

Our Ref: 4004/JM/19062020

19 June 2020

Matthew Sprott  
Director  
Resource Assessments  
Department of Planning, Industry and Environment  
Locked Bag 5022  
PARRAMATTA NSW 2124

Dear Matthew

**Re: Mangoola Coal Continued Operations Project (SSD-8642) Request for Additional Information**

Mangoola understands the Department is continuing to progress its assessment of the Mangoola Coal Continued Operations Project (SSD-8642) and has received further feedback from the Department's Biodiversity Conservation Division (BCD) requesting additional information to complete its consideration of Commonwealth matters.

On 21 January 2019, the (then) Department of the Environment and Energy (DoEE) confirmed the Mangoola Coal Continued Operations (MCCO) Project was a controlled action under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for impacts on threatened species and communities and water related matters of national environmental significance (MNES). Specifically, DoEE considered the MCCO Project as likely to have a significant impact on:

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands Critically Endangered Ecological Community (CEEC)
- *Prasophyllum* sp. Wybong
- regent honeyeater (*Anthochaera phrygia*)
- water resources – as the Project is likely to result in changes to groundwater and surface water and impact on surface water quality.

In addition, DoEE also considered that the MCCO Project may result in a significant impact on:

- swift parrot (*Lathamus discolor*)
- grey-headed flying fox (*Pteropus poliocephalus*).

The additional information requested by BCD, via correspondence received from the Department dated 4 June 2020, is identified below along with a response providing the information.

***Please provide an update of any protected matters listed since referral of the Project, and provide a statement outlining whether any further assessment is required***

Since the referral of the Project in 2018, the white-throated needletail (*Hirundapus caudacutus*) was listed as Vulnerable under the EPBC Act (listed in July 2019). No other newly listed species were identified as relevant to the Project.

Department of Agriculture, Water and the Environment (DAWE) (2020) describes the white-throated needletail as a non-breeding migrant to Australia, mostly aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. The species roosts in trees amongst dense foliage in the canopy or in hollows.

Extensive surveys of the MCCO Additional Disturbance Area over many survey periods did not detect the white-throated needletail. The MCCO Additional Project Area is not considered to provide habitat for an important population of the species and further detailed assessment of the species is not required.

***Please identify all of the EPBC Act listed threatened species that occur on, or in the vicinity of the Project site (as per the Environmental Reporting Tool), and state whether these species require any further consideration***

An updated Protected Matters Search was undertaken on 11 June 2020 (refer to **Attachment 1**), buffering the MCCO Additional Project Area by 10km. **Table 1** provides a table of all EPBC Act listed MNES that are predicted to occur on, or in the vicinity of the MCCO Additional Disturbance Area and includes a statement as to whether any species requires further consideration.

**Table 1 MNES Recorded or with Potential to Occur within the MCCO Additional Project Area**

MNES Name	Status		Likelihood to Occur within the MCCO Additional Project Area	Further Consideration Required?
	BC Act	EPBC Act		
<b>Wetlands of International Importance</b>				
Hunter Estuary Wetlands	-	Ramsar	Not present – occurs approximately 120 km to the southeast of the MCCO Additional Project Area. Disturbances in the MCCO Additional Project Area will not have any impact on the Hunter Estuary Wetlands Ramsar Site.	No
<b>Threatened Ecological Communities</b>				
<i>Central Hunter Valley Eucalypt Forest and Woodland</i>	-	CEEC	Not present – eucalypt forest and woodland communities identified in the MCCO Additional Project Area do not conform to the CEEC diagnostic criteria on the basis of soil and geological assessments ruling out the presence of potentially floristically suitable vegetation on Permian derived soils within the MCCO Additional Project Area. This community was considered as part of the referral assessment undertaken by Umwelt for the EPBC controlled action decision (2018/8280).	No
<i>Hunter Valley Weeping Myall (Acacia pendula) Woodland</i>	CEEC	CEEC	Not present – known occurrences of weeping myall in the MCCO Additional Project Area do not meet the condition threshold criteria for the <i>Hunter Valley Weeping Myall (Acacia pendula) Woodland</i> .	No
<i>Weeping Myall woodlands</i>	-	EEC	Not present – known occurrences of weeping myall in the MCCO Additional Project Area do not meet the listing criteria for the <i>Weeping Myall Woodlands</i> .	No
<i>Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions</i>	-	EEC	Not present – not recorded within the MCCO Additional Project Area and unlikely to occur based on habitat requirements and known distribution.	No
<i>Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia</i>	-	EEC	Not present – not recorded within the MCCO Additional Project Area and unlikely to occur based on habitat requirements and known distribution.	No
<i>Natural Grasslands on Basalt and fine-Textured Alluvial Plains of Northern NSW and Southern Queensland</i>		CEEC	Not present – not recorded within the MCCO Additional Project Area and unlikely to occur based on habitat requirements and known distribution.	No

MNES Name	Status		Likelihood to Occur within the MCCO Additional Project Area	Further Consideration Required?
	BC Act	EPBC Act		
<i>White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland</i>	EEC	CEEC	<b>Recorded</b> – known occurrences in the MCCO Additional Project Area identified through targeted floristic surveys. Vegetation mapped as PCT 1598 and PCT 1607 is considered to conform to the Box Gum Woodland CEEC based on the identification of samples of intergrades or hybrids of Blakely’s red gum ( <i>Eucalyptus blakelyi</i> ) and forest red gum ( <i>Eucalyptus tereticornis</i> ). A total of 15.6 hectares of woodland and 8.4 hectares of derived native grassland is considered to meet the diagnostic criteria of the CEEC.	Yes – Detailed assessment of significance provided in Appendix 24 of the EIS. There are no changes to the outcomes of that assessment
<b>Threatened Flora Species</b>				
<i>Androcalva procumbens</i>	V	V	Not present – the MCCO Additional Project Area does not provide suitable habitat for this species. This species occurs more commonly in the Dubbo-Mendooran-Gilgandra region and the Pilliga and Nymagee areas	No
Sandy Hollow Commersonia <i>Androcalva rosea</i>	E	E	Not present – detailed targeted surveys did not identify this species within the MCCO Additional Project Area, however known to occur in surrounding areas within an 8 km radius of Sandy Hollow.	No
Leafless Tongue-orchid <i>Cryptostylis hunteriana</i>	V	V	Not present – the MCCO Additional Project Area does not provide suitable habitat for this species however it is known to occur in the Karuah Manning and Wyong CMA sub-regions. This species appears to favour moist soils on the flat coastal plains.	No
White-flowered Wax Plant <i>Cynanchum elegans</i>	E	E	Not present – the MCCO Additional Project Area does not provide suitable habitat for this species. It is recorded from rainforest gullies scrub and scree slopes (PlantNET, 2017).	No
bluegrass <i>Dichanthium setosum</i>	V	V	Unlikely – not recorded within the MCCO Additional Project Area. It is predominantly located in the northern tablelands in the Saumarez area, west of Armidale and east of Guyra and was not recorded during detailed floristic surveys and targeted threatened species surveys	No

MNES Name	Status		Likelihood to Occur within the MCCO Additional Project Area	Further Consideration Required?
	BC Act	EPBC Act		
<i>Euphrasia arguta</i>	CE	CE	Unlikely - not recorded within the MCCO Additional Project Area and the MCCO Additional Project Area does not provide suitable habitat for this species.	No
<i>Lasiopetalum longistamineum</i>	V	V	Unlikely - the MCCO Additional Project Area provides suitable habitat for this species however it has not been recorded in the MCCO Additional Project Area during detailed floristic surveys and targeted threatened species surveys.	No
<i>Ozothamnus tessellatus</i>	V	V	Unlikely – not recorded within the MCCO Additional Project Area and is known to occur east of Ravensworth, NSW.	No
Omeo Stork's-bill <i>Pelargonium sp. striatellum</i>	E	E	Not present – the MCCO Additional Project Area does not provide suitable habitat for this species as it typically occurs just above the high water level of irregularly inundated or ephemeral lakes.	No
<i>Philotheca ericifolia</i>	-	V	Not present – the MCCO Additional Project Area does not provide suitable habitat for this species, growing chiefly in dry sclerophyll forest and heath on damp sandy flats and gullies.	No
Denman Pomaderris <i>Pomaderris reperta</i>	CE	CE	Unlikely – the MCCO Additional Project Area provides suitable habitat for this species however it has not been recorded in the MCCO Additional Project Area during detailed floristic surveys and targeted threatened species surveys.	No
Leek Orchid <i>Prasophyllum sp Wybong</i>	E	CE	<b>Recorded</b> – known occurrences throughout the MCCO Additional Project Area from targeted surveys and is known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area.	Yes – Detailed assessment of significance provided in Appendix 24 of the EIS. There are no changes to the outcomes of that assessment

MNES Name	Status		Likelihood to Occur within the MCCO Additional Project Area	Further Consideration Required?
	BC Act	EPBC Act		
Wollemi Mint-bush <i>Prostanthera cryptandroides</i> <i>subsp.cryptandroides</i>	V	V	Unlikely – the MCCO Additional Project Area does not provide suitable habitat for this species which has been recorded between Lithgow and Sandy Hollow.	No
Illawarra greenhood <i>Pterostylis gibbosa</i>	E	E	Unlikely - known only from a small number of populations in the Hunter around Milbrodale, the Illawarra and the Shoalhaven regions. It has not been recorded within the MCCO Additional Project Area and is unlikely to occur based on known distribution.	No
Austral toadflax <i>Thesium australe</i>	V	V	Unlikely - not recorded within the MCCO Additional Project Area despite targeted floristic surveys and is unlikely to occur based on a lack of preferred <i>Themeda triandra</i> habitat and the highly disturbed condition of the MCCO Additional Project Area.	No
Pokolbin Mallee ( <i>Euclayptus pumila</i> )	V	V	Unlikely - not recorded within the MCCO Additional Project Area despite targeted floristic surveys and is unlikely to occur based on a lack of preferred habitat.	No
<i>Tylophora linearis</i>	V	E	Unlikely – unlikely to occur based on known distribution.	No
<b>Threatened Fauna Species</b>				
<b>Amphibians</b>				
Booroolong frog <i>Litoria booroolongensis</i>	E	E	Unlikely - not recorded within the MCCO Additional Project Area and unlikely to occur based on known distribution and lack of suitable habitat as it is known to live along permanent streams.	No

MNES Name	Status		Likelihood to Occur within the MCCO Additional Project Area	Further Consideration Required?
	BC Act	EPBC Act		
<b>Birds</b>				
regent honeyeater <i>Anthochaera phrygia</i>	CE	CE	<b>Potential</b> – the species has not been recorded in the MCCO Additional Project Area despite targeted surveys however is known to occur in surrounding areas. The MCCO Additional Project Area contains low to moderate quality potential habitat for this species and is within the likely distribution of the species.	Yes – Detailed assessment of significance provided in Appendix 24 of the EIS. There are no changes to the outcomes of that assessment
Australasian bittern <i>Botaurus poiciloptilus</i>	E	E	Unlikely - not recorded within the MCCO Additional Project Area or surrounds and unlikely to occur based on a lack of suitable habitat within the MCCO Additional Project Area.	No
curlew sandpiper <i>Calidris ferruginea</i>	E	CE	Unlikely - not recorded within the MCCO Additional Project Area or the surrounds and unlikely to occur based on known distribution in mainly coastal wetland environments and lack of suitable habitat in the MCCO Additional Project Area.	No
red goshawk <i>Erythrorchis radiatus</i>	CE	V	Unlikely - not recorded within the MCCO Additional Project Area and is unlikely to occur based on a lack of records in NSW since the 1980s.	No
painted honeyeater <i>Grantiella picta</i>	V	V	Unlikely - not recorded within the MCCO Additional Project Area or the surrounds and unlikely to occur based on known distribution mainly on the inland slopes of the Great Dividing Range.	No

MNES Name	Status		Likelihood to Occur within the MCCO Additional Project Area	Further Consideration Required?
	BC Act	EPBC Act		
swift parrot <i>Lathamus discolor</i>	E	CE	<b>Potential</b> – the species has not been recorded in the MCCO Additional Project Area despite targeted surveys however is known to occur in surrounding areas. The MCCO Additional Project Area contains low to moderate quality potential habitat for this species and is within the likely distribution of the species.	Yes – Detailed assessment of significance provided in Appendix 24 of the EIS. There are no changes to the outcomes of that assessment
eastern curlew <i>Numenius madagascariensis</i>	-	CE	Unlikely - not recorded within the MCCO Additional Project Area or the surrounds and unlikely to occur based on known distribution in mainly coastal wetland environments and lack of suitable habitat in the MCCO Additional Project Area.	No
Australian painted snipe <i>Rostratula australis</i>	E	E	Unlikely - not recorded within the MCCO Additional Project Area or the surrounds and unlikely to occur based on known distribution in mainly shallow wetlands.	No
White-throated needle-tail <i>(Hirundapus caudacutus)</i>	-	V	Unlikely - Extensive surveys of the MCCO Additional Disturbance Area over many survey periods did not detect the aerial white-throated needletail, although the species could forage throughout the areal space above the MCCO Additional Disturbance Area. The MCCO Additional Project Area is not considered to provide a habitat for an important population of the species.	No



MNES Name	Status		Likelihood to Occur within the MCCO Additional Project Area	Further Consideration Required?
	BC Act	EPBC Act		
<b>Mammals</b>				
large-eared pied bat <i>Chalinolobus dwyeri</i>	V	V	<b>Potential</b> – not recorded within the MCCO Additional Project Area however the MCCO Additional Project Area contains suitable foraging habitat for the species. This species was considered as part of the referral assessment undertaken by Umwelt for the EPBC controlled action decision (2018/8280).	No
spotted-tailed quoll <i>Dasyurus maculatus maculatus</i>	V	E	<b>Potential</b> – not recorded within the MCCO Additional Project Area however is known to occur in surrounding areas. The MCCO Additional Project Area contains areas of suitable foraging and movement habitat for the species as the species preferred habitat is highly variable. This community was considered as part of the referral assessment undertaken by Umwelt for the EPBC controlled action decision (2018/8280).	No
Corben’s long-eared bat <i>Nyctophilus corbeni</i>	V	V	Unlikely - not recorded within the MCCO Additional Project Area or the surrounds and unlikely to occur based on known distribution primarily west of the Great Dividing Range.	No
greater glider <i>Petauroides volans</i>	-	V	Unlikely - not recorded within the MCCO Additional Project Area or the surrounds and unlikely to occur based on known distribution in contiguous eucalypt forests at higher elevations.	No
brush-tailed rock-wallaby <i>Petrogale penicillata</i>	E	V	<b>Recorded</b> – one record of a scat is known to occur near the boundary of the north-western extent of the MCCO Additional Project Area adjacent to suitable rocky habitat of the type the species is known to occupy. There is no suitable habitat for this species in the impact area of the Proposed Action and the location of the scat is greater than 1 km from the proposed additional mining area. The Project will not impact the habitat of this species and therefore it will not be adversely impacted.	No

MNES Name	Status		Likelihood to Occur within the MCCO Additional Project Area	Further Consideration Required?
	BC Act	EPBC Act		
Koala <i>Phascolarctos cinereus</i> (Combined Populations of Qld, NSW and ACT)	V	V	<b>Potential</b> – not recorded within the MCCO Additional Project Area. Habitat critical to the survival of the koala was identified, as defined by the Koala Referral Guidelines, however the species was not considered to be likely to be significantly impacted by the Project. This species was considered as part of the referral assessment undertaken by Umwelt for the EPBC controlled action decision (2018/8280).	No
New Holland mouse <i>Pseudomys novaehollandiae</i>	-	V	Unlikely - not recorded within the MCCO Additional Project Area or the surrounds and unlikely to occur based on known distribution in contiguous wet eucalypt forests and coastal heaths.	No
grey-headed flying-fox <i>Pteropus poliocephalus</i>	V	V	<b>Potential</b> – not recorded within the MCCO Additional Project Area however it is known to occur in surrounding areas with a camp located at Muswellbrook, approximately 17km from the MCCO Additional Project Area.	Yes – Detailed assessment of significance provided in Appendix 24 of the EIS. There are no changes to the outcomes of that assessment
<b>Reptiles</b>				
Pink-tailed worm lizard <i>Aprasia parapulchella</i>	V	V	Unlikely - not recorded within the MCCO Additional Project Area. Known distribution in NSW is in the Central and Southern Tablelands and the South Western Slopes but highly isolated from each other.	No
striped legless lizard <i>Delma impar</i>	V	V	Unlikely - not recorded within the MCCO Additional Project Area. The striped legless lizard is a grassland specialist, found only in areas of high-quality native grassland and nearby grassy woodland and exotic pasture.	No

**Please clarify the extent of suitable habitat for the Regent Honeyeater. The Biodiversity Assessment Report notes 6.3 hectares (ie Table 5.4) while an area of 8.6 hectares is quoted in Appendix 24 (ie page 26)**

Consultation with the DAWE (formerly DoEE) assessment officer during the preparation of the Environmental Impact Statement (EIS) determined that DAWE had identified all PCTs that contain ironbark as providing critical habitat for the species.

Review of PCTs determined that the MCCO Additional Project Area contains 147.97 hectares of woodland and forest communities that contain narrow-leaved ironbark (*Eucalyptus crebra*) and spotted gum (*Corymbia maculata*) as occurring in the canopy. These communities meet the broad definition of potential habitat that DAWE has considered as habitat critical to the survival of the species. Derived native grassland communities of these PCTs have not been included in the analysis of potential habitat. PCTs include the following:

- HU816/PCT1602 Spotted Gum - Narrow-leaved Ironbark Shrub - Grass Open Forest of the Central and Lower Hunter
- HU817/PCT1603 Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter
- HU821/PCT1607 Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter (*Eucalyptus tereticornis* x *Eucalyptus blakelyi* intergrades dominant in the canopy).

The regent honeyeater has not been recorded in the MCCO Additional Project Area and it is unlikely to contain breeding or nesting habitat for the species. The above assessment based on advice from the DAWE assessment officer at that time is conservative and based on the presence of canopy species only and with no consideration of the quality of habitat for the regent honeyeater as defined by the recovery plan for the species and knowledge of the species ecology and habitat preferences.

The 6.3 hectares of potential habitat identified in the BAR (Umwelt 2019) represents the outcome of Umwelt's analysis of potential habitat based on specific site assessment and consideration of the habitat preferences of the species, based on the recovery plan for the species. The 8.6 hectares referred to in Appendix 24 is incorrect, with the 6.3 hectares of Table 5.4 based on boundary revisions during the EIS finalisation process.

**Please provide an assessment of the Project's cumulative impact on food resources for the Grey-headed Flying-fox in the broader region, and also of the Project's proximity to any nationally significant camps**

All eucalypt forest and woodland vegetation within the MCCO Additional Project Area provides potential foraging habitat for the grey-headed flying-fox. Eucalypt-dominated vegetation communities within the MCCO Additional Disturbance Area occur across approximately 162.6 hectares.

Camp sites (breeding habitat) were not identified within the MCCO Additional Project Area and are not expected to occur. The nearest substantial roost camp site of the grey-headed flying-fox to the MCCO Additional Project Area is in Muswellbrook approximately 17 km to the east (DoEE 2019). The population estimate for grey-headed flying-foxes in Muswellbrook was estimated to be between 2,500 and 9,999 individuals during surveys in August 2018 (DoEE 2019) and recent surveys identified a population size of approximately 500 to 1200 individuals between October and December 2019 (Umwelt in prep). The highest estimate of this population is from 2015 with the population at that time estimated to be between 16,000 and 49,999 individuals (DoEE 2019). Potentially occurring

foraging individuals in the MCCO Additional Project Area are likely to be from this camp site located within 50 km of the site.

**Figure 1** shows the locations of nationally significant camp sites. The MCCO Additional Project Area is located approximately 90 km from the closest nationally significant camp site located at East Cessnock.

The Muswellbrook Camp Management Plan (Muswellbrook Shire Council 2017) provides an analysis of the foraging habitat of the Muswellbrook grey-headed flying-fox population which may potentially forage within the MCCO Additional Project Area during suitable flowering conditions in the canopy of eucalypt forest and woodland communities. This analysis identifies the extent of habitat available to the Muswellbrook population against which the cumulative loss of potential habitat for the species can be measured. Native forests and woodlands in the local area have been extensively cleared historically, with only 17% of land within 20km of the Muswellbrook population supporting native forests and woodland. The following excerpt is from the Muswellbrook Camp Management Plan (Muswellbrook Shire Council 2017):

*The number of flying-foxes present in a camp is primarily driven by the amount and quality of food available in the local area, relative to that available within migration distance (Tidemann 1999; Eby 1991; Roberts et al 2012). Flying-foxes typically feed within 20 km of their roost (Tidemann 1999), and digital maps of feeding habitat for Grey-headed Flying-foxes have been used to summarise feeding resources within 20 km of the Muswellbrook camp (Eby and Law 2008).*

*The area surrounding the Muswellbrook camp has been heavily cleared for agriculture and mining. Approximately 17% of land within 20 km of the site supports native forests and woodlands, primarily in small remnant patches. While some dry rainforest occurs in the area, it is rare and rainforest fruits provide sparse food resources for flying-foxes during late summer and autumn.*

*Approximately 90% of forested land within 20km of Muswellbrook contains flowering trees visited by flying-foxes.*

Based on the analysis provided in the Muswellbrook Camp Management Plan (Muswellbrook Shire Council 2017), approximately 19,227 hectares of potential foraging habitat exists within a 20km radius of the population. The loss of 162.6 hectares of potentially suitable eucalypt foraging habitat for this species represents a reduction of 0.8% of the local foraging habitat.

Eucalypt forest and woodland habitat of the grey-headed flying-fox continues to be cleared as a result of agricultural, mining and other industrial development and residential land uses. Habitat loss is identified in the Muswellbrook Camp Management Plan as a key threat to the survival of the species.

The MCCO Additional Project Area is considered to comprise up to 162.6 hectares of potentially suitable eucalypt foraging habitat for this species and may be productive during winter and spring. The loss of 162.6 hectares of suitable foraging habitat for the species is not considered to comprise a significant cumulative impact on foraging resources for the species in the Hunter Valley. Eucalypt forests and woodlands providing potential foraging habitat for this species occur widely in lands surrounding the MCCO Additional Project Area and more broadly across the Hunter Valley.

It is also noted that over time, the native woodland vegetation proposed as part of the rehabilitation of the MCCO Project will replace the habitat removed, however, it is recognised that the vegetation will take time to provide foraging habitat.

Therefore, given that this species has not been recorded in the MCCO Additional Project Area, and given that it only represents a relatively small area of suitable fragmented habitat when compared to the local area, it is considered that the MCCO Project is unlikely to substantially adversely affect foraging habitat critical to the survival of the species.

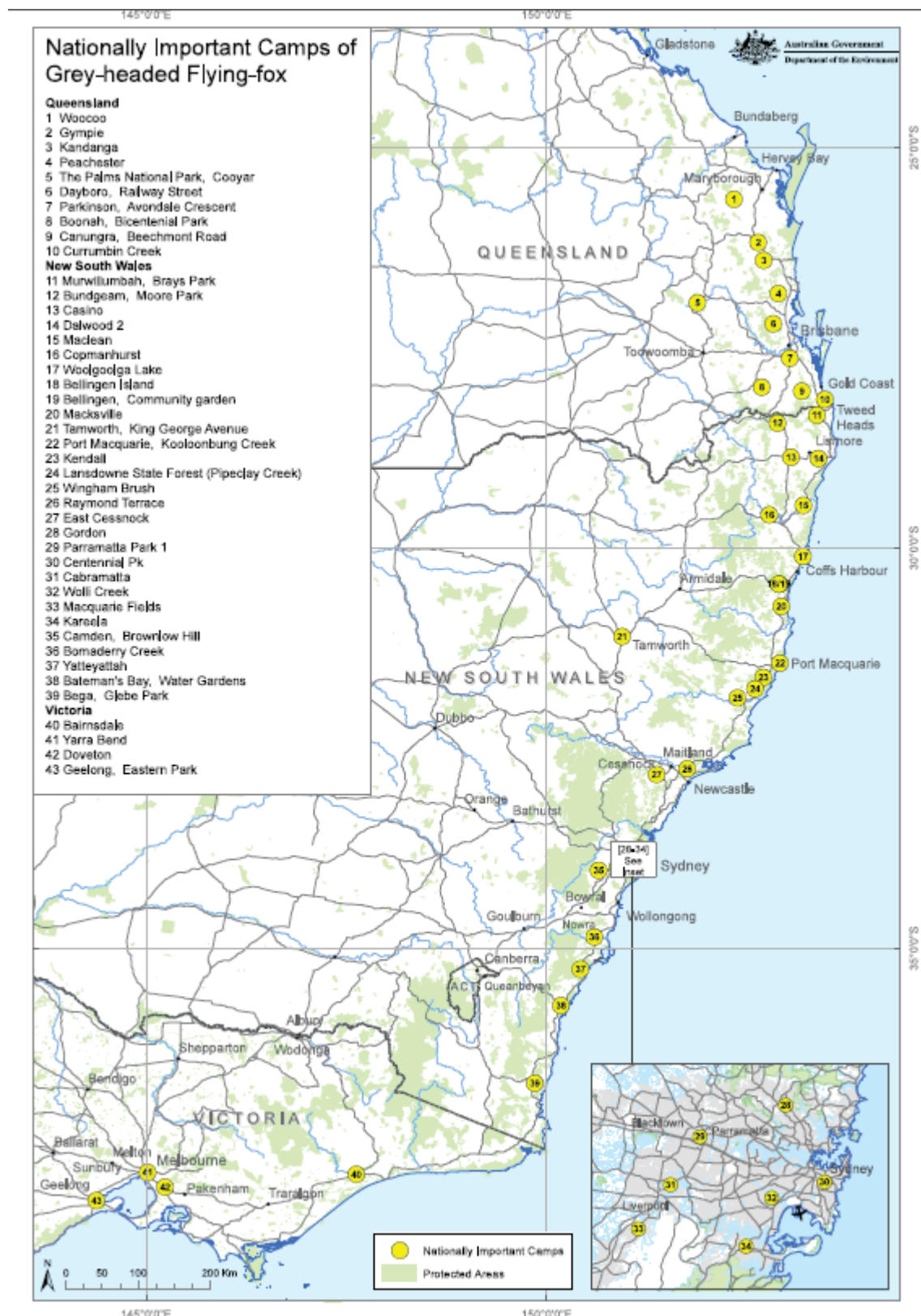


Figure 1 Nationally Important Grey-headed Flying-fox Populations



**Please identify the total number of ecosystem credits generated by White Box-Yellow Box-Blakely's Red Gum grassy woodland**

Approximately 15.6 hectares of woodland and 8.4 hectares of derived native grassland that conforms to the *White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland* CEEC will be directly impacted as a result of the MCCO Project. The following PCTs in the MCCO Proposed Additional Project Area were identified as having Blakely's red gum (*Eucalyptus blakelyi*) or Blakely's red gum/forest red gum (*Eucalyptus blakelyi* x *Eucalyptus tereticornis*) intergrades as the dominant overstorey species and are therefore considered to conform (in part) to *White Box-Yellow Box-Blakely's Red Gum Woodland and Derived Native Grassland* CEEC:

- HU812/PCT1598 Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter
- HU812/PCT1598 Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter – derived native grassland
- HU821/PCT1607 Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter.

**Table 2** identifies the areas of each and the total number of ecosystem credits generated by these three communities.

**Table 2 Ecosystem credits generated by White Box-Yellow Box-Blakely's Red Gum grassy woodland**

<i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland</i>	<i>Area of PCT that conforms to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland CEEC (ha)</i>	<i>Ecosystem Credits generated by White Box-Yellow Box-Blakely's Red Gum Grassy Woodland</i>
HU812/PCT1598 Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter	9.4	737
HU812/PCT1598 Forest Red Gum Grassy Open Forest on Floodplains of the Lower Hunter – derived native grassland	8.4	399
HU821/PCT1607 Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter.	6.2	253

**Please identify the potential foraging habitat area (in both hectares and PCTs) for the Regent Honeyeater**

Consultation with the DAWE (formerly DoEE) assessment officer during preparation of the EIS determined that they consider that all PCTs that contain ironbark provide critical habitat for the species.

In consideration of DAWE's assessment officers position, the area of potential foraging habitat in the MCCO Additional Project Area for the regent honeyeater is provided in **Table 3**, also showing each of the PCTs identified as potential habitat.

**Table 3 Area of potential foraging habitat for the regent honeyeater by PCT**

Potential Foraging Habitat	Area within the MCCO Additional Project Area (ha)
HU816/PCT1602 Spotted Gum - Narrow-leaved Ironbark Shrub - Grass Open Forest of the Central and Lower Hunter	6.3
HU817/PCT1603 Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter	135.21
HU821/PCT1607 Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter.	6.46
<b>Total area of potential foraging habitat</b>	<b>147.97</b>

**Please identify the species-credits generated by known and predicted *Prasophyllum* 'sp. Wybong' plants in the proposed offset lands**

Following the revisions made to the expert report in response to comments made by BCD through the response to submissions (RTS) phase of the MCCO Project, the revised Expert Report documented a small reduction in the predicted numbers of *Prasophyllum sp Wybong* in the proposed offsets (refer to **Table 4**).

**Table 4 Updated *Prasophyllum sp Wybong* Numbers in Proposed Offsets**

Species	Predicted Number of Orchids		
	Previous Expert Report (June 2019)	Revised Expert Report (December 2019)	Difference
<i>Prasophyllum sp Wybong</i>	1,314	1,264	-50

A total of 8,983 impact credits require offsetting (retirement) as part of the MCCO Project. Whilst there was a small reduction in the numbers of orchids in the proposed offset areas, the species-credit based offsetting outcomes of the MCCO Project remains the same, that is, that sufficient credits are generated to offset the impacts of the MCCO Project on this orchid species in accordance with the FBA (refer to **Table 5**).

**Table 5 Offset Credits generated by Known and Predicted *Prasophyllum sp Wybong* in the Mangoola Proposed Offsets**

Known and Predicted Numbers of Orchids	Number	Offset Credits
<b>Mangoola Offset site</b>		
Tarengo leek orchid ( <i>Prasophyllum petilum</i> ) (known)	877 ind	6,226
Tarengo leek orchid ( <i>Prasophyllum petilum</i> ) (predicted)	859 ind	6,099
<b>Mangrove BioBank Site</b>		
Tarengo leek orchid ( <i>Prasophyllum petilum</i> ) (known)	27 ind	191
Tarengo leek orchid ( <i>Prasophyllum petilum</i> ) (predicted)	405 ind	2,876
<b>Total Credits</b>		<b>15,392</b>

We trust that the above information meets your requirements. Please do not hesitate to contact me if you require any additional clarification.

Kind regards,

A handwritten signature in black ink, appearing to be 'AR' with a flourish.

Allison Riley  
NSW Ecology Manager





## ATTACHMENT 1

**Protected Matters Search Tool Results**



# EPBC Act Protected Matters Report

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

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: 11/06/20 15:16:20

## [Summary](#)

### [Details](#)

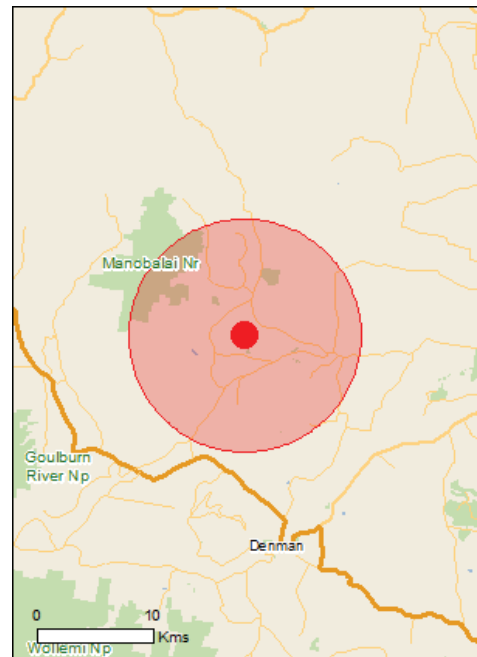
[Matters of NES](#)

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

[Extra Information](#)

### [Caveat](#)

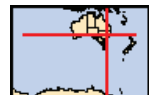
### [Acknowledgements](#)



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

[Coordinates](#)

Buffer: 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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	1
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	6
<a href="#">Listed Threatened Species:</a>	33
<a href="#">Listed Migratory Species:</a>	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.

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	21
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	1
<a href="#">Regional Forest Agreements:</a>	1
<a href="#">Invasive Species:</a>	31
<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="#">Hunter estuary wetlands</a>	100 - 150km upstream	

## Listed Threatened Ecological Communities

[ Resource Information ]

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

Name	Status	Type of Presence
<a href="#">Central Hunter Valley eucalypt forest and woodland</a>	Critically Endangered	Community likely to occur within area
<a href="#">Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia</a>	Endangered	Community may occur within area
<a href="#">Hunter Valley Weeping Myall (<i>Acacia pendula</i>) Woodland</a>	Critically Endangered	Community likely to occur within area
<a href="#">Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland</a>	Critically Endangered	Community may occur within area
<a href="#">Weeping Myall Woodlands</a>	Endangered	Community may 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	Foraging, feeding or related behaviour likely to occur within area
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Erythrorichis radiatus</a> Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Grantiella picta</a> Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needle-tail [682]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
<b>Frogs</b>		
<a href="#">Litoria booroolongensis</a> Booroolong Frog [1844]	Endangered	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 known 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 known to occur within area
<a href="#">Nyctophilus corbeni</a> Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Petauroides volans</a> Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
<a href="#">Petrogale penicillata</a> Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat known to 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 known to occur within area
<a href="#">Pseudomys novaehollandiae</a> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to 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="#">Androcalva procumbens</a> [87153]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Androcalva rosea</a> Sandy Hollow Commersonia [86861]	Endangered	Species or species habitat may occur within area
<a href="#">Cryptostylis hunteriana</a> Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
<a href="#">Dichanthium setosum</a> bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Eucalyptus pumila</a> Pokolbin Mallee [16510]	Vulnerable	Species or species habitat may occur within area
<a href="#">Euphrasia arguta</a> [4325]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Lasiopetalum longistamineum</a> [19181]	Vulnerable	Species or species

Name	Status	Type of Presence
<a href="#">Ozothamnus tessellatus</a> [56203]	Vulnerable	habitat known to occur within area Species or species habitat likely to occur within area
<a href="#">Pomaderris reperta</a> Denman Pomaderris [77103]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Prasophyllum sp. Wybong (C.Phelps ORG 5269)</a> a leek-orchid [81964]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Prostanthera cryptandroides subsp. cryptandroides</a> Wollemi Mint-bush [68496]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Pterostylis gibbosa</a> Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	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

### Reptiles

<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, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat likely to occur within area

### Listed Migratory Species

[ Resource Information ]

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

Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area

### Migratory Terrestrial Species

<a href="#">Hirundapus caudacutus</a> White-throated Needle-tail [682]	Vulnerable	Species or species habitat known to 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 likely to occur within area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area

### Migratory Wetlands Species

<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species

Name	Threatened	Type of Presence
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	habitat may occur within area Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

## Other Matters Protected by the EPBC Act

Listed Marine Species		[ Resource Information ]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
<b>Birds</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<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="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area
<a href="#">Chrysococcyx osculans</a> Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Lathamus discolor</a> Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">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 likely to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat may occur within area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

## Extra Information

### State and Territory Reserves [\[ Resource Information \]](#)

Name	State
Manobalai	NSW

### Regional Forest Agreements [\[ Resource Information \]](#)

Note that all areas with completed RFAs have been included.

Name	State
<a href="#">North East NSW RFA</a>	New South Wales

### 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>		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species



Name	Status	Type of Presence
Alauda arvensis Skylark [656]		habitat likely to occur within area  Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		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
<b>Frogs</b>		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
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

Name	Status	Type of Presence
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>		
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Cylindropuntia spp. Prickly Pears [85131]		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
Opuntia spp. Prickly Pears [82753]		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
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

# Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

## Coordinates

-32.25166 150.66189

# 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.