodland (Swan Coastal Plain centred woodlands of grey/white sands community B2)' (Priority 1);
- 'Whicher Scarp Jarrah woodland of deep coloured sands' (Priority 1);
- '*Eucalyptus haematoxylon* - *E. marginata* woodlands on Whicher foothills' (Priority 3); and
- 'Banksia dominated woodlands of the Swan Coastal Plain IBRA Region' (Priority 3).

All the State-listed TECs are also listed as TECs by the Commonwealth except for SCP2 and SCP1b. The 'Banksia-dominated woodlands of the Swan Coastal Plain IBRA Region' is listed as an 'Endangered' TEC by the Commonwealth under the EPBC Act, while the 'Claypans with mid dense shrublands of *Melaleuca lateritia* over herbs' and 'Subtropical and Temperate Coastal Saltmarsh' are listed as Critically Endangered and Vulnerable, respectively.

The site is situated within the buffer zones of the 'SCP10b – Shrublands on southern Swan Coastal Plain Ironstones (Busselton area)', the 'Banksia dominated woodlands of the Swan Coastal Plain IBRA Region' and the SCP1b – '*Corymbia calophylla* woodlands on heavy soils of the southern Swan Coastal Plain' TECs, and the 'Swan Coastal Plain Paluslope Wetlands' PEC (Figure 3).

1.6 Vegetation Complexes

Vegetation complexes are a series of plant communities forming a regularly repeating pattern associated with a particular soil unit (Government of Western Australia 2000). The vegetation complex mapped as occurring within the site is the Swan Coastal Plain fluvial deposit landform of the Abba complex, which has approximately 6.6% of its original 50 892 ha pre-European extent remaining, and 0.17% of its original extent occurs on lands with some level of protection (Government of Western Australia 2017).

1.7 Regional Ecological Linkages

Ecological linkages are important conservation tools that allow the movement of fauna, flora and genetic material between areas of remnant habitat. The movement of fauna and the exchange of genetic material between vegetation remnants improves the viability of those remnants by allowing greater access to breeding partners, food sources, refuge from disturbances such as fire and maintains the genetic diversity of plant communities and populations (Molloy *et al.* 2009).

The remnant vegetation within the site has a continuous link to a regional axis line that passes through the nearby native vegetation stand to the west (Figure 4). This linkage may enhance the movement of fauna through the area, but the poor condition of the site (see Discussion below) is more likely to hinder the flow of genetic material of the native flora. Also, the density of exotic species may act as a source of infestation for the nearby native stands.

1.8 Purpose

The purpose of the survey was to assess the botanical values within the site by:

- Undertaking a detailed flora and vegetation survey in accordance with the Environmental Protection Authority's (EPA) Technical Guidance: Flora and Vegetation Survey for Environmental Impact Assessment (2016).
- Identifying the presence of any Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs);
- Undertaking a systematic search for all vascular plant taxa present; and
- Recording the locations and numbers present of any Threatened Flora and Priority Flora identified at the time of the field survey.

1

2 Methods

2.1 Field Survey

A field survey of the site was undertaken by a botanist from Plantecology Consulting on the 14 October 2022. A detailed survey of the vegetation was undertaken at two 100 m² sampling plots (10m x 10m quadrats), selected to adequately sample the flora within a stand (Figure 5). Plots were positioned to sample a representative and homogeneous area (i.e. not located in transitional areas between communities). The location of each corner of a plot was recorded with a hand-held GPS unit and a photograph of the plot taken looking inward to the quadrat. All vascular plant species were recorded and an estimate of the Foliage Projective Cover (FPC) percentage was made for each species.

Environmental data recorded included topographic position, aspect, slope, soil colour and texture class, rock outcropping, litter cover as well as the degree of disturbance and an estimate of the time since the last fire event. The condition of the vegetation of the site was assessed to assist in determining the conservation values of the site. The vegetation condition was rated according to Keighery (1994), a vegetation condition scale commonly used in the metropolitan and southwest regions. The categories are listed and defined in Table 2. Data on the vegetation structure was also recorded and included the height of the three main strata and the dominant species within each stratum. The vegetation structural description follows that of the National Vegetation Information System (Thackway et al. 2006).

Table 2: Vegetation Condition Scale (Keighery 1994)

Vegetation Condition	Definition
Pristine (1)	Pristine or nearly so, no obvious signs of disturbance.
Excellent (2)	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, 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. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, 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. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, 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 or shrubs.

All plant specimens collected during the field survey were dried, pressed and then sorted in accordance with requirements of the Western Australian Herbarium. Identification of specimens occurred through comparison with named material and through the use of taxonomic keys. Taxonomic determinations were made using reference material at the Western Australian State

Herbarium. Taxa names utilise the current terminologies from FloraBase (2022). Family names utilise the revised phylogeny of the Angiosperm Phylogeny Group - APGIII (FloraBase 2022).

2.2 Survey Limitations

Various factors can limit the effectiveness of a vegetation survey. Pursuant to EPA Technical Guidance: Flora and Vegetation Survey for Environmental Impact Assessment (EPA 2016), these factors have been identified and their potential impact on the effectiveness of the survey has been assessed (Table 3).

The survey was undertaken in October 2022 and would likely have intercepted the flowering period of most taxa of conservation concern with the potential to occur within the site, in particular the Threatened annual and geophytic taxa. The rainfall for July and August was slightly below average for the region, and maximum temperatures within the preceding three months were also slightly below average. It is not expected that this would have affected the local species' phenology noticeably.

Table 3: Potential limitations affecting the vegetation survey

Potential limitations	Constraint	Comment
Availability of contextual information	No	Sufficient regional and local information was available to place the survey site in its environmental context.
Competency and experience of the botanists	No	The survey was undertaken by botanists with a comprehensive knowledge of southwest vegetation, with at least 20 years' experience in vegetation surveys in Western Australia.
Seasonality	No	The rainfall in July and August was below average, and near average in September. Maximum temperatures were below average for July and September.
Adequate coverage and intensity of survey	No	The survey area was traversed on foot. It is considered the survey quadrats and mapping points provided adequate coverage of the site.
Proportion of Flora identified	No	In a small site, a calculated estimator is not appropriate but it is expected the majority of taxa were recorded.
Disturbance	No	The vegetation has been highly disturbed previously but most areas remained observable.
Resources	No	Adequate resources were available to conduct the survey.
Access restrictions	no	All parts of the site were accessible.

3 Results

3.1 Flora

3.1.1 Floristic Summary

A total of 11 native and 16 non-native (exotic) taxa was recorded within the site, representing 16 families and 26 genera. The dominant family containing mostly native taxa was Myrtaceae (5 native taxa). For a complete species list and the individual site data refer to Appendix A and Appendix B, respectively.

3.2 Vegetation

3.2.1 Plant Associations

The survey identified three vegetation types within the site (Figure 5):

Corymbia calophylla - **Acacia longifolia* Woodland (Plates 1-3, 6-8)

Woodland of *Corymbia calophylla* with *Acacia longifolia* subsp. *longifolia* on cream medium clays.

This vegetation type occupies most of the site and consists of dense overstorey over almost completely bare ground and litter.

Herbland and grassland of exotic species (Plates 4 & 5)

Mixed herbland and grassland of exotic species including **Zantedeschia aethiopica*, **Anthoxanthum odoratum*, **Echium plantagineum*, **Ehrharta longiflora* and **Arctotheca calendula*.

This community occupies the firebreak areas adjacent to fence lines and the previously cleared area on the western side of the site.

Eucalyptus globulus plantation

Planted individuals of **Eucalyptus globulus* on the western fringe of the site (Figure 5).

3.2.2 Vegetation Condition

The vegetation condition of the majority of the site is rated as 'Completely Degraded' (Figure 6). Almost all of the site has lost its original vegetation structure with only a few individuals of *Corymbia calophylla*, *Eucalyptus marginata* and *Allocasuarina fraseriana* remaining in the overstorey. The mid-storey is dominated by a dense infestation of **Acacia longifolia* subsp. *longifolia* (Sydney Golden Wattle) which has excluded native trees and shrubs and seems to be preventing the regeneration of the understorey. The open herbland areas have lost all native structure and consists of exotic species.

A small area rated as 'Degraded' has been mapped in the northern section of the site. This patch has retained some native mid-storey species such as *Xanthorrhoea preissii*, but the ground layer largely consists of exotic species and **Acacia longifolia* subsp. *longifolia* is still present in the overstorey.

Table 4: Calculated areas for condition ratings within the site.

Condition Rating	Area (Ha)
Degraded	0.046
Completely Degraded	1.020
Total	1.066

3.3 Conservation Significance

No TECs or PECs are inferred to occur within the site. The presence of mature *Corymbia calophylla* and *Eucalyptus marginata* individuals in heavy soils suggest that the original FCT for the site was likely SCP1b – '*Corymbia calophylla* woodlands on heavy soils of the southern Swan Coastal Plain'. SCP1b occurs in the stand of native vegetation to the west and the site lies within the buffer zone for this occurrence. The condition of the vegetation within the site, however, means that it can no longer be considered native vegetation.

No Threatened Flora pursuant to the Biodiversity Conservation Act (2016) nor the EPBC Act (1999) were recorded during the survey.

No Priority Flora pursuant to the Biodiversity Conservation Act (2016) were recorded during the survey.

3.4 Weeds

Sixteen of the taxa recorded during the survey are exotics (weeds). **Zantedeschia aethiopica*, **Asparagus asparagoides* and **Echium plantagineum* are a Declared Pests under the Biosecurity and Agriculture Management Act 2007, with restrictions on their sale and movement.

4 Discussion

The site has likely been mostly cleared in the past and the native flora largely replaced by exotic taxa. **Acacia longifolia* subsp. *longifolia* forms a dense overstorey, reducing light penetration to the ground layer. This inhibits the regeneration of native herbs and shrubs, and the site has not recovered its original structure or floristics. No Threatened Flora or Priority Flora were recorded within the site.

No communities of conservation significance (TECs or PECs) are inferred to occur within the site. The heavy soils with the presence of *Corymbia calophylla* and *Eucalyptus marginata* in the overstorey indicates that the site may have originally contained a stand of SCP1b - 'Corymbia calophylla woodlands on heavy soils of the southern Swan Coastal Plain'. An occurrence of SCP1b is recorded from the nearby native vegetation to the west and the site is within the buffer zone of this occurrence. However, the stand of vegetation within the site can no longer be considered native vegetation as it is in a 'Completely Degraded' condition.

The small area that is in 'Degraded' condition also only contains a few remnant native taxa and is still dominated by exotic taxa. The presence of *Melaleuca preissiana* indicates that the northern part of the site may have once supported a stand of the 'Swan Coastal Plain Paluslope Wetlands' PEC. As above, the current vegetation condition precludes assigning to this community.

The species assemblage within the site is also not consistent with the presence of the other two conservation significant communities with buffer zones that overlap or are adjacent to the site: 'Banksia dominated woodlands of the Swan Coastal Plain IBRA Region'; and SCP10b - 'Shrublands on southern Swan Coastal Plain Ironstones (Busselton area)'.

Three Declared Plants pursuant to the Biosecurity and Agriculture Management Act 2007 were recorded within the site: **Zantedeschia aethiopica*, **Asparagus asparagoides* and **Echium plantagineum*. None currently have management categories assigned and do not require active management to eradicate the infestations.

5 Summary

The vegetation within the site at Lot 1 Payne Rd, Koorup is in a 'Completely Degraded' or 'Degraded' condition and no longer represents native vegetation. The majority of species recorded are exotics and the overstorey is mostly comprised of **Acacia longifolia* subsp. *longifolia*. The site has few remaining botanical values with no conservation significant flora or communities recorded or still extant.

6 References

- Bureau of Meteorology (2022) Climate Statistics Busselton Aero meteorological station 9603. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/>
- Environmental Protection Authority (2016) Technical Guidance: Flora and Vegetation Survey for Environmental Impact Assessment, Perth.
- FloraBase (2022). FloraBase the Western Australian Flora. Parks and Wildlife Service, Como, Western Australia. <http://florabase.dpaw.wa.gov.au/>
- Government of Western Australia (2017) 2016 South West Vegetation Complex Statistics. Current as of December 2016. WA Department of Parks and Wildlife, Perth
- Keighery, BJ (1994), Bushland plant survey: A Guide to Plant Community Survey for the Community, Wildflower Society of WA (inc), Nedlands, Western Australia.
- Molloy, S., Wood, J., Hall, S., Wallrodt, S. and Whisson, G. (2009) *South West Regional Linkages: Technical report*, A report for the Western Australian Local Government Association and Department of Environment and Conservation, Perth.
- Natural Resource Information Centre (1991) Digital Atlas of Australian Soils, Bureau of Rural Sciences, Canberra.
- Parks and Wildlife Service (2019a) Conservation Codes for Western Australian Flora and Fauna, Department of Environment and Conservation, Perth.
- Parks and Wildlife Service (2019b) Definitions, Categories and Criteria for Threatened and Priority Ecological Communities, Parks and Wildlife Service, Perth.
- Thackway, R., Neldner, J. and Bolton, M. (2006) Chapter 8: Vegetation, in: *The Blue Book: Australian Soil and Land Survey Handbook Guidelines for Conducting Surveys*, CSIRO, Canberra.

Figures

Figure 1: Locality Plan Lot 1 Payne Road, Kaloorup Flora and Vegetation Survey

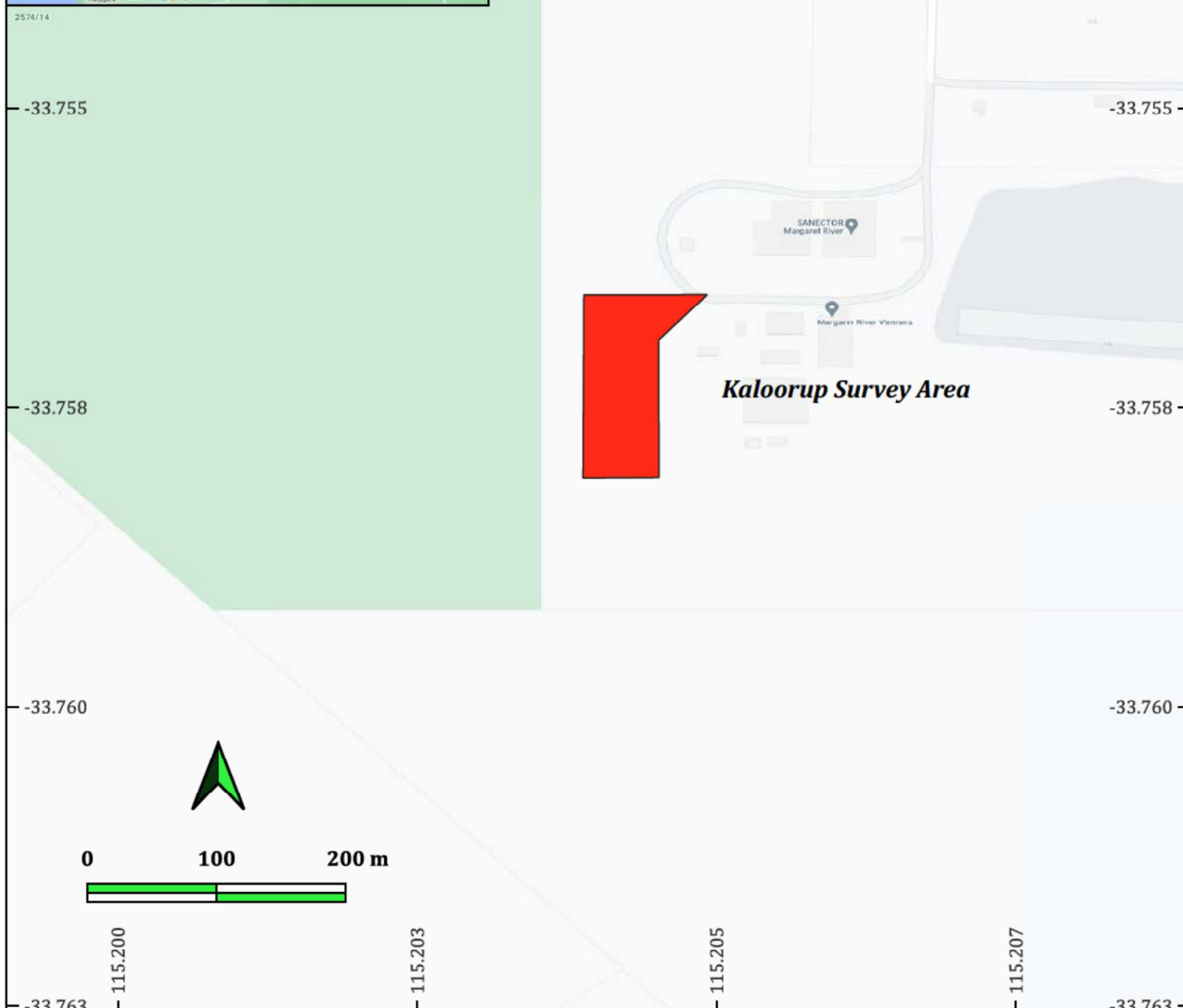
Figure 2: Conservation Significant Flora from the Local Region


Figure 3: Conservation Significant Communities with Potential to Occur within the Site

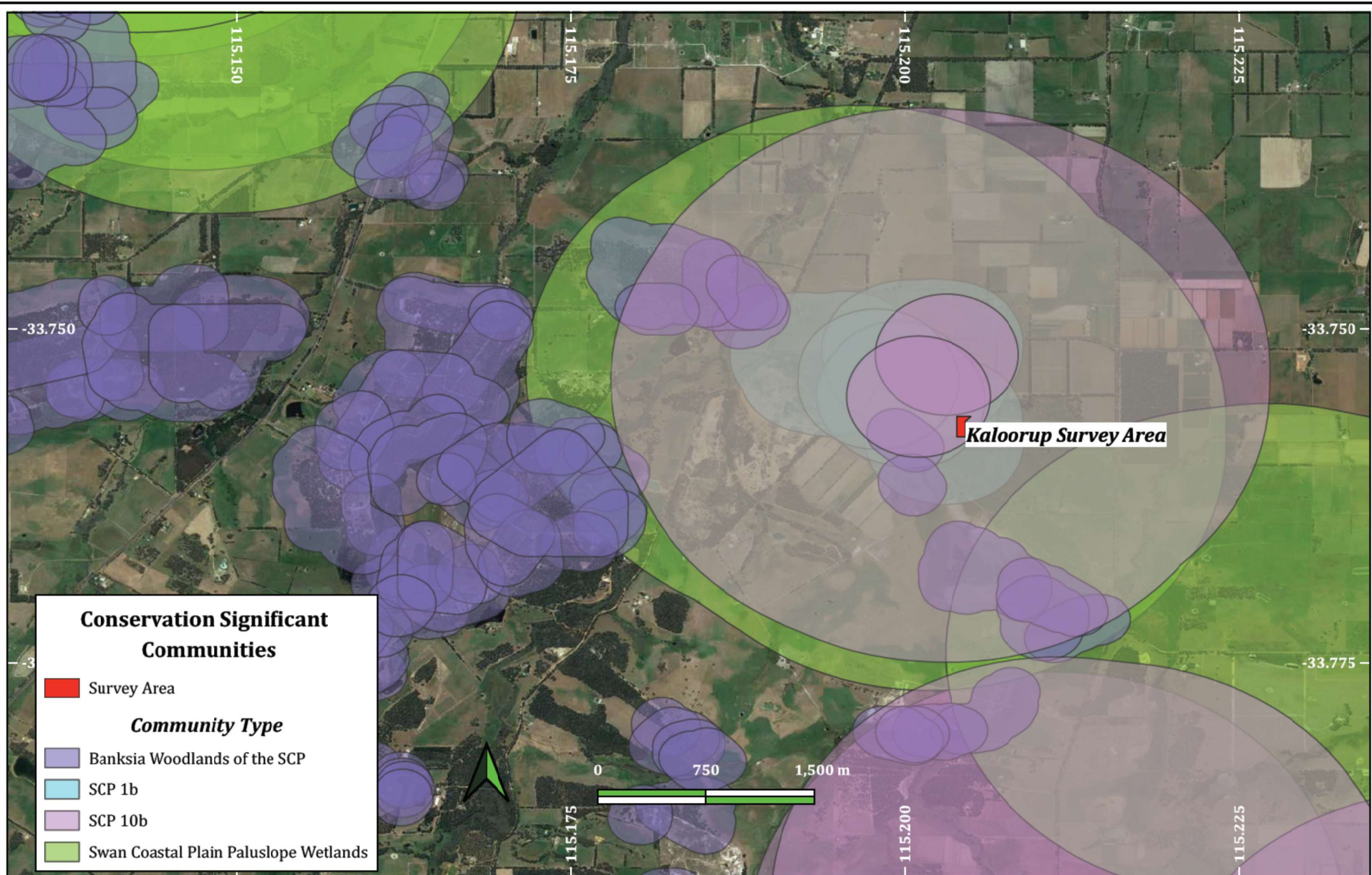
Figure 4: Regional Ecological Linkages

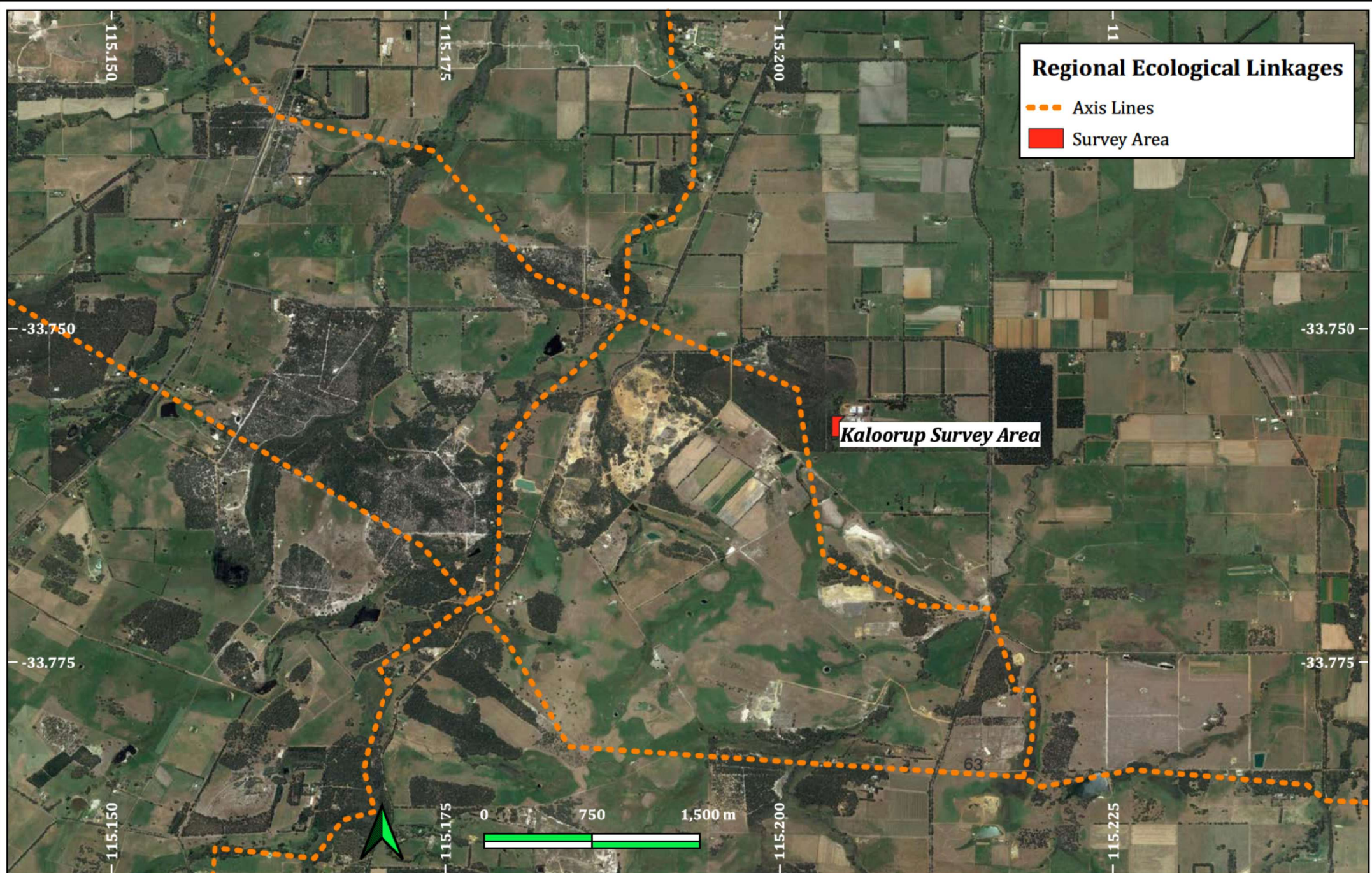
Figure 5: Plant Communities

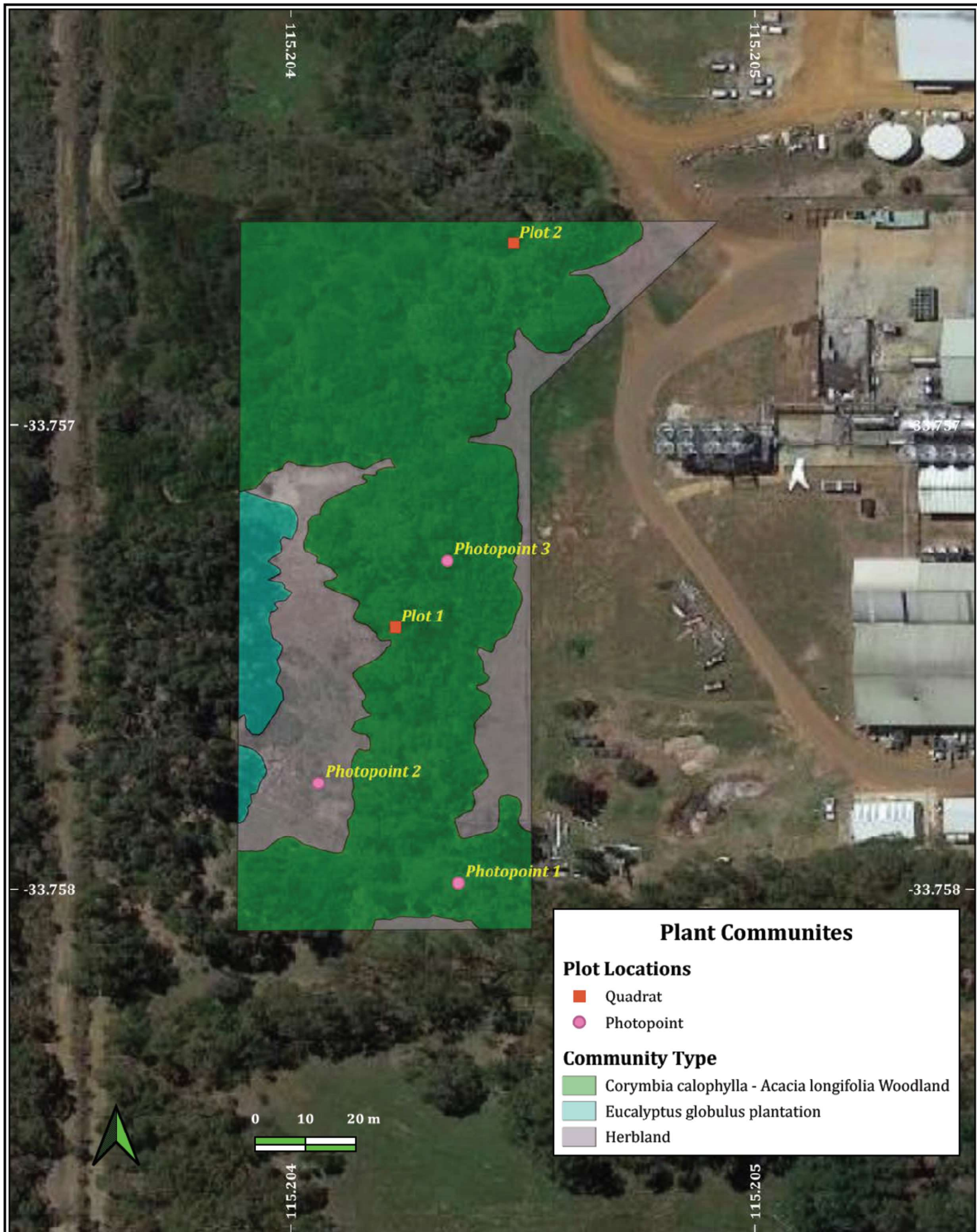
Figure 6: Vegetation Condition



 <p>50 New Cross Rd Kingsley WA 6026</p>	<p>Scale 1 3500 Basemap Source Google Road Datum GDA94 Projection EPSG 4283</p>	<p>Client Accendo Australia Project Payne Road Flora Survey Location Lot 1 Payne Road, Kaloorup Author S.T.S. Chalwell Drawn S.T.S. Chalwell</p>	<p>Figure 1: Locality Plan</p>
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Vegetation Condition

Condition Rating

- Degraded
- Completely Degraded



50 New Cross Rd Kingsley WA 6026

Scale 1 700
 Basemap Source Google Satellite
 Datum GDA94
 Projection ESPG4283

Client Accendo Australia
 Project Payne Road Flora Survey
 Location Lot 1 Payne Rd, Kaloorup
 Author S.T.S. Chalwell
 Drawn S.T.S. Chalwell

**Figure 6:
 Vegetation
 Condition**



Plates



Plate 1: View of sampling Plot 1: *Corymbia calophylla* – *Acacia longifolia* subsp. *longifolia* Woodland in 'Completely Degraded' condition.



Plate 2: Another view of *Corymbia calophylla* – *Acacia longifolia* subsp. *longifolia* Woodland at Photopoint 1 looking east.



Plate 3: Another view of *Corymbia calophylla* – *Acacia longifolia* subsp. *longifolia* Woodland at Photopoint 1 looking west.



Plate 4: View of herbland in 'Completely Degraded' condition at Photopoint 2 looking north.



Plate 5: View of herbland in 'Completely Degraded' condition at Photopoint 2 looking south.



Plate 6: Another view of *Corymbia calophylla* – *Acacia longifolia* subsp. *longifolia* Woodland at Photopoint 3 looking west.



Plate 7: Another view of *Corymbia calophylla* – *Acacia longifolia* subsp. *longifolia* Woodland at Photopoint 3 looking east.



Plate 8: View of sampling Plot 2: *Corymbia calophylla* – *Acacia longifolia* subsp. *longifolia* Woodland in 'Degraded' condition.



Appendix A

List of flora recorded within the survey area, including opportunistically observed taxa.

NB: * indicates introduced flora

<u>Family</u>	<u>Taxon</u>
Juncaceae	<i>Juncus pallidus</i>
Araceae	* <i>Zantedeschia aethiopica</i>
Iridaceae	* <i>Romulea rosea</i>
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>
Asparagaceae	* <i>Asparagus asparagoides</i>
Asteraceae	* <i>Arctotheca calendula</i> * <i>Hypochaeris glabra</i> * <i>Sonchus asper</i>
Cyperaceae	<i>Cyathochaeta avenacea</i> * <i>Carex divisa</i> <i>Mesomelaena tetragona</i>
Poaceae	* <i>Briza maxima</i> * <i>Ehrharta longiflora</i> * <i>Anthoxanthum odoratum</i>
Fabaceae	* <i>Acacia longifolia</i> subsp. <i>longifolia</i>
Casuarinaceae	<i>Allocasuarina fraseriana</i>
Myrtaceae	<i>Corymbia calophylla</i> <i>Eucalyptus marginata</i> * <i>Eucalyptus globulus</i> <i>Melaleuca preissiana</i> <i>Astartea scoparia</i> <i>Taxandria parviceps</i>
Caryophyllaceae	* <i>Petrorhagia dubia</i>
Primulaceae	* <i>Lysimachia arvensis</i>
Ericaceae	<i>Leucopogon verticillatus</i>
Boraginaceae	* <i>Echium plantagineum</i>
Solanaceae	* <i>Solanum nigrum</i>



Appendix B

Site x species matrix of flora recorded within plots in the survey area.

Taxon	Percentage Cover	
	Plot 1	Plot 2
<i>Corymbia calophylla</i>	15	10
<i>Melaleuca preissiana</i>	0	3
* <i>Acacia longifolia</i> subsp. <i>longifolia</i>	75	15
<i>Taxandria parviceps</i>	0	1
<i>Xanthorrhoea preissii</i>	0	3
* <i>Asparagus asparagoides</i>	0	0.1
* <i>Briza maxima</i>	0	0.1
* <i>Hypochaeris glabra</i>	0	0.1
<i>Juncus pallidus</i>	0	0.1
* <i>Carex divisa</i>	0	0.2
* <i>Anthoxanthum odoratum</i>	0	0.3
* <i>Zantedeschia aethiopica</i>	0.1	0



Appendix C

Sampling plot environmental data

Plot	Date	Latitude (°)	Longitude (°)	Plot Type	Plot Size (m2)	Time since fire (years)	Bare Ground (%)
1	14/10/2022	-33.7574354	115.2042251	Quadrat	100	>3	85
2	14/10/2022	-33.7566071	115.2044798	Quadrat	100	>3	30

Plot	Bare Rock (%)	Litter (%)	Landform	Soil Type	Soil Texture	Rock Type	Vegetation Condition
1	N/A	10	Swale	Cream	Medium clay	N/A	Completely degraded
2	N/A	25	Swale	Cream grey	Medium clay	N/A	Degraded

Plot	Stratum 1 Cover (%)	Stratum 2 Cover (%)	Stratum 3 Cover (%)	Stratum 1 Dominants	Stratum 2 Dominants	Stratum 3 Dominants
1	15	75	0.1	<i>Corymbia calophylla</i> , <i>Acacia longifolia</i>	<i>Corymbia calophylla</i> , <i>Acacia longifolia</i>	
2	15	5	20		<i>Xanthorrhoea preissii</i> , <i>Taxandria parviceps</i>	<i>*Anthoxanthum odoratum</i> , <i>*Carex divisa</i>



Appendix D

EPBC Protected Matters Search Results



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. Please see the caveat for interpretation of information provided here.

Report created: 12-Dec-2022

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	28
Listed Migratory Species:	8

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 <https://www.dcceew.gov.au/parks-heritage/heritage>

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[\[Resource Information \]](#)

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community may occur within area

Listed Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
<u>Zanda baudinii listed as Calyptorhynchus baudinii</u>		
Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding likely to occur within area
<u>Zanda latirostris listed as Calyptorhynchus latirostris</u>		
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat likely to occur within area
CRUSTACEAN		
<u>Engaewa pseudoreducta</u>		
Margaret River Burrowing Crayfish [82674]	Critically Endangered	Species or species habitat likely to occur within area
<u>Engaewa reducta</u>		
Dunsborough Burrowing Crayfish [82675]	Critically Endangered	Species or species habitat known to occur within area
FISH		
<u>Nannatherina balstoni</u>		
Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
<u>Dasyurus geoffroii</u>		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
<u>Pseudocheirus occidentalis</u>		
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area
PLANT		
<u>Banksia nivea subsp. uliginosa</u>		
Swamp Honeypot [82766]	Endangered	Species or species habitat likely to occur within area
<u>Banksia squarrosa subsp. argillacea</u>		
Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat likely to occur within area
<u>Brachyscias verecundus</u>		
Ironstone Brachyscias [81321]	Critically Endangered	Species or species habitat may occur within area
<u>Caladenia busselliana</u>		
Bussell's Spider-orchid [24369]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
<u>Caladenia huegelii</u> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area
<u>Chamelaucium sp. S coastal plain (R.D.Royce 4872)</u> Royce's Waxflower [87814]	Vulnerable	Species or species habitat may occur within area
<u>Daviesia elongata subsp. elongata</u> Long-leaved Daviesia [64883]	Vulnerable	Species or species habitat may occur within area
<u>Diuris micrantha</u> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
<u>Drakaea elastica</u> Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat may occur within area
<u>Drakaea micrantha</u> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
<u>Gastrolobium papilio</u> Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat may occur within area
<u>Grevillea brachystylis subsp. grandis</u> Large-flowered Short-styled Grevillea [85001]	Critically Endangered	Species or species habitat known to occur within area
<u>Lambertia echinata subsp. occidentalis</u> Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area
<u>Petrophile latericola</u> Laterite Petrophile [64532]	Endangered	Species or species habitat may occur within area
<u>Verticordia plumosa var. ananeotes</u> Tufted Plumed Featherflower [23871]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Verticordia plumosa var. vassensis Vasse Featherflower [55804]	Endangered	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	
Sussex Location 2561	NRS Addition - Gazettal in Progress	WA	

Regional Forest Agreements		[Resource Information]
Note that all areas with completed RFAs have been included.		
RFA Name		State
South West WA RFA		Western Australia

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and 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

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

Where little information is available for a 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 detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact us](#) page.

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Appendix E

Definitions of Threatened and Priority Flora and Communities

CONSERVATION CODES

For Western Australian Flora and Fauna

Threatened, Extinct and Specially Protected fauna or flora¹ are species² which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016*.

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T **Threatened species**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR **Critically endangered species**

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN **Endangered species**

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU **Vulnerable species**

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct species

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

EX Extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P **Priority species**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

1 Priority 1: Poorly-known species

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.

2 Priority 2: Poorly-known species

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.

3 Priority 3: Poorly-known species

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.

4 Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

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

¹ The definition of flora includes algae, fungi and lichens

² Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

Categories of Threatened Species pursuant to the Environment Protection and Biodiversity Conservation Act 1999

EPBC Act Category	Department of Environment and Energy Definition
Extinct	A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
Extinct in the wild	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	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	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	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	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: (a) 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; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

DEFINITIONS, CATEGORIES AND CRITERIA FOR THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES

1. GENERAL DEFINITIONS

Ecological Community

A naturally occurring biological assemblage that occurs in a particular type of habitat.

Note: The scale at which ecological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified.

A **threatened ecological community** (TEC) is one which is found to fit into one of the following categories; “presumed totally destroyed”, “critically endangered”, “endangered” or “vulnerable”.

Possible threatened ecological communities that do not meet survey criteria are added to DEC’s Priority Ecological Community Lists under Priorities 1, 2 and 3. Ecological Communities that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

An **assemblage** is a defined group of biological entities.

Habitat is defined as the areas in which an organism and/or assemblage of organisms lives. It includes the abiotic factors (eg. substrate and topography), and the biotic factors.

Occurrence: a discrete example of an ecological community, separated from other examples of the same community by more than 20 metres of a different ecological community, an artificial surface or a totally destroyed community.

By ensuring that every discrete occurrence is recognised and recorded future changes in status can be readily monitored.

Adequately Surveyed is defined as follows:

“An ecological community that has been searched for thoroughly in most likely habitats, by relevant experts.”

Community structure is defined as follows:

“The spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage” (eg. *Eucalyptus salmonophloia* woodland over scattered small shrubs over dense herbs; structure in a faunal assemblage could refer to trophic structure, eg. dominance by feeders on detritus as distinct from feeders on live plants).

Definitions of Modification and Destruction of an ecological community:

Modification: “changes to some or all of ecological processes (including abiotic processes such as hydrology), species composition and community structure as a

direct or indirect result of human activities. The level of damage involved could be ameliorated naturally or by human intervention.”

Destruction: “modification such that reestablishment of ecological processes, species composition and community structure within the range of variability exhibited by the original community is unlikely within the foreseeable future even with positive human intervention.”

Note: Modification and destruction are difficult concepts to quantify, and their application will be determined by scientific judgement. Examples of modification and total destruction are cited below:

Modification of ecological processes: The hydrology of Toolibin Lake has been altered by clearing of the catchment such that death of some of the original flora has occurred due to dependence on fresh water. The system may be brought back to a semblance of the original state by redirecting saline runoff and pumping waters of the rising watertable away to restore the hydrological balance. Total destruction of downstream lakes has occurred due to hydrology being altered to the point that few of the original flora or fauna species are able to tolerate the level of salinity and/or water logging.

Modification of structure: The understorey of a plant community may be altered by weed invasion due to nutrient enrichment by addition of fertiliser. Should the additional nutrients be removed from the system the balance may be restored, and the original plant species better able to compete. Total destruction may occur if additional nutrients continue to be added to the system causing the understorey to be completely replaced by weed species, and death of overstorey species due to inability to tolerate high nutrient levels.

Modification of species composition: Pollution may cause alteration of the invertebrate species present in a freshwater lake. Removal of pollutants may allow the return of the original inhabitant species. Addition of residual highly toxic substances may cause permanent changes to water quality, and total destruction of the community.

Threatening processes are defined as follows:

“Any process or activity that threatens to destroy or significantly modify the ecological community and/or affect the continuing evolutionary processes within any ecological community.”

Examples of some of the continuing threatening processes in Western Australia include: general pollution; competition, predation and change induced in ecological communities as a result of introduced animals; competition and displacement of native plants by introduced species; hydrological changes; inappropriate fire regimes; diseases resulting from introduced microorganisms; direct human exploitation and disturbance of ecological communities.

Restoration is defined as returning an ecological community to its pre-disturbance or natural state in terms of abiotic conditions, community structure and species composition.

Rehabilitation is defined as the re-establishment of ecological attributes in a damaged ecological community although the community will remain modified.

2. DEFINITIONS AND CRITERIA FOR PRESUMED TOTALLY DESTROYED, CRITICALLY ENDANGERED, ENDANGERED AND VULNERABLE ECOLOGICAL COMMUNITIES

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant **and either** of the following applies (A or B):

- A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats **or**
- B) All occurrences recorded within the last 50 years have since been destroyed

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

An ecological community will be listed as **Critically Endangered** when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting **any one or more of** the following criteria (A, B or C):

- A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% **and either or both** of the following apply (i or ii):

- i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);
- ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.

- B) Current distribution is limited, **and one or more** of the following apply (i, ii or iii):

- i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years);

ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes;

iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.

C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

An ecological community will be listed as **Endangered** when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting **any one or more of** the following criteria (A, B, or C):

A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement **and either or both** of the following apply (i or ii):

i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years);

ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.

B) Current distribution is limited, **and one or more** of the following apply (i, ii or iii):

i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years);

ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes;

iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.

C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

An ecological community will be listed as **Vulnerable** when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium (within approximately 50 years) to long-term future. This will be determined on the basis of the best available information by it meeting **any one or more of** the following criteria (A, B or C):

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

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

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

3. DEFINITIONS AND CRITERIA FOR PRIORITY ECOLOGICAL COMMUNITIES

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of $\leq 100\text{ha}$). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of $\leq 200\text{ha}$). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

- (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:
- (ii) 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;
- (iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: 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.

- (i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.
- (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.
- (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Categories of Threatened Communities pursuant to the Environment Protection and Biodiversity Conservation Act 1999

Category	Definition
Critically Endangered	(1) An ecological community is eligible to be included in the <i>critically endangered</i> 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	(2) An ecological community is eligible to be included in the <i>endangered</i> 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	(3) An ecological community is eligible to be included in the <i>vulnerable</i> category at a particular time if, at that time: (a) it is not critically endangered nor 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.