



Crookwell Development Pty Ltd

# Crookwell 3 Wind Farm

## *Addendum Ecology Report – RSA Revision*

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## Crookwell 3 Wind Farm

*Addendum Ecology Report – RSA Revision*

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## CONTENTS

1	<i>INTRODUCTION</i>	
1.1	<i>SCOPE OF THIS REPORT</i>	1
2	<i>METHODS</i>	
3	<i>RESULTS</i>	
3.1	<i>ATLAS OF NSW WILDLIFE DATABASE</i>	3
3.2	<i>COMMONWEALTH PROTECTED MATTERS SEARCH TOOL</i>	5
3.2.1	<i>PAINTED HONEYEATER</i>	5
3.3	<i>MODIFICATION TO THE PROJECT</i>	5
4	<i>IMPACT ASSESSMENT</i>	
4.1	<i>WTG REMOVAL</i>	7
4.2	<i>MODIFICATION TO WTG ENVELOPE</i>	8
4.3	<i>ASSESSMENTS OF SIGNIFICANCE REVISION FOR MNES UNDER THE EPBC ACT</i>	8
4.4	<i>ASSESSMENTS OF SIGNIFICANCE REVISION FOR SPECIES LISTED UNDER THE TSC ACT</i>	9
4.5	<i>RECALCULATION OF VEGETATION CLEARANCE</i>	15
4.6	<i>CONCLUSION</i>	17
5	<i>REFERENCES</i>	
ANNEX A	<i>ASSESSMENTS OF SIGNIFICANCE (SEVEN PART TESTS)</i>	
	<i>LIST OF FIGURES</i>	
FIGURE 1	<i>PROJECT AREA, ATLAS RECORDS AND WTGS PROPOSED FOR REMOVAL</i>	4

## INTRODUCTION

Crookwell Development Pty Ltd (CDPL) are seeking State significant development consent for the Crookwell 3 Wind Farm (the Project).

Following the preparation of the Crookwell 3 Preferred Project and Response to Submissions Report in March 2014 (PPRSR), CDPL has further refined the Project by modifying the wind turbine generator (WTG) envelope for the Project and reducing the total number of WTGs proposed as part of the Project from 28 to 23 (**Project Refinements**) and have altered the layout of some access tracks to avoid areas of higher ecological value.

The changes made to the WTG envelope for the ecological assessment are as follows:

- an increase in the maximum rotor size from 104 m to 130 m;
- a decrease in the maximum tower height from 105 m to 95 m; and
- an increase maximum tip height from 150 m to 157 m.

A diagram showing the proposed changes to the WTG envelope is contained in *Annex A*. A function of these alterations is a change in the rotor swept area (RSA).

Additionally, five WTGs have been removed, decreasing the total number from 28 to 23 and the layout of some access tracks have been altered to avoid areas of higher ecological value. *Figure 1* shows the locations of the WTGs which have been removed from the Project. As a consequence of the removal of these WTGs, a number of access tracks and underground cabling servicing the removed WTGs will be redundant and have also be removed from the Project.

### 1.1

#### SCOPE OF THIS REPORT

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by CDPL to prepare this report which updates the ecological assessments undertaken for the Project to reflect the Project Refinements.

As outlined above, the reduced number of WTGs has the benefit removing from the project a number of access tracks and underground cabling routes. Furthermore, refinements to the access track layout to avoid areas of higher ecological value have been undertaken. Both of these refinements reduce the overall Project footprint and hence results in a reduction to the total amount of vegetation clearing required for the Project.

This report focuses on two main areas in revising the ecological impacts of the Project:

- assessing the impacts resulting from the changes made to the WTG envelope and reduction in WTG numbers on bird and bat species, which include collision risk, alienation of habitat and barotrauma; and
- re-calculation of the vegetation clearance required for the Project.

## 2

### *METHODS*

This report builds on existing impact assessments prepared in relation to the Project. The existing ecological impact assessments that have been prepared in relation to the Project and have been relied upon in preparing this report are:

- Ecological Assessment for Crookwell 3 Wind Farm (Anderson Environmental Consultants (AEC) 2010 revised in 2012);
- Targeted Threatened Species Assessment for Crookwell 3 Wind Farm (AEC 2011);
- Response to Comments/Objections – Ecological Assessment (AEC 2013);
- Crookwell 3 Wind Farm: Supplementary Ecology Report (ERM 2013a);
- Crookwell 3 Wind Farm: Ecology – Adequacy of Response to Submissions (ERM 2013b);
- Preferred Project and Response to Submissions Report: Crookwell 3 Wind Farm – Major Project Application Number (MP 10\_0034). (CDPL 2014).

In addition, updated database searches were conducted to obtain records of threatened birds and bats, listed under the *Environment Protection and Biodiversity Conservation Act* (EPBC Act) and *Threatened Species Conservation Act* (TSC Act). This allowed the existing impact assessments to be updated in the case of any recent additional records or highlight species which have changed listing status or have been recently listed. The following searches were conducted on 24/11/2015, with a 10 km buffer (the locality) applied to the Project Area (PA):

- the NSW Office of Environment and Heritage (OEH) Atlas of NSW Wildlife database (Bionet 2014); and
- the Commonwealth Department of the Environment’s (DoE) online Protected Matters Search Tool (PMST).

## 3.1 ATLAS OF NSW WILDLIFE DATABASE

A total of five different species were recorded within a 10 km buffer of the PA, all of which were birds (refer to *Table 3.1* and *Figure 1*). The latest records were dated during 2009, and therefore precede the previous impact assessments undertaken to date. Owing to the lack of any new information related to the atlas records, none of the impact assessments require further review on this basis alone.

**Table 3.1** *Atlas of NSW Wildlife Database Records*

Common Name	Scientific Name	TSC Act	EPBC Act	Date Recorded
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	1/11/1992
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	V		30/06/2009
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V		30/06/2009
Powerful Owl	<i>Ninox strenua</i>	V		3/04/2007
Powerful Owl	<i>Ninox strenua</i>	V		30/06/2009
Powerful Owl	<i>Ninox strenua</i>	V		31/05/2006
Diamond Firetail	<i>Stagonopleura guttata</i>	V		4/07/2005

1. Species status under the EPBC Act and TSC Act: V - Vulnerable, E - Endangered, CE - Critically Endangered.
2. Only birds and bats were included in the record search.



Data Source:  
 Imagery - Bing Maps captured Dec 2003  
 Threatened Species - NSW Office of Environment and Heritage's Atlas of NSW  
 Wildlife, which holds data from a number of custodians. Data obtained 24/11/2015



**Legend**

- Turbines and Access Track Buffer (10km)

**Wind Farm Layout:**

- Wind Turbine Generator
- Wind Turbine Generator (Removed)
- Access Track

**Threatened Species\*:**

- Diamond Firetail
- Regent Honeyeater
- Varied Sittella

**Note\*:**  
 The following Threatened Species have been recorded within the Locality, their locations are not shown as they are classified as Sensitive Species by OEH:  
 Gang-gang Cockatoo, Powerful Owl

0 1 2 3km  
 1:110,000

Client: Crookwell Development Pty Ltd	<b>Figure 1 - Project Area, Atlas Records and WTGs Proposed for Removal</b>
Drawing No: 0326058b_AD_EC_RE_G001_R1.mxd	
Date: 10/03/2016	Drawing Size: A3
Drawn By: TC	Reviewed By: MF
This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.	
Crookwell 3 Wind Farm Addendum Ecology Report - RSA Revision Environmental Resources Management ANZ Auckland, Brisbane, Canberra, Christchurch, Melbourne, Newcastle, Perth, Port Macquarie, Sydney	





## 3.2

### COMMONWEALTH PROTECTED MATTERS SEARCH TOOL

The result of the PMST search was cross referenced against the species considered in AEC (2012). One additional bird, The Painted Honeyeater (*Grantiella picta*) was highlighted in the PMST (refer to *Annex B*). This species has recently been listed as Vulnerable under the EPBC Act (effective from 08/07/15) and is also listed Vulnerable under the TSC Act. As this species has not been considered during preceding ecological assessments the likelihood of occurrence and potential for impacts are discussed below. The impacts of the Project on all of the other threatened birds and bats highlighted within the recent PMST search have already been considered as part of the original ecological assessment (AEC, 2012).

### 3.2.1

#### *Painted Honeyeater*

The Painted Honeyeater is nomadic and occurs at low densities throughout its range, which extend from Victoria through to central Queensland. The greatest concentrations of the bird and almost all breeding occur on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. This species inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. The species is a specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias and it prefers mistletoes of the genus *Amyema*. Insects and nectar from mistletoe or eucalypts are also occasionally eaten (OEH, 2015a).

The Project exists within the South Eastern Highland Bioregion, outside of the key inland slopes habitat area for the species. The Project is within an area which has highly fragmented vegetation (ERM 2013b), which lowers the suitability of the habitat for the Painted Honeyeater. Suitable habitat within the PA is restricted to small patches of Box Gum Woodland, much of which is sub-optimal given its partially cleared and thinned nature (ERM 2013a). This species has not been recorded from any field surveys to date, despite numerous bird surveys being undertaken (AEC 2012, ERM 2013a), including targeted surveys for nectivorous birds such as the Regent Honeyeater and Swift Parrot (ERM, 2013b). Furthermore there are no records of the species within the locality with the nearest record of the species being 25 km north of the PA. Given the lack of records, and the suboptimal habitat it is considered that this species is unlikely to occur. No further impact assessment is deemed necessary under either the TSC Act or the EPBC Act.

## 3.3

### MODIFICATION TO THE PROJECT

The PPRS report submitted in 2014, provided information on the likely specifications of WTGs to be used for the Project. In order to allow flexibility regarding WTG selection, a conservative approach was taken which assessed a maximum WTG envelope, which took the largest attributes of each of the WTGs then under consideration for the Project.



Owing to the advancing technology of turbine design CDPL has now amended the maximum WTG envelope proposed for the Project. The table below (*Table 3.2*) summarises the proposed changes to the maximum WTG envelope.

**Table 3.2** *Changes to the WTG Envelope*

	Original	Change	Difference
Tip Height Maximum (m)	150	157	+7 m
Tip Height Min (Ground Clearance (m))	46	27	-19
Rotor Diameter (m)	104	130	+26

The ecological assessments to date have considered impacts of various WTG envelopes and specifications, as described below:

- AEC (2012) assessed impacts to birds and bats with respect to WTGs, but did not make specific reference to minimum rotor height (ground clearance) or maximum rotor height (blade tip height) as part of the assessment. However, the maximum rotor height of 152 m was detailed in the project description.
- ERM (2013a) provided an estimate of the maximum rotor height to be approximately 150 m for the purposes of the ecological impact assessment.
- Later studies including several revised impact assessments by ERM (2013b) used precautionary specifications of a ground clearance at 25 m and maximum blade tip height of 200 m.

In addition to the changes of the WTG envelope, five (5) turbines will be removed from the Project (refer to *Figure 1*). This will consequently result in the removal of associated access tracks for those WTGs and therefore reduce the total length of access tracks.

Detailed ecological impact assessment has been previously conducted for the Project by AEC (2011 & 2012) and ERM (2013a & 2013b). The following sections build on the previous assessments and assess the impacts of the modifications to the proposed maximum WTG envelope and reduction in WTG numbers on bird and bat species collision risk, barotrauma and alienation of habitat, along with recalculation of the extent of the native vegetation removal.

Operational wind farms pose a potential collision risk to birds and bats. The risks are injury and/or death to individual birds and bats which collide or fly close to WTGs, as well as alienation of habitat where birds and bats avoid WTGs.

Fatalities and injuries to birds and bats from WTGs are usually caused by a collision with the moving blades (blade strike), or with turbine infrastructure, such as guy lines and powerlines.

Alienation of habitat is a further consideration related to blade strike, as it indicates a measure of “avoidance” of WTGs by birds and bats. The avoidance rate for birds in Australia is generally considered to be in the order of 95% to 99% (Smales 2005). This avoidance effect essentially leads to a loss of habitat within the footprint of the proposed development.

Barotrauma primarily affects bats and is caused by rapid decompression near the moving turbine blades (Baerwald 2008). Barotrauma involves tissue damage to air-containing structures caused by rapid or excessive pressure changes; pulmonary barotrauma is lung damage due to expansion of air in the lungs that is not accommodated by exhalation (Baerwald 2008). As with any airfoil, moving wind- turbine blades create zones of low pressure as the air flows over them. Bats entering these low pressure areas may suffer barotrauma (Baerwald 2008).

Each of these issues are considered below.

#### **4.1**

##### **WTG REMOVAL**

The removal of five WTGs from the project reduces the total number of proposed turbines from 28 to 23, representing a decrease of 18 %. This will reduce the total Rotor Swept Area (RSA) of the Project, therefore also lowering the risk of rotor impacts for birds and bats, including collision risk, barotrauma and habitat alienation. All of the impacts assessments conducted to date have considered the rotor impacts based on at least 28 turbines (ERM 2013a and 2013b) with AEC considering 30 WTG. These assessments have concluded no significant impacts to any threatened species, as a result of the Project. The removal of five (5) WTGs from the Project will further reduce the ecological impacts to birds and bats found within the Project Area.

In addition to the reduced rotor related impacts, the footprint of the Project will be reduced due to removal of WTGs and access tracks. This will further reduce alienation of habitat and other ecological impacts including habitat reduction from clearing (refer *Section 4.5*).

#### 4.2 *MODIFICATION TO WTG ENVELOPE*

Ecological impact assessments conducted to date have not made conclusions based on an exact RSA, instead they have referenced potential upper and lower heights as detailed in *Section 3.3*. The maximum rotor height (blade tip height) referenced in the reports produced to date has included heights of 150 m, 152 m and 200 m, therefore this either represents an increase of 7 m, 5 m or a decrease of 43 m respectively, compared to the revised WTG envelope which has a maximum blade tip height of 157 m.

Bird and bat species which regularly fly at heights of 150 m would occur over a wide range of heights and adapted to flying in open areas. Whether it is fast powered flight or soaring behaviour, these birds and bats are not likely to be restricted to a flight height of 150m. The increased tip height of 7 m (compared to 150 m) is not considered a significant increase. It is therefore considered that the same species as considered previously would be affected at a similar magnitude, meaning that the increased tip height is not considered to significantly increase impacts.

The minimum rotor height ground clearance was previously only considered by ERM (2013b) which stated a blade ground clearance at 25 m. The proposed modification lists a revised blade ground clearance of 27 m. The additional 2 m ground clearance is not likely to materially affect impact risk for low flying bird and bat species.

The proposed change to the WTG envelope is not expected to result in any significant increase to the risk of bird and bat collision and barotrauma for the Project. Individual threatened species are considered below.

#### 4.3 *ASSESSMENTS OF SIGNIFICANCE REVISION FOR MNES UNDER THE EPBC ACT*

Two general Assessments of Significance (AoS) were undertaken by AEC (2012) for;

- Critically Endangered and Endangered individual threatened species, and
- Vulnerable individual threatened species.

The assessments did not list the species which were included in this assessment, however concluded that the Project is not likely to have a significant impact on any fauna species listed under the EPBC Act. These assessments did not specifically discuss any bird or bats species listed under the EPBC Act, therefore no reference to collision risk or barotrauma was made.



#### 4.4

#### *ASSESSMENTS OF SIGNIFICANCE REVISION FOR SPECIES LISTED UNDER THE TSC ACT*

*Table 4.1* applies the impacts outlined in *Section 4.2* to the species specific AoS completed to date. Where multiple AoS have been completed the most recent was used to inform if any changes to the impact assessment are required. In summary, the modifications made to the WTG maximum envelope are negligible and are considered to not result in any change to the conclusion of the existing AoS that the Project is not likely to result in a significant impact on any species listed under the EPBC Act.

Table 4.1 Assessments of Significance Undertaken and Modifications Required Due to Revision of WTG Specifications

Common Name	Species Name	EPBC Act	TSC Act	Assessment of Significance Completed (TSC Act)?			Changes Required to the AoS	AoS Conclusion and Justification
				AEC (2012)	ERM (2013a)	ERM (2013b)		
<b>Birds</b>								
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	✓	✓	✓	ERM 2013b states that the maximum rotor tip height will be 150 m. This height is now revised to 157 m	<b>No Significant Impact - Unchanged</b> The AoS concluded that the species is unlikely to occur within the PA, based on a lack of recent records, and the absence of preferred habitat. The closest record of this species was 10km from the PA and is considered historical at 23 years ago. Rotor strike is not considered a key risk given the absence of the species from the PA. Note that this species listing has been upgraded to CE from E under both the TSC Act and EPBC Act.
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	-	V	✓	✓		No changes required.	<b>No Significant Impact - Unchanged</b> The Gang-Gang Cockatoo has not been recorded flying at height over the PA and is unlikely to regularly fly at 150 m, therefore the minor increase of the maximum rotor tip to 157 m is not likely to have any significant effect on the species. Furthermore the Gang-gang Cockatoo are considered to be an infrequent visitor to the PA, owing to the sub-optimal habitat present.
Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>	-	V	✓			No changes required.	<b>No Significant Impact - Unchanged</b> AEC (2012) considered that the PA was unimportant for the species given the negligible foraging resources and low densities of hollows to support breeding for this species. Rotor heights were not considered a key part of the impact assessment; and the change in maximum tip height is considered negligible.
Brown Treecreeper	<i>Climacteris picumnus</i>	-	V	✓	✓		No changes required.	<b>No Significant Impact - Unchanged</b> ERM 2013a considered this species on the basis of footprint impacts rather than rotor strike, given that this is a woodland species unlikely to fly at height in open areas. The proposed modifications will have no change on the impact assessment for this species.

Common Name	Species Name	EPBC Act	TSC Act	Assessment of Significance Completed (TSC Act)?			Changes Required to the AoS	AoS Conclusion and Justification
				AEC (2012)	ERM (2013a)	ERM (2013b)		
Varied Sittella	<i>Daphoenositta chrysoptera</i>	-	V	✓	✓		No changes required.	<b>No Significant Impact - Unchanged</b> ERM 2013a considered this species on the basis of footprint impacts rather than rotor strike, given that this is a woodland species unlikely to fly at height in open areas. The proposed modifications will have no change on the impact assessment for this species.
White Fronted Chat	<i>Epthianura albifrons</i>	-	V		✓		No changes required.	<b>No Significant Impact - Unchanged</b> ERM 2013a considered this species on the basis of footprint impacts rather than rotor strike, given that this is a woodland species unlikely to fly at height in open areas. The proposed modifications will have no change on the impact assessment for this species.
Little Eagle	<i>Hieraaetus morphnoides</i>	-	V		✓		ERM 2013a states that the maximum rotor tip height will be 150 m. This height is now revised to 157 m	<b>No Significant Impact - Unchanged</b> The risk of rotor strike to this species was considered in the AoS by ERM (2013a) with further discussion also provided in ERM 2013b. An increase of the rotor tip height of 7 m for this species is considered a minor change and will not alter the previous AoS conclusion. A residual rotor strike risk remains for this species; however the impact is not considered significant impact at a species or population level.
Swift Parrot	<i>Lathamus discolor</i>	E	E	✓	✓	✓	ERM 2013b states that the maximum rotor tip height will be 150 m. This height is now revised to 157 m	<b>No Significant Impact - Unchanged</b> The AoS concluded that the species is unlikely to occur within the PA, based on a lack of records, and the absence of preferred habitat. Rotor strike is discussed in the AoS for this species and an increase of the rotor tip height of 7 m is considered a minor change and will not alter the previous AoS conclusion.
Hooded Robin	<i>Melanodryas cucullata</i>	-	V	✓	✓		No changes required.	<b>No Significant Impact - Unchanged</b> ERM 2013a considered this species on the basis of footprint impacts rather than rotor strike, given that this is a woodland species unlikely to fly at height in open areas. The proposed modifications will have no change on the impact assessment for this species.



Common Name	Species Name	EPBC Act	TSC Act	Assessment of Significance Completed (TSC Act)?			Changes Required to the AoS	AoS Conclusion and Justification
				AEC (2012)	ERM (2013a)	ERM (2013b)		
Barking Owl	<i>Ninox connivens</i>	-	v	✓			No changes required.	<b>No Significant Impact - Unchanged</b> AEC (2012) considered that the PA was unimportant for the species given the negligible foraging resources and low densities of hollows to support breeding. Rotor heights were not considered a key part of the impact assessment; and the change in maximum tip height is considered negligible.
Powerful Owl	<i>Ninox strenua</i>	-	V	✓			No changes required.	<b>No Significant Impact - Unchanged</b> AEC (2012) states that this species hunts at night at low altitudes, below the blades of the turbines and is therefore generally not at risk from blade strike. The ground clearance for rotors is not explicitly stated within AEC (2012) however the height of 27 m is within expected parameters for WTGs and it remains likely that the Powerful Owl would typically fly below this level. This species may occasionally fly at height when travelling between areas of foraging habitat and therefore some residual risk of rotor strike remains. Despite this residual risk it is considered that it would affect a small number of individuals only, and therefore the conclusion of No Significant Impact, remains current. It should be noted that one Powerful Owl was recorded aurally by ERM (2013b) in the vicinity of A18 (on the eastern limit of the PA) and this was subsequent to AECs assessment of the species.
Scarlet Robin	<i>Petroica boodang</i>	-	V	✓	✓		No changes required.	<b>No Significant Impact - Unchanged</b> ERM 2013a considered this species on the basis of footprint impacts rather than rotor strike, given that this is a woodland species unlikely to fly at height in open areas. The proposed modifications will have no change on the impact assessment for this species.
Superb Parrot	<i>Polytelis swainsonii</i>	V	V	✓			No changes required.	<b>No Significant Impact - Unchanged</b> AEC (2012) considered that the species was unlikely to occur, based on its known range and lack of records within the region. The proposed changes to the WTGs do not affect the impact assessment for this species, given its likely absence from the PA.

Common Name	Species Name	EPBC Act	TSC Act	Assessment of Significance Completed (TSC Act)?			Changes Required to the AoS	AoS Conclusion and Justification
				AEC (2012)	ERM (2013a)	ERM (2013b)		
Speckled Warbler	<i>Pyrrholaemus sagittatus</i>	-	V	✓	✓		No changes required.	<b>No Significant Impact - Unchanged</b> ERM 2013a considered this species on the basis of footprint impacts rather than Rotor Strike, given that this is a woodland species unlikely to fly at height in open areas. The proposed modifications will have no change on the impact assessment for this species.
Diamond Firetail	<i>Stagonopleura guttata</i>	-	V	✓	✓		No changes required.	<b>No Significant Impact - Unchanged</b> ERM 2013a considered this species on the basis of footprint impacts rather than Rotor Strike, given that this is a small woodland and grassland species unlikely to fly at height in open areas. The proposed modifications will have no change on the impact assessment for this species.
<b>Bats</b>								
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	-	V	✓		✓	For the purposes of the impact assessment ERM 2013b considered ground clearance of 25 m and a maximum blade tip height of 200 m. The revised specification will reduce this to 27 m and 157 m respectively. A reduction of 45 m in total.	<b>No Significant Impact - Unchanged</b> ERM 2013b considered this species with a precautionary approach to rotor strike, with a RSA larger than that now proposed. Residual risks of rotor strike and barotrauma were anticipated for this species but they were not of sufficient magnitude to significantly impact the species or local population. The proposed modifications will have no change on the impact assessment for this species given that the original RSA was greater than the revised RSA.
Eastern Bentwing-Bat	<i>Miniopterus schreibersii oceanensis</i>	-	V			✓	For the purposes of the impact assessment ERM 2013b considered ground clearance of 25 m and a maximum blade tip height of 200 m. The revised specification will reduce this to 27 m and 157 m respectively. A reduction of 45 m in total.	<b>No Significant Impact - Unchanged</b> ERM 2013b considered this species with a precautionary approach to rotor strike, with a RSA larger than that now proposed. Residual risks of rotor strike and barotrauma were anticipated for this species but they were not of sufficient magnitude to significantly impact the species or local population. The proposed modifications will have no change on the impact assessment for this species given that the original RSA was greater than the revised RSA.

Common Name	Species Name	EPBC Act	TSC Act	Assessment of Significance Completed (TSC Act)?			Changes Required to the AoS	AoS Conclusion and Justification
				AEC (2012)	ERM (2013a)	ERM (2013b)		
Corben's Long-eared Bat	<i>Nyctophilus corbeni</i> *	V	V	✓			No changes required.	<b>No Significant Impact - Unchanged</b> AEC (2012) did not specifically address the risk of rotor strike and barotrauma within the AoS, focusing on footprint impacts to potential habitat. Notwithstanding, this species has a low risk of rotor strike and barotrauma impacts given that it is a slow flying, agile species, typically hunting beneath the understory in vegetated areas (OEH, 2015a). The species is not likely to fly at heights of 27 m , nor occur in open areas away from forested or wooded areas.
Yellow-bellied Sheath-tailed Bat	<i>Saccolaimus flaviventris</i>	-	V	✓			No changes required.	<b>No Significant Impact - Unchanged</b> AEC (2012) considered the effects of rotor strike within the AoS, considering that the species is likely to demonstrate a high level of avoidance with few individuals likely to be impacted. Revision of the AoS is not required as the outcome was not specifically linked to blade heights and remains current.
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	-	V	✓			No changes required.	<b>No Significant Impact - Unchanged</b> AEC (2012) did not specifically address the risk of rotor strike and barotrauma within the AoS, focusing on footprint impacts to potential habitat including roosting trees.

Species status under the EPBC Act and TSC Act: V - Vulnerable, E - Endangered, CE - Critically Endangered.

\* Corben's Long-eared Bat (*Nyctophilus corbeni*) has been upgraded to a full species status and was previously assessed as the Greater Long-eared Bat (*Nyctophilus timoriensis* -south eastern form).



## 4.5

### *RECALCULATION OF VEGETATION CLEARANCE*

In addition to the reduced rotor related impacts discussed above, the footprint of the Project will be reduced due to both the removal of WTGs and their access tracks, as well as the revision of the access track layout alignment to avoid areas of higher ecological value.

The most important revisions to the WTG layout affecting areas of higher ecological value are:

- the removal of WTG A18 from the woodland in the east of the PA;
- the realignment of the access track north of WTG A16 around the areas of Box Gum Woodland; and
- the removal of WTG A26 from within the Box Gum Woodland Derived Native Grassland patch in the western part of the PA and realignment of the access track to avoid this patch.

The recalculated vegetation clearance calculations are shown below in *Table 4.2*.

**Table 4.2 Recalculation of Vegetation Impacts**

Vegetation Type	Supplementary Ecology Report (ERM 2013a)	PP&RtS Report (CDPL 2014)	Revised Calculation (March 2016)	Change from Supplementary Ecology Report (ERM 2013a)	Change from PP&RtS Report (CDPL 2014)
<b>Native Vegetation Types</b>					
Box-Gum Woodland	0.64	0	0	-0.64	0
Box-Gum Woodland – Derived Native Grassland (DNG)	0.03	0.03	0	-0.03	-0.03
Planted Native Vegetation	0.3	0.3	0	-0.3	-0.3
Red Stringybark Open Forest	1.37	1.37	1.63	0.26	0.26
Red Stringybark Open Forest - DNG	4.96	4.96	4.44	-0.52	-0.52
Silvertop Ash Open Forest (includes area mapped as 'regrowth')	1.89	1.89	1.09	-0.8	-0.8
Silvertop Ash Open Forest - DNG	0.56	0.56	0.52	-0.04	-0.04
<i>Sum Native Vegetation</i>	9.75	9.11	7.68	-2.07	-1.43
<b>Non-native Vegetation Types</b>					
Pasture	22.25	22.25	21.54	-0.67	-0.67

- Note: the access track to the Wollondilly Property (to turbines west of Crookwell Road) traverses a patch of Box Gum Woodland that meets the EPBC Act-listing status and a patch of Red Stringybark Open Forest. Impacts to these patches have not been included in the calculations as the existing access track through there will be used and no vegetation either side of the track will be affected.
- Note: the impacts to the Red Stringybark Open Forest are slightly increased due to revisions to the track alignment.

Overall, *Table 4.2* shows a general reduction in area to be cleared. Most importantly, revision of the access track layout has resulted in the avoidance of areas of higher ecological value such as:

- avoidance of impacts to areas of EPBC Act-listed Box Gum Woodland; and
- avoidance of impacts to areas of TSC Act-listed Box Gum Woodland and Derived Native Grassland.

#### 4.6

#### CONCLUSION

The report assesses the impacts resulting from the changes made to the WTG envelope and reduction in WTG numbers on collision risk and barotrauma for birds and bats, and presents a calculation of the reduction in the native vegetation removal due to redesign and refinement of the Project layout.

The modifications to the maximum WTG envelope for the Project and the reduction in the total number of WTGs is considered unlikely to significantly increase bird and bat species collision risk, alienation of habitat and barotrauma or result in any significant impacts on bird and bat species listed under the TSC Act or the EPBC Act. The reductions in turbines and realignment of the access tracks have resulted in total avoidance of EPBC Act-listed Box Gum Woodland and areas of TSC Act-listed Box Gum Woodland and Derived Native Grassland.

A biodiversity offset is proposed to account for the residual biodiversity impacts from the Project. CDPL propose that this will be finalised in liaison with the NSW Department of Planning and Environment (DP&E) following project approval. Changes have occurred to the biodiversity offsetting policies of the NSW DP&E and OEH in 2014 (during this project's approvals process) with the introduction of the *NSW Biodiversity Offsetting Policy for Major Projects* (OEH 2014) on 1 October 2014. Transitional arrangements for introduction of that policy offering some flexibility to proponents was applied to projects that, "were in a late stage of their planning approval process at this time" (OEH 2015b). These are referred to as the "Interim options for securing an offset site" (OEH 2015c).

As CDPL had submitted the PP&RtS Report (CDPL 2014) in March 2014, it is anticipated that these 'interim options' will be available to this project rather than the *Biodiversity Offsetting Policy for Major Projects* (OEH 2014) which is underpinned by the Framework for Biodiversity Assessment. The proposed biodiversity offset for this project may take the form of a land management agreement by a landholder to offset impacts onsite in accordance with the method outlined in the PP&RtSR (CDPL 2014): Appendix 4 (which is ERM 2013b) (with the exception that at the time of writing, that offset was to account for some impacts to Box Gum Woodland that will no longer occur). Notwithstanding, it is proposed that the biodiversity offset will be finalised in liaison with the DP&E following project approval and will be consistent with the six principles underpinning the *NSW Biodiversity Offsetting Policy for Major Projects* (OEH 2014).



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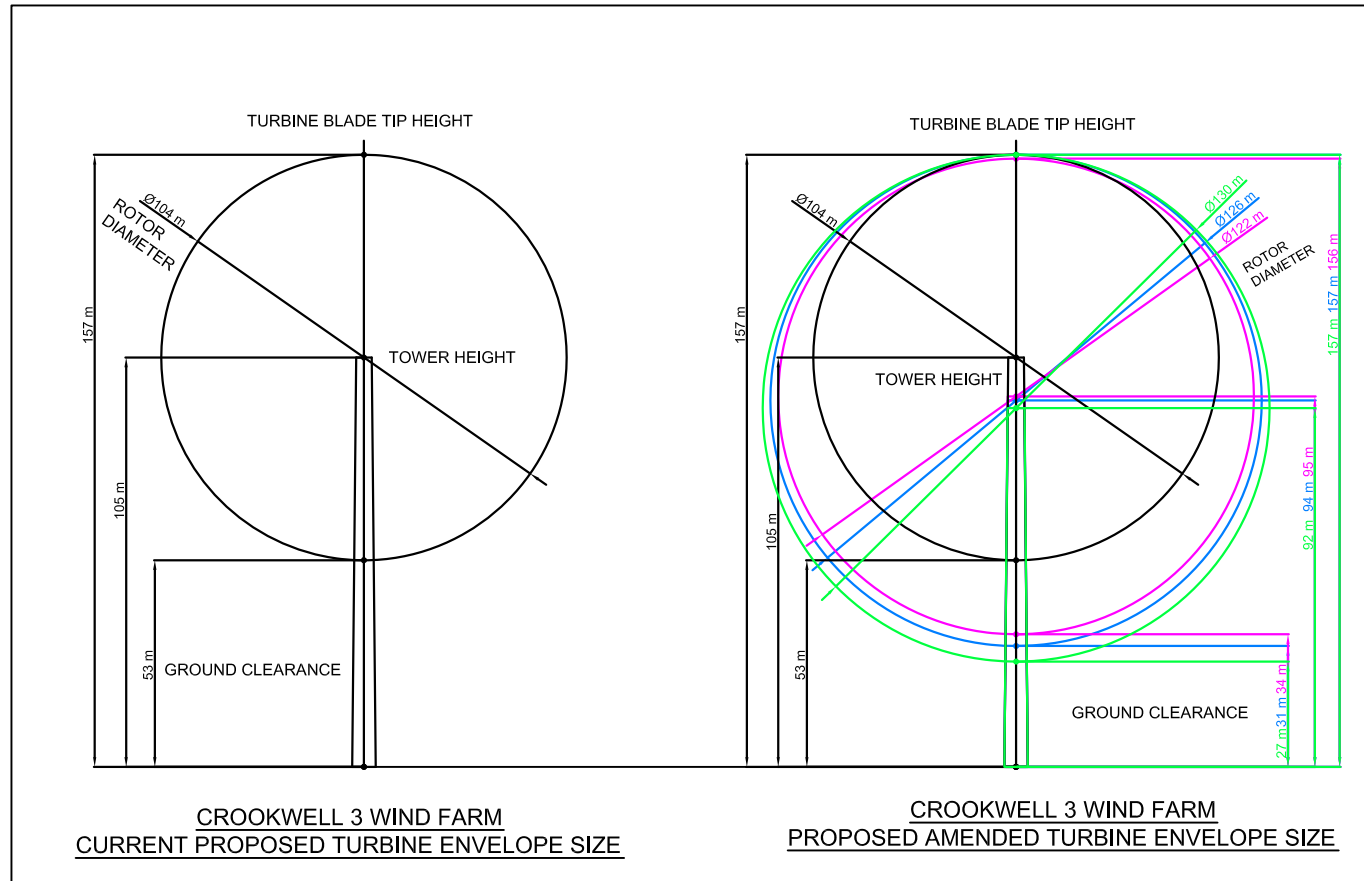
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Annex A

## Turbine Size Comparison

# UNION FENOSA WIND AUSTRALIA CROOKWELL DEVELOPMENT PTY LTD CROOKWELL 3 TURBINE SIZE COMPARISON



**Revision: 20151104-001**

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Annex B

## Protected Matters Search Tool





# 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: 24/11/15 12:00:26

[Summary](#)

[Details](#)

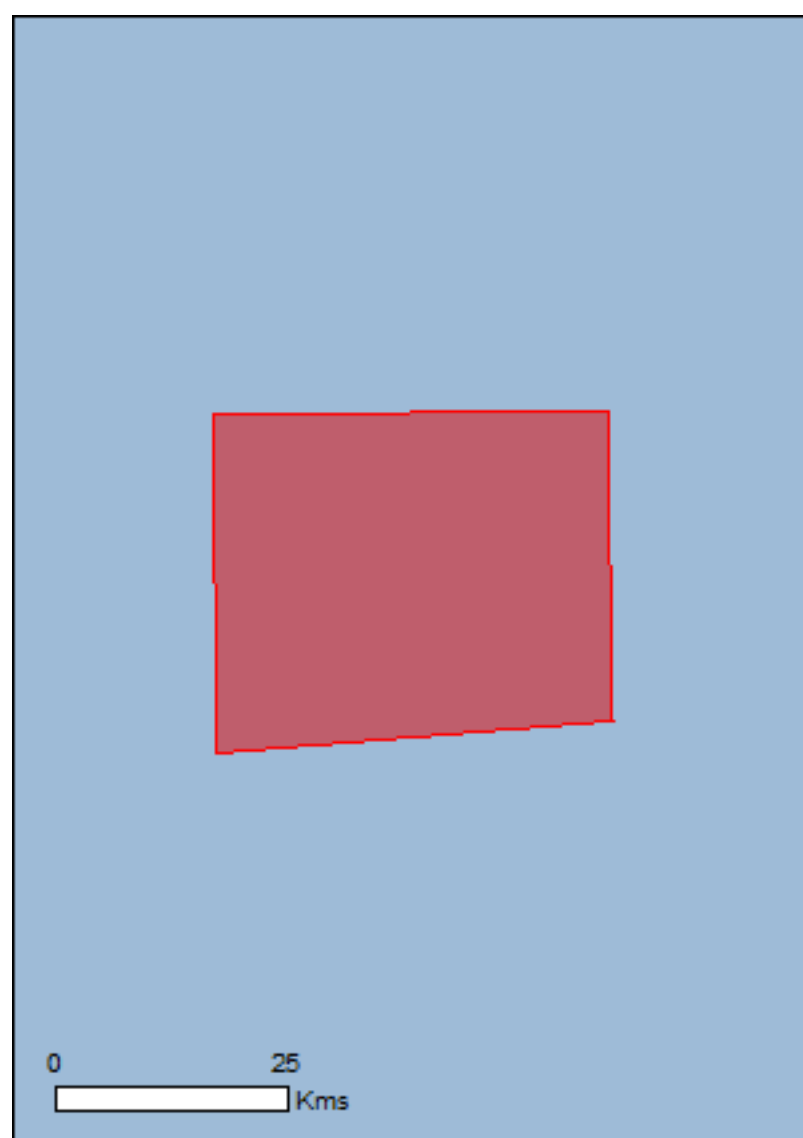
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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

[Coordinates](#)

Buffer: 0.0Km



# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	4
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	2
<a href="#">Listed Threatened Species:</a>	26
<a href="#">Listed Migratory Species:</a>	10

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	3
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	13
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Commonwealth Reserves Marine:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	2
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	35
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[ Resource Information ]
Name	Proximity
<a href="#">Banrock station wetland complex</a>	800 - 900km upstream
<a href="#">Hattah-kulkyne lakes</a>	600 - 700km upstream
<a href="#">Riverland</a>	700 - 800km upstream
<a href="#">The coorong, and lakes alexandrina and albert wetland</a>	800 - 900km upstream

## Listed Threatened Ecological Communities [ Resource Information ]

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

Name	Status	Type of Presence
<a href="#">Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory</a>	Endangered	Community likely to occur within area
<a href="#">White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</a>	Critically Endangered	Community likely to occur within area

## Listed Threatened Species [ Resource Information ]

Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Anthochaera phrygia</a> Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Grantiella picta</a> Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Endangered	Species or species habitat may occur within area
<a href="#">Polytelis swainsonii</a> Superb Parrot [738]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
<b>Fish</b>		
<a href="#">Maccullochella peelii</a> Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
<a href="#">Macquaria australasica</a> Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
<b>Frogs</b>		
<a href="#">Litoria booroolongensis</a> Booroolong Frog [1844]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
<a href="#">Litoria littlejohni</a> Littlejohn's Tree Frog, Heath Frog [64733]	Vulnerable	Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Chalinolobus dwyeri</a> Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Dasyurus maculatus maculatus (SE mainland population)</a> Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
<a href="#">Petrogale penicillata</a> Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
<a href="#">Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</a> Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
<a href="#">Pseudomys novaehollandiae</a> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area
<a href="#">Pteropus poliocephalus</a> Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
<b>Plants</b>		
<a href="#">Amphibromus fluitans</a> River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area
<a href="#">Diuris aequalis</a> Buttercup Doubletail [21588]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Eucalyptus aggregata</a> Black Gum [20890]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Lepidium hyssopifolium</a> Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat may occur within area
<a href="#">Leucochrysum albicans var. tricolor</a> Hoary Sunray, Grassland Paper-daisy [56204]	Endangered	Species or species habitat known to occur within area
<a href="#">Pelargonium sp. Striatellum (G.W.Carr 10345)</a> Omeo Stork's-bill [84065]	Endangered	Species or species habitat may occur within area
<a href="#">Prasophyllum petilum</a> Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area
<a href="#">Prasophyllum sp. Wybong (C.Phelps ORG 5269)</a> a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Thesium australe</a> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
<b>Reptiles</b>		
<a href="#">Aprasia parapulchella</a> Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Delma impar</a> Striped Legless Lizard [1649]	Vulnerable	Species or species



Name	Status	Type of Presence
		habitat likely to occur within area

### Listed Migratory Species [\[ Resource Information \]](#)

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

Name	Threatened	Type of Presence
------	------------	------------------

#### 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

[Merops ornatus](#)

Rainbow Bee-eater [670] Species or species habitat may occur within area

[Monarcha melanopsis](#)

Black-faced Monarch [609] 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 known to occur within area

[Rhipidura rufifrons](#)

Rufous Fantail [592] Species or species habitat likely to occur within area

#### Migratory Wetlands Species

[Ardea alba](#)

Great Egret, White Egret [59541] Species or species habitat known to occur within area

[Ardea ibis](#)

Cattle Egret [59542] Species or species habitat may occur within area

[Gallinago hardwickii](#)

Latham's Snipe, Japanese Snipe [863] Species or species habitat may occur 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
Commonwealth Land - Airservices Australia
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Telstra Corporation Limited

#### 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

[Apus pacificus](#)

Fork-tailed Swift [678] Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]		Species or species habitat likely to occur within area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Endangered	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat likely to occur within area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat likely to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

## Extra Information

State and Territory Reserves	[ Resource Information ]
Name	State
Back Arm	NSW
Narrangarril	NSW

## Invasive Species

[ [Resource Information](#) ]

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

Name	Status	Type of Presence
<b>Birds</b>		
<i>Acridotheres tristis</i> Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
<i>Alauda arvensis</i> Skylark [656]		Species or species habitat likely to occur within area
<i>Anas platyrhynchos</i> Mallard [974]		Species or species habitat likely to occur within area
<i>Carduelis carduelis</i> European Goldfinch [403]		Species or species habitat likely to occur within area
<i>Carduelis chloris</i> European Greenfinch [404]		Species or species habitat likely to occur within area
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<i>Passer domesticus</i> House Sparrow [405]		Species or species habitat likely to occur within area
<i>Streptopelia chinensis</i> Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
<i>Sturnus vulgaris</i> Common Starling [389]		Species or species habitat likely to occur within area
<i>Turdus merula</i> Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
<b>Mammals</b>		
<i>Bos taurus</i> Domestic Cattle [16]		Species or species habitat likely to occur within area
<i>Canis lupus familiaris</i> Domestic Dog [82654]		Species or species habitat likely to occur within area
<i>Capra hircus</i> Goat [2]		Species or species habitat likely to occur within area
<i>Equus caballus</i> Horse [5]		Species or species habitat likely to occur within area
<i>Felis catus</i> 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

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
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		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
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		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
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		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

Name	Status	Type of Presence
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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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

-34.667381 149.791015,-34.669686 149.792415,-34.669686 149.792415,-34.667957 149.791015,-34.695038 149.408457,-34.423841 149.404955,-34.420952 149.787513,-34.667381 149.791015

# 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](#)
- [-Parks and Wildlife Commission NT, Northern Territory Government](#)
- [-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
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- [-Australian Museum](#)
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- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- Other groups and individuals

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

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

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