

## Appendix 14

### Mount Emerald Wind Farm – Threatened Fauna Species Desktop Assessment (October 2013)

Prepared by RPS



# Mount Emerald Wind Farm

## Threatened Fauna Species Desktop Assessment

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# Contents

**1.0 INTRODUCTION .....4**  
**2.0 THREATENED SPECIES ECOLOGICAL ASSESSMENTS.....5**  
**3.0 MIGRATORY SPECIES ASSESSMENTS .....16**  
**4.0 REFERENCES .....22**

# Tables

Table 1 Threatened Fauna and Flora Known To Occur or Having The Potential To Occur On The Site.....7  
Table 2 Migratory Species Potentially Occurring Within The Project Site.....17

## I.0 Introduction

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), actions that have, or are likely to have, a significant impact on a Matter of National Environmental Significance (MNES) require approval from the Australian Government Minister for Sustainability, Environment, Water, Population and Communities (the minister). As identified in Chapter 1, a delegate of the Minister determined that the proposed development was a controlled action under the provision of the EPBC Act as the action has the potential to have a significant impact on a number of MNES and therefore required an EIS before approval could be considered.

The controlling provisions for the proposal under the EPBC Act are:

- (a) Listed threatened species and ecological communities;
- (b) Listed migratory species;
- (c) World Heritage Properties; and
- (d) National Heritage Places.

This report assesses the likelihood of occurrence of listed threatened and migratory fauna species on a 2,422ha rural property on the northern end of the Herberton Range, described as Lot 7 on SP235244, and is referred to hereafter in this report as 'Mt Emerald'. The establishment of a wind farm is proposed for the site by Mt Emerald Wind Farm Pty Ltd.

This report is produced as a supplement to a preliminary flora and fauna assessment (RPS 2012), which included both desktop and extensive field surveys.

## 2.0 Threatened Species Ecological Assessments

The EPBC Protected Matters Search Tool and Queensland Department of Environment and Heritage Protection Wildlife Online Database (DEHP 2013a) returned a total of 35 threatened fauna species as being known to occur or having the potential to occur within a 10 km of the centroid of the project area (-17.166736, 145.386955).

This EPBC Protected Matters database is a predictive model that identifies all species that could potentially occur or suitable habitat for threatened species that could potentially occur within a given radius of the site. It applies a range of bio-models to predict the presence of those species and does not necessarily mean the species has been previously recorded in the area. This tool only predicts species listed as threatened or migratory under the EPBC Act, and does not predict species listed as Threatened under state legislation only.

The information used to produce the Wildlife Online lists is based on collated species lists and wildlife records acquired by the department through a range of sources including;

- Specimen collections;
- Research and monitoring programs;
- Inventory programs including extension activities;
- Literature records;
- Wildlife permit returns; and
- Community wildlife recording programs.

Two fauna species were added to these assessments that were not predicted to occur by either fauna database. The Buff-breasted Button Quail was not included in the EPBC Protected Matters Search Tool, but is considered as potentially occurring within the site, based on the presence of suitable habitat in open *Eucalyptus* woodland and known records from nearby Mareeba and Mt Molloy. The 'Near-threatened' Diadem Horseshoe Bat was not predicted using the EPBC Protected Matters Search Tool as it has no threatened species status under the EPBC, and there were no nearby records that had been incorporated into the Wildlife Online database. However, this species was recorded on the subject site during field surveys.

To assist in assessing the likelihood of occurrence, locations of fauna sightings and museum records were obtained from the Atlas of Living Australia, Qld Museum fauna record databases and previous studies undertaken on the site (RPS 2012). Likelihood of occurrence was determined for the species utilising the site for any purpose, including overflying. The site has a number of wetlands in proximity, and several wetland species (e.g. Little pied cormorants, Darters, Australian pelicans, unidentified ducks, Little black cormorants) have been observed overflying, but not actually utilising any habitats within the subject site.

Of the 37 species assessed for likelihood of occurrence in **Table 1** below, 15 species are not considered likely to occur on the site due to the lack of suitable habitats: principally closed rainforest, wet sclerophyll forest, permanent wetlands or streams. An additional five species, the Squatter Pigeon, Eastern Bristlebird, Star finch (eastern), Northern Bettong, Grey-headed Flying-fox, and Brush-tailed Rabbit Rat are also considered unlikely to occur on the site given knowledge of their known current distributions. Thirteen species are considered to have a 'Moderate' likelihood of occurrence either due to the presence of suitable habitat or likelihood of overflying, but no positive sightings during field investigations. Of the EPBC-listed fauna, three threatened species, the Northern Quoll (*Dasyurus hallucatus*), Spectacled Flying-fox (*Pteropus conspicillatus*) and Bare-rumped Sheathtail (*Saccolaimus saccolaimus nudiclatus*) bat were positively

confirmed during the field surveys along with the NCA listed Diadem Horseshoe Bat (*Hipposideros diadema reginae*)

Table 1 Threatened Fauna and Flora Known To Occur or Having The Potential To Occur On The Site

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
<b>FISH</b>					
Lake Eacham Rainbowfish	<i>Melanotaenia eachamensis</i>	C, E	This small freshwater fish prefers small streams and lakes, but has disappeared from much of its former range. It is now restricted to the headwaters of the Johnstone, Tully and Barron Rivers above an altitude of 500m (Curtis <i>et al</i> 2012).	<b>LOW:</b> The site is in the Barron River catchment and is above 500m elevation but the site does not contain permanent streams or lakes.	Yes
Freshwater Sawfish	<i>Pristis microdon</i>	C, V	This large fish species inhabits sandy or muddy bottoms of shallow coastal waters, estuaries, river mouths, freshwater rivers and isolated water holes (Curtis <i>et al</i> 2012).	<b>LOW:</b> The site does not contain the preferred habitat of this species. There are no permanent streams on the site and is a significant distance and elevation from suitable coastal environments.	No
<b>FROGS</b>					
Waterfall Frog	<i>Litoria nannotis</i>	E, E	This species is patchily distributed across the Wet tropics of north-eastern Queensland across an altitudinal range of 100-1,300m. It inhabits fast flowing streams in rainforest and adjacent sclerophyll forest (Hoskin & Hero 2008).	<b>LOW:</b> The site does not contain the preferred habitat of this species. There are no permanent streams, rainforest or wet sclerophyll vegetation communities on the site.	No
Mountain Mist Frog	<i>Litoria nyakalensis</i>	E, CE	This frog species has not been recorded since 1990; however, there is still insufficient data to list it as extinct. Suitable habitat is considered to be fast flowing streams in rainforest and wet sclerophyll, where they were found near riffles or cascade (Hoskin & Hero 2008).	<b>LOW:</b> The site does not contain the preferred habitat of this species. There are no permanent streams, rainforest or wet sclerophyll vegetation communities on the site.	No
Common Mist Frog	<i>Litoria rheocola</i>	E, E	The Common mist frog occurs from Broadwater Creek National Park (north of Ingham) to Amos Bay (south of Cooktown) in northern Queensland, at altitudes between 0 and 1,180m above sea level. The species is restricted to fast flowing rocky creeks and streams in rainforest or wet sclerophyll forest (SEWPaC 2012a).	<b>LOW:</b> The site does not contain the preferred habitat of this species. There are no permanent streams, rainforest or wet sclerophyll vegetation communities on the site.	No
Australian Lacelid	<i>Nyctimystes dayi</i>	E, E	The Lace-eyed tree frog occurs throughout the Wet Tropics Bioregion from Paluma to Cooktown, at altitudes between 0 and 1,200m. It is associated with rainforests and rainforest margins. At low elevations, the Lace-eyed Tree Frog favours rock soaks, narrow ephemeral streams and rock	<b>LOW:</b> The site does not contain the preferred habitat of this species. There are no permanent streams or rainforest communities on the site.	No



Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
			outcrops in larger watercourses (SEWPaC 2012b).		
Magnificent Brood Frog	<i>Psuedophryne covacevichae</i>	V, V	Populations of this brightly coloured frog are known from a small area 27km by 9km near Millstream Falls, Ravenshoe (McDonald <i>et al.</i> 2000), in open eucalypt woodlands with grassy understoreys (Curtis <i>et al.</i> 2012). Known locations are on acid volcanic and granitic hills above 800m. Adults have mostly been located in seepage areas however dry season habitat use, movement patterns, and habitat use by tadpoles and metamorphs is unknown (McDonald <i>et al.</i> 2000). Museum records are known from vegetation contiguous and within 50km of the Mt Emerald.	<b>MODERATE:</b> Although this species is not known not known from outside current distribution near Millstream Falls, areas of <i>Xanthorrhoea/ Themeda triandra</i> understorey habitats at Mt Emerald fit the broad habitat description but extent of seepage areas is unknown. The current limited distribution size may be an artefact of low sampling effort across its potential range.	No
<b>REPTILES</b>					
Salt-water Crocodile, Estuarine Crocodile	<i>Crocodylus porosus</i>	V,-	The Estuarine crocodile inhabits coastal rivers and swamps and extends inland along major drainage systems. It is also occasionally observed in the open ocean (Wilson & Swan 2010).	<b>LOW:</b> The site does not contain the preferred habitat of this species. There are no permanent streams or deep waterholes necessary for this species.	No
Common death adder	<i>Acanthophis antarcticus</i>	NT, -	This is a relatively short, squat elapid snake found in a broad range of vegetation types including rainforest, woodland and grassland, but in association with deep leaf litter (DEHP 2013). Refuge within suitable habitat includes fallen logs, leaf litter and rocks (DEHP 2013). It should be noted that the taxonomy of this species is poorly known with some known populations possibly being the 'Least-Concern' Northern Death adder <i>A. praelongus</i> (Pers.comm. Keith McDonald).	<b>MODERATE.</b> Mt Emerald is within the currently accepted range for this species and its broad tolerance to vegetation types would not exclude it from here. They are very difficult to detect in low abundances but if present on site may occur in fire-protected areas where leaf litter is able to accumulate. Other microhabitat potentially suitable as daytime refuges includes fallen timber, exfoliating rock slabs and boulder piles.	Yes
<b>BIRDS</b>					
Southern Cassowary	<i>Casuaris casuaris johnsonii</i>	E, E	This large and conspicuous bird generally requires dense tropical rainforest (such as complex/non-complex notophyll/ mesophyll vine forest) and associated habitat (such as mangrove Melaleuca, eucalypt woodland, swamp and swamp forest), that provides a year-round supply of fleshy fruit (SEWPaC 2012c).	<b>LOW:</b> The site does not contain the preferred habitat of this species. None of the Regional Ecosystem types listed as Essential Habitat factors for this species occur on site.	No
Australian Cotton Pygmy-goose	<i>Nettapus coromandelianu</i>	NT,-	Normally found on permanent water such as deeper freshwater swamps, lagoons, and dams with water lilies and other semi-emergent water plants (Pizzey & Knight,	<b>MODERATE:</b> No suitable habitat (permanent water) is present on the subject site and unlikely to utilise small ephemeral water	Yes

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
	<i>s albigennis</i>		2007). Although often seen in pairs or small groups, they congregate in larger flocks on permanent water-bodies during the dry season.	bodies. However, the species may fly over site at rotor height between suitable nearby water bodies.	
square-tailed kite	<i>Lophoictinia isura</i>	NT, -	The Square-tailed Kite typically inhabits the coastal forested and wooded lands of tropical and temperate Australia (Marchant & Higgins 1993). The species occupies a broad range of habitats including heathlands, woodlands, forests, tropical rainforests, timbered watercourses, hills and gorges (Pizzey & Knight 2007). Wildnet records indicate that this species has been sighted within 10km of the site.	<b>MODERATE.</b> Mt Emerald is within the currently accepted range for this species and vegetation communities are within the broad range of habitats used by this species. No breeding places have been recorded.	Yes
Red Goshawk	<i>Erythrotriorchis radiatus</i>	E, V	The Red goshawk occurs in coastal and sub-coastal areas in wooded and forested lands of tropical and warm-temperate Australia (Marchant & Higgins 1993). It nests in large trees, frequently the tallest and most massive in a tall stand, and nest trees are invariably within 1km of permanent water. Habitat must be open enough for fast attack and manoeuvring in flight, but provide cover for ambushing of prey. Therefore, forests of intermediate density are favoured, or ecotones between habitats of differing densities, such as between rainforest and eucalypt forest, between gallery forest and woodland, or on edges of woodland and forest where they meet grassland, cleared land, roads or watercourses (SEWPAC 2012d).	<b>MODERATE.</b> There is potential for this species to fly over and utilise the site for foraging from time to time. However, no nests or suitable nesting sites were identified during the field investigations, so breeding places are unlikely to exist.	Yes
grey goshawk	<i>Accipiter novaehollandiae</i>	NT, -	The Grey goshawk generally favours tall, wet forests, particularly in gullies, for roosting and hunting. It depends on mature forests for breeding, rarely using forest regrowth less than 30 years old (Marchant & Higgins 1993). The Grey goshawk is an opportunistic hunter preying mostly on mammals, such as rabbits, possums and sometimes bats. They also prey on birds, reptiles and insects and hunt from either concealed or exposed perches and often take prey both in flight and on the ground.	<b>LOW - MODERATE:</b> The site does not contain the preferred habitat of this species, particularly tall, mature wet forests. There is potential for this species to fly over and utilise the site for foraging from time to time. No breeding places are likely to exist.	Yes
Buff-breasted Button Quail	<i>Turnix olivii</i>	V, E	This ground-dwelling bird is most often recorded from stony and/or grassy woodlands and forest with a mid-storey of <i>Melaleuca viridiflora</i> or <i>M. minutifolia</i> , but is known to use sparsely wooded, well-drained bases of hills during the breeding season (Curtis <i>et al.</i> 2012). Rarely seen,	<b>MODERATE:</b> Suitable habitat is potentially widespread on the subject site, however, based on limited habitat records for this species, open woodland areas with a grassy understorey and a mid storey on <i>Melaleuca</i>	No

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
			however, there are a number of recorded observations from the Lake Mitchell/ Big Mitchell Creek area north of Mareeba.	<i>monantha</i> and/or <i>M. viridiflora</i> may represent the most likely habitat.	
Australian Painted Snipe	<i>Rostratula australis</i>	V, V	The Australian painted snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (SEWPAC 2012e). Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire. Although there are records from within 30km of the subject area centroid, this species is only rarely observed and the region is not considered to be important for it.	<b>LOW:</b> The subject site does not contain the preferred habitat of this species, particularly vegetated wetland habitats. They are unlikely to utilise the small ephemeral water bodies present during the wet season. No breeding places are likely to exist and they are only rarely observed in the broader region.	No
Squatter Pigeon (southern)	<i>Geophaps scripta scripta</i>	V, V	The Squatter pigeon (southern) occurs mainly in dry grassy eucalypt woodlands and open forests, mostly in sandy sites near permanent water (Curtis <i>et al.</i> 2012). It has also been recorded in highly modified grassland environments and remains common in heavily-grazed country (Curtis <i>et al.</i> 2012). It is almost always found close to bodies of water (SEWPac 2012f). The threatened southern subspecies occurs as far north as Townsville, where it is generally found in drier areas or where there are large expanses of thinly wooded grassland.	<b>LOW:</b> The subject site occurs well outside the recognised range of the threatened southern subspecies. One individual (northern race) was sighted in the vicinity of turbine #11 in Jan 2013. It is presumed that incursions for foraging are made during the wet season when there is standing water available since there are no suitable permanent water bodies to facilitate a dry season presence. Not present in 2011 EPBC Search.	Yes (northern)
Macleay's fig-parrot	<i>Cyclopsitta diophthalma macleayana</i>	V, -	This small frugivorous parrot prefers rainforest, semi-deciduous vine forest and gallery forest that include <i>Ficus</i> spp, from lowland habitats to 1200m elevation (Curtis <i>et al.</i> 2012).	<b>LOW:</b> The subject site does not contain the preferred habitat of this species.	Yes
Masked Owl (northern)	<i>Tyto novaehollandiae kimberli</i>	V, V	This owl species typically occurs in sclerophyll forest and woodland with a grassy understorey or with a mosaic of sparse and dense ground cover (Curtis <i>et al.</i> 2012). Preferred roosting sites are in tree hollows, caves or dense foliage 3-8 metres above the ground (Curtis <i>et al.</i> 2012). A historic record from 1958 exists from within 10km of the subject site.	<b>MODERATE.</b> Historic records indicate that they have occurred in the area in the past and suitably wooded areas exist in sheltered valleys where it is presumed that fire intensity is less. Not present in 2011 EPBC Search.	No
Eastern Bristlebird	<i>Dasyornis</i>	E, E	This small brown passerine bird is restricted to upland open forest and montane heath in Southern Queensland in the	<b>LOW:</b> The subject site occurs well outside the recognised range of this species. Museum	No

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
	<i>brachypterus</i>		Conondale Range, Lamington National Park and Mt Barney National Park (Curtis <i>et al</i> 2012).	records and Eremaea Birds databases do not show any records for North Queensland. Communication received from Canberra EPBC mapping department that the record was incorrect (9:74am 27-9-2013)	
Gouldian Finch	<i>Erythrura gouldiae</i>	E, E	This small brightly coloured granivorous bird prefers open tropical woodland with a grassy understorey, often in rocky hills or low escarpment country (Curtis <i>et al</i> 2012). They have now undergone a significant contraction in their range, particularly in Queensland (Garnett & Crowley 2000). The Atlas of Living Australia includes a Gouldian finch record from approximately 7km north of Mt Emerald from October 1976. There were attempts to reintroduce this species to the Mareeba area but no birds have been recorded since 2007.	<b>LOW – MODERATE:</b> The open woodland with a grassy understorey on rocky hills that dominates the project site is considered suitable habitat but it is doubtful any populations persist in the region.	Yes
Star Finch (eastern)	<i>Neochmia ruficauda ruficauda</i>	E, E	The distribution of the Star Finch (eastern) is very poorly known. The Star Finch (eastern) occurs only in central Queensland. Based on the small number of accepted records, the distribution of the Star Finch (eastern) is believed to extend north to Bowen, west to beyond Winton and, based on recent records, south to near Wowan. Within this range it occurs mainly in grasslands and grassy woodlands that are located close to bodies of fresh water (SEWPaC 2012g).	<b>LOW:</b> The subject site occurs well outside the recognised range of the Endangered eastern subspecies which is currently only known from a 20km <sup>2</sup> area in Central Queensland. A 2010 record from the Atherton Tablelands is not thought to be this subspecies..	No
Black-throated Finch (southern)	<i>Poephila cincta cincta</i>	E, E	The Black-throated finch (southern) (BTF) occurs mainly in grassy, open woodlands and forests, typically dominated by <i>Eucalyptus</i> (especially <i>E. tetradonta</i> & <i>E. platyphylla</i> ), <i>Corymbia</i> and <i>Melaleuca</i> , and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water (SEWPaC 2012h). It is likely that permanent sources of water provide refuge for this species during the dry season, especially during drought years.	<b>LOW:</b> Although the endangered subspecies occurs as far north as the Mareeba Wetlands, the subject site does not contain permanent water needed for this species to persist in an area. The species predominantly occurs on Land Zone 3 while the subject site is dominated by Land Zone 12. Not present in 2011 EPBC Search.	No
<b>MAMMALS</b>					
Northern Quoll	<i>Dasyurus hallucatus</i>	C, E	The Northern quoll is known to occur as far south as Gracemere and Mt Morgan, south of Rockhampton, and as far north as Cooktown. It occupies a diversity of habitats	<b>CONFIRMED:</b> A number of individuals of both sexes and different ages were detected across the subject site, predominantly in rocky areas	Yes

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
			including rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert. However, habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Habitats usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes (SEWPAC 2012i).	in both ridges and valleys. Quolls were detected through cage trapping, camera traps and scat identification. It was concluded that Northern quolls are abundant and widespread across the site (RPS 2012).	
Spotted-tailed Quoll	<i>Dasyurus maculatus gracilis</i>	E, E	The subspecies is mostly confined to the relatively cool, wet and climatically equable upland closed-forests (mostly above 900 m altitude) that occur in the upper catchments of rivers draining east and west of the Eastern Escarpment. It is also suggested that the species occurs in lower altitude notophyll, mesophyll and wet sclerophyll forests in lesser numbers. The subspecies utilises dens for resting and for raising young. Dens have been found in tree hollows, logs, rock crevasses and even among building materials (SEWPaC 2012j).	<b>LOW:</b> The subject site does not contain the preferred habitat of this species, particularly rainforest habitat above 900m.	No
Koala	<i>Phascolarctos cinereus</i>	C, V	The range of this population extends from approximately the latitude of Cairns to the New South Wales-Victoria border (SEWPaC 2012k). Koalas inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by species from the genus <i>Eucalyptus</i> (Martin & Handasyde 1999). The koalas diet is restricted mainly to foliage of <i>Eucalyptus</i> species but may also consume foliage of related genera, including <i>Corymbia</i> , <i>Angophora</i> and <i>Lophostemon</i> and at times supplement its diet with other species, including species from the genera <i>Leptospermum</i> and <i>Melaleuca</i> (Martin and Handasyde 1999; Moore and Foley 2000). There are very few records for the area west of the Wet Tropics rainforest, however, a 2005 record from Koah, between Kuranda and Mareeba probably represents the northern-most record for this species. .	<b>MODERATE:</b> The subject site does not contain and is not contiguous with any known koala habitat or population. Not present in 2011 EPBC Search.	No
Mareeba rock-wallaby	<i>Petrogale mareeba</i>	NT, -	This highly variable rock wallaby can only be distinguished from Allied and Sharman's rock wallaby based on genetics (Van Dyke & Strahan 2008). It prefers rocky habitats in	<b>MODERATE.</b> The subject site contains suitable habitat for this species and has unbroken connectivity to an area with a known	Yes

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
			open forest, grassy woodland or sometimes vine thicket (Van Dyke & Strahan 2008). Records exist for Granite Gorge, which is contiguous with Mt Emerald.	population.	
Northern Bettong	<i>Bettongia tropica</i>	E, E	The preferred habitat of the Northern Bettong is tall or medium open eucalypt forest with grassy understorey along the western edge of rainforest (SEWPaC 2012). Structure and floristic composition of forests vary within their range, but the limiting factor is the presence and abundance of truffle fungi (Curtis <i>et al.</i> 2012). Historically, the Northern Bettong occurred in Queensland, from Rockhampton to the present northern distribution near Cairns. The species currently occurs in only three geographically isolated locations - the Lamb Range, Paluma and Mt Zero.	<b>LOW:</b> Habitat is not considered likely to support Northern bettongs, which are currently only known from Seaview Range, Lamb Range, Mt Carbine Tablelands & Mt Windsor.	No
Green Ringtail possum	<i>Pseudocheirops archeri</i>	NT, -	This species is endemic to north-eastern Queensland and occurs over a restricted range between Paluma (north of Townsville) and the Mount Windsor Tableland (west of Mossman). It inhabits dense upland rainforest and is rarely found below 300m elevation (Van Dyke and Strahan 2008).	<b>LOW:</b> The subject site does not contain the preferred habitat of this species, particularly dense upland rainforest.	Yes
Fluffy Glider	<i>Petaurus australis un-named subspecies</i>	V, V	This glider species is restricted to tall eucalypt forest above 600m altitude that always includes <i>Eucalyptus grandis</i> , <i>E resinifera</i> and usually <i>Syncarpia glomulifera</i> and <i>Banksias</i> (Curtis <i>et al.</i> 2012).	<b>LOW:</b> The subject site does not contain the preferred habitat of this species, particularly wet sclerophyll forest containing essential feed and denning trees ( <i>Eucalyptus resinifera</i> or <i>Eucalyptus grandis</i> ).	No
Spectacled Flying-fox	<i>Pteropus conspicillatus</i>	C, V	The Spectacled Flying-fox occurs in north-eastern Queensland, between Ingham and Cooktown, and between the McIlwraith and Iron Ranges of Cape York (SEWPaC 2012m). The species is associated primarily with tropical rainforest but may also occur in mangroves, eucalypt forests, melaleuca swamps, littoral and coastal mixed forests, farmland and urban gardens (Curtis <i>et al.</i> 2012). Bats may forage up to 50-100km each night (Curtis <i>et al.</i> 2012), but roosts are always found within 6 km of rainforest (SEWPaC 2012m). The Atlas of Living Australia show records from Mareeba and Tolga, within 20km of the subject site.	<b>CONFIRMED:</b> No suitable roosting habitat (rainforest) is present on the subject site, however, the species may forage on site during mass flowering of Myrtaceous trees, and/or fly over site at rotor height between suitable nearby foraging areas.	Yes

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	C, V	This flying fox species occurs in a variety of forest and woodland communities along the east coast of Australia, from Melbourne to Mackay (Curtis <i>et al.</i> 2012).	<b>LOW:</b> The site is outside the known geographic range for this species (Mackay) and does not contain the preferred habitat.	No
Diadem Horseshoe Bat	<i>Hipposideros diadema reginae</i>	NT, -	This microbat utilises a broad range of vegetation types including lowland rainforest, eucalypt woodland, Melaleuca forests, vine thicket and open woodland (Churchill 2008). However, roosting preferences are for large caves, although they will also use disused caves and road culverts (Churchill 2008).	<b>CONFIRMED:</b> This bat species was positively confirmed to occur on the site from single call recorded during May 2010 (RPS 2012). Potential roost locations exist on the site, but are generally limited in abundance and size. Not predicted on any database searches.	No
Semon's Leaf-nosed Bat	<i>Hipposideros semoni</i>	E, E	The known broad-scale distribution for Semon's Leaf-nosed Bat includes coastal Queensland from Cape York to just south of Cooktown. There is an outlier population at Kroombit Tops, near Gladstone (Churchill 2008). Semon's Leaf-nosed Bat is found in tropical rainforest, monsoon forest, wet sclerophyll forest and open savannah woodland (Churchill 2008). This species does not have an obligatory requirement for cave roosts. Daytime roost sites include tree hollows, deserted buildings in rainforest, road culverts and shallow caves amongst granite boulders or in fissures (SEWPaC 2012n).	<b>MODERATE.</b> The subject site contains suitable habitat for this species, including suitable vegetation communities and abundant potential roost sites. No records could be located for any area in or west of the Wet Tropics rainforest between Cedar Bay National Park and Townsville.	No
Greater Large-eared Horseshoe Bat	<i>Rhinolophus philippinensis maros</i>	E, E	This species occurs only in northern Queensland, from the Iron Range southwards to Townsville and west to Chillagoe (Churchill 2008). The species is found in lowland rainforest, along gallery forest-lined creeks within open eucalypt forest, <i>Melaleuca</i> forest with rainforest understorey, open savanna woodland and tall riparian woodland of <i>Melaleuca</i> , Forest red gum ( <i>E. tereticornis</i> ) and Moreton Bay ash ( <i>C. tessularis</i> ) (SEWPaC 2012o). It mainly roosts in caves and underground mines located in rainforest, and open eucalypt forest and woodland, however roosts have also been observed in road culverts, and it is suspected that the species also uses basal hollows of large trees, dense vegetation, rockpiles and areas beneath creek banks (SEWPaC 2012o).	<b>MODERATE.</b> The subject site contains suitable habitat for this species, including suitable vegetation communities and potential roost sites.	No
Bare-rumped Sheath-tail Bat	<i>Saccolaimus saccolaimus nudicluniatu</i>	E, CE	Occasional individuals have been collected from a narrow coastal region (less than 40 km inland) between Ayr and Cooktown, North Queensland, with one isolated specimen	<b>CONFIRMED.</b> The subject site contains suitable habitat for this species, particularly in the lower reaches of Granite Creek where <i>E.</i>	No

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
			from north of Coen on Cape York Peninsula (SEWPaC 2012p). The species inhabits tropical woodland and tall open forests where it roosts in long, wide hollows in the trunks of various Eucalypts, especially <i>E. tetradonta</i> and <i>E. platyphylla</i> (Churchill 2008). It appears to prefer coastal Eucalypt forests with high annual rainfall (Curtis <i>et al.</i> 2012).	<i>platyphylla</i> is present. Calls potentially belong to this species have been recorded in the vicinity of turbine #30 and turbine #38 (RPS 2012).	
Brush-tailed Rabbit Rat	<i>Conilurus pencillatus</i>	C, V	This small rodent lives in mixed eucalypt open forest and woodland, or on <i>Casuarina</i> -dominated sand dunes, but occurs mostly in the Kimberley (Western Australia), and Cobourg Peninsula and Kakadu in the Northern Territory. The only known Queensland population is on Bentinck Island, Gulf of Carpentaria (Van Dyke and Strahan 2008).	<b>LOW:</b> The subject site is a significant distance outside the known geographic range for this species, and does not contain likely habitat.	No

<sup>1</sup> Conservation status as listed under the NCA, where E: Endangered, V: Vulnerable, NT: Near Threatened; C: Common and the EPBC Act, where CE\*: Critically Endangered, E\*: Endangered, V\*: Vulnerable, -: No listing.

<sup>2</sup> Likelihood of occurrence is based on the known distribution and ecological requirements of the species in the context of the site, where **Low:** No recent records or suitable habitat present on the site; **Moderate:** Recent records and/or suitable/preferred habitat present and/or species that they commonly associated with are present on the site, or likely to overfly the site, however, the species was not recorded during the field investigations; and **High:** Known to occur on the site through direct observation within or immediately adjacent to the site.

<sup>3</sup> Previous records exist within 10km of the site (Wildlife Online).



### 3.0 Migratory Species Assessments

Under the EPBC, an action will require approval from the Federal Environment Minister if the action has, will have or is likely to have a significant impact on a listed migratory species. Significant impacts are defined as impacts which degrade areas of important habitat for listed migratory species, or which disrupt the lifecycle of ecologically significant populations of the listed migratory species.

DEWHA (2009) notes that an action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;
- Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or
- Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Important habitat is defined in terms of

- (a) Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or
- (b) Habitat that is of critical importance to the species at particular life-cycle stages; and/or
- (c) Habitat utilised by a migratory species which is at the limit of the species range; and/or
- (d) Habitat within an area where the species is declining (DEWHA 2009).

Criteria are not specified for determining the ecological significance of a population of a migratory species. Exactly what constitutes an 'ecologically significant proportion' of the population is different for each species, and may need to consider the species' population status, genetic distinctiveness and species specific behavioural patterns (DEWHA 2009).

The EPBC Protected Matters Search Tool lists a total of 17 species (16 birds and the Estuarine Crocodile) as known or having the potential to occur up to 10km around the project site (refer **Table 2**). Of these, nine species were recorded in the DEHP Wildnet search as having been recorded within 10km of the centroid of the subject site.

Due to the lack of suitable habitat, principally permanent vegetated water bodies, it is not considered likely that six of these migratory listed species will utilise the site as roosting, nesting or foraging habitat (refer **Table 2**). Four species were assessed as having a Moderate likelihood of occurrence, in that suitable habitat exists but were not recorded during site surveys. Bird species that are unlikely to utilise the subject site but possibly fly over the site whilst moving between suitable surrounding habitats were also given a Moderate likelihood of occurrence.

A total of five EPBC migratory listed species were recorded during the field surveys (refer **Table 2**). It is not considered that the subject site represents Important Habitat for any of the listed migratory species. It is also not considered that the construction phase of the proposed project is likely to have a significant impact; however, mortality to animals in transit through the site during the operational phase of the project is an unknown level of impact and outside the scope of the current report to assess.

Table 2 Migratory Species Potentially Occurring Within The Project Site

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
<b>REPTILES</b>					
Salt-water Crocodile, Estuarine Crocodile	<i>Crocodylus porosus</i>	V,-	The Estuarine crocodile inhabits coastal rivers and swamps and extends inland along major drainage systems. It is also occasionally observed in the open ocean (Wilson & Swan 2010).	<b>LOW:</b> The subject site does not contain the preferred habitat of this species. There are no permanent streams or deep waterholes necessary for this species.	No
<b>BIRDS</b>					
Australian Cotton Pygmy-goose	<i>Nettapus coromandelianus albigennis</i>	MW	Normally found on permanent water such as deeper freshwater swamps, lagoons, and dams with water lilies and other semi-emergent water plants (Pizzey & Knight, 2007). Although often seen in pairs or small groups, they congregate in larger flocks on permanent water-bodies during the dry season.	<b>MODERATE:</b> No suitable habitat (permanent water) is present on the subject site and unlikely to utilise small ephemeral water bodies. However, the species may fly over site at rotor height between suitable nearby water bodies.	Yes
Great Egret, White Egret	<i>Ardea alba</i>	MM, MW	Great egrets are widespread and occur in all states/territories. They have been reported in a wide range of wetland habitats (for example inland and coastal, freshwater and saline, permanent and ephemeral, open and vegetated, large and small, natural and artificial) (SEWPAC 2012q). These include swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs (Marchant & Higgins 1993).	<b>MODERATE:</b> The site does not contain the preferred habitat of this species and unlikely to utilise small ephemeral water bodies. However, the species is common in surrounding areas and may fly over site at rotor height between suitable nearby water bodies.	No
Cattle Egret	<i>Ardea ibis</i>	MM, MW	The Cattle egret is widespread and common according to migration movements and breeding localities surveys (SEWPAC 2012r). The species occurs in tropical and temperate grasslands, woodlands and terrestrial wetlands. High numbers have been observed in moist, low-lying poorly drained pastures with an abundance of high grass; it avoids low grass pastures. It is commonly associated with the habitats of farm animals, particularly cattle, and is known to follow earth-moving machinery. It also uses predominately shallow, open and fresh wetlands including meadows and swamps with low emergent vegetation and	<b>MODERATE.</b> The subject site contains potential seasonal habitat for this species.	No

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
			abundant aquatic flora (Marchant & Higgins 1993).		
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	MT	The White-bellied sea-eagle is distributed along the coastline (including offshore islands) of mainland Australia and Tasmania. It also extends inland along some of the larger waterways, especially in eastern Australia (SEWPAC 2012s). The habitats occupied by the sea-eagle are characterised by the presence of large areas of open water (larger rivers, swamps, lakes, the sea). Birds have been recorded at or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs, saltmarsh and sewage ponds, as well as in (or flying over) a variety of terrestrial habitats (Marchant & Higgins 1993).	<b>HIGH:</b> This species has been recorded during site surveys. There is potential for this species to fly over at rotor height. No nests or suitable nesting sites were identified during the field investigations.	Yes
Sarus Crane	<i>Grus antigone</i>	MW	This large crane prefers well-vegetated shallow freshwater wetlands, isolated swamps in eucalypt forest, grasslands, paddocks, ploughed fields, irrigated pastures, bore drains, claypans, crops, grain stubbles and sometimes tidal areas (Pizzey & Knight 2007). Locally common on the Atherton Tablelands (Pizzey & Knight 2007).	<b>HIGH:</b> Several flocks and aggregations have been seen on or adjacent to the subject site (RPS 2012). No suitable foraging/roosting habitat present on site and unlikely to utilise small ephemeral water bodies. There is potential for this species to fly over at rotor height between suitable nearby habitat.	Yes
Latham's Snipe, Japanese Snipe	<i>Gallinago hardwickii</i>	MW	Latham's snipe is a non-breeding visitor to south-eastern Australia, and is a passage migrant through northern Australia (i.e. it travels through northern Australia to reach non-breeding areas located further south) (Higgins & Davies 1996). It occurs in permanent and ephemeral wetlands up to 2,000 m above sea-level and usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies) (SEWPAC 2012t).	<b>LOW:</b> The site does not contain the preferred wetland habitat of this species and is unlikely to utilise small ephemeral water bodies.	No
Painted Snipe	<i>Rostratula benghalensis s. lat.</i>	MW	The Australian painted snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (SEWPAC 2012e). Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire.	<b>LOW:</b> The subject site does not contain the preferred habitat of this species, particularly vegetated wetland habitats. They are unlikely to utilise the small ephemeral water bodies present during the wet season. No breeding places are likely to exist.	No
Fork-tailed Swift	<i>Apus pacificus</i>	MMB	The Fork-tailed swift is a non-breeding visitor to all states	<b>MODERATE.</b> The subject site contains	No

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
			and territories of Australia (Higgins 1999). In north-east Queensland there are many records east of the Great Divide from near Cooktown and south to Townsville. The species is almost exclusively aerial, and mostly occur over inland plains, over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They also occur over settled areas, including towns, urban areas and cities (SEWPAC 2012u).	suitable habitat for this species. The Atlas of Living Australia has a 2010 record 10.2km north of the Mt Emerald centroid. The species may fly over site at rotor height between suitable nearby water bodies.	
White-throated Needletail	<i>Hirundapus caudacutus</i>	MT	The White-throated needletail breeds in the Northern Hemisphere but is widespread in eastern and south-eastern Australia during summer months (Barrett <i>et al.</i> 2003; Higgins 1999). In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains (SEWPAC 2012v). The species is almost exclusively aerial, from heights of less than 1m up to more than 1,000m above the ground. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest (Higgins 1999).	<b>HIGH:</b> - Several flocks (up to 50 individuals) have been recorded flying within the rotor sweep area in the vicinity of turbines #62, 65, 66 and 70 (RPS 2012).	No
Rainbow Bee-eater	<i>Merops ornatus</i>	MT	The Rainbow bee-eater is distributed across much of mainland Australia, where it is both a migratory and wintering resident species. The species occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation (Higgins 1999). It usually occurs in open, cleared or lightly-timbered areas that are often, but not always, located in close proximity to permanent water (SEWPAC 2012w). It also occurs in inland and coastal sand dune systems, and has been recorded in various other habitat types including heathland, sedgeland, vine forest and vine thicket, and on beaches (Higgins 1999).	<b>HIGH:</b> This species is regarded as being among the most common bird species on the site (RPS 2012). No nest sites were observed on the subject site.	Yes
Black-faced Monarch	<i>Monarcha melanopsis</i>	MT	The Black-faced monarch is found along the coast of eastern Australia, becoming less common further south. The species inhabits rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating. It forages for insects among foliage, or catches flying insects on the wing	<b>LOW:</b> The site does not contain the preferred rainforest habitat of this species. It is likely to utilise patches of rainforest and gallery forest to disperse, reducing likelihood of flying within rotor strike zone.	Yes

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
			(Marchant & Higgins 1993).		
Spectacled Monarch	<i>Monarcha trivirgatus</i>	MT	The Spectacled monarch is found throughout coastal north-eastern and eastern Australia and coastal islands, from Cape York (Qld) to the Watson River on the west coast and to Port Stephens (NSW) on the east coast. It inhabits the understorey of mountain and lowland rainforests, thickly wooded gullies, waterside vegetation including mangroves, mostly well below the canopy (Pizzey & Knight 2007).	<b>LOW:</b> The site does not contain the preferred rainforest habitat of this species. It is likely to utilise patches of rainforest and gallery forest to disperse, reducing likelihood of flying within rotor strike zone.	Yes
Satin Flycatcher	<i>Myiagra cyanoleuca</i>	MT	The Satin flycatcher is widespread in eastern Australia. In Queensland, it is widespread but scattered in the east (SEWPAC 2012x). Satin flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands. They especially prefer wet sclerophyll forest with a tall shrubby understorey of tall acacias (Blakers <i>et al.</i> 1984). They are mainly insectivorous, preying on mostly insects, although very occasionally they will also eat seeds. They are arboreal foragers, feeding high in the canopy and subcanopy of trees, usually sallying for prey in the air or picking prey from foliage and branches of trees (Pizzey & Knight 2007).	<b>MODERATE.</b> The subject site contains suitable habitat for this species, particularly along heavier wooded valleys.	Yes
Rufous Fantail	<i>Rhipidura rufifrons</i>	MT	The Rufous fantail is found throughout coastal eastern Australia and coastal islands (Pizzey & Knight 2007). It inhabits the understorey of rainforest, wetter eucalypt forest, thickly wooded gullies, monsoon forest, paperbarks, sub-inland and coastal scrubs, and vegetation along watercourses. They are mainly insectivorous, preying on arthropods, mostly insects which are gleaned from leaves, branches, the ground and logs (Pizzey & Knight 2007).	<b>HIGH:</b> This species has been sighted at least once on the subject site (RPS 2012). The open woodland vegetation on the subject site is considered to represent potential habitat for this species, particularly along the ephemeral watercourses.	Yes
Gouldian Finch	<i>Erythrura gouldiae</i>	MT	This small brightly coloured granivorous bird was formerly common in tropical woodland with a grassy understorey (Garnett & Crowley 2000), but has now undergone a significant contraction in their range, particularly in Queensland.	<b>LOW:</b> The open woodland with a grassy understorey on rocky hills that dominates the project site is considered suitable habitat but it is doubtful any populations persist in the region.	Yes
Barn Swallow	<i>Hirundo rustica</i>	MT	The Barn swallow is a non-breeding migrant to Australia, usually occurs patchily along the north coast from the Pilbara region, Western Australia, to Fraser Island in Queensland (SEWPAC 2012y). It is recorded in open	<b>MODERATE.</b> The subject site contains woodland areas suitable for this species. The Atlas of Living Australia has a 1976 record from the 10 minute grid square containing the	No

Common Name	Scientific Name	Status <sup>1</sup>	Habitat	Assessed Likelihood of Occurrence <sup>2</sup>	DEHP Record <sup>3</sup>
			country in coastal lowlands, often near water, towns and cities. Birds are often sighted perched on overhead wires (Blakers <i>et al.</i> 1984), and also in or over freshwater wetlands, paperbark Melaleuca woodland, mesophyll shrub thickets and tussock grassland (Schodde & Mason 1999).	Mt Emerald centroid and there are confirmed 2013 records from Kairi approximately 16 from the centroid. This is an uncommon bird unlikely to ever be present in significant numbers in the subject site. .	

<sup>1</sup> Migratory status as listed under the EPBC, where MW – migratory wetland species, MT - migratory terrestrial species, MM – migratory marine species MMB - migratory marine birds, -: No listing.  
<sup>2</sup> Likelihood of occurrence is based on the known distribution and ecological requirements of the species in the context of the site, where **Low**: No recent records or suitable habitat present on the site; **Moderate**: Recent records and/or suitable/preferred habitat present and/or species that they commonly associated with are present on the site, or likely to overfly the site, however, the species was not recorded during the field investigations; and **High**: Known to occur on the site through direct observation within or immediately adjacent to the site.  
<sup>3</sup> Previous records exist within 10km of the site (Wildlife Online).

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