

Figure 21. Condition of vegetation in quadrant 2 of the Survey Area.



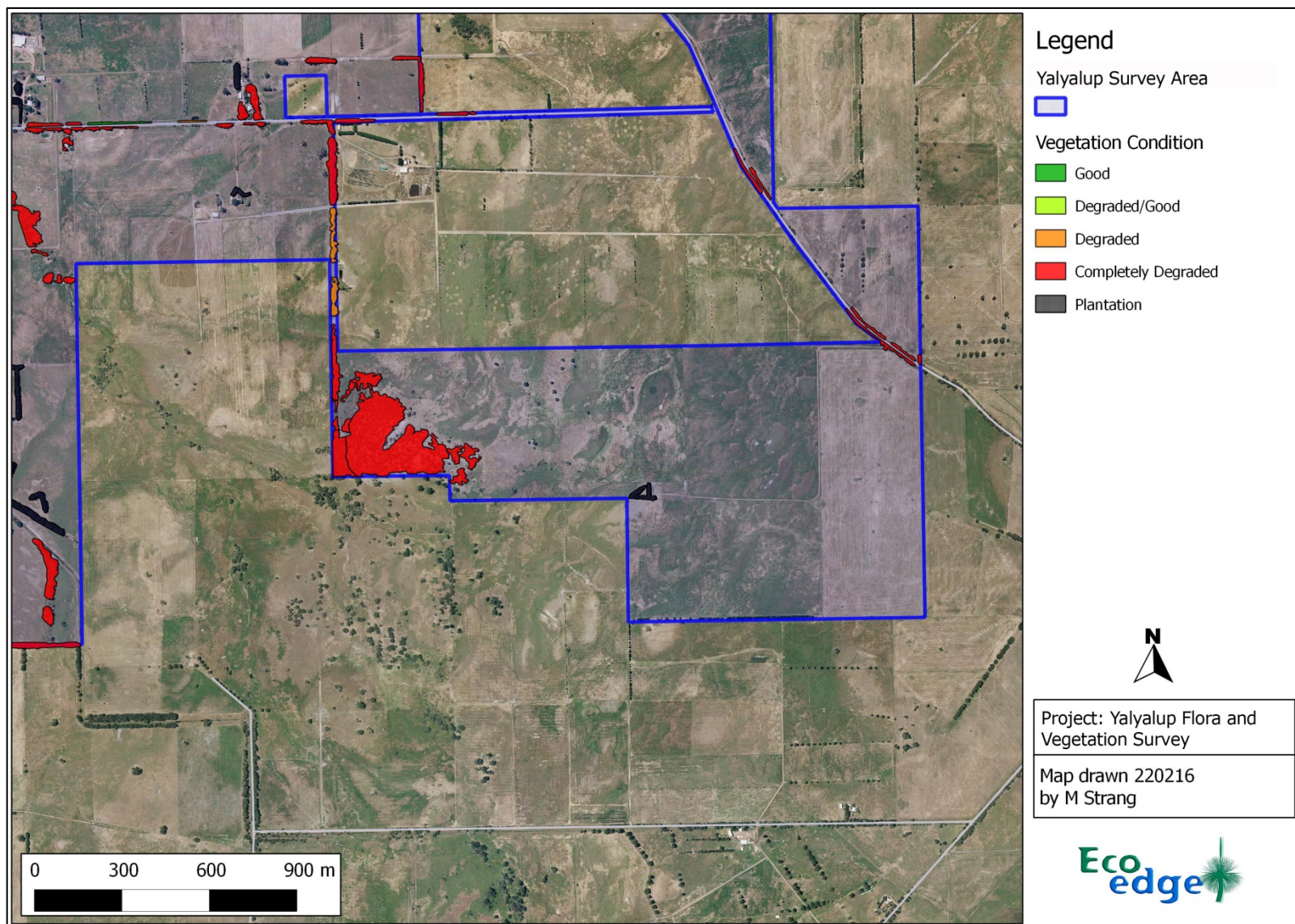


Figure 22. Condition of vegetation in quadrant 3 of the Survey Area.



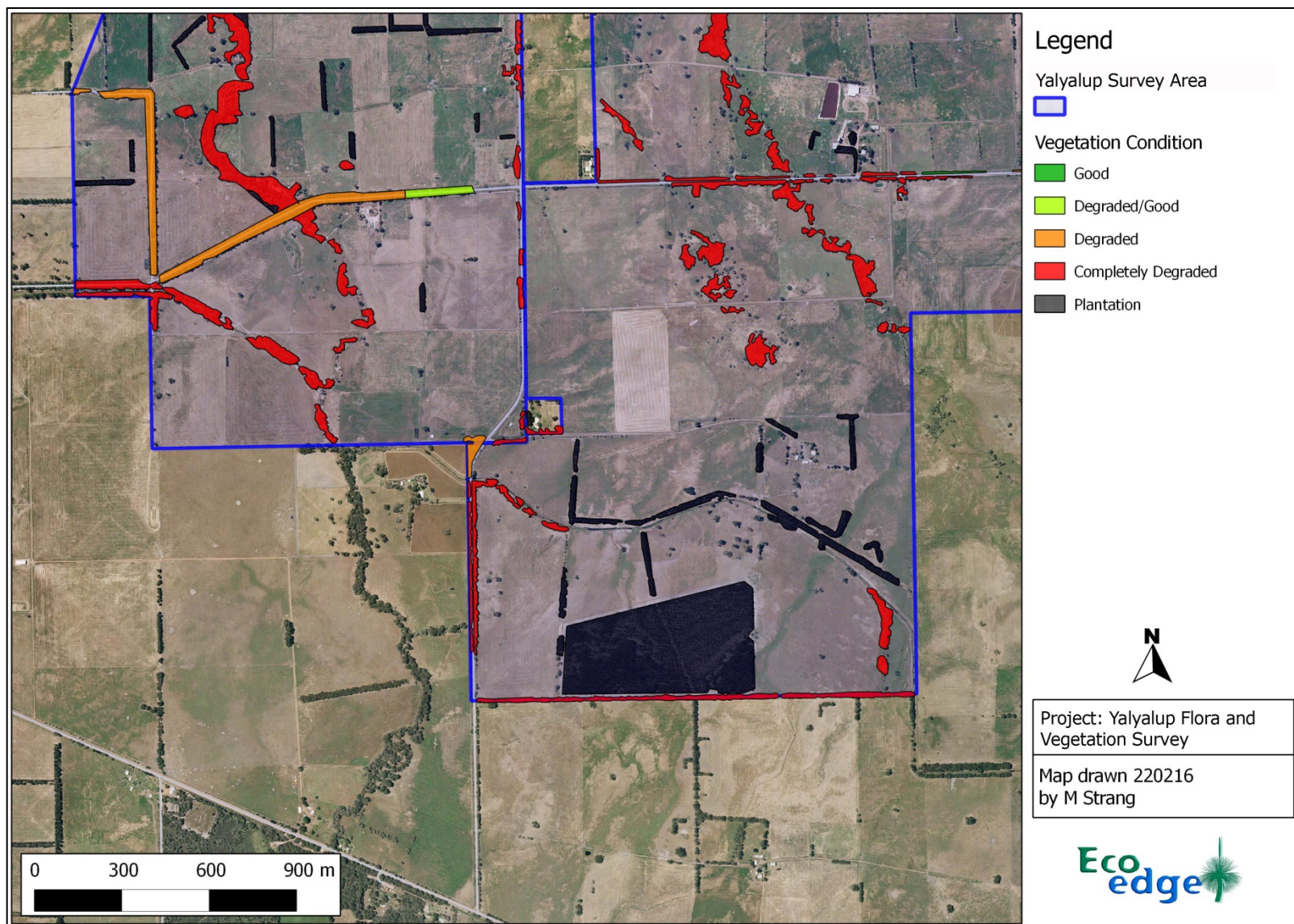


Figure 23. Condition of vegetation in quadrant 4 of the Survey Area.

### 3.6 Groundwater Dependant Ecosystems in the Survey Area

In the absence of detailed information on soil-type and depth to groundwater distribution within the Survey Area, only general comments can be made with regard to the presence of likely GDEs or phreatophytic<sup>6</sup> vegetation. The discussion below is based on the recorded plant species recorded and vegetation units derived during the present study, as well as general observations on soil type and distribution.

Classification schemes for assessing the dependence of vegetation on groundwater or the phreatophytic class of the vegetation have been developed, such as that by Froend and Zencich (2001). A similar classification scheme was employed in a GDE assessment for a proposed mine-site at DMS's Burekup operations by Soil Water Consultants (SWC) (2007). The steps in making the assessment are set out by SWC:

1. Identify the soil profile and aquifer systems underlying each of the vegetation communities;
2. Assess the root distribution of the vegetation and the interaction with groundwater;
3. Determine the likely groundwater dependence of the vegetation based on the properties of the soils, the root distribution of the vegetation, and the location of groundwater;
4. Determine the risk that mining and groundwater dewatering may have on the growth and survival of the vegetation.

Individual plant species associated with potential GDEs are assessed with regard to their degree of reliance on groundwater as opposed to water stored in the soil profile above the groundwater.

Most of the vegetation units present within the Survey Area contain species that are associated with wetland vegetation and potentially phreatophytic. *Eucalyptus rudis*, *Melaleuca raphiophylla*, *M. preissiana* and *Banksia littoralis*, one or more of which are present in all but one of the Survey Area vegetation units, are known to be groundwater dependent (obligate phreatophytes) on the Swan Coastal Plain (Water Corporation, 2005). However, *Banksia attenuata*, which is typically found on deep sands well above the water-table (and is found in Vegetation Unit D), may also be partially phreatophytic (facultative phreatophytes) (Canham, *et al.*, 2009).

In conclusion, it is likely that much of the native vegetation within the Survey Area is at least partially phreatophytic and that most of the vegetation units are potential GDEs. Detailed

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<sup>6</sup> A "phreatophyte" is a plant often with deep roots, that is mostly or entirely dependent on water from a permanent ground supply.

studies similar to those carried out at the Burekup minesite by SWC (2007) will be needed to pinpoint the vegetation most at risk from potential water-drawdown due to mining.

#### 3.6.1 Local and Regional Conservation Significance of the GDEs at Yalyalup

There is no readily available information on the conservation significance of these TECs (SWAFCT01b, SWAFCT02, SWAFCT09 and SWAFCT10b) at a local or regional level. This information is held by the DBCA.

However, SWAFCT01b, SWAFCT02 and SWAFCT10b are only found on the Swan Coastal Plain south of Capel so their local threat status and conservation significance would be the same as their State-wide level.

## 4 Conclusions

A spring flora and vegetation survey of 78 ha of remnant vegetation within the Survey Area at Yalyalup resulted in the following primary findings:

Native flora richness is relatively low (92 taxa in total), with a high proportion of introduced species (38%).

Floristically, the most important part of the Survey Area is the remnant vegetation along McGibbon Track, which has 50% of the total number of native species identified in the Survey Area represented in its 5.1 ha of remnant vegetation.

Two taxa of Declared Rare (Threatened) Flora (*Banksia squarrosa* subsp. *argillacea*, *Verticordia plumosa* var. *vassensis*) and two Priority flora (*Loxocarya magna* and *Calothamnus quadrifidus* subsp. *teretifolius*) were found within the Survey Area – three of these being found within the ironstone vegetation on McGibbon Track.

Of the eight vegetation units identified in the Survey Area, an occurrence of one of them (Unit B1 on McGibbon Track) has previously been identified as an example of the Critically Endangered ecological community SWAFCT10b (“Shrublands on southern Swan Coastal Plain Ironstones (Busselton area)”).

Two small areas of Vegetation unit B2 are also inferred to be occurrences of SWAFCT10b, although one of these, located at the corner of Coopers Road, is being degraded and is in urgent need of improved management.

Two vegetation units dominated by *Corymbia calophylla* are inferred to be occurrences of the threatened communities SWAFCT01b (Southern *Corymbia calophylla* woodlands on heavy soils) – Vegetation unit A1, and SWAFCT02 (Southern wet shrublands) – Vegetation unit A2.

Some of the other Vegetation units identified in the Survey Area are similar to several other threatened or priority ecological communities. However, the small size or degraded condition of these remnants probably precludes them from being recognised as new occurrences of these communities.

Most remnant vegetation in the Survey Area is in “Degraded” or “Completely Degraded” condition, with only a relatively small percentage (5.8%) rated as “Degraded/Good” or “Good” condition – most of this is on McGibbon Track. All remnant vegetation on farmland is in “Completely Degraded” condition.

It is likely that much of the remnant vegetation within the Survey Area is groundwater dependent to some extent. Almost all vegetation units have wetland species in their overstorey that have been shown to be at least partially phreatophytic. However, detailed

studies of hydrology and soils within the Survey Area are required to quantify and qualify the degree of groundwater dependence of the vegetation.

Vegetation within the Survey Area is mapped by Webb *et al.*, (2016) as the Abba and Southern River vegetation complexes. The Abba complex has less than 7% of its original areal extent remaining and less than 1% in reserves. The Southern River complex has just over 18% of its original extent remaining but less than 2% is represented in secure reserves.



## 5 Recommendations

- That the McGibbon Track vegetation is recognised as the most important nature conservation asset within the Survey Area and due attention is given to improving its management and protecting it from any potential negative effects from mining the adjacent land
- That efforts be made to further protect and manage the nature conservation values of the area of Busselton Ironstone at the corner of Princefield Road and Coopers Road
- That the possibility of carrying out revegetation of areas of private property adjacent to and within the Busselton Ironstone occurrence on McGibbon Track using locally sourced seed be considered
- That where possible vegetation comprising the Abba vegetation complex is retained
- That further fencing of riverine vegetation be carried out to protect remaining native vegetation, reduce erosion and to ensure the value and integrity of the Regional Ecological Linkage is maintained in this largely cleared landscape



## 6 References

(Not necessarily cited)

Aplin, T.E.H. (1979). *The flora*. In: Environment and Science. Ed: B.J. O'Brien. University of WA Press. Perth, Western Australia.

Australian Government (2012). *Inclusion of ecological communities in the list of threatened ecological communities under section 181 of the Environment Protection and Biodiversity Conservation Act 1999 - Clay Pans of the Swan Coastal Plain (EC 121) (06/03/2012)*.

<https://www.comlaw.gov.au/Details/F2012L00685/Explanatory%20Statement/Text>

Australian Government (2009). *Interim Biogeographic Regionalisation of Australia (IBRA) Version 6.1*, Department of the Environment, Water, Heritage and the Arts. Retrieved January 2011 from <http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/index.html>

Canham, C. Froend, R. and Stock, W. (2009). Water stress vulnerability of four Banksia species in contrasting ecohydrological habitats on the Gnangara Mound, Western Australia. *Plant Cell Environ.* 32(1):64-72.

City of Busselton (2015). *Local Planning Scheme 21, Map Sheet No. 4 Yoganup*. City of Busselton, Western Australia.

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*. Environment Australia, Department of Environment and Heritage, Canberra, Australian Capital Territory.

Del Borello, N. (2008). *Management triggers and responses for groundwater-dependent ecosystems in the South West groundwater areas*. Water resource allocation planning series, Report no. 31.

Department of Agriculture and Food (DAF) (2007). *Biosecurity and Agriculture Management Act 2007*. Perth Western Australia.

Department of Agriculture and Food (DAF). 2014. *Declared plants*. <https://www.agric.wa.gov.au/pests-weeds-diseases/weeds/declared-plants>

Department of Environment and Conservation, (2008). *Geomorphic Wetlands of the Swan Coastal Plain GIS Mapping dataset*. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment and Conservation (DEC) (2010) *Definitions, categories and criteria for threatened and priority ecological communities*. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment, Water, Heritage and the Arts (DEWHA) (1999) *Environment Protection and Biodiversity Conservation Act 1999*. Department of Environment, Water, Heritage and the Arts. Canberra, Australian Capital Territory.

Department of Parks and Wildlife (DPaW) (2014a). *Conservation Codes for Western Australian Flora and fauna*. [http://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Conservation\\_code\\_definitions.pdf](http://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Conservation_code_definitions.pdf)

Department of Parks and Wildlife (DPaW) (2014b). *Environmentally Sensitive Areas GIS Mapping Dataset*. 2014 Version. Perth, Western Australia <https://www2.landgate.wa.gov.au/web/guest/57> (Dataset DER016).

Department of Parks and Wildlife (DPaW) (2015a). *Threatened ecological communities endorsed by the Minister for the Environment* (June 2015). [http://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/threatened ecological communities endorsed by the minister for the environment june 2015.pdf](http://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/threatened_ecological_communities_endorsed_by_the_minister_for_the_environment_june_2015.pdf)

Department of Parks and Wildlife (DPaW) (2015b). *Priority ecological communities list* (December 2015). Department of Parks and Wildlife. [https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/priority ecological communities list wa.pdf](https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/priority_ecological_communities_list_wa.pdf)

Department of Parks and Wildlife (DPaW) (2015c). *Naturemap*. Western Australian Herbarium. <http://naturemap.dpaw.wa.gov.au/default.aspx> accessed 23 September 2015.

Department of Parks and Wildlife (DPaW) (2015d). *The WA Herbarium Census of WA Plants Database* (WACENSUS: 'Max' update 13/07/2015).

Department of Parks and Wildlife (DPaW) (2015e). *Florabase*. Western Australian Herbarium. <http://florabase.dpaw.wa.gov.au/>

Department of the Environment. (DotE) (2015a). *Threatened ecological communities under the EPBC Act*. <http://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl> Accessed 28 August 2015

Department of the Environment. (DotE) (2015b). *Protected Matters Search Tool query*. Generated 10 September 2015

- Department of the Environment. (DotE) (2015c). *Categories of Threatened species under the EPBC Act*. <http://www.environment.gov.au/biodiversity/threatened/species.html> Accessed 24 September 2015
- Department of the Environment. (DotE) (2015d). *Environment Protection and Biodiversity Conservation Act. Species Profile and Threats Database*. <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl> accessed 26 August 2015
- Department of the Environment (DotE) (2015e). *Banksia squarrosa* subsp. *argillacea* — Whicher Range Dryandra. SPRAT Profile. [http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=82769](http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=82769)
- Department of the Environment (DotE) (2015f). *Verticordia plumosa* var. *vassensis* — Vasse Featherflower. SPRAT Profile. [http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=55804](http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=55804)
- Department of Water. (2009a). *South West groundwater areas allocation plan, Water resource allocation planning report no. 21*. Department of Water, Government of Western Australia. Perth, Western Australia.
- Department of Water (2009b). *Busselton–Capel groundwater area subarea reference sheets: Plan companion for the South West groundwater areas allocation plan*. Department of Water, Government of Western Australia. Perth, Western Australia.
- Ecoedge (2019). Report of a Supplementary Detailed and Reconnaissance Flora and Vegetation survey of part of the Yalyalup Proposed Mine Area. Report to Doral Mineral Sands.
- Environment Australia (2001). *National objectives and targets for biodiversity conservation 2001–2005*. <http://www.environment.gov.au/resource/national-objectives-and-targets-biodiversity-conservation-2001%E2%80%932005>
- Environmental Protection Authority (2000). *Environmental Protection of Native Vegetation in Western Australia. EPA Position Statement No. 2*. EPA. Perth, Western Australia.
- Environmental Protection Authority of WA (2004). *Guidance for the Assessment of Environmental Factors: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia, Guidance Statement No. 51*. EPA. Perth, Western Australia.
- Environmental Protection Authority (2006). *Level of Assessment for Proposals affecting Natural Area within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region*. Guidance Statement No. 10, June 2006, Perth, Western Australia.



- Environmental Protection Authority of WA (EPA) (2009). *South West Regional Ecological Linkages. Environmental protection Bulletin No. 8*. EPA. Perth, Western Australia.
- Environmental Protection Authority of WA (2016). Technical Guidance Flora and Vegetation Surveys for Environmental Impact. EPA, Perth, Western Australia. [http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EPA/Technical/Guidance/FloraandVegetationsurvey\\_Dec13.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA/Technical/Guidance/FloraandVegetationsurvey_Dec13.pdf)
- Froend, R. and Zencich, S. (2001). *Phreatophytic Vegetation and Groundwater Study. Phase 1: Phreatophytic Vegetation Research Review*. A report to the Water Corporation. Centre for Ecosystem Management Report No. 2001-12, ECU, Joondalup, Western Australia.
- Gibson, N. Keighery, G. and Keighery, B. (2000). Threatened plant communities of Western Australia. 1 The Ironstone communities of the Swan and Scott Coastal Plains. *Journal of the Royal Society of Western Australia*, 83:1-11.
- Golder Associates. (2008). Groundwater level trends analysis for the South West groundwater areas, report to the Department of Water and the Australian Government's Water for the Future – Water Smart Australia program, Perth, Western Australia.
- Government of Western Australia (1950). Wildlife Conservation Act 1950. Perth, Western Australia.
- Government of Western Australia (2005). *Environmental Protection (Environmentally Sensitive Areas) Notice 2005* (Environmental Protection Act 1986). Government Gazette, No.55. Perth, Western Australia.
- Government of Western Australia. (2019). *2018 South West Vegetation Complex Statistics*. Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth, <https://catalogue.data.wa.gov.au/dataset/dbca>
- Government of Western Australia (2013b). *Wildlife Conservation Act 1950, Wildlife Conservation (Rare Flora) Notice 2013*. Government Gazette, 17 September 2013.
- Havel, J.J. and Matiske, E.M. (2000). *Vegetation mapping of south west forest regions of Western Australia. Parts 6 and 7 (Maps)*. CALMScience Division, Australia. Environment Australia.
- Hoffman, N. and Brown, A. (2011). *Orchids of South – West Australia*. Third Edition Noel Hoffman. Gooseberry Hill, Western Australia.
- Hyde, N.L. (2006). A summary of investigations into ecological water requirements of groundwater-dependent ecosystems in the South West groundwater areas. Environmental Water Report 3, Department of Water. Perth, Western Australia.

- Keighery, B. J. (1994). *Bushland Plant Survey: A guide to plant community survey for the community*. Wildflower Society of Western Australia (Inc.), Nedlands, Western Australia.
- Lindenmayer, D. (2007). *On borrowed time: Australia's environmental crisis and what we must do about it*. Penquin/CSIRO Publishing, Camberwell, Victoria.
- Mattiske, E.M. and Havel, J.J., 1998. *Vegetation Complexes of the South-west Forest Region of Western Australia. Maps and report prepared as part of the Regional Forest Agreement*. Western Australia for the Department of Conservation and Land Management and Environment Australia. Western Australia.
- Meissner, R. and English, V. (2005). *Shrubland Association on Southern Swan Coastal Plain Ironstone (Busselton area) (Southern Ironstone Association) Interim recovery plan no. 215*. Department of Environment and Conservation, Species and Communities Branch, November 2005. Perth, Western Australia.
- Molloy, S., O'Connor, T., Wood, J. and Wallrodt, S. (2007). *Addendum for the South West Biodiversity Survey Area*. Western Australian Local Government Association, West Perth, Western Australia.
- Muir, B.G. (1977). *Biological Survey of the Western Australian Wheatbelt. Part II. Vegetation and habitat of Bendering Reserve*. Records of the West Australian Museum, Supplement No. 3.
- Pettit, N. Ladd, P. and Froend, R. (1998). Passive clearing of native vegetation: Livestock damage to remnant jarrah (*Eucalyptus marginata*) woodlands in Western Australia. *Journal of the Royal Society of Western Australia*, 81:95-106.
- Schoknecht, N., Tille, P., Purdie, B. (2004). *Soil Landscape Mapping in South-Western Australia –Overview of Methodology and Outputs – Resource Management Technical Report 280*. Department of Agriculture, Government of Western Australia.
- Soil Water Consultants (SWC). (2007). *Groundwater Dependent Ecosystem Assessment for the Proposed Burkeup Minesite*. Prepared for Iluka Resources Limited.
- Tille, P.J. and Lantzke, N.C. (1990) *Busselton Margaret River Augusta Land Capability Study*. Land Resources Series No. 5. Department of Agriculture. Perth, Western Australia.
- Water Corporation. (2005). *South West Yarragadee Hydrogeological Investigations and Evaluation, Southern Perth Basin*. Infrastructure Planning Branch, Planning and Development Division. Perth, Western Australia.

- Webb, A. (2004). *The Busselton Ironstone Shrubland Threatened Community*. Presentation to the Busselton Ironstones Threatened Ecological Community Workshop. Geographe Bayview Resort, Busselton, 23-24 November 2004.
- Webb, A, Keighery, B.J., Keighery, G.J., Longman, V. (2009). *The flora and vegetation of the Busselton Plain (Swan Coastal Plain): a report for the Department of Environment and Conservation as part of the Swan Bioplan Project*. Dept. of Environment and Conservation. Perth, Western Australia.
- Webb, A., Kinloch, J., Keighery, G. and Pitt, G. (2016). *The extension of vegetation complex mapping to landform boundaries within the Swan Coastal Plain landform and forested region of south west Western Australia*. Department of Parks and Wildlife. Perth, Western Australia.
- Williams, K., A. Horan, S. Wood & A. Webb. (2001). *Declared Rare and Poorly Known Flora in the Central Forest Region*. Department of Conservation and Land Management, State Species Management Plan.
- Wilson, J. and Froend, R. (2010). *Vegetation Monitoring Swan Coastal Plain (Bunbury, Busselton-Capel Groundwater Areas)*. A Report to Water Smart Australia and the Department of Water. ECU, Joondalup.



## Appendix 1. Protected Matters Search Tool Report.

# Yalyalup con sig spp NatureMap Species Report

Created By Guest user on 25/10/2017

**Kingdom** Plantae  
**Conservation Status** Conservation Taxon (T, X, IA, S, P1-P5)  
**Current Names Only** Yes  
**Core Datasets Only** Yes  
**Method** 'By Circle'  
**Centre** 115° 28' 02" E, 33° 41' 53" S  
**Buffer** 5km

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	3339	<i>Acacia flagelliformis</i>		P4	
2.	3537	<i>Acacia semitrullata</i>		P4	
3.	19258	<i>Actinotus whicheranus</i>		P2	
4.	4586	<i>Amperea micrantha</i>		P2	
5.	17107	<i>Banksia meisneri</i> subsp. <i>ascendens</i> (Scott River Banksia)		P4	
6.	32204	<i>Banksia nivea</i> subsp. <i>uliginosa</i>		T	
7.	32046	<i>Banksia squarrosa</i> subsp. <i>argillacea</i>		T	
8.	20026	<i>Blennospora doliiiformis</i>		P3	
9.	17804	<i>Boronia tetragona</i>		P3	
10.	35796	<i>Calothamnus quadrifidus</i> subsp. <i>teretifolius</i>		P4	
11.	19974	<i>Calytrix</i> sp. <i>Tutunup</i> (G.J. Keighery & N. Gibson 2953)		P2	
12.	43980	<i>Chamelaucium</i> sp. <i>S coastal plain</i> (R.D.Royce 4872)		T	
13.	35657	<i>Chamelaucium</i> sp. <i>Yoongarillup</i> (G.J. Keighery 3635)		P4	
14.	17686	<i>Chordifex gracilior</i>		P3	
15.	1639	<i>Drakaea elastica</i> (Glossy-leaved Hammer Orchid)		T	
16.	20509	<i>Gastrolobium papilio</i>		T	
17.	30453	<i>Gastrolobium</i> sp. <i>Yoongarillup</i> (S.Dilkes s.n. 1/9/1969)		P1	
18.	7063	<i>Gratiola pedunculata</i> (Stalked Brooklime)		P2	
19.	14011	<i>Grevillea brachystylis</i> subsp. <i>brachystylis</i>		P3	
20.	2190	<i>Hakea oldfieldii</i>		P3	
21.	16522	<i>Isopogon formosus</i> subsp. <i>dasylepis</i>		P3	
22.	29492	<i>Leucopogon</i> sp. <i>Busseton</i> (D. Cooper 243)		P2	
23.	13779	<i>Loxocarya magna</i>		P3	
24.	36200	<i>Ornduffia submersa</i>		P4	
25.	1008	<i>Schoenus pennisetis</i>		P3	
26.	7756	<i>Stylidium longitubum</i> (Jumping Jacks)		P4	
27.	12453	<i>Verticordia plumosa</i> var. <i>vassensis</i>		T	

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

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



# 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: 25/10/17 15:20:20

[Summary](#)

[Details](#)

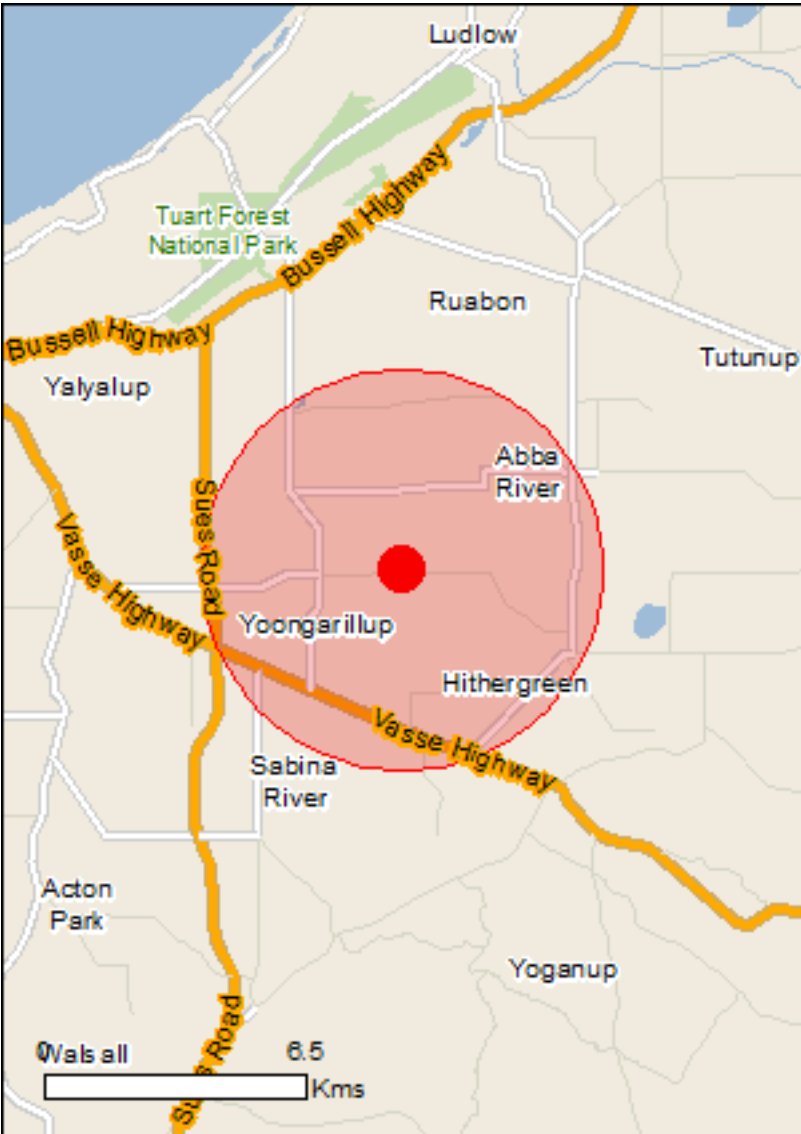
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

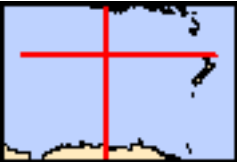
[Acknowledgements](#)



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>	2
<a href="#">Listed Threatened Species:</a>	28
<a href="#">Listed Migratory Species:</a>	10

## 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>	1
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	15
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Commonwealth Reserves Marine:</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>	1
<a href="#">Invasive Species:</a>	25
<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="#">Vasse-wonnerup system</a>		Within 10km of Ramsar

## 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="#">Banksia Woodlands of the Swan Coastal Plain ecological community</a>	Endangered	Community likely to occur within area
<a href="#">Clay Pans of the Swan Coastal Plain</a>	Critically Endangered	Community likely to occur within area

## Listed Threatened Species

[ Resource Information ]

Name	Status	Type of Presence
Birds		

<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
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<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to 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 known to occur within area
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<a href="#">Calyptorhynchus baudinii</a> Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Breeding known to occur within area
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<a href="#">Calyptorhynchus latirostris</a> Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
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<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
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Fish		
<a href="#">Nannatherina balstoni</a> Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat may occur within area

Mammals		
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area

<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Vulnerable	Species or species habitat known to occur within area
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Plants		
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Name	Status	Type of Presence
<a href="#">Andersonia gracilis</a> Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
<a href="#">Banksia nivea subsp. uliginosa</a> Swamp Honeypot [82766]	Endangered	Species or species habitat known to occur within area
<a href="#">Banksia squarrosa subsp. argillacea</a> Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Brachyscias verecundus</a> Ironstone Brachyscias [81321]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Caladenia hoffmanii</a> Hoffman's Spider-orchid [56719]	Endangered	Species or species habitat may occur within area
<a href="#">Caladenia huegelii</a> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
<a href="#">Chamelaucium sp. S coastal plain (R.D.Royce 4872)</a> Royce's Waxflower [87814]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Darwinia whicherensis</a> Abba Bell [83193]	Endangered	Species or species habitat may occur within area
<a href="#">Daviesia elongata subsp. elongata</a> Long-leaved Daviesia [64883]	Vulnerable	Species or species habitat may occur within area
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
<a href="#">Drakaea elastica</a> Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
<a href="#">Drakaea micrantha</a> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Gastrolobium papilio</a> Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat may occur within area
<a href="#">Lambertia echinata subsp. occidentalis</a> Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat likely to occur within area
<a href="#">Petrophile latericola</a> Laterite Petrophile [64532]	Endangered	Species or species habitat likely to occur within area
<a href="#">Synaphea sp. Fairbridge Farm (D. Papenfus 696)</a> Selena's Synaphea [82881]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Synaphea stenoloba</a> Dwellingup Synaphea [66311]	Endangered	Species or species habitat may occur within area
<a href="#">Verticordia densiflora var. pedunculata</a> Long-stalked Featherflower [55689]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
<a href="#">Verticordia plumosa var. vassensis</a> Vasse Featherflower [55804]	Endangered	Species or species habitat known to occur within area
Listed Migratory Species		[ <a href="#">Resource Information</a> ]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
<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
Migratory Wetlands Species		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat likely to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land		[ <a href="#">Resource Information</a> ]
The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.		
Name		
Commonwealth Land -		
Listed Marine Species		[ <a href="#">Resource Information</a> ]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat likely to occur



Name	Threatened	Type of Presence
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		within area  Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Breeding known 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 likely to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to 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
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area
<a href="#">Thinornis rubricollis</a> Hooded Plover [59510]		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[ Resource Information ]
Name	State
Unnamed WA14567	WA

Regional Forest Agreements [ Resource Information ]

Note that all areas with completed RFAs have been included.

Name	State
<a href="#">South West WA RFA</a>	Western Australia

Invasive Species [ Resource Information ]

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

Name	Status	Type of Presence
Birds		
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
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		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

Name	Status	Type of Presence within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		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
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		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

-33.70015 115.4657



# 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 2. List of vascular flora found within the Survey Area at Yalyalup.

FAMILY	SPECIES NAME	NATURALISED	CONSV_CODE
Alliaceae	<i>Allium triquetrum</i>	*	
Anacardiaceae	<i>Schinus terebinthifolius</i>	*	
Anarthriaceae	<i>Anarthria laevis</i>		
	<i>Lyginia imberbis</i>		
Araceae	<i>Lemna disperma</i>		
	<i>Zantedeschia aethiopica</i>	*	
Asparagaceae	<i>Asparagus asparagoides</i>	*	
	<i>Sowerbaea laxiflora</i>		
Asteraceae	<i>Arctotheca calendula</i>	*	
	<i>Cotula coronopifolia</i>	*	
	<i>Cotula turbinata</i>	*	
	<i>Hypochaeris glabra</i>	*	
	<i>Sonchus asper</i>	*	
	<i>Sonchus oleraceus</i>	*	
Boraginaceae	<i>Echium plantagineum</i>	*	
Casuarinaceae	<i>Allocasuarina humilis</i>		
	<i>Allocasuarina thuyoides</i>		
Centrolepidaceae	<i>Aphelia cyperoides</i>		
Colchicaceae	<i>Burchardia multiflora</i>		
Crassulaceae	<i>Crassula colorata</i>		
Cucurbitaceae	<i>Citrullus lanatus</i>		
Cyperaceae	<i>Caustis dioica</i>		
	<i>Cyathochaeta avenacea</i>		
	<i>Isolepis stellata</i>		
	<i>Lepidosperma gladiatum</i>		
	<i>Lepidosperma leptostachyum</i>		
	<i>Lepidosperma longitudinale</i>		
	<i>Lepidosperma pubisquameum</i>		
	<i>Lepidosperma squamatum</i>		
	<i>Mesomelaena tetragona</i>		
	<i>Schoenus rigens</i>		
Dasypogonaceae	<i>Kingia australis</i>		
	<i>Lomandra hermaphrodita</i>		
Dennstaedtiaceae	<i>Pteridium esculentum</i>		
Dilleniaceae	<i>Hibbertia amplexicaulis</i>		
	<i>Hibbertia hypericoides</i>		
	<i>Hibbertia racemosa</i>		
	<i>Hibbertia vaginata</i>		
Droseraceae	<i>Drosera glanduligera</i>		
Ericaceae	<i>Leucopogon australis</i>		
	<i>Leucopogon capitellatus</i>		

FAMILY	SPECIES NAME	NATURALISED	CONSV_CODE
Fabaceae	<i>Acacia applanata</i>		
	<i>Acacia extensa</i>		
	<i>Acacia incurva</i>		
	<i>Acacia longifolia</i>	*	
	<i>Acacia paradoxa</i>	*	
	<i>Acacia pulchella</i>		
	<i>Acacia saligna</i>		
	<i>Callistachys lanceolata</i>		
	<i>Daviesia preissii</i>		
	<i>Gastrolobium capitatum</i>		
	<i>Gastrolobium praemorsum</i>		
	<i>Jacksonia furcellata</i>		
	<i>Kennedia coccinea</i>		
	<i>Kennedia prostrata</i>		
	<i>Lotus subbiflorus</i>	*	
	<i>Lupinus cosentinii</i>	*	
	<i>Trifolium arvense</i>	*	
	<i>Trifolium campestre</i>	*	
	<i>Trifolium dubium</i>	*	
	<i>Trifolium hirtum</i>	*	
	<i>Trifolium repens</i>	*	
	<i>Vicia sativa</i>	*	
	<i>Viminaria juncea</i>		
Geraniaceae	<i>Erodium botrys</i>	*	
	<i>Erodium cicutarium</i>	*	
	<i>Pelargonium capitatum</i>	*	
Haemodoraceae	<i>Anigozanthos viridis</i>		
	<i>Conostylis setigera</i>		
	<i>Haemodorum spicatum</i>		
Hemerocallidaceae	<i>Caesia micrantha</i>		
Iridaceae	<i>Romulea rosea</i>	*	
	<i>Sparaxis bulbifera</i>	*	
	<i>Watsonia meriana</i>	*	
Juncaceae	<i>Juncus holoschoenus</i>		
	<i>Juncus microcephalus</i>	*	
	<i>Juncus pallidus</i>		
Loranthaceae	<i>Nuytsia floribunda</i>		
Lythraceae	<i>Lythrum hyssopifolia</i>	*	
Malvaceae	<i>Malva multiflora</i>	*	
Myrtaceae	<i>Agonis flexuosa</i>		
	<i>Astartea scoparia</i>		
	<i>Astartea zephyra</i>		
	<i>Calothamnus quadrifidus</i> subsp. <i>teretifolius</i>		4

FAMILY	SPECIES NAME	NATURALISED	CONSV_CODE
	<i>Corymbia calophylla</i>		
	<i>Eucalyptus marginata</i>		
	<i>Eucalyptus melliodora</i>	*	
	<i>Eucalyptus rudis</i>		
	<i>Hypocalymma angustifolium</i>		
	<i>Kunzea micrantha</i> subsp. <i>micrantha</i>		
	<i>Leptospermum laevigatum</i>	*	
	<i>Melaleuca osullivanii</i>		
	<i>Melaleuca preissiana</i>		
	<i>Melaleuca raphiophylla</i>		
	<i>Melaleuca viminea</i>		
	<i>Verticordia plumosa</i> var. <i>vassensis</i>		DRF
Oleaceae	<i>Olea europaea</i>	*	
Oxalidaceae	<i>Oxalis pes-caprae</i>	*	
Papaveraceae	<i>Fumaria capreolata</i>	*	
Poaceae	<i>Aira caryophyllea</i>	*	
	<i>Austrostipa campylachne</i>		
	<i>Avena fatua</i>	*	
	<i>Briza maxima</i>	*	
	<i>Bromus diandrus</i>	*	
	<i>Cenchrus clandestinus</i>	*	
	<i>Cynodon dactylon</i>	*	
	<i>Desmazeria rigida</i>	*	
	<i>Ehrharta longiflora</i>	*	
	<i>Eragrostis curvula</i>	*	
	<i>Holcus lanatus</i>	*	
	<i>Hordeum leporinum</i>	*	
	<i>Lolium perenne</i>	*	
	<i>Lolium rigidum</i>	*	
	<i>Poa annua</i>	*	
Polygonaceae	<i>Acetosella vulgaris</i>	*	
	<i>Polygonum arenastrum</i>	*	
	<i>Rumex brownii</i>	*	
	<i>Rumex crispus</i>	*	
	<i>Rumex obtusifolius</i>	*	
	<i>Rumex pulcher</i>	*	
Proteaceae	<i>Adenanthos meisneri</i>		
	<i>Banksia attenuata</i>		
	<i>Banksia dallanneyi</i>		
	<i>Banksia grandis</i>		
	<i>Banksia littoralis</i>		
	<i>Banksia squarrosa</i> subsp. <i>argillacea</i>		DRF
	<i>Hakea ceratophylla</i>		
	<i>Hakea lasianthoides</i>		



FAMILY	SPECIES NAME	NATURALISED	CONSV_CODE
	<i>Hakea lissocarpa</i>		
	<i>Hakea prostrata</i>		
	<i>Hakea ruscifolia</i>		
	<i>Hakea varia</i>		
Proteaceae	<i>Persoonia elliptica</i>		
	<i>Persoonia longifolia</i>		
	<i>Stirlingia latifolia</i>		
	<i>Xylomelum occidentale</i>		
Ranunculaceae	<i>Ranunculus muricatus</i>	*	
Restionaceae	<i>Chordifex laxus</i>		
	<i>Desmocladius flexuosus</i>		
	<i>Hypolaena pubescens</i>		
	<i>Loxocarya magna</i>		3
	<i>Lyginia barbata</i>		
	<i>Lyginia imberbis</i>		
	<i>Meeboldina coangustata</i>		
	<i>Meeboldina roycei</i>		
	<i>Stenotalis ramosissima</i>		
Rubiaceae	<i>Opercularia hispidula</i>		
Solanaceae	<i>Solanum nigrum</i>	*	
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>		

Appendix 3. List of vascular flora found in the vicinity of the ironstone vegetation on McGibbon Track prior to 2007 by Andrew Webb of DPaW, Bunbury.

FAMILY	SPECIES	CONSV_CODE
Anarthriaceae	<i>Anarthria laevis</i>	
Asparagaceae	<i>Lomandra purpurea</i>	
	<i>Lomandra sonderi</i>	
	<i>Thysanotus sparteus</i>	
Casuarinaceae	<i>Allocasuarina thuyoides</i>	
Cyperaceae	<i>Caustis dioica</i>	
	<i>Cyathochaeta avenacea</i>	
	<i>Lepidosperma</i> aff. <i>resinosum</i>	
	<i>Lepidosperma longitudinale</i>	
	<i>Lepidosperma squamatum</i>	
	<i>Lepidosperma tenue</i>	
	<i>Mesomelaena tetragona</i>	
	<i>Schoenus rigens</i>	
	<i>Tetraria capillaris</i>	
Dasypogonaceae	<i>Kingia australis</i>	
Dilleniaceae	<i>Hibbertia hypericoides</i>	
	<i>Hibbertia racemosa</i>	
Ericaceae	<i>Leucopogon australis</i>	
	<i>Leucopogon</i> sp.	
Fabaceae	<i>Acacia applanata</i>	
	<i>Acacia extensa</i>	
	<i>Acacia flagelliformis</i>	4
	<i>Acacia pulchella</i>	
	<i>Acacia saligna</i>	
	<i>Daviesia preissii</i>	
	<i>Gastrolobium praemorsum</i>	
	<i>Hovea trisperma</i> var. <i>grandiflora</i>	
	<i>Kennedia coccinea</i>	
	<i>Viminaria juncea</i>	
Haemodoraceae	<i>Conostylis serrulata</i>	
	<i>Haemodorum spicatum</i>	
Hemerocallidaceae	<i>Agrostocrinum scabrum</i>	
Iridaceae	<i>Patersonia occidentalis</i>	
	<i>Patersonia umbrosa</i>	
Loranthaceae	<i>Nuytsia floribunda</i>	
Malvaceae	<i>Thomasia grandiflora</i>	

FAMILY	SPECIES	CONSV_CODE
Myrtaceae	<i>Calothamnus quadrifidus</i> subsp. <i>teretifolius</i>	4
	<i>Corymbia calophylla</i>	
	<i>Eucalyptus marginata</i>	
	<i>Eucalyptus rudis</i>	
	<i>Hypocalymma angustifolium</i>	
	<i>Hypocalymma robustum</i>	
	<i>Kunzea micrantha</i>	
	<i>Melaleuca preissiana</i>	
	<i>Melaleuca uncinata</i>	
	<i>Regelia ciliata</i>	
Proteaceae	<i>Adenanthos meisneri</i>	
	<i>Banksia dallanneyi</i>	
	<i>Banksia grandis</i>	
	<i>Banksia littoralis</i>	
	<i>Banksia squarrosa</i> subsp. <i>argillacea</i>	DRF
	<i>Hakea ceratophylla</i>	
	<i>Hakea oldfieldii</i>	3
	<i>Hakea prostrata</i>	
	<i>Hakea ruscifolia</i>	
	<i>Hakea varia</i>	
	<i>Isopogon formosus</i> subsp. <i>dasylepis</i>	3
	<i>Persoonia elliptica</i>	
	<i>Xylomelum occidentale</i>	
Restionaceae	<i>Chordifex laxus</i>	
	<i>Hypolaena exsulca</i>	
	<i>Hypolaena pubescens</i>	
	<i>Loxocarya magna</i>	3
	<i>Stenotalis ramosissima</i>	
	<i>Tremulina tremula</i>	
Thymelaeaceae	<i>Pimelea</i> sp.	
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>	

## Appendix 4. Photographs of Vegetation Units within the Survey Area

### Vegetation Unit A1



Woodland of *Corymbia calophylla* and *Eucalyptus marginata*, with scattered *Agonis flexuosa*, *Banksia attenuata*, *B. grandis*, *Melaleuca preissiana*, *Nuytsia floribunda*, *Persoonia longifolia* or *Xylomelum occidentale* over *Xanthorrhoea preissii* over weeds on grey-brown or grey loamy sand or sand (on farmland usually only *C. calophylla* and *E. marginata* are present).

### Vegetation Unit A2



Woodland of *Corymbia calophylla* (sometimes with *Eucalyptus marginata* or *E. rudis*) with scattered *Melaleuca preissiana* or *Banksia littoralis* over open shrubland that may include *Acacia extensa*, *A. saligna*, *Hakea ceratophylla*, *H. lissocarpa*, *H. prostrata*, *H. varia*, *Kingia australis*, *Melaleuca viminea* and *Xanthorrhoea preissii* over weeds on seasonally wet grey loamy sand.



### Vegetation Unit B1



Tall shrubland of *Acacia saligna*, *Banksia squarrosa* subsp. *argillacea*, *Calothamnus quadrifidus* subsp. *teretifolius*, *Hakea oldfieldii* and *Kunzea micrantha* (with scattered emergent *Eucalyptus rudis*) over scattered native herbs including *Drosera glanduligera* and *Sowerbaea laxiflora*, the sedge *Loxocarya magna*, and weeds on shallow red sandy clay on massive ironstone.

### Vegetation Unit B2



Woodland of *Eucalyptus rudis* and (in some areas) *Melaleuca raphiophylla* over weeds on massive ironstone.



### Vegetation Unit C1



Woodland of *Eucalyptus rudis* (and sometimes *Corymbia calophylla*) over scattered *Agonis flexuosa* and *Melaleuca raphiophylla* over weeds on grey-brown clayey loams in drainage lines.

### Vegetation Unit C2



Open woodland of *Melaleuca preissiana* over weeds on seasonally wet brown clay-loam.



### Vegetation Unit C3



Tall Open Shrubland that may include *Acacia saligna*, *Jacksonia furcellata*, *Kingia australis*, *Melaleuca osullivanii*, *M. preissiana*, *M. viminea* and *Xanthorrhoea preissii* on seasonally wet grey-brown sandy loam.

### Vegetation Unit D



Woodland of *Agonis flexuosa* with scattered *Banksia attenuata* over weeds on grey sand on low dunes.