WILLATOOK WINDFARM

ASSESSMENT OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Willatook Wind Farm Pty Ltd

BL&A Brett Lane & Associates Pty. Ltd.
Ecological Research & Management
Suite 5 61–63 Camberwell Road, Hawthorn, VIC 3123
P.O. Box 337, Camberwell, VIC 3124
Ph. (03) 9815 2111
Fax. (03) 9815 2685

April 2019

Report No. 16087 (4.7)

CONTENTS

APPENDICES

1. INTRODUCTION

Willatook Wind Farm Pty Ltd engaged Brett Lane and Associates Pty. Ltd. (BL&A) to report on the combined results of a number of flora and fauna assessments for the Willatook Wind Farm (WWF). The location of the proposed wind farm is approximately 32 kilometers (km) north-west of Warrnambool. The WWF extends across both sides of the Woolsthorpe-Heywood Road, between Penhurst-Warrnambool Road and Hamilton-Port Fairy Road. It covers approximately 7,000 hectares (ha) of private and public land and is located within the Moyne Shire. This area is referred to hereafter as 'the study area'.

This report consolidates the results of these assessments for Matters of National Environmental Significance (MNES), listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the 'EPBC Act'). A number of investigations have been commissioned in the study area to provide information on the extent and condition of native vegetation (including threatened communities), flora species, fauna habitat and fauna species (in particular EPBC Act listed threatened and migratory species). As this report forms part of a Commonwealth EPBC Act Referral, the information gained from these investigations and utilised in this report only describes the occurrence of and likely impacts of the proposed action to MNES listed under the EPBC Act.

The EPBC Act protects listed threatened species, ecological communities and migratory species and defines them as 'Matters of National Environmental Significance' (MNES). Any significant impacts on these Matters requires the approval of the Australian Minister for the Environment. If there is a possibility of a significant impact on MNES, a Referral under the EPBC Act should be considered. The Minister will decide after 20 business days whether the project will be a 'controlled action' under the EPBC Act, in which case it cannot be undertaken without the approval of the Minister. This process depends on a further assessment and approval process.

The investigations have been commissioned to determine the presence and status of any MNES which have the potential to occur in the study area, and to determine whether development of the WWF will, is likely to or may have a significant impact on any MNES.

This report summarises the findings for MNES of flora and fauna investigations of the wind farm site and the over dimensional transport route (OD Route) to accompany an EPBC Act Referral. A full account of the investigations, including survey methods and findings, is provided in the following more detailed Flora and Fauna Assessments:

- BL&A 2019. Flora and Fauna assessment for MNES. BL&A Report 16087 (3.2) April 2019 – *included as Attachment 8 to the Willatook WF EPBC Referral;*
- EHP (Ecology and Heritage Partners) 2018, Biodiversity Assessment: Willatook Wind Farm, Willatook, Victoria. Report prepared for Willatook Wind Farm Pty Ltd, September 2018. EHP, Ascot Vale, Victoria. - *included as Attachment 7 to the Willatook WF EPBC Referral;*

This assessment was undertaken by a team from BL&A comprising Elinor Ebsworth (Senior Ecologist), Teisha Lay (Zoologist), Peter Lansley (Senior Zoologist), Jackson Clerke (Zoologist), Curtis Doughty (Senior Zoologist), Bernard O'Callaghan (Senior Ecologist and Project Manager) and Brett Lane (Principal Consultant).

This report is divided into the following sections:

Section 2 details the analysis of likelihood of occurrence for MNES, showing how species were short-listed for further consideration.

Section 3 describes methods used for and results of field surveys for MNES short-listed because of their likelihood or potential to occur.

Section 4 presents the significant impact assessment for the project on MNES that are likely to or potentially occur and the conclusions of this assessment.

2. LIKELIHOOD OF OCCURRENCE OF MNES

2.1. Existing information

2.1.1. Existing reporting

The reports below of past flora and fauna investigations of the study area were reviewed.

- *Biodiversity Assessment, Willatook Wind Farm, Willatook, Victoria* (EHP 2018). - *included as Attachment 7 to the Willatook WF EPBC Referral;*

  This report presented the results of the initial ecological surveys of site and an initial assessment of the impacts on flora and fauna from a revised wind farm layout (EHP 2018).

- *Willatook Wind Farm: Flora and Fauna Assessment*, Report No. 16087 (3.2) (BL&A 2019 – *included as Attachment 8 to the Willatook WF EPBC Referral*;

  This report presented the results of updated ecological assessments to address gaps in previous assessments, and included an assessment of the impacts on flora and fauna from the revised wind farm layout (BL&A 2019).

2.1.2. Existing MNES records and habitat modelling

Wind Farm Site

Existing EPBC Act listed flora and fauna species records and information about the potential occurrence of other MNES was obtained from an area termed the 'Wind Farm site search region', defined here as an area with a radius of 15 kilometres from the centre of the wind farm (Latitude -38.15037 Longitude 142.16408) which includes a minimum buffer of 5 km around the boundaries of the wind farm.

A list of records of EPBC Act listed flora and fauna species in the search region has been obtained from the Victorian Biodiversity Atlas (VBA), a database administered by DELWP (2018a).

The online *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (PMST) (DoEE 2015a) has been accessed (March 2019) to determine which EPBC Act-listed species or communities that occur or potentially occur in the search region based on existing records and habitat modelling. Based on this and the nature of habitats on the wind farm site, the likelihood of occurrence of MNES on the proposed wind farm site has been assessed. The MNES report is attached in Appendix 4.

Over-dimensional transport route

This report also includes an assessment of the OD Route from Portland to the WWF. Existing EPBC Act listed flora and fauna species records and information about the potential occurrence of other MNES was obtained from an area termed the 'OD route search region', defined here as an area with a radius of 10 kilometres from the OD Route. The OD Route is linear, and included the following coordinates: Latitude 38° 19' 25.58" S Longitude 141° 35' 51.98" E, Latitude 38° 18' 06.45" S Longitude 141° 36' 02.11" E, Latitude 38° 16' 59.91" S Longitude 141° 39' 37.52" E, Latitude 38° 17' 47.90" S Longitude 141° 38' 32.20" E

A list of the EPBC Act listed flora and fauna species recorded in the OD route search region has been obtained from the Victorian Biodiversity Atlas (VBA), a database administered by DELWP (2018b).

The online *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (PMST) (DoEE 2015b) has been accessed (March 2019) to determine which EPBC Act-listed species or communities occur or potentially occur in the search region based on existing records and habitat modelling. Based on this and the nature of habitats within the OD route, the likelihood of occurrence of MNES within the OD route has been assessed. This report is attached in Appendix 5.

2.2. Ecological communities

2.2.1. Wind Farm Site

The EPBC Protected Matters Search Tool (DoEE 2015a - see Appendix 4) indicated that four ecological communities listed under the EPBC Act had the potential to occur in the study area (Table 1). Based on an assessment of native vegetation in the study area by BL&A (see Section 3) against published descriptions and condition thresholds for these communities, two of these were recorded in the study area.

Table 1: EPBC Act listed ecological communities with potential to occur in the study area

Ecological Community	EPBC
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	CR
Natural Temperate Grassland of the Victorian Volcanic Plain	CR
Seasonal Herbaceous Wetland of the Temperate Lowland Plain	CR
White Box-Yellow-Box-Blakeley's Red Gum Grassy Woodland and Derived Native Grassland	CR

Notes: EPBC = status under EPBC Act: CR = critically endangered.

Recorded listed threatened communities are considered in more detail in Section 3.

2.2.2. OD route

The EPBC Protected Matters Search Tool (DoEE 2015b) indicated that seven ecological communities listed under the EPBC Act had the potential to occur in the OD route (Table 2).

Table 2: EPBC Act listed ecological communities with potential to occur in the OD route study area

Ecological Community	EPBC
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	EN
Giant Kelp Marine Forests of South East Australia	EN
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	CR
Natural Temperate Grassland of the Victorian Volcanic Plain	CR
Seasonal Herbaceous Wetland of the Temperate Lowland Plain	CR
Subtropical and Temperate Coastal Saltmarsh	VU
White Box-Yellow-Box-Blakeley's Red Gum Grassy Woodland and Derived Native Grassland	CR

Notes: EPBC = status under EPBC Act: CR = Critically Endangered; EN = Endangered; VU = Vulnerable.

2.3. Flora Species

2.3.1. Wind Farm Site

VBA records (DELWP 2018a) and the EPBC Protected Matters Search Tool (DoEE 2015a) indicated that within the Wind Farm site search region there were records of, or there occurred potential suitable habitat for, 19 species listed under the EPBC Act. Two flora species listed under the EPBC Act were previously recorded in the study area (EHP 2018); however accurate records of the location of these species were not taken. These are:

- Basalt Peppercress; and
- Western Water-starwort.

The likelihood of occurrence in the study area of species listed under the EPBC Act is addressed in detail in Appendix 1. Species considered 'likely to occur' are those that have a very high chance of being in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those for which suitable habitat exists, but recent records in the search region are scarce.

This analysis indicates that 10 listed flora species are likely to occur or have the potential to occur in the study area. These species are listed below.

- Basalt Peppercress
- Button Wrinklewort
- Clover Glycine
- Dense Leek-orchid
- Gorae Leek-orchid
- Maroon Leek-orchid
- Matted Flax-lily

- Swamp Everlasting
- Swamp Fireweed
- Western Water-starwort

These species were the focus of targeted field surveys described in Section 3 of this report.

2.3.2. OD route

VBA records (DELWP 2018b) and the EPBC Protected Matters Search Tool (DoEE 2015b) indicated that within the OD route search region there were records of, or there occurred potential suitable habitat for, 19 species listed under the EPBC Act.

The likelihood of occurrence in the area affected by the OD route of species listed under the EPBC Act and FFG Act is addressed in detail in Appendix 2. Species considered 'likely to occur' are those that have a very high chance of being in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those where suitable habitats exists, but recent records in the search region are scarce.

This analysis indicates that four listed flora species are likely to occur or have the potential to occur in the study area. These species are listed below.

- Clover Glycine
- Gorae Leek-orchid
- Maroon Leek-orchid
- River Swamp Wallaby-grass

These species were the subject of targeted field surveys described in Section 3 of this report.

2.4. Fauna Species

An initial desktop review was undertaken in the period 2009-11 to determine the likelihood of listed species occurring in the wind farm site (EHP 2018). Databases searched included the Atlas of Victorian Wildlife (AVW) and Birds Australia Atlas data.

This analysis indicated that ten listed fauna species are likely to occur or have the potential to occur in the study area. These species are listed below.

- Southern Bent-wing Bat
- Striped Legless Lizard
- Growling Grass Frog
- Dwarf Galaxias
- Yarra Pygmy Perch
- Golden Sun Moth
- Latham's Snipe
- Sharp-tailed Sandpiper
- White-throated Needletail.

Where it was determined that the development had the potential to affect certain species negatively, targeted surveys for those species were undertaken in the study area by Ecology Partners (2018) to determine their status and distribution on the wind farm site. These surveys confirmed the presence of some of these species; others were not detected or will not be impacted by the proposed wind farm.

Additional investigations were commissioned (BL&A 2019) to provide updated information on EPBC Act listed fauna species, including listed migratory shorebird species, Growling Grass Frog, Striped Legless Lizard and Southern Bent-wing Bat. Database searches included the Victorian Biodiversity Atlas (VBA) (DELWP 2019) and Protected Matters Search Tool (PMST) (DoEE 2015a) (see Appendix 4).

The additional listed migratory species below were also considered likely to occur in the more recent analysis.

- Common Greenshank;
- Red-necked Stint;
- Magpie Goose;
- Black-eared Cuckoo; and
- Fork-tailed Swift.

Where it was determined that the development had the potential to affect certain species negatively, targeted surveys for those species were undertaken in the study area by BL&A (2019) to determine their status and distribution on the wind farm site.

White-bellied Sea Eagle, Rainbow Bee-eater, Great Egret and Cattle Egret are listed in the latest PMST (DoEE 2019). However, upon review, these are all listed migratory marine species, and do not need to be considered as the WWF is over 30 km from the coast.

The methods and results of these surveys are detailed in Section 3 of this report.

3. SURVEYS FOR MNES

3.1. Ecological communities

3.1.1. Wind Farm site

Methods

Work undertaken by EHP (2018) identified that one listed ecological community, *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* (GEWVVP) occurred within the study area. A second listed ecological community, *Seasonal Herbaceous Wetland of the Temperate Lowland Plain*, SHWTLP, was identified as potentially occurring in the study area, although field assessments were not conducted during the optimal season to assess the presence of the community (October – December) (TSSC 2012a).

One EVC (Plains Grassy Wetland (EVC 125)) that is associated with this community (TSSC 2012) was recorded within the study area. Patches of Plains Grassy Wetland that intersected with the targeted flora survey area were therefore assessed by BL&A in October 2018 to determine whether they met the key diagnostic criteria and condition thresholds for this community (TSSC 2012a).

The results from these investigations are provided below.

Results

Each listed threatened community is considered below.

- **Grassy Eucalypt Woodland of the Victorian Volcanic Plain** (GEWVVP) – listed as Critically Endangered under the EPBC Act

  Higher Rainfall Plains Grassy Woodland (EVC 55_63), Basalt Shrubby Woodland (EVC 642) and Heavier-soils Plains Grassland (EVC 132_61) (which EHP identified was a derived grassland community from Basalt Shrubby Woodland and Plains Grassy Woodland (EHP 2018)) mapped within the study area would potentially meet the key diagnostic criteria for this community (TSSC 2008b), namely remnant native vegetation within the Victorian Volcanic Plain where trees are present such that the projective foliage cover of native trees is more than 5% and the tree canopy is generally dominated by River Red Gum (*Eucalyptus camaldulensis*) or associated eucalypts, including Swamp Gum and Manna Gum in areas receiving over 700 mm rainfall (as the WWF site does (BoM 2019a)).

  Two patches of Higher Rainfall Plains Grassy Woodland (EVC 55_63) within the study area, denoted PGW2, were found to meet the condition thresholds for this community (EHP 2018), namely each patch is at least 0.5 hectares and 50% or more of the perennial ground layer vegetation comprises native species (TSSC 2008b). These patches total 0.834 hectares. See Figure 1 in BLA 2019.

  1.940 hectares of Heavier-soils Plains Grassland (EVC 132_61) (which EHP identified was a derived grassland community from Basalt Shrubby Woodland and Plains Grassy Woodland (EHP 2018)) would potentially qualify as the listed community, as each patch is at least 0.5 hectares in area. No assessment of these patches against the condition thresholds for the community (TSSC 2008b) has been undertaken. These patches of potential GEWVVP are shown in Figure 1 in BLA 2019.

All other patches of Higher Rainfall Plains Grassy Woodland (EVC 55_63), Basalt Shrubby Woodland (EVC 642) and Heavier-soils Plains Grassland (EVC 132_61) within the study area were found not to meet the condition thresholds for this community, either as they were too small or because 50% or more of the perennial ground layer vegetation was not native species, and there were not more than ten native perennial species and at least three big trees per hectare (TSSC 2008b).

- **Seasonal Herbaceous Wetland of the Temperate Lowland Plain** (SHWTLP) – listed as Critically Endangered under the EPBC Act

  One EVC (Plains Grassy Wetland (EVC 125)) that is associated with this community (TSSC 2012) was recorded within the study area. EHP (2018) determined that due to the modified condition of Plains Grassy Wetland patches it was unlikely that these would meet the thresholds for the community; however, they also recognised that the field assessments were not conducted during the optimal season to assess this ecological community (i.e. October – December) (TSSC 2012a).

  Patches of Plains Grassy Wetland that intersected with the targeted flora survey area were therefore assessed in October 2018 to determine whether they met the key diagnostic criteria and condition thresholds for this community (TSSC 2012a). Patches of Plains Grassy Wetland that intersected with the targeted survey area and met these criteria (TSSC 2012a), namely they were patches in which 50% or more of the total cover of plants in the ground layer of the wetland was dominated by native species characteristic of the Seasonal Herbaceous Wetlands ecological community, and the wetland was 0.5 ha or larger in size, are shown in Figure 1 in BLA 2019.

  Areas of Plains Grassy Wetland (EVC 125) beyond the targeted flora survey area have not been checked against the condition thresholds for the community, and are therefore considered to be potential SHWTLP, as shown in Figure 1 in BLA 2019.

Based on an assessment of native vegetation in the study area against published descriptions and condition thresholds, the communities discussed below were found not to occur in the study area based on the factors described.

- **Natural Temperate Grassland of the Victorian Volcanic Plain** – listed as Critically Endangered under the EPBC Act

  One EVC (Heavier-soils Plains Grassland (EVC 132_61)) that is associated with this community (TSSC 2008c) was recorded within the study area; however, all patches of Heavier-soils Plains Grassland (EVC 132_61) mapped within the study area are a derived grassland community from Basalt Shrubby Woodland (EVC 642) and do not meet the key diagnostic criteria for the listed community, which is described as a patch of remnant native vegetation on the Victorian Volcanic Plain where trees are (and were) absent or sparse such that the projective foliage cover of native trees in the patch is (or would have been) 5% or less (TSSC 2008c).

- **White Box - Yellow Box - Blakeley's Red Gum Grassy Woodland and Derived Native Grassland** – listed as Critically Endangered under the EPBC Act

  No vegetation within the study area met the first key diagnostic criterion for this community (EHP 2018), namely that at least one of the most common overstorey species is/was White Box, Yellow Box or Blakely's Red Gum (TSSC 2006).

3.1.2. OD route

Methods

The communities were assessed in 2018 during the on-ground identification of native vegetation at each of the sites potentially impacted by the OD route.

Results

The results of the survey of the OD route for listed threatened communities are presented below.

Based on an assessment of native vegetation in the OD route study area against published descriptions and condition thresholds, the communities with potential to occur based on the review of existing information were found not to occur in the OD route study area. Each community is considered below.

- **Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community** – listed as Endangered under the EPBC Act

  No remnant ecosystems within the OD route study area met the description of this community, which occurs in estuaries (DoEE 2018b).

- **Giant Kelp Marine Forests of South East Australia** – listed as Endangered under the EPBC Act

  No vegetation within the OD route study area met the key diagnostic criteria of this community, which occurs at or below sea level (TSSC 2012b).

- **Grassy Eucalypt Woodland of the Victorian Volcanic Plain** – listed as Critically Endangered under the EPBC Act

  Herb-rich Foothill Forest (EVC 23) mapped within the OD route study area would potentially meet the key diagnostic criteria for this community (TSSC 2008a), namely remnant native vegetation within the Victorian Volcanic Plain where trees are present such that the projective foliage cover of native trees is more than 5% and the tree canopy is generally dominated by River Red Gum or associated eucalypts, including Swamp Gum and Manna Gum in areas receiving over 700 mm rainfall (as patches of Herb-rich Foothill Forest mapped within the OD route study area would (BoM 2019b)). Habitat Zones AB, AC, AD, AE, AF and AG do not meet the minimum patch size (0.5 hectares) for the listed ecological community (TSSC 2008a). Habitat zone AA does meet the minimum patch size, but does not meet the first condition threshold for the listed ecological community, because 50% or more of the perennial ground layer vegetation was not native species, and there were not more than ten native perennial species and at least three big trees per hectare (TSSC 2008a). Therefore, this community does not occur within the OD route study area.

- **Natural Temperate Grassland of the Victorian Volcanic Plain** – listed as Critically Endangered under the EPBC Act

  No vegetation within the OD route study area met the key diagnostic criteria of this community, which is described as a patch of remnant native vegetation on the Victorian Volcanic Plain where trees are (and were) absent or sparse such that the projective foliage cover of native trees in the patch is (and would have been) 5% or less (TSSC 2008b).

- **Seasonal Herbaceous Wetland of the Temperate Lowland Plain** – listed as Critically Endangered under the EPBC Act

  No EVCs associated with the listed ecological community (TSSC 2012a) were recorded within the OD route study area.

- **Subtropical and Temperate Coastal Saltmarsh** – listed as Vulnerable under the EPBC Act

  No vegetation within the OD route study area met the physical conditions of the listed community, which occurs in coastal areas under regular or intermittent tidal influence (DSEWPaC 2013).

- **White Box-Yellow-Box-Blakeley's Red Gum Grassy Woodland and Derived Native Grassland**– listed as Critically Endangered under the EPBC Act

  No vegetation within the OD route study area met the first key diagnostic criterion for this community, namely that at least one of the most common overstorey species is/was White Box, Yellow Box or Blakely's Red Gum (TSSC 2006).

3.2. Flora species

3.2.1. Wind Farm site

Methods

Targeted surveying for the 10 flora species with potential to occur in the Wind Farm study area was undertaken across two separate site surveys (October 2018 and December 2018) to coincide with the published flowering times for the target species, as indicated in Table 3. Targeted surveying for threatened flora was undertaken only where native vegetation supporting suitable habitat for those species within the targeted survey area (as shown in Figure 1 in BLA 2019), which was based on a provisional footprint provided by WWF Pty Ltd. As such, the targeted survey areas were small/linear/narrow bands of habitat, allowing very thorough visual searching of these areas to be undertaken (BL&A 2018).

This method, combined with the timing of the surveys (within the published flowering times for all species) was considered appropriate to determine whether the targeted species were present or absent in the impact areas.

These targeted surveys for threatened flora were conducted as described below.

- October targeted flora survey (targeting spring flowering species namely Button Wrinklewort, Clover Glycine, Dense Leek-orchid and Western Water-starwort): 22nd to 24th October 2018.
- December targeted flora survey (targeting summer flowering species namely Basalt Peppercress, Gorae Leek-orchid, Maroon Leek-orchid, Matted Flax-lily, Swamp Everlasting and Swamp Fireweed): 10th to the 12th December 2018.

During both of these surveys, the following areas were surveyed (see Figure 1 in BLA 2019):

- All areas of Plains Grassy Woodland (EVC 55_63) within the targeted survey area;
- All areas of Plains Grassy Wetland (EVC 125) within the targeted survey area;

- All areas of *Heavier-soils* Plains Grassland (EVC 132_61) within the targeted survey area; and
- All areas of Basalt Shrubby Woodland (EVC 642) within the targeted survey area.

All the above detailed targeted surveying for threatened flora involved visual searching on foot by qualified and experienced botanists along transects spaced 5 metres apart. Where any threatened flora species was observed, its location was recorded using a handheld GPS.

Table 3: Survey season and suitable habitat for EPBC Act listed flora species within the Wind Farm site

Common Name	Scientific Name	EVCs	EPBC	j	f	m	a	m	j	j	a	s	o	n	d
Western Water-starwort	*Callitriche cyclocarpa*	125	VU												
Matted Flax-lily	*Dianella amoena*	132, 55	EN												
Clover Glycine	*Glycine latrobeana*	132, 55	VU												
Basalt Peppercress	*Lepidium hyssopifolium*	132, 55, 642	EN												
Gorae Leek-orchid	*Prasophyllum diversiflorum*	125	EN												
Maroon Leek-orchid	*Prasophyllum frenchii*	125	EN												
Dense Leek-orchid	*Prasophyllum spicatum*	125	VU												
Button Wrinklewort	*Rutidosis leptorhynchoides*	132, 55, 642	EN												
Swamp Fireweed	*Senecio psilocarpus*	132, 125	VU												
Swamp Everlasting	*Xerochrysum palustre*	125	VU												

Results

One flora species listed under the EPBC Act was recorded in the targeted survey area: Swamp Everlasting (*Xerochrysum palustre*).

No additional threatened flora species listed under the EPBC Act were recorded in the October or December 2018 targeted flora surveys, and they are therefore now considered unlikely to occur in the impact area.

Swamp Everlasting (EPBC Act listed) – 24 Swamp Everlasting plants were recorded in the targeted survey area, all of which were recorded within habitat zone CA, a patch of Plains Grassy Wetland on private land (see Figure 1 in BLA 2019). Swamp Everlasting plants recorded within the targeted survey area were large, well-established individuals that were in flower at the time of survey (see Photograph 1 and 2).

Photograph 1 and 2: Swamp Everlasting within Habitat Zone CA

3.2.2. OD route

Methods

Targeted surveying for the four threatened flora species with potential to occur in the OD route was undertaken across two separate site surveys (October 2018 and December 2018) to coincide with the published flowering times for the target species, as indicated in Table 4. Targeted surveying for threatened flora was undertaken in all areas of suitable habitat within the over-dimensional route study area to allow for design flexibility. As these patches were small and often linear, very thorough visual searching of these areas was undertaken.

This method, combined with the timing of the surveys (within the published flowering times of all species) was considered appropriate to determine whether the targeted species were present or absent in the impact areas.

These targeted surveys for threatened flora were conducted as described below.

- October targeted flora survey (targeting spring flowering species namely Clover Glycine): 31st October 2018.

  During this survey, impact areas for the following areas were surveyed:

  - Herb-rich Foothill Forest (EVC 23); and
  - Aquatic Herbland (EVC 653).

- December targeted flora survey (targeting summer flowering species namely River Swamp Wallaby-grass, Gorae Leek-orchid and Maroon Leek-orchid): 12th December 2018.

  During this survey, impact areas for the following EVC were surveyed:

  - Aquatic Herbland (EVC 653).

All the above detailed targeted surveying for threatened flora involved visual searching on foot by qualified and experienced botanists along transects spaced 5 metres apart. Where any threatened flora species was observed, its location was recorded using a handheld GPS.

Table 4: Survey season and suitable habitat for EPBC Act listed flora species within the OD route

Common Name	Scientific Name	EVCs	EPBC	j	f	m	a	m	j	j	a	s	o	n	d
River Swamp Wallaby-grass	*Amphibromus fluitans*	653	EN												
Clover Glycine	*Glycine latrobeana*	23	VU												
Gorae Leek-orchid	*Prasophyllum diversiflorum*	653	EN												
Maroon Leek-orchid	*Prasophyllum frenchii*	653	EN												

Results

None of the above-listed threatened flora species were recorded in the October or December 2018 targeted flora surveys, and they are therefore now considered unlikely to occur in the OD route area.

3.3. Fauna surveys

Fauna surveys have been carried out at the WWF since 2009. Initial surveys were conducted by Ecology and Heritage Partners between 2009 and 2011 (EHP 2018) and additional surveys conducted by BL&A (2019) for listed species considered likely to occur. These surveys methods and the results are detailed below.

3.3.1. BUS (Bird Utilisation Surveys)

Methods

Initial bird utilisation surveys were undertaken using fixed point counts over ten days from 4th-6th and 16th-20th November 2009 (EHP 2018).

The 2018/2019 BUS surveys undertaken by BL&A utilised the fixed-point bird count method which involved an observer stationed at a survey point for 15 minutes, during which time all birds observed within a 200-metre radius were recorded. Eight impact sites were surveyed.

The adequacy of using 15 minutes as an interval to record the presence of birds during bird utilisation surveys was investigated in an earlier study at another wind farm site (BL&A, unpublished data). This showed that 82 to 100 percent (average 88 percent) of species actually seen in one hour of surveying were seen in the initial 15 minutes of observation. Based on this result, the period of 15 minutes used in the formal bird utilisation surveys was considered adequate to generate representative data on the bird species in the area during the survey.

During this period, all bird species and numbers of individual birds observed within 200 metres of the survey point were recorded. The species, the number of birds and the height of the bird when first observed were documented. For species of concern (threatened species, waterbirds and raptors), the minimum and maximum heights were recorded.

The flight heights were estimated for each bird observation in 10 metres bands up to 40 metres and then in 20 metre intervals above that.

The 2018/2019 Bird Utilisation Surveys were conducted on the following dates:

- Spring – 15 - 20 October 2018
- Summer-autumn - 25 February – 1 March 2019.

Results

A total of 49 species were observed in the 2009 survey (EHP 2018). In the spring 2018 survey, 35 species were recorded. Overall, the number of species recorded reflects the largely agricultural nature of the landscape.

A single EPBC listed species, the Fork-tailed Swift (EPBC-Migratory), was recorded during the 2019 survey. Five individuals were recorded at 40 metres in height. The minimum RSA of the turbines will be 60 metres.

All other species observed within Rotor Swept Area (RSA) were common birds of agricultural environments (i.e. modified habitats) in southern Victoria (EHP 2018 and BL&A unpublished data).

3.4. Bat Surveys

Methods

A series of targeted bat surveys using ultrasonic bat detectors (Anabat® and Songmeter ® models) were conducted between 2009 and 2019. These are detailed in BL&A 2019 and EHP 2018 and include:

- **Spring 2009 survey:** The EHP spring bat survey was conducted over the period from 30th of October to 22nd November 2009, for 23 consecutive days at 18 sites (including a ground level and high-mounted recorder at wind monitoring masts).
- **Spring 2010 survey:** The EHP spring targeted bat survey was conducted over the period from 20th of October to 22nd November 2010, for 33 consecutive days at 20 sites (including at wind monitoring masts).
- **Summer/autumn 2011 survey:** The EHP targeted summer/autumn bat survey was conducted over the period from 9th February to 31st March 2011 for 50 consecutive days at 16 sites.
- **Spring 2018 survey:** The spring bat survey data was obtained over the period from 25th of October to 14th December 2018 (51 nights) at 36 sites (BL&A 2019).

A focus of the targeted surveys has been the EPBC Act listed Critically Endangered **Southern Bent-wing Bat** (*Miniopterus orianae bassanii)* (SBB) and in particular the migration seasons of this species. In total, the bat activity at the site has been monitored for at least 268 detector nights by EHP (2018) and 388 detector nights by BL&A (2019) with a total of over 650 detector nights which is considered to be adequate to understand the level of risk associated with bats, including listed species at the site.

Results

In early spring this species migrates to one of two maternity caves, one located in Naracoorte in South Australia and the other, known as Starlight Cave, in Warrnambool Victoria (located approximately 45 kilometres from Willatook) utilising caves along the way (Churchill 2008). Within these caves, females give birth to and rear young which are then weaned and become independent by February-March. The majority of adults will then leave the cave and disperse to non-breeding caves. The closest known non-breeding caves are located in Byaduk approximately 25-30 kilometres north west of the site and Yambuk, approximately 15-20 kilometres south west of the site.

Bat calls, including SBB calls can be directly identified electronically from recordings by plotting sound frequency over time for a call or series of calls. Not all calls can be identified to species level and a number of calls were recorded that could represent three different

species which call in the same frequency range: SBB, Chocolate Wattled Bat and Little Forest Bat. It is not possible to infer anything about SBB activity from these results of the recording of the call complex.

Within the wind farm site, SBBs were not recorded in most locations (see Figure 3). The SBB was confirmed in four locations during spring and at three locations during autumn of 2010/11, and in five locations during spring/summer of 2018.

Two locations held the highest number of confirmed calls in the surveys (see Figure 4 and 5 in BL&A 2019). These are described below.

- SBB was recorded at the eastern edge of the wind farm site, approximately 600 metres from an area known as 'Wild Dog Swamp', which holds large amounts of water and is adjacent to a channelised section of the Moyne River. This is location WS3-4 of EHP (2018). This area represents the highest quality wetland within 1 km of the wind farm boundary, and it may be important foraging habitat for SBB. This habitat will not be affected by the WWF and is 1.4 km from the nearest turbine. In spring 2018 BL&A (2018) recorded 5 calls over 9 nights (WS-8) in the eastern portion of the study area less than 1 km west of WS3-4;
- SBB was recorded at the western edge of the wind farm site, near roadside treed vegetation and the Shaw River and close to a Blue Gum *Eucalyptus globulus* plantation approximately 450 meters south of the western limit of planned wind turbines. This corresponds to sites WA-7 and WS2-4 of the EHP survey. This area supported good quality riparian vegetation and a larger area of eucalypt plantation; as such the habitat was of much better quality in this area than elsewhere on or near the proposed wind farm site. This site will not be affected by the WWF and is 450 metres from the nearest proposed turbines and other infrastructure.

To summarise, the Southern Bent-winged Bat activity was recorded primarily around the Shaw River to the west of the WWF and along the Moyne River to the east of the site, indicating these are the main foraging habitats for this species within the study area. These habitats are not characteristic of the wider wind farm site, which is mostly cleared for agricultural purposes. A few other locations which yielded one or two confirmed and/or complex calls indicated that Southern Bent-wing Bat may occasionally utilise roadside and wind break vegetation, and farm dams on the site but this would be infrequent, given the low-quality habitat. Thirty-one of the 36 sites surveyed by BL&A did not record any calls that were attributable to the SBB or the SBB complex.

Based on this, it is unlikely that the Southern Bent-wing Bat would frequently use the proposed wind farm site.

Southern Bent-wing Bat flight height

Southern Bent-wing Bat are thought to fly many times above canopy height in treed areas but drop to approximately six metres above ground level in open areas (Churchill 1998, 2008). BL&A have recorded SBB flying up to 25 metres above the ground but the vast majority of records are from ground-based detectors which record up to less than 25 metres. As there is little treed habitat across the WWF site, the SBB are unlikely to utilise the open paddocks in the site, and highly unlikely to fly at turbine rotor swept area (RSA) above 60 metres in height frequently in the location of proposed turbines.

There have been recordings of bat flights at height for over 70 nights at the proposed WWF. There have been no records of SBB or SBB species complex flights at height.

3.5. Striped Legless Lizard survey

Methods

Targeted Striped Legless Lizard surveys, listed as Vulnerable under the EPBC Act, were conducted by EHP (2018) between 4th November 2009 and 19th February 2010. Three tile grids were installed outside the impact area. No Striped Legless Lizards were found. For this reason, the survey was repeated by BL&A within the wind farm site during winter-spring 2018 (see BL&A 2019. *Flora and Fauna assessment for MNES*. BL&A Report 16087 (3.0) – *included as Attachment 8 to the WWF EPBC Referral*) for a full description of the survey and results).

The Striped Legless Lizard survey was undertaken using methods consistent with the DELWP Biodiversity Precinct Planning Kit (DSE 2010) and the EPBC Act Referral guidelines (DSEWPAC 2011) using the tile grid method. An initial habitat assessment identified a limited area of potential Striped Legless Lizard habitat so three tile grids were deployed. In each grid, 50 grooved terracotta or concrete roof tiles were placed in a 20 x 45 metre grid configuration, with tiles spaced five metres apart. The north-west corner of the grid was recorded using a handheld GPS.

Tile grids were laid out on 30th-31st July 2018 in the only available small patches of habitat on-site and monitored during suitable weather conditions in spring and early summer at fortnightly intervals. The first monitoring took place on 13th September, with the last check on 22nd November. A final check was completed upon decommissioning of the tiles on 7th December 2018. Each grid was checked a total of seven times, including decommissioning.

Results

Habitat condition at each tile grid site is described in detail below (Table 5).

Table 5: Tile grid habitat assessment

Grid number	Quality	Site description	Public/ Private tenure
1	Low to moderate	Located in paddock grazed by sheep, on a stony knoll dominated by Austral Bracken and exotic pasture grasses. Next to a Tussock Grass swamp. Limited connectivity.	Private
2	Low	Located in a road reserve, dominated by Kangaroo Grass, *Themeda triandra*, cracking soils, no rocks, overstory of Acacia on eastern side of road (Black Wattle and Blackwood). Introduced grasses and bulbs also present. Connectivity is poor.	Public
3	Low	Located between two remnant patches of stony knoll shrubland. Dominated by exotic pasture grass; stony knoll areas have Austral Bracken and herbs.	Private

Tiles were checked while ambient temperatures ranged between 10°C and 22°C and between 54% and 84% relative humidity. Striped Legless Lizards are optimally detectable under tiles when ambient temperatures are between 15°C and 25°C, but can be found between approximately 12°C and 30°C ambient.

No observations of Striped Legless Lizards were recorded during the spring 2018 tile grid survey at Willatook WF.

The Striped Legless Lizard is listed as vulnerable under the EPBC Act and was not observed during the current assessment. It is assessed as either absent from the WWF footprint or

possibly present in small numbers such that it avoided detection in spring 2018 and previously (EHP, 2018). It is unlikely that an important population of this species occurs on the wind farm site. Impacts on the Striped Legless Lizard resulting from the proposed wind farm are therefore considered not to be significant.

Nevertheless, a small possibility remains that a few Striped Legless Lizard may survive in the WWF area. If during construction a population is detected in areas physically affected by the wind farm development, a salvage and translocation protocol will be implemented to relocate affected Lizards.

3.6. Growling Grass Frog (GGF) surveys

Methods

A habitat assessment of wetlands within the boundaries of the WWF was undertaken by BL&A (see BL&A 2019 (Attachment 8 of the WWF EPBC Referral)) to determine the status of the wetlands, habitats and values with a focus on potential habitats within 100 metres of infrastructure. This distance is based on the distance from wetlands and waterways in which the species is most frequently recorded (Heard et al., 2010). During the habitat assessment, undertaken in November 2018,

Targeted Growling Grass Frog surveys were conducted by EHP (2018) between 16th and 20th November 2009.

Results

In 2009, no Growling Grass Frog was recorded within the wind farm site boundary by EHP (2018). One call of a Growling Grass Frog was heard from a wetland located to the east of the study area, adjacent to Moyne River (EHP 2018) which is likely to provide a habitat corridor for the species' dispersal.

During BL&A's spring and early summer fauna surveys, one Growling Grass Frog was heard along Back Creek at WWF on 23rd October 2018.

The November 2018 targeted Growling Grass Frog survey assessed mapped wetlands, as well as creek and river frontages, throughout the development footprint of the WWF. These are documented in BL&A 2019 (Attachment 8 of the WWF EPBC Referral). Most wetlands were found to be ephemeral and lacking the sufficient fringing, floating or emergent vegetation of the type favoured by Growling Grass Frog. Many wetlands at the WWF were therefore considered unsuitable. Some wetlands and creek lines did meet the requirements for potential Growling Grass Frog habitat; these were usually creek lines serving as movement corridors or small farm dams that supported vegetation favoured by the species. These areas were mapped as Growling Grass Frog habitat and movement corridors and are shown in Figure 9 in Attachment 8 of the WWF EPBC Referral.

No infrastructure will be placed within 100 metres of this potential Growling Grass Frog habitat. One creek crossing will be upgraded; however, the process of construction will be guided by a Construction Environmental Management Plan (CEMP) that will ensure minimisation of impacts on the connectivity of the creek for this species. A second cable crossing of the habitat will be directionally drilled underground to avoid impacts on the GGF habitat. The WWF construction and operation are therefore unlikely to be of consequence for the population of this species in the region.

3.7. Aquatic Fauna Surveys

Methods

Aquatic fauna surveys were undertaken by EHP from 15th to 18th December 2009 (EHP 2018) to determine the presence of significant fish species within the study area.

Ten bait traps with light sticks targeting native fish species were deployed in suitable habitat in three locations in the Kangaroo Creek in the north of the site (that drains into the Shaw river) and the Moyne river to the east of the site. In addition, dip netting was undertaken across multiple sites and two Fyke nets were set at dusk in another two locations for two nights. Details can be found in EHP (2018).

Results

Two EPBC Act-listed species, Yarra Pygmy Perch (*Nannoperca obscura*) (collected within the Moyne River sites) and Dwarf Galaxias (*Galaxiella pusilla*) (collected within the Kangaroo Creek), were detected during the surveys.

Impact assessments on these species is considered below in Section 4.3.4.

3.8. Migratory bird species

Methods

Wetlands within the boundaries of the WWF and within three kilometres of planned turbine locations were surveyed to determine the status of the wetlands, and the suitability of habitat for migratory shorebird species (see BL&A 2019 (Attachment 8 of the WWF EPBC Referral)). Surveys followed survey guidelines from *EPBC Act Policy Statement 3.21 Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (DoEE 2018c). Four surveys were completed by BL&A: one in December 2018, two in January 2019 and one in February 2019. Each survey ran for up to four days in the field.

Results

Based on analysis of VBA records (DELWP 2018b), the following species of migratory shorebirds could be expected to occur in the search region: Curlew Sandpiper, Common Greenshank, Latham's Snipe, Red-necked Stint and Sharp-tailed Sandpiper (BL&A 2019).

A total of three species of migratory shorebird were recorded within the study area during the current investigation. Each species was recorded in the eastern section of the study area to the east of Tarrone North Road on a shallow depression that has been partly modified into a dam.

Migratory shorebirds of three species were recorded by BL&A during spring-early summer 2018 at Willatook Wind Farm:

- **Sharp-tailed Sandpiper**: Seven on 15th November, 11 on 20th November and 24 on 5th December 2018.
- **Common Greenshank**: One on 5th December 2018.
- **Latham's Snipe**: One on 1st November 2018. The record of Latham's Snipe was close to the previous record documented in VBA.

Based on the habitat assessment, review of past records, knowledge that the best habitats for listed migratory shorebirds are well south of the wind farm site in coastal wetlands and given these survey results, it has been concluded that it is highly unlikely that an important population of any of these listed migratory shorebirds (i.e. 0.1% or more of a flyway population, DoEE 2018c) occurs on or near the proposed wind farm. It is unlikely that significant numbers of any other listed migratory shorebird species would occur at WWF due to a lack of extensive, suitable habitat.

4. SIGNIFICANT IMPACT ASSESSMENT

This section of the report assesses the impacts of the proposed wind farm and OD route and associated infrastructure on the listed communities and species either recorded or initially assessed as potentially occurring in the two study areas. This comprises a series of tables addressing the significant impact criteria (DoEE 2015).

4.1. Ecological communities

4.1.1. Wind Farm site

Two EPBC Act listed ecological communities were recorded within the WWF site.

The proposed project footprint will not impact any confirmed or potential occurrences of the EPBC Act listed community *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* (GEWVVP). This impact is therefore not considered further here.

Less than 0.15 hectares over a number of patches of the EVC Plains Grassy Wetland, which qualifies as the EPBC Act listed community *Seasonal Herbaceous Wetland of the Temperate Lowland Plain* (SHWTLP) will be impacted by the current project footprint.

The impacts of the proposed WWF on SHWTLP are considered below against the EPBC Act Significant Impact Guidelines for critically endangered and endangered ecological communities (DoE 2013).

No other areas considered to be potential SHWTLP will be impacted by the Project.

Criterion*	Assessment	Significant impact likelihood
Reduce the extent of an ecological community	The Project will reduce the extent of SHWTLP by less than 0.15 hectares	A very small reduction in area, but not overall extent
Fragment or increase fragmentation of an ecological community	The occurrence of SHWTLP within the Wind Farm site is already fragmented through landscape features such as rocky outcrops, and by existing tracks and loss of vegetation from past agricultural development. In the majority of cases, the Project will not further fragment SHWTLP, although where infrastructure impacts larger wetland areas (such as Cockatoo Swamp), there may be some patches removed.	Potential
Adversely affect habitat critical to the survival of an ecological community	As the Project will permanently alter wetlands within the footprint, habitat for SHWTLP will be adversely affected on a local scale; however, given the large number of wetlands within and surrounding the Wind Farm site, it is considered unlikely that the Project would adversely affect habitat critical to the survival of an ecological community on the Wind Farm site, or at a larger scale.	Unlikely

Criterion*	Assessment	Significant impact likelihood
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	As the Project will permanently alter wetlands within the footprint, abiotic factors necessary for the ecological community's survival will be modified or destroyed on a small scale; however, given the large number of wetlands within and surrounding the Wind Farm site, it is considered unlikely that the Project would modify or destroy abiotic factors necessary for the persistence of the ecological community on the Wind Farm site.	Unlikely
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	SHWTLP that will be impacted by the Project has been subject to stock grazing, and is therefore already relatively species poor. While the Project will impact 0.15 hectares of SHWTLP, it is considered unlikely that it would cause a substantial change in the species composition of an occurrence of the ecological community given the small area of removal in each instance, and the area remaining across the Wind Farm site.	Unlikely
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: *– assisting invasive species, that are harmful to the listed ecological community, to become established, or* *– causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community*	The Project will be constructed and operated in accordance with a detailed environmental management plan that will include monitoring and adaptive control of weed and pest animal infestations, and strict controls for the management of chemicals and pollutants. It will therefore not cause a substantial reduction in the quality or integrity of an occurrence of an ecological community.	Unlikely
Interfere with the recovery of an ecological community	Given the large number of wetlands within and surrounding the Wind Farm site, it is considered unlikely that the Project would interfere with the recovery of SHWTLP. Ample opportunities will remain in currently modified wetland basins on the site and in the wider region to restore this community, should the opportunity arise.	Unlikely
Overall assessment of likelihood of significant impact		**Unlikely**

4.1.2. OD route

No EPBC Act listed ecological communities were recorded within the OD route.

Therefore, no EPBC Act listed ecological communities will be impacted by the current OD route footprint.

4.2. Flora

4.2.1. Wind Farm site

The analysis of the likelihood of occurrence of listed flora species (Appendix 2) identified that ten species could occur in remnant native vegetation within the Wind Farm site (see Section 2.3.1).

Targeted surveys identified that one EPBC Act listed flora species, Swamp Everlasting, occurred within the targeted survey area (i.e. the development footprint).

The Project has been re-designed to avoid all Swamp Everlasting individuals recorded, whilst not impacting any further potential habitat, as shown in Figure 1 in BLA 2019. Consequently, no impacts are expected provided the population is clearly temporarily marked and signed as a no-go area in the project construction and operational environmental management plan (CEMP and OEMP).

Targeted surveys for EPBC listed flora species were undertaken based on a layout provided in October 2018 and refined in December 2018. Since the surveys were undertaken the layout has been modified slightly in response ongoing design requirements and to avoid impacts on the listed TEC - Seasonal Herbaceous Wetlands. Seasonally appropriate surveys will be undertaken of the modified layout where the layout impacts on native vegetation for EPBC listed species that is yet to be surveyed in the seasonally appropriate targeted surveys. It is considered that EPBC listed are unlikely to occur as they were not recorded in the 2018 targeted surveys described above. However, should an EPBC listed species be recorded in the remaining footprint that is yet to be surveyed the relocation of infrastructure will occur to eliminate the potential for impact on these species (as demonstrated by the relocation of infrastructure away from the Swamp Everlasting described above).

4.2.2. OD route

No EPBC Act listed flora species were recorded within the OD route.

Therefore, no EPBC Act listed flora species will be impacted by the current OD route footprint.

4.3. Fauna

This assessment found that 10 EPBC Act-listed fauna species were 'likely to occur' or have 'potential to occur' or were recorded during surveys at the WWF (Appendix 3). These are considered further below.

4.3.1. Southern Bent-wing Bat (SBB)

SBB activity was primarily recorded associated with a native riparian vegetation and eucalypt plantation adjacent to the Shaw River to the west of the WWF and along the Moyne River to the east of the site, indicating these are the main foraging habitats for this species within the study area. These habitats are not characteristic of the wider wind farm

site, which is mostly cleared for agricultural purposes. The locations of records are respectively 450 metres south and 1.5 kilometres west of the nearest turbines, beyond the distance foraging bats normally fly regularly from favoured habitat (i.e. 120 metres based on gradient studies by BL&A at a number of sites). A few other locations which yielded one or two confirmed and/or complex calls indicating that SBB may occasionally utilise roadside and wind break vegetation and farm dams on the site but this would be infrequent, given the low-quality habitat. Thirty-one of the 36 sites surveyed by BL&A did not record any calls that were attributable to the SBB or the SBB complex.

Based on this, it is unlikely that the Southern Bent-wing Bat would frequently use the proposed wind farm site.

The proposed turbine blade lower tip height is to be a minimum of 60 metres above the ground, which is higher than most wind turbine RSAs currently installed in Australia. This higher minimum RSA height will reduce the risks of bat collisions with the SBB which is not known to fly at height in open areas, with few calls being recorded more than 25 metres above the ground (BL&A, unpublished data).

The WWF will operate under a comprehensive Bat and Avifauna Management Plan which will require the wind farm operator to monitor and manage impacts on bats and avifauna, including SBB. In the unlikely event of an SBB collision with turbines, further monitoring and mitigation measures will be designed and implemented with the aim of avoiding significant impacts to this species.

The impacts of the proposed WWF on the SBB are considered below against the EPBC Act Significant Impact Guidelines for critically endangered and endangered species.

Criterion*	Assessment	Significant impact likelihood
Lead to a long-term decrease in the size of a population	The population of SBB migrating from the Warrnambool maternity cave is estimated to be approximately 10,000-15,000 individuals. The total species' population is estimated to be approximately 40,870 overall (DoEE 2019). While electronic bat recordings cannot give an accurate representation of numbers of individuals in an area, the low numbers of confirmed SBB calls recorded in the survey indicates that it is unlikely that a significant proportion of SBB individuals migrate through or utilise the area regularly. No preferred habitats occur on the proposed Wind Farm site, as it has mostly been cleared for agricultural purposes. At almost all of the bat survey sites where turbines will be located, SBBs were not detected and, where they were, very few calls were recorded. Therefore, SBB are not likely to frequently use the wind farm site. The low number of SBB calls detected over four migration seasons, and the lack of suitable habitat on the proposed Wind Farm site, the chance of collisions with turbines by SBB is considered very low. No impact on the population of a scale that would lead to a long-term decrease in numbers is expected from the Willatook Wind Farm. The minimum lower rotor swept area of the turbines will be 60 metres in height. This is one of the highest minimum RSAs of turbines in Australia. The SBB are not known to fly regularly at this height. Thus, it	Unlikely

	is highly unlikely for potential interactions between the turbines and SBB.	
Reduce the area of occupancy of the species	The proposed wind farm site supports mostly highly modified habitat that surveys show SBB use very infrequently or not at all. The proposed turbine locations and associated infrastructure do not affect the areas with the highest numbers of calls; namely 'Wild Dog Swamp' and the treed area adjacent to the Shaw River, which lie 1.5 and 0.45 kilometres respectively from the nearest turbines. Any habitat being removed during construction is unlikely to be key habitat for SBB and therefore the project will not reduce the area of occupancy of the species.	Unlikely
Fragment an existing population into two or more populations	The project will not fragment the population. Even if flying across the site, bats will be able to pass between turbines	Unlikely
Adversely affect habitat critical to the survival of a species	Habitat critical to the survival of the species is primarily the breeding caves locations in South Australia and Warrnambool, both a considerable distance from the site. Other habitat critical to the species are over-winter roosting caves, the closest known of these are at Byaduk approximately 25-30 kilometres from the site and Yambuk, approximately 15-20 kilometres from the site. There are no other known caves closer to the site and no caves are to be impacted by the construction of the WWF. Foraging habitat in proximity to the above-mentioned caves is also critical habitat to the species. The two most likely areas of important foraging habitat close to the proposed wind farm site are the two areas with the highest numbers of recorded calls, which will not be impacted by the Project. Therefore, no critical habitat for the SBB will be adversely affected.	Unlikely
Disrupt the breeding cycle of a population	The wind farm lies 45 km from the nearest maternity cave (near Warrnambool), which is well beyond the nightly flying distance (c. 35 km) of breeding adults and juvenile bats using these caves. The project will therefore not disrupt the breeding cycle of this species.	Unlikely
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	For the reasons outlined above, the site does not support habitat of importance to the species. For this reason, the advent of the proposed wind farm will not decrease the availability or quality of any suitable habitat. The species will therefore not decline as a result.	Unlikely
Result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat	The Project will be constructed and operated in accordance with a detailed environmental management plan that will include monitoring and adaptive control of weed and pest animal infestations and agricultural and plant diseases. It will therefore not result in an outbreak of any invasive species or diseases on the site.	Unlikely

Introduce disease that may cause the species to decline	See previous comment.	Unlikely
Interfere with the recovery of the species	The site is not considered prime habitat for the recovery of this species. It will continue to be used for intensive grazing and will not be available for revegetation that might increase the area of habitat within the species' range.	Unlikely
Overall assessment of likelihood of significant impact		**Unlikely**

4.3.2. Striped Legless Lizard

EHP conducted targeted tile grid surveys for Striped Legless Lizard in three locations outside the impact zone (EHP 2018). These were adjacent to the proposed WWF. There were no Striped Legless Lizards recorded.

Further targeted investigations within the proposed development zone were undertaken in the small areas of suitable habitat within the WWF to determine whether the species is present on and near the proposed development footprint. If they are recorded suitable mitigation measures will be put in place to avoid or, if necessary, minimise impacts.

Impacts on the Striped Legless Lizard resulting from the proposed wind farm are therefore considered to be negligible and a further, more detailed impact assessment is unwarranted.

4.3.3. Growling Grass Frog

One Growling Grass Frog was detected inside the wind farm boundary, heard along Back Creek at the WWF on 23rd October 2018 (BL&A 2019) and one call was heard in an area adjacent to the site near the Moyne River (EHP 2018). It is possible Growling Grass Frogs may use the Shaw River and Moyne River as movement corridors during and after heavy rainfall events to access other wetlands, but on current information they are unlikely to reside in the wind farm other than along the Back Creek. Several other wetlands were considered to have the potential to support Growling Grass Frogs but may be unsuitable due to their relative isolation.

To ensure protection and enable connectivity between populations, a buffer is to be applied along each waterway and its associated terrestrial habitats of at least 100 metres, wherever possible.

Proposed mitigation measures, set out in a Construction Environmental Management Plan (CEMP) will preclude short-term, temporary impacts from having any enduring consequences for the local Growling Grass Frog population. Provided there are no impacts on flows or water quality on aquatic habitats from construction and operation of the proposed wind farm, significant impacts on this species are not expected.

Criteria for significant impacts on the Growling Grass Frog are set out in EPBC Act Policy Statement 3.14 (DEWHA 2009). The following table provides an assessment of Growling Grass Frog against MNES Impact Criteria for Vulnerable species.

Significant impact criterion	Assessment	Significant impact likelihood
Lead to a long-term decrease in the size of an important population of a species.	The proposed wind farm construction will not lead to a long-term decrease in the population size of Growling Grass Frogs as most infrastructure is set back 100 metres from the potential habitat. Any upgrading of the creek crossing will be completed without impacts on flows or water quality and there will be no impacts on aquatic habitats from construction and operation of the proposed wind farm. Significant impacts on this species are not expected.	Unlikely
Reduce the area of occupancy of an important population.	The proposed works associated with the wind farm will not reduce the area of occupancy of an important population as most infrastructure is set back 100 metres from the potential habitat and the upgrading of the creek crossing will be completed in a sensitive manner. There will be no impacts on flows or water quality on aquatic habitats from construction and operation of the proposed wind farm, significant impacts on this species are not expected.	Unlikely
Fragment an existing important population into two or more populations.	The proposed works associate with the wind farm will not fragment important populations as the mapped habitat is mainly contiguous along creeks and stream as infrastructure is set back 100 metres from the potential habitat and any upgrading of the creek crossing will be completed without impacts on connectivity.	Unlikely
Adversely affect habitat critical to the survival of a species.	The proposed works will not adversely affect habitat critical to the survival of the species. Suitable and important habitat is available and will not be impacted by the proposed development.	Unlikely
Disrupt the breeding cycle of a population.	The proposed works will not disrupt the breeding cycle of an important population as infrastructure is set back 100 metres from the potential habitat and any upgrading of the creek crossing will be completed without impacts on connectivity.	Unlikely
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The proposed works will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, as infrastructure is set back 100 metres from the potential habitat and any upgrading of the creek crossing will be completed without impacts on connectivity.	Unlikely

Significant impact criterion	Assessment	Significant impact likelihood
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Invasive species which are a threat to Growling Grass Frog include species such as Gambusia (Mosquito Fish) which predate on tadpoles. The proposed development does not pose the threat of introducing a new invasive species that would affect Growling Grass Frogs, as mitigation measures during construction will be implemented and monitored as stated in the CEMP.	Unlikely
Introduce disease that may cause the species to decline.	The Growling Grass Frog is susceptible to a highly infectious disease caused by the amphibian chytrid fungus *Batrachochytrium dendrobatidi*. Management measures will be enforced to prevent such harmful diseases to be introduced. Actions will be undertaken during the construction phase to control the spread of disease between waterbodies and adjacent waterways.	Unlikely
Interfere substantially with the recovery of the species.	The proposed residential development will not interfere substantially with the recovery of the species as infrastructure is set back 100 metres from the potential habitat and any upgrading of the creek crossing will be completed without impacts on connectivity.	Unlikely

4.3.4. Dwarf Galaxias and Yarra Pygmy Perch

Suitable aquatic habitat exists within the study area, particularly in tributaries of the Moyne River. These two listed fish species were detected along the Moyne River and Kangaroo Creek during surveys conducted by EHP (2018) in 2009.

Provided there are no impacts on flows or water quality on these two watercourses from construction and operation of the proposed wind farm, then impacts are not expected on these species. A buffer of at least 100 metres will be provided between wind farm infrastructure and these substantial waterways, wherever possible. Where this is not possible a minimum 30 metre separation between the development footprint (i.e. turbines, access tracks and power cabling) and the Moyne River, Kangaroo Creek and any significant tributaries on the site together with best practice sediment and erosion control measures will prevent significant impacts on these fish species.

4.3.5. Golden Sun Moth

There are no previous records of Golden Sun Moth from database searches undertaken within the wind farm site search region. Suitable habitat of Plains Grassland and Stony Knoll Shrubland were patchy and limited across the wind farm site. EHP (2018) considered that this species has a moderate likelihood of occurrence within the wind farm site. However, during the assessments in 2019 it was considered that due to the lack of recent or regular records and the lack of availability of suitable habitat in the wind farm site it was considered unlikely that Golden Sun Moth occurs on the wind farm site. Therefore, any

impacts the proposed development may have on this species are considered to be negligible.

4.3.6. Migratory shorebirds

Latham's Snipe, Red-necked Stint, Common Greenshank, Magpie Goose, Black-eared Cuckoo and Sharp-tailed Sandpiper

It is unlikely that the project represents a significant risk to these species' populations as none of the species are listed as threatened and all are considered to have stable populations (DoEE 2019).

Table 6: Assessment against MNES Impact Criteria for Latham's Snipe

Significant impact	Comment
Loss of habitat	Migratory shorebirds were only detected at one site on the wind farm and this wetland was not considered to be of significant importance to any of the species. In addition, all wetlands are to be buffered by 100m, where possible, to exclude construction from affecting these areas. All construction works will also be subject to CEMPs which will have water run-off and sediment controls which should prevent impacts from these sources occurring in any wetlands. Given this, there expected to be no loss of migratory shorebird habitat.
Degradation of habitat leading to a *substantial reduction* in migratory shorebird numbers	All wetlands are to be buffered by 100m, where possible, to exclude construction from affecting these areas. All construction works will also be subject to CEMPs which will have water run-off and sediment controls which should prevent impacts from these sources occurring in any wetlands. Given this, there expected to be no loss of migratory shorebird habitat and no related reduction in migratory numbers. In addition, it is unlikely that there are significant population levels, defined as 1% of the population, of any of the species given the very low number detected or absence of each species on the site, so a significant reduction in numbers is additionally unlikely.
Increased **disturbance** leading to a *substantial reduction* in migratory shorebird numbers	Most disturbance would occur to potential shorebird habitat during the construction phase of the project, during which they would be able to move to alternative suitable habitat. Therefore, impacts would be minor and temporary, and would not involve modification of available habitat. Disturbance during operation of the windfarm is also unlikely given the low numbers of migratory species present and additional and higher quality habitat available in the surround region.
Direct mortality of birds leading to a *substantial reduction* in migratory shorebird numbers	Direct mortality of shorebird during construction is highly unlikely given the mobility of avian species. During operation there will be a higher chance of direct mortality through collision with turbines. This is likely to be a very uncommon occurrence given the low numbers of migratory species present and low numbers of records in the immediate region.

	The wind farm will also be subject to a bird and bat management plan during operation which will involve monitoring and mitigation procedures aimed at reducing any residual risk that will be posed to migratory, and other species. Given the above it is not expected that there will be a substantial reduction in migratory species' numbers from the wind farm.

White-throated Needletail and Fork-tailed Swift

White-throated Needletail and Fork-tailed Swift are aerial foragers, spending most of their time flying in search of aerial insect prey and rarely roosting (Higgins 1999). They usually occur in Victoria in summer or early autumn and may be expected to forage over the study area on several days each year.

They move large distances in a short time and their use of the site is transitory and brief when moving these long distances.

These migratory species were found to have the potential to occur over the proposed wind farm and the Fork-tailed Swift (EPBC-Migratory) was recorded during the 2019 survey. There are few regional records to date. This low level of historical occurrence, coupled with the suboptimal habitat on the site (primarily farmland with few forested areas), suggests the frequency of occurrence of these species over the site is likely to be low.

Observations at operating wind farms in south eastern Australia indicate that these species may occasionally collide with wind turbines (BL&A, unpublished records). Collisions at WWF are expected to be low in number (one or two per year), based on experience at wind farms elsewhere in its range. Both species remain common and widespread throughout eastern Australia during summer and early autumn according to DoEE (2018a). The population of White-throated Needletail numbers 10,000 or more (Higgins 1999), so the loss of the occasional individual is expected to have negligible consequences for the species' population. While the population of Fork-tailed Swift is unknown in Australia, it is believed to be stable and the species is listed as least concern by the IUCN (DoEE 2018a).

Table 7 provides an assessment of potential impacts to White-throated Needletail and Fork-tailed Swift against the MNES significant impact criteria for species listed as Migratory under the EPBC Act.

Table 7: Assessment of White-throated Needletail and Fork-tailed Swift against MNES Impact Criteria for migratory species

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	Analysis of proposed impact
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.	The proposed works will not impact important habitat for these species as they are predominately aerial and rarely roost. Their breeding habitat exists internationally also.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	Analysis of proposed impact
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.	As these species are almost exclusively aerial (Higgins 1999), the proposed works will not result in any invasive species that is harmful to these species becoming established in an area of important habitat. The temporary and short-term nature of the species' occurrence on the site means any infestations of invasive species would have a negligible impact on them. That said, the adoption of best practice construction environmental management measures will ensure monitoring and adaptive control of any infestation of an invasive plant or animal species.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	These species don't breed in Australia and the wind farm site does not represent important non-breeding habitat. Therefore, the proposed works will not seriously disrupt the life-cycle of the White-throated Needletail.

No EPBC Act listed migratory bird species are therefore considered to be impacted significantly by the proposed project.

5. REFERENCES

Bates RJ 1994, 'Prasophyllum', in Walsh NG & Entwisle TJ (eds), *Flora of Victoria*, Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne.

Bishop T 2000, *Field guide to the Orchids of New South Wales and Victoria*, 2nd edition, University of New South Wales Press, Sydney.

Brett Lane & Associates (BL&A) 2019, *Willatook Wind Farm: Flora and Fauna Assessment*, Report No. 16087 (3.0), prepared for Willatook Wind Farm Pty Ltd.

Bureau of Meteorology (BoM) 2019a, *Climate data online: Monthly rainfall - Hawkesdale (Post Office)*, Australian Government, http://www.bom.gov.au, accessed 30th January 2019.

Bureau of Meteorology (BoM) 2019b, *Climate data online: Monthly rainfall - Portland*, Australian Government, http://www.bom.gov.au, accessed 4th February 2019.

Carter O 2010, *National Recovery Plan for the Curly Sedge (Carex tasmanica)*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria.

Cater O & Walsh N 2006, *National Recovery Plan for the Wrinkled Cassinia (Cassinia rugata)*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria.

Churchill S 1998, *Australian Bats*, Reed New Holland, Sydney.

Churchill S 2008, *Australian Bats Second Edition*, Allen & Unwin, Crows Nest.

Department of Environment, Land, Water and Planning (DELWP) 2018a, *Victorian Biodiversity Atlas 3.2.5*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 31st July 2018, < https://vba.dse.vic.gov.au>.

Department of Environment, Land, Water and Planning (DELWP) 2018b, *Victorian Biodiversity Atlas 3.2.5*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 29th October 2018, < https://vba.dse.vic.gov.au>.

Department of the Environment (DoE) 2013, Matters of National Environmental Significance, Significant impact guidelines 1.1, EPBC Act, Department of the Environment and Energy, Canberra.

Department of the Environment and Energy (DoEE) 2015a, *EPBC Act Protected Matters Search Tool,* Department of the Environment and Energy, Canberra, viewed 1st March 2019, http://www.environment.gov.au/epbc/pmst/index.html

Department of the Environment and Energy (DoEE) 2018a, *Species Profile and Threats Database*, Department of the Environment and Energy, Canberra.

Department of the Environment and Energy (DoEE) 2018b, *Approved Conservation Advice (including Listing Advice) for the Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community*, Commonwealth of Australia.

Department of the Environment and Energy (DoEE) 2018c, EPBC Act Policy Statement 3.21—Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species, Commonwealth of Australia 2017

Department of the Environment and Energy (DoEE) 2019, *EPBC Act Protected Matters Search Tool,* Department of the Environment and Energy, Canberra, viewed 4th March 2019, http://www.environment.gov.au/epbc/pmst/index.html

Department of Sustainability and Environment 2010, *Biodiversity Precinct Structure Planning Kit,* Department of Sustainability and Environment East Melbourne, Victoria.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPAC) 2011, 'Environment Protection and Biodiversity Conservation Act referral guidelines for the vulnerable striped legless lizard, *Delma impar*', Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Duncan M 2010, *National Recovery Plan for the Dense Leek Orchid Prasophyllum spicatum*, Department of Sustainability and Environment, Victoria.

Duncan M 2010, *National Recovery Plan for the Leafy Greenhood (Pterostylis cucullata)*, Department of Environment, Land, Water and Planning, Victoria.

Duncan M, Pritchard A & Coates F 2009, *National Recovery Plan for Fifteen Threatened Orchids in South-eastern Australia*, Department of Environment, Land, Water and Planning, Victoria.

Ecology and Heritage Partners (EHP) Pty Ltd 2018, *Biodiversity Assessment, Willatook Wind Farm, Willatook, Victoria*, prepared for Willatook Wind Farm Pty Ltd.

Ecology Partners (EP) Pty Ltd 2011, *Targeted Flora and Fauna and Net Gain Assessment for the proposed Willatook Wind Farm, Willatook, Victoria*, prepared for Wind Prospect WA Pty Ltd.

Entwisle TJ 1994, 'Orchidaceae', in NG Walsh & TJ Entwisle (eds), *Flora of Victoria*, Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 740-901.

Heard, G.W., Scroggie, M.P., and Clemann, N. (2010). Guidelines for managing the endangered Growling Grass Frog in urbanising landscapes. Arthur Rylah Institute for Environmental Research Technical Report Series No. 208. Department of Sustainability and Environment, Heidelberg,

VictoriaHiggins, PJ (ed) 1999, *Handbook of Australian, New Zealand and Antarctic Birds*, Volume 4: Parrots to Dollarbird, Oxford University Press, Melbourne.

Jones DL 1994, 'Pterostylis', in NG Walsh & TJ Entwisle (eds), *Flora of Victoria*, Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 798-830.

Jones DL 2006, *A Complete Guide to Native Orchids of Australia Including the Island Territories*, Reed New Holland, Sydney.

Nicolle D 2006, *Eucalypts of Victoria and Tasmania*, Bloomings Books, Melbourne.

Natural Resources South East (NRSE) 2014, *Threatened Flora of the South East Bell-flower Hyacinth-orchid Dipodium campanulatum Fact Sheet*, Natural Resources South East.

NSW Office of Environment and Heritage (NSW OEH) 2012, *National Recovery Plan for Button Wrinklewort (Rutidosis leptorhynchoides)*, NSW Office of Environment and Heritage, Hurstville.

NSW Office of Environment and Heritage (NSW OEH) 2017, 'Western Water-starwort', *Threatened Species Profile Database*, NSW Office of Environment and Heritage, Hurstville.

Scarlett NH 1999, 'Taraxacum', in Walsh NG and Entwisle TJ (eds) *Flora of Victoria*, Volume 4: Dicotyledons, Cornaceae to Asteraceae, Inkata Press, Melbourne, pp. 688-694.

Short, PS 1999 'Ixodia', in NG Walsh & TJ Entwisle (eds), *Flora of Victoria*, Volume 4: Dicotyledons Cornaceae to Asteraceae, Inkata Press, Melbourne, pp. 747-749.

Spencer RD 1996, 'Melaleuca', in NG Walsh & TJ Entwisle (eds), *Flora of Victoria*, Volume 3: Dicotyledons Winteraceae to Myrtaceae, Inkata Press, Melbourne, pp. 1027-1034.

Tarburton, M. 2014, 'Status of the White-throated Needletail *Hirundapus caudacutus* in Australia: Evidence for a marked decline', *Australian Field Ornithology*, Vol. **31**, pp 122-140.

Threatened Species Scientific Committee (TSSC) 2006, *Commonwealth Listing Advice on White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, Department of Environment and Energy, Canberra.

Threatened Species Scientific Committee (TSSC) 2008a, *Commonwealth Conservation Advice on Senecio psilocarpus*, Department of Environment and Energy, Canberra.

Threatened Species Scientific Committee (TSSC) 2008b, *Commonwealth Listing Advice on Grassy Eucalypt Woodland of the Victorian Volcanic Plain*, Department of Environment and Energy, Canberra.

Threatened Species Scientific Committee (TSSC) 2008c, *Commonwealth Listing Advice on Natural Temperate Grassland of the Victorian Volcanic Plain*, Department of Environment and Energy, Canberra.

Threatened Species Scientific Committee (TSSC) 2012a, *Commonwealth Listing Advice on Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains*, Department of Environment and Energy, Canberra.

Threatened Species Scientific Committee (TSSC) 2012b, *Commonwealth Listing Advice on Giant Kelp Marine Forests of South East Australia*, Department of Environment and Energy, Canberra.

Walsh NG 1994, 'Poaceae', in NG Walsh & TJ Entwisle (eds), *Flora of Victoria*, Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 356-627.

Walsh NG 1996, 'Chenopodiaceae', in NG Walsh & TJ Entwisle (eds), *Flora of Victoria*, Volume 3: Dicotyledons Winteraceae to Myrtaceae, Inkata Press, Melbourne, pp. 129-199.

Weber JZ & Entwisle TJ 1994, 'Thelymitra', in NG Walsh & TJ Entwisle (eds), *Flora of Victoria*, Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 840-854.

Weber JZ & Entwisle TJ 1994, 'Thelymitra', in NG Walsh & TJ Entwisle (eds), *Flora of Victoria*, Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 840-854.

Appendix 1: EPBC Act listed flora species and likelihood of occurrence with the Wind Farm site

Common Name	Scientific name	EPBC	Habitat	Number of records	Date of last record	Likelihood of occurrence
River Swamp Wallaby-grass	*Amphibromus fluitans*	VU	River Swamp Wallaby-grass grows mostly in permanent swamps and also lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally-fluctuating water levels (DoEE 2018).	None	N/A	No suitable habitat. No records within 10 km. **Unlikely to occur.**
Western Water-starwort	*Callitriche cyclocarpa*	VU	NSW and Victoria in thick patches in floodwaters. Also, Victoria in River Red Gum open woodland with an open grassy understorey dominated by Paspalidium jubiflorum along river banks, and with wallaby grasses on ground less-frequently inundated (NSW OEH 2017).	1	25/11/2009	Previously recorded within the study area (EHP 2018). Known to occur within Wind Farm site. Not recorded during targeted surveys, and therefore now considered **unlikely to occur within impact area.**
Matted Flax-lily	*Dianella amoena*	EN	Lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic Geology. It is widely distributed from eastern to south-western Victoria (DoEE 2018).	1	2/10/2016	Suitable habitat. Recent records within 10 km. Likely to occur. Not recorded during targeted surveys, and therefore now considered **unlikely to occur within impact area.**
Clover Glycine	*Glycine latrobeana*	VU	Found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. In Victoria, populations occur in lowland grasslands, grassy woodlands and sometimes in grassy heath (DoEE 2018).	9	9/11/2016	Suitable habitat. Recent records within 10 km. Likely to occur. Not recorded during targeted surveys, and therefore now considered **unlikely to occur within impact area.**
Coast Ixodia	*Ixodia achillaeoides subsp. arenicola*	VU	Confined to coastal vegetation in the Cape Bridgewater-Portland area (Short 1999).	None	N/A	No suitable habitat. No records within 10 km. **Unlikely to occur.**
Adamson's Blown-grass	*Lachnagrostis adamsonii*	EN	Confined to slow moving creeks, swamps, flats, depressions or drainage lines that are seasonally inundated or waterlogged and usually moderately to highly saline. Appear to favour sites that have some shelter from the wind (DoEE 2018).	None	N/A	No suitable habitat. No records within 10 km. **Unlikely to occur.**
Basalt Peppercress	*Lepidium hyssopifolium*	EN	Known to establish on open, bare ground with limited competition from other plants. Previously recorded from Eucalypt woodland with a grassy ground cover, low open Casuarina woodland with a grassy ground cover and tussock grassland. Now generally found amongst exotic pasture grasses and beneath exotic trees (DoEE 2018).	3	25/11/2009	Previously recorded within the study area (EHP 2018). Known to occur within Wind Farm site. Not recorded during targeted surveys, and therefore now considered **unlikely to occur within impact area.**
Salt-lake Tussock-grass	*Poa sallacustris*	VU	Margins of brackish to salt lakes (Walsh 1994).	None	N/A	Marginal suitable habitat. No records within 10 km. **Unlikely to occur.**
Gorae Leek-orchid	*Prasophyllum diversiflorum*	EN	Wet grasslands or inundated swamps among tussocks (Jones 2006).	6	19/11/1998	Suitable habitat. Recent records within 10 km. Likely to occur. Not recorded during targeted surveys, and therefore now considered

Common Name	Scientific name	EPBC	Habitat	Number of records	Date of last record	Likelihood of occurrence
						unlikely to occur within impact area.
Maroon Leek-orchid	*Prasophyllum frenchii*	EN	Grows mainly in open sedge swampland or in wet grassland and wet heathland generally bordering swampy regions. Sites are generally low altitude, flat and moist. Soils are generally moderately rich damp sandy or black clay loams. Climate is mild, with an annual rainfall of 600–1100 mm, occurring predominantly in winter and spring (DoEE 2018).	1	01/12/1893	Suitable habitat. No recent records within 10 km. Potential to occur. Not recorded during targeted surveys, and therefore now considered **unlikely to occur within impact area.**
Dense Leek-orchid	*Prasophyllum spicatum*	VU	Occurs in coastal and near-coastal heathland and heathy woodland. Soils are generally sandy, with some sites seasonally waterlogged (Duncan 2010).	3	1/11/2000	Suitable habitat. Recent records within 10 km. Likely to occur. Not recorded during targeted surveys, and therefore now considered **unlikely to occur within impact area.**
Green-striped Greenhood	*Pterostylis chlorogramma*	VU	Occurs in mixed Box-Stringybark forest with a shrubby understorey, often with Pteridium esculentum as a major component on sandy or clay loam soils (Duncan et al 2009).	None	N/A	No suitable habitat. No records within 10 km. **Unlikely to occur.**
Leafy Greenhood	*Pterostylis cucullata*	VU	Tea-tree scrubs on tall sandy and calcareous dunes, in moist, open or even deep shaded locations (Jones 1994).	None	N/A	No suitable habitat. No records within 10 km. **Unlikely to occur.**
Button Wrinklewort	*Rutidosis leptorhynchoides*	EN	In Victoria restricted to open stands of plains grassland and grassy woodlands, on fertile clays to clay loams, usually in areas where the grass cover is more open, either as a result of recurrent fires or grazing by native macropods or stock. It also occurs on low rises with shallow, stony soils at less than 100 m above sea level.	None	N/A	Suitable habitat. No records within 10 km. Potential to occur. Not recorded during targeted surveys, and therefore now considered **unlikely to occur within impact area.**
Swamp Fireweed	*Senecio psilocarpus*	VU	Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne, and Honans Scrub in south-eastern South Australia (TSSC 2008a).	8	27/10/2015	Suitable habitat. Recent records within 10 km. Likely to occur. Not recorded during targeted surveys, and therefore now considered **unlikely to occur within impact area.**
Coast Dandelion	*Taraxacum cygnorum*	VU	Woodland and scrub on limestone (Scarlett 1999).	None	N/A	No suitable habitat. No records within 10 km. **Unlikely to occur.**
Metallic Sun-orchid	*Thelymitra epipactoides*	EN	Grows primarily in mesic coastal heathlands, grasslands and woodlands, but is also found in drier inland heathlands, open forests and woodlands. Substrates may be moist or dry sandy loams or loamy sands. Critical habitat has not been determined but the species is likely to require open conditions, which may be created by soil disturbance or fire, for recruitment (DoEE 2018).	None	N/A	No suitable habitat. No records within 10 km. **Unlikely to occur.**
Spiral Sun-orchid	*Thelymitra matthewsii*	VU	Slightly elevated sites to 300m in well-drained soils (sandy loams to gravelly limestone soils) in light to dense forest; sometimes in coastal sandy flats (Weber & Entwisle 1994).	None	N/A	No suitable habitat. No records within 10 km. **Unlikely to occur.**
Swamp Everlasting	*Xerochrysum palustre*	VU	Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include Amphibromus, Baumea, Carex,	2	19/02/2009	Suitable habitat. No records within 10 km. Recorded during targeted surveys.

Common Name	Scientific name	EPBC	Habitat	Number of records	Date of last record	Likelihood of occurrence
			Chorizandra, Craspedia, Eleocharis, Isolepis, Lachnagrostis, Lepidosperma, Myriophyllum, Phragmites australis, Themeda triandra and Villarsia (DoEE 2018).			Infrastructure moved to avoid impacts. Now considered **unlikely to occur within impact area.**

Notes: EPBC = threatened species status under EPBC Act: CR = critically endangered; EN = endangered; VU = vulnerable

Appendix 2: EPBC Act listed flora species and likelihood of occurrence with the OD route

Common Name	Scientific Name	EPBC	Habitat	Number of records	Date of last record	Likelihood of occurrence
River Swamp Wallaby-grass	*Amphibromus fluitans*	VU	River Swamp Wallaby-grass grows mostly in permanent swamps and also lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally-fluctuating water levels (DoEE 2018aa).	None	N/A	Suitable (but marginal) habitat. Potential to occur in EVC 653. Not recorded during targeted surveys. Now considered **unlikely to occur within the OD route survey area.**
Limestone Spider-orchid	*Caladenia calcicola*	VU	Well-drained limey sands in heathy forest on limestone ridges (Jones 2006).	111	1/10/2005	No suitable habitat. **Unlikely to occur.**
Mellblom's Spider-orchid	*Caladenia hastata*	EN	Well-drained sands in dense coastal heathland and heathy forest (Jones 2006).	55	9/10/2017	No suitable habitat. **Unlikely to occur.**
Ornate Pink-fingers	*Caladenia ornata*	VU	Heathy forest and among shrubs on seasonally moist sandy loams (Jones 2006).	None	N/A	No suitable habitat. **Unlikely to occur.**
Wrinkled Cassinia	*Cassinia rugata*	VU	Found in damp, low open forest or dense heathy scrub. Open forest sites are generally dominated by Eucalyptus ovata (Swamp Gum) (Carter & Walsh 2006).	1	21/04/1962	No suitable habitat. **Unlikely to occur.**
Bell-flower Hyacinth-orchid	*Dipodium campanulatum*	EN	Typically found on deep grey sands or limestone in stringybark woodland with an understorey of bracken fern, Acacia species, cranberry heath and magenta storks bill (NRSE, 2014). These areas have wet winters and long dry mild summers.	None	N/A	No suitable habitat. **Unlikely to occur.**
Clover Glycine	*Glycine latrobeana*	VU	Found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. In Victoria, populations occur in lowland grasslands, grassy woodlands and sometimes in grassy heath (DoEE 2018a).	1	1/01/1980	Suitable (but marginal) habitat. Potential to occur in EVC 23. Not recorded during targeted surveys. Now considered **unlikely to occur within the OD route survey area.**
Coast Ixodia	*Ixodia achillaeoides subsp. arenicola*	VU	Confined to coastal vegetation in the Cape Bridgewater-Portland area (Short 1999).	3	27/08/2008	No suitable habitat. **Unlikely to occur.**
Gorae Leek-orchid	*Prasophyllum diversiflorum*	EN	Wet grasslands or inundated swamps among tussocks (Jones 2006).	4	5/11/1949	Suitable (but marginal) habitat. Potential to occur in EVC 653. Not recorded during targeted surveys. Now considered **unlikely to occur within the OD route survey area.**
Maroon Leek-orchid	*Prasophyllum frenchii*	EN	Grows mainly in open sedge swampland or in wet grassland and wet heathland generally bordering swampy regions. Sites are generally low altitude, flat and moist. Soils are generally moderately rich damp sandy or black clay loams. Climate is mild, with an annual rainfall of 600–1100 mm, occurring predominantly in winter and spring (DoEE 2018a).	2	9/10/1947	Suitable (but marginal) habitat. Potential to occur in EVC 653. Not recorded during targeted surveys. Now considered **unlikely to occur within the OD route survey area.**
Pale Leek-orchid	*Prasophyllum pallidum s.l.*	VU	Western Victoria, where it grows in forest with a heathy-grassy understorey in gravelly loam (Bishop 2000)	1	1/01/1980	No suitable habitat. **Unlikely to occur.**
Dense Leek-orchid	*Prasophyllum spicatum*	VU	Occurs in coastal and near-coastal heathland and heathy woodland. Soils are generally sandy, with some sites seasonally waterlogged (Duncan 2010).	1	10/11/1980	No suitable habitat. **Unlikely to occur.**
Green-striped Greenhood	*Pterostylis chlorogramma*	VU	Occurs in mixed Box-Stringybark forest with a shrubby understorey, often with Pteridium esculentum as a major component on sandy or clay loam soils (Duncan et al 2009).	4	10/07/2007	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific Name	EPBC	Habitat	Number of records	Date of last record	Likelihood of occurrence
Leafy Greenhood	*Pterostylis cucullata subsp. cucullata*	VU	Coast Tea-tree (Leptospermum laevigatum) or Moonah (Melaleuca lanceolata) coastal scrubs on stabilized sand dunes, with an open understorey and grassy and herbaceous groundcover on seasonally damp but well drained humus rich sandy loams. Mt Eccles population occurs in Brown Stringybark (Eucalyptus baxteri) and Manna Gum (E. viminalis) forest with a grassy groundcover (Duncan 2010).	3	24/10/1944	No suitable habitat. **Unlikely to occur.**
Swamp Fireweed	*Senecio psilocarpus*	VU	Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne, and Honans Scrub in south-eastern South Australia (DEWHA 2008).	None	N/A	Suitable (but marginal) habitat. No records within 10km. **Unlikely to occur.**
Coast Dandelion	*Taraxacum cygnorum*	VU	Woodland and scrub on limestone (Scarlett 1999).	None	N/A	No suitable habitat. **Unlikely to occur.**
Metallic Sun-orchid	*Thelymitra epipactoides*	EN	Grows primarily in mesic coastal heathlands, grasslands and woodlands, but is also found in drier inland heathlands, open forests and woodlands. Substrates may be moist or dry sandy loams or loamy sands. Critical habitat has not been determined but the species is likely to require open conditions, which may be created by soil disturbance or fire, for recruitment (DoEE 2018a).	None	N/A	Suitable (but marginal) habitat. No records within 10km. **Unlikely to occur.**
Spiral Sun-orchid	*Thelymitra matthewsii*	VU	Slightly elevated sites to 300m in well-drained soils (sandy loams to gravelly limestone soils) in light to dense forest; sometimes in coastal sandy flats (Weber & Entwisle 1994).	None	N/A	No suitable habitat. **Unlikely to occur.**
Swamp Everlasting	*Xerochrysum palustre*	VU	Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include Amphibromus, Baumea, Carex, Chorizandra, Craspedia, Eleocharis, Isolepis, Lachnagrostis, Lepidosperma, Myriophyllum, Phragmites australis, Themeda triandra and Villarsia (DoEE 2018a).	None	N/A	Suitable (but marginal) habitat. No records within 10km. **Unlikely to occur.**

Notes:

EPBC = threatened species status under EPBC Act: CR = critically endangered; EN = endangered; VU = vulnerable.

Appendix 3: EPBC Act listed fauna species from the search region and likelihood of occurrence in the study area

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
Birds							
Australasian Bittern	*Botaurus poiciloptilus*	EN		Terrestrial wetlands, including a range of wetland types but prefers permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant & Higgins 1990).	None	N/A	Lack of suitable habitat. **Unlikely to occur.**
Australian Painted Snipe	*Rostratula australis*	EN		Generally inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum Muehlenbeckia or canegrass or sometimes tea-tree (Melaleuca). Sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (DoEE 2019).	2	2/02/2009	No suitable habitat. **Unlikely to occur.**
Black-eared Cuckoo	*Chrysococcyx osculans*		Listed Marine	Found in drier country where mulga and mallee dominate in open woodlands and shrublands. May be observed along riparian habitats. (Marchant & Higgins 1990)	None	N/A	Lack of suitable habitat. **Unlikely to occur.**
Cattle Egret	*Ardea ibis*		Listed Marine	Tropical and temperate grasslands, wooded areas, and terrestrial wetlands are typical habitats. Foraging is often away from water on low-lying grasslands, improved pastures and croplands, and is commonly found in cattle fields and farm areas containing livestock. It feeds on ticks and insects associated with livestock in the absence of other food sources. It roosts in trees, or amongst ground vegetation in or near wetlands and lakes. It has been seen foraging in rubbish tips, and roosting in industrial areas. (Marchant & Higgins 1990)	136	16/12/2015	Suitable habitat. **Potential to occur.**
Common Greenshank	*Tringa nebularia*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))	Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins & Davies 1996).	None	N/A	Suitable wetland habitat. **Recorded on site.**
Common Sandpiper	*Actitis hypoleucos*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)	Inhabits a wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands. In Vic. Mostly found Westernport and Port Phillip Bay. (Higgins & Davies 1996).	None	N/A	No suitable habitat. **Unlikely to occur.**
Curlew Sandpiper	*Calidris ferruginea*	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))	Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins & Davies 1996).	None	N/A	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
Eastern Curlew	*Numenius madagascariensis*	CR	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)	Inhabits sheltered coasts, especially estuaries, embayment, harbours, inlets and coastal lagoons with large intertidal mudflats or sandflats, often with beds of sea grass (Higgins & Davies 1996).	None	N/A	No suitable habitat. **Unlikely to occur.**
Fork-tailed Swift	*Apus pacificus*		M (JAMBA, CAMBA, ROKAMBA)	The species can occur in wet sclerophyll forest but mainly prefers open forest or plains. It is almost exclusively aerial and feeds up to hundreds on metres above the ground, but can feed among open forest canopy. The species breeds internationally and seldom roosts in trees (Higgins *et al* 2006b).	None	N/A	Suitable habitat. **Recorded on site.**
Great Egret	*Ardea alba*		Listed Marine	Wide range of wetland habitats, including marshes and swamps, riparian margins, damp or flooded grasslands, pastures and agricultural lands, frequenting shallow waters. (Marchant & Higgins 1990)	327	29/07/2017	Suitable habitat. **Potential to occur.**
Latham's Snipe	*Gallinago hardwickii*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)	Occurs in wide variety of permanent and ephemeral wetlands; it prefers open freshwater wetlands with dense cover nearby, such as the edges of rivers and creeks, bogs, swamps, waterholes. The species is wide spread in southeast Australia and most of its population occurs in Vic. Except in the northwest of the state (Naarding 1983; Higgins and Davies 1996).	20	2/11/2009	Suitable habitat. **Recorded on site.**
Magpie Goose	*Anseranas semipalmata*		Listed Marine	The Magpie Goose is a specialized feeder with wild rice, Oryza, Paspalum, Panicum and spike-rush, Eleocharis, forming the bulk of its diet. Once widespread in southern Australia, it has disappeared from there due to wetlands being drained.	316	19/01/2010	Suitable habitat. **Potential to occur.**
Orange-bellied Parrot	*Neophema chrysogaster*	CE	M (JAMBA)	The Orange-bellied Parrot is endemic to south-eastern Australia. Its current non-breeding mainland distribution is from the mouth of the Murray River in South Australia, along the coast, to the east of Jack Smith Lake in South Gippsland, Victoria, covering approximately 1000 km of coastline. The most used sites in Victoria are around Port Phillip Bay and Bellarine Peninsula. In South Australia, Carpenter Rocks is the main site. During winter on the mainland, found mostly within 3 km of the coast. In Victoria, they mostly occur in sheltered coastal habitats, such as bays, lagoons and estuaries, or, rarely, saltworks. They are also found in low samphire herbland dominated by Beaded Glasswort (Sarcocornia quinqueflora), Sea Heath (Frankenia pauciflora) or Sea-blite (Suaeda australis), and in taller shrubland dominated by Shrubby Glasswort (Sclerostegia arbuscula). They are sometimes found in low samphire dominated by Grey Glasswort (Halosarcia halocnemoides) or in Chenopodium herbfields. Breeds at Melaleuca in Tas during spring/summer months (DoEE 201X).	None	N/A	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
Osprey	*Pandion cristatus*		M (Bonn (A2S))	Rare vagrant to Victoria (Marchant & Higgins 1993). Littoral and coastal habitats and terrestrial wetlands. They are mostly found in coastal areas but occasionally travel inland along major rivers (Johnstone & Storr 1998; Marchant & Higgins 1993; Olsen 1995). They require extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993).	None	N/A	No suitable habitat. **Unlikely to occur.**
Painted Honeyeater	*Grantiella picta*	VU		Inhabits box-ironbark forests and woodlands and mainly feeds on the fruits of mistletoe. Strongly associated with mistletoe around the margins of open forests and woodlands. Occurs at few localities. Uncommon breeding migrant from further north, arriving in October and leaving in February. (Higgins et al. 2001; Tzaros 2005).	None	N/A	No suitable habitat. **Unlikely to occur.**
Pectoral Sandpiper	*Calidris melanotos*		M (JAMBA, ROKAMBA, Bonn (A2H))	Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	None	N/A	No suitable habitat. **Unlikely to occur.**
Plains-wanderer	*Pedionomus torquatus*	CR		This species inhabits native grasslands with sparse cover, preferring grasslands that include wallaby grass and spear grass species (Marchant & Higgins 1993).	None	N/A	No suitable habitat. **Unlikely to occur.**
Rainbow Bee-eater	*Merops ornatus*		Listed Marine	Occurs in open forests and woodlands, shrublands, mangroves, mallee, grasslands, arid and semi-arid areas, riparian, floodplain or wetland vegetation, sand dunes in coastal areas and inland sites in proximity to water, quarries, mines, gravel pits, and in various cleared and semi-cleared habitats including farmlands and areas of human habitation. (Higgins et al. 2001)	None	N/A	Suitable habitat. **Potential to occur**
Red Knot	*Calidris canutus*	EN	M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)	In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps (DoEE 201X).	None	N/A	No suitable habitat. **Unlikely to occur.**
Red-necked Stint	*Calidris ruficollis*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H)	In Australasia the Red-necked Stint mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches.	1	27/12/1977	Suitable habitat. **Potential to occur**
Rufous Fantail	*Rhipidura rufifrons*		M (Bonn (A2H))	In east and south-east Australia, mainly inhabits tall wet sclerophyll forests, often in gullies. When on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, as well as parks and gardens (Higgins et al. 2006).	None	N/A	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
Satin Flycatcher	*Myiagra cyanoleuca*		M (Bonn (A2H))	Tall forests and woodlands in wetter habitats but not in rainforest (Higgins et al. 2006)	None	N/A	No suitable habitat. **Unlikely to occur.**
Sharp-tailed Sandpiper	*Calidris acuminata*		M (JAMBA, CAMBA, ROKAMBA, Bonn (A2H))	Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	12	2/11/2009	Suitable wetland habitat. **Recorded on site.**
Swift Parrot	*Lathamus discolor*	CR		Prefers a narrow range of eucalypts in Victoria, including White Box, Red Ironbark and Yellow Gum as well as River Red Gum when this species supports abundant 'lerp'. Breeds in Tasmania and migrates to the mainland of Australia for the autumn, winter and early spring months. It lives mostly north of the Great Dividing Range, passing through two areas of Victoria on migration: the Port Phillip district and Gippsland. (Emison et al. 1987; Higgins 1999; Kennedy and Tzaros 2005).	None	N/A	No suitable habitat. **Unlikely to occur.**
White-bellied Sea-eagle	*Haliaeetus leucogaster*		Listed Marine	Distributed along the coast and inland along larger waterways. Recent analysis indicates climate may shift distribution, with populations increasing along the coast during drought.	None	N/A	May occasionally pass through/fly over the study area. **Potential to occur.**
White-throated Needletail	*Hirundapus caudacutus*		M (JAMBA, CAMBA, ROKAMBA)	Aerial, over all habitats, but probably more over wooded areas, including open forest and rainforest. Often over heathland and less often above treeless areas such as grassland and swamps or farmland (Higgins 1999).	9	20/03/1986	May occasionally pass through/fly over the study area. **Potential to occur.**
Yellow Wagtail	*Motacilla flava*		M (JAMBA, CAMBA, ROKAMBA)	Extremely uncommon migrant. Few sightings in Victoria. Mostly occurs in well-watered open grasslands on the fringes of wetlands. Roosts in mangroves and other dense vegetation (DoEE 201X).	None	N/A	No suitable habitat. **Unlikely to occur.**
Mammals							
Common Bent-wing Bat (southern ssp.)	*Miniopterus schreibersii bassanii*	CR		Roosts in caves during the day, dispersing over a range of habitats at night. Its feeding areas tend to be associated with major drainage systems (Menkhorst 1995).	None	N/A	**Recorded**
Grey-headed Flying-fox	*Pteropus poliocephalus*	VU		Brisbane, Newcastle, Sydney and Melbourne are occupied continuously. Elsewhere, during spring, they are uncommon south of Nowra and widespread in other areas of their range. Roosts in aggregations of various sizes on exposed branches. Roost sites are typically located near water, such as lakes, rivers or the coast. Roost vegetation includes rainforest patches, stands of Melaleuca, mangroves and riparian vegetation, but colonies also use highly modified vegetation in urban and suburban areas (DoEE 2019).	None	N/A	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
Heath Mouse	*Pseudomys shortridgei*	EN		In eastern Australia, the Dayang prefers recently burnt (preferably 7–10 years post fire), floral species-rich, treeless, dry heathlands in an area with 600 mm annual rainfall. The optimum situation for the species appears to be a mosaic of habitats of differing maturity, subject to the disturbance by fire. Some populations occur in Eucalyptus forest with a heathy understorey (DoEE 201X).	None	N/A	No suitable habitat. **Unlikely to occur.**
Long-nosed Potoroo	*Potorous tridactylus tridactylus*	VU		in Victoria coastal heathy woodland; in Tasmania moist forest with dense shrub layer; in the north edge of rainforest (Menkhorst 1995).	None	N/A	No suitable habitat. **Unlikely to occur.**
Southern Brown Bandicoot	*Isoodon obesulus obesulus*	EN		Species experts define suitable habitat for Southern Brown Bandicoots (eastern) to be any patches of native or exotic vegetation, within their distribution, which contains understorey vegetation structure with 50–80% average foliage density in the 0.2–1 m height range. In areas where native habitats have been degraded or diminished, exotic vegetation, such as Blackberry (Rubus spp.), can and often does, provide important habitat (DoEE 201X).	6	17/12/2012	No suitable habitat. **Unlikely to occur.**
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN		Rainforest, wet and dry forest, coastal heath and scrub and River Red-gum woodlands along inland rivers (Menkhorst 1995).	12	1/01/1982	No suitable habitat. **Unlikely to occur.**
Swamp Antechinus	*Antechinus minimus maritimus*	VU		Dense wet heath, tussock grassland, sedgeland heathy woodland and coastal heath and scrub (Menkhorst 1995).	None	N/A	No suitable habitat. **Unlikely to occur.**
Reptiles							
Striped Legless Lizard	Delma impar	VU		Grassland specialist. Known to occur in some areas dominated by introduced species such as Phalaris aquatica, Serrated Tussock (Nasella trichotoma) and Hypocharis radicata and at sites with a history of grazing and pasture improvement. shelter in grass tussocks, thick ground cover, soil cracks, under rocks, spider burrows, and underground debris such as timber. The majority of sites in Victoria and NSW occur on cracking clay soils with some surface rock which provide shelter for the species (DoEE 2019).	None	N/A	No suitable habitat. **Unlikely to occur.**
Frogs							
Growling Grass Frog	*Litoria raniformis*	VU		Permanent, still or slow flowing water with fringing and emergent vegetation in streams, swamps, lagoons and artificial wetlands such as farm dams and abandoned quarries (Clemann & Gillespie 2004).	None	N/A	Suitable habitat. **Recorded on site.**
Fish							
Australian Grayling	*Prototroctes maraena*	VU		Large and small coastal streams and rivers with cool, clear waters with a gravel substrate and altering pools and riffles (Cadwallader & Backhouse 1983).	None	N/A	No suitable habitat. **Unlikely to occur.**

Common Name	Scientific name	EPBC-T	EPBC-M	Habitat	Number of records	Date of last record	Likelihood of occurrence
Dwarf Galaxias	*Galaxiella pusilla*	VU		Barwon River to Mitchell River. Vegetated margins of still water, ditches, swamps and backwaters of creeks, both ephemeral and permanent (Allen et al. 2002).	None	N/A	Suitable habitat. **Recorded on site.**
Yarra Pygmy Perch	*Nannoperca obscura*	VU		Streams and small lakes, prefers flowing water with abundant aquatic vegetation (Allen et al. 2002).	66	4/02/2016	Suitable habitat. **Recorded on site.**
Invertebrates							
Glenelg Spiny Crayfish	*Euastacus bispinosus*	EN		Glenelg Spiny Freshwater Crayfish is considered a specialist species with typically low tolerance to environmental conditions (namely dissolved oxygen concentrations), ensuring that species requires specific habitat requirements. As with other Euastacus species, Glenelg Spiny Freshwater Crayfish have a preference for permanently-flowing, cool (and shaded) and well-oxygenated water (Morgan 1986; Morgan 1997). Other habitat requirements vary across Victorian and South Australian populations.	None	N/A	No suitable habitat. **Unlikely to occur.**
Golden Sun Moth	*Synemon plana*	CR		Areas that are, or have been native grasslands or grassy woodlands. It is known to inhabit degraded grasslands with introduced grasses being dominant, with a preference for the native wallaby grass being present (DEWHA 2009).	None	N/A	No suitable habitat. **Unlikely to occur.**

Notes: EPBC-T = threatened species status under EPBC Act; EX = presumed extinct in the wild; CR = critically endangered; EN = endangered; VU = vulnerable; **EPBC-M** = migratory status under the EPBC Act; M = listed migratory taxa; Bonn Convention (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family; Bonn Convention (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly; CAMBA - China-Australia Migratory Birds Agreement; JAMBA - Japan-Australia Migratory Birds Agreement; ROKAMBA - Republic of Korea Australia Migratory Birds Agreement.

Appendix 4: Protected Matters Search Tool report (01/03/2019) – Wind Farm site

Australian Government
Department of the Environment and Energy

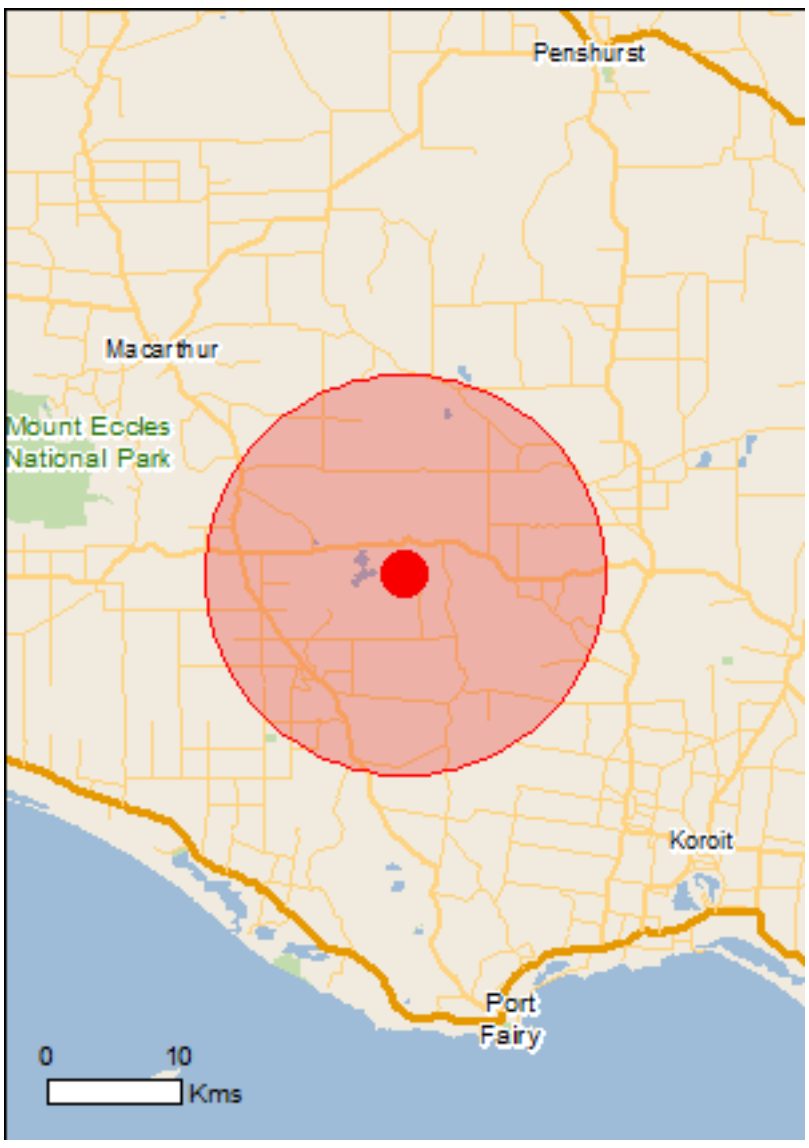
EPBC Act Protected Matters Report

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

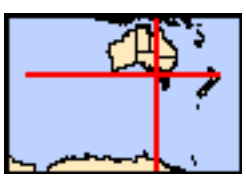
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

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

Report created: 01/03/19 12:26:02



Coordinates
Buffer: 15.0Km



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.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	37
Listed Migratory Species:	14

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	4
Regional Forest Agreements:	1
Invasive Species:	28
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community may occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Crustaceans		
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat likely to occur within area
Fish		
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Vulnerable	Species or species habitat known to occur

Name	Status	Type of Presence within area
[Nannoperca obscura](#) Yarra Pygmy Perch [26177]	Vulnerable	Species or species habitat likely to occur within area
[Prototroctes maraena](#) Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
[Litoria raniformis](#) Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat likely to occur within area
Insects		
[Synemon plana](#) Golden Sun Moth [25234]	Critically Endangered	Species or species habitat may occur within area
Mammals		
[Antechinus minimus maritimus](#) Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat likely to occur within area
[Dasyurus maculatus maculatus (SE mainland population)](#) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
[Isoodon obesulus obesulus](#) Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
[Miniopterus orianae bassanii](#) Southern Bent-wing Bat [87645]	Critically Endangered	Species or species habitat likely to occur within area
[Potorous tridactylus tridactylus](#) Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat likely to occur within area
[Pseudomys shortridgei](#) Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat may occur within area
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Species or species habitat likely to occur within area
Plants		
[Amphibromus fluitans](#) River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area
[Glycine latrobeana](#) Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
[Ixodia achillaeoides subsp. arenicola](#) Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat may occur within area
[Lachnagrostis adamsonii](#) Adamson's Blown-grass, Adamson's Blowngrass [76211]	Endangered	Species or species habitat may occur within area
[Poa sallacustris](#) Salt-lake Tussock-grass [24424]	Vulnerable	Species or species habitat likely to occur within area
[Prasophyllum diversiflorum](#) Gorae Leek-orchid [13210]	Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
Prasophyllum frenchii		
Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum		
Dense Leek-orchid [55146]	Vulnerable	Species or species habitat known to occur within area
Pterostylis chlorogramma		
Green-striped Greenhood [56510]	Vulnerable	Species or species habitat may occur within area
Pterostylis cucullata		
Leafy Greenhood [15459]	Vulnerable	Species or species habitat may occur within area
Rutidosis leptorrhynchoides		
Button Wrinklewort [7384]	Endangered	Species or species habitat may occur within area
Senecio psilocarpus		
Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area
Taraxacum cygnorum		
Coast Dandelion [2508]	Vulnerable	Species or species habitat likely to occur within area
Thelymitra epipactoides		
Metallic Sun-orchid [11896]	Endangered	Species or species habitat may occur within area
Thelymitra matthewsii		
Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre		
Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
Reptiles		
Delma impar		
Striped Legless Lizard [1649]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus		
White-throated Needletail [682]		Species or species habitat likely to occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat likely to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		

Name	Threatened	Type of Presence
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	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
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		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
Pandion haliaetus Osprey [952]		Species or species habitat likely to 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]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area
[Chrysococcyx osculans](#) Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
[Hirundapus caudacutus](#) White-throated Needletail [682]		Species or species habitat likely to occur within area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat likely to occur within area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat likely to occur within area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat likely to occur within area
[Rostratula benghalensis (sensu lato)](#) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Broadwater I91 B.R.	VIC
Pretty Hill F.R	VIC
St Helens F.R	VIC
Unnamed P0059	VIC

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
West Victoria RFA	Victoria

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		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris European Greenfinch [404]		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
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Lepus capensis Brown Hare [127]		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 norvegicus Brown Rat, Norway Rat [83]		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
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
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 monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to 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
Ulex europaeus Gorse, Furze [7693]		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

-38.15037 142.16408

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.

Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

Appendix 5: Protected Matters Search Tool report (04/03/2019) – OD route

Australian Government
Department of the Environment and Energy

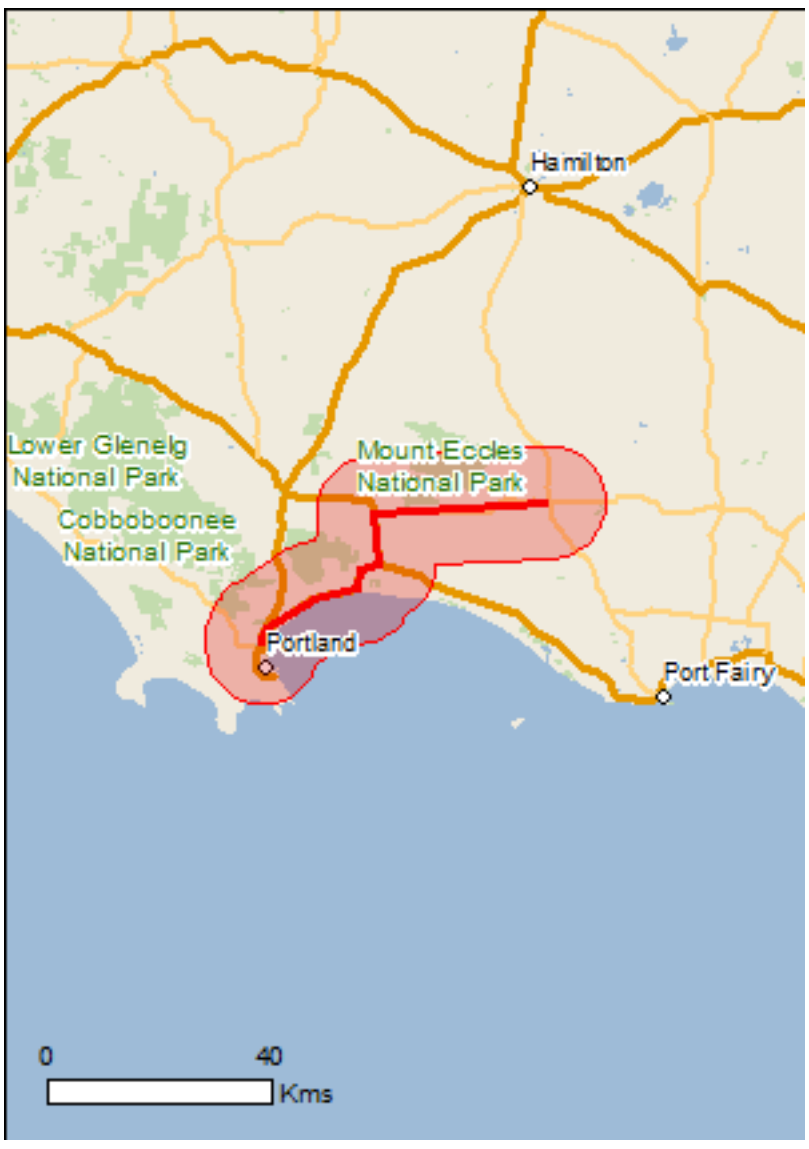
EPBC Act Protected Matters Report

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

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

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

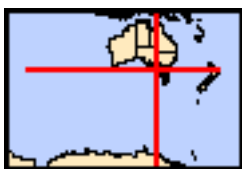
Report created: 04/03/19 15:53:29



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

Coordinates

Buffer: 10.0Km



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.

World Heritage Properties:	None
National Heritage Places:	2
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	76
Listed Migratory Species:	54

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	92
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	24
Regional Forest Agreements:	1
Invasive Species:	32
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	1

Details

Matters of National Environmental Significance

National Heritage Properties [Resource Information]

Name	State	Status
Indigenous		
Budj Bim National Heritage Landscape - Mt Eccles Lake Condah Area	VIC	Listed place
Budj Bim National Heritage Landscape - Tyrendarra Area	VIC	Listed place

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Glenelg estuary and discovery bay wetlands	Within 10km of Ramsar

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name
EEZ and Territorial Sea

Marine Regions [Resource Information]

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name
South-east

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
Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	Endangered	Community likely to occur within area
Giant Kelp Marine Forests of South East Australia	Endangered	Community may occur within area
Grassy Eucalypt Woodland of the Victorian Volcanic Plain	Critically Endangered	Community known to occur within area
Natural Temperate Grassland of the Victorian Volcanic Plain	Critically Endangered	Community may occur within area
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur

Name	Status	Type of Presence
		within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii graptogyne Red-tailed Black-Cockatoo (south-eastern) [25982]	Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable	Species or species habitat known to occur within area
Crustaceans		
Euastacus bispinosus Glenelg Spiny Freshwater Crayfish, Pricklyback [81552]	Endangered	Species or species habitat known to occur within area
Fish		
Galaxiella pusilla Eastern Dwarf Galaxias, Dwarf Galaxias [56790]	Vulnerable	Species or species habitat known to occur within area
Nannoperca obscura Yarra Pygmy Perch [26177]	Vulnerable	Species or species habitat likely to occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat known to occur

Name	Status	Type of Presence within area
Insects		
[Synemon plana](#) Golden Sun Moth [25234]	Critically Endangered	Species or species habitat may occur within area
Mammals		
[Antechinus minimus maritimus](#) Swamp Antechinus (mainland) [83086]	Vulnerable	Species or species habitat known to occur within area
[Balaenoptera borealis](#) Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
[Balaenoptera physalus](#) Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
[Dasyurus maculatus maculatus (SE mainland population)](#) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
[Isoodon obesulus obesulus](#) Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
[Megaptera novaeangliae](#) Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
[Miniopterus orianae bassanii](#) Southern Bent-wing Bat [87645]	Critically Endangered	Species or species habitat likely to occur within area
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat may occur within area
[Potorous tridactylus tridactylus](#) Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat known to occur within area
[Pseudomys fumeus](#) Smoky Mouse, Konoom [88]	Endangered	Species or species habitat may occur within area
[Pseudomys shortridgei](#) Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Species or species habitat likely to occur within area
Plants		
[Amphibromus fluitans](#) River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area
[Caladenia calcicola](#) Limestone Spider-orchid [10065]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Caladenia hastata Melblom's Spider-orchid [16118]	Endangered	Species or species habitat likely to occur within area
Caladenia ornata Ornate Pink Fingers [76213]	Vulnerable	Species or species habitat may occur within area
Cassinia rugata Wrinkled Cassinia, Wrinkled Dollybush [21885]	Vulnerable	Species or species habitat may occur within area
Dipodium campanulatum Bell Flower Hyacinth Orchid [55051]	Endangered	Species or species habitat may occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat likely to occur within area
Ixodia achillaeoides subsp. arenicola Sand Ixodia, Ixodia [21474]	Vulnerable	Species or species habitat known to occur within area
Prasophyllum diversiflorum Gorae Leek-orchid [13210]	Endangered	Species or species habitat known to occur within area
Prasophyllum frenchii Maroon Leek-orchid, Slaty Leek-orchid, Stout Leek-orchid, French's Leek-orchid, Swamp Leek-orchid [9704]	Endangered	Species or species habitat likely to occur within area
Prasophyllum spicatum Dense Leek-orchid [55146]	Vulnerable	Species or species habitat likely to occur within area
Pterostylis chlorogramma Green-striped Greenhood [56510]	Vulnerable	Species or species habitat known to occur within area
Pterostylis cucullata Leafy Greenhood [15459]	Vulnerable	Species or species habitat known to occur within area
Senecio psilocarpus Swamp Fireweed, Smooth-fruited Groundsel [64976]	Vulnerable	Species or species habitat likely to occur within area
Taraxacum cygnorum Coast Dandelion [2508]	Vulnerable	Species or species habitat likely to occur within area
Thelymitra epipactoides Metallic Sun-orchid [11896]	Endangered	Species or species habitat may occur within area
Thelymitra matthewsii Spiral Sun-orchid [4168]	Vulnerable	Species or species habitat may occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Delma impar Striped Legless Lizard [1649]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Sharks		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely

Name	Threatened	Type of Presence
		to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat known to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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
Defence - Training Depot, Darts RD 3305 Portland

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur

Name	Threatened	Type of Presence
		within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Puffinus tenuirostris Short-tailed Shearwater [1029]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Sterna albifrons Little Tern [813]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Foraging, feeding or

Name	Threatened	Type of Presence
		related behaviour likely to occur within area
Thalassarche chrysostoma Grey-headed Albatross [66491]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche sp. nov. Pacific Albatross [66511]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Thinornis rubricollis rubricollis Hooded Plover (eastern) [66726]	Vulnerable	Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Fish		
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area
Hypselognathus rostratus Knifesnout Pipefish, Knife-snouted Pipefish [66245]		Species or species habitat may occur within area
Kaupus costatus Deepbody Pipefish, Deep-bodied Pipefish [66246]		Species or species habitat may occur within area
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Mitotichthys semistriatus Halfbanded Pipefish [66261]		Species or species habitat may occur within area
Mitotichthys tuckeri Tucker's Pipefish [66262]		Species or species habitat may occur within area
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus robustus Robust Pipehorse, Robust Spiny Pipehorse [66274]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Stipecampus cristatus Ringback Pipefish, Ring-backed Pipefish [66278]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Mammals		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat likely to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Foraging, feeding or related behaviour known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Tursiops aduncus		
Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str.		
Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Bolwarra H43 B.R.	VIC
Bolwarra H44 B.R.	VIC
Bolwarra H45 B.R.	VIC
Broadwater I90 B.R.	VIC
Broadwater I91 B.R.	VIC
Discovery Bay Coastal Park	VIC
Dunmore B.R.	VIC
Fitzroy River SS.R.	VIC
Gorae B.R.	VIC
Kurtonitj	VIC
Lake Condah	VIC
Mount Eccles National Park	VIC
Myamyn B.R.	VIC
Narrawong F.R.	VIC
Nine Mile F.F.R.	VIC
Portland H46 B.R.	VIC
Portland H47 B.R.	VIC
The Stones	VIC
The Stones W.R.	VIC
Trewalla H48 B.R.	VIC
Trewalla H49 B.R.	VIC
Tyrendarra	VIC
Tyrendarra F.R	VIC
Unnamed P0059	VIC

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
West Victoria RFA	Victoria

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		
Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis		
Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris European Greenfinch [404]		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
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species 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
Lepus capensis Brown Hare [127]		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 norvegicus Brown Rat, Norway Rat [83]		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
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		

Name	Status	Type of Presence
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to 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
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to 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
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Nationally Important Wetlands [Resource Information]

Name	State
Lake Condah	VIC

Key Ecological Features (Marine) [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Bonney Coast Upwelling	South-east

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

-38.322113 141.596192,-38.309722 141.594818,-38.298406 141.603745,-38.259597 141.679276,-38.246656 141.747254,-38.225082 141.753433,-38.21699 141.782959,-38.152764 141.771973,-38.139264 142.053497

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.

Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111