30 October 2020

[redacted]

By email

Dear [redacted]

Summary of Red-tailed Black-Cockatoo flight behaviour investigation

Our ref: Matter 30754

This letter report provides details and findings of an investigation undertaken to document flight behaviours of South-eastern Red-tailed Black-Cockatoo near Edenhope, Victoria. The study was collaboratively supported by Neoen (Australia) Pty Ltd and Wind Projects Australia Pty Ltd. In the absence of any pre-existing quantitative data about flight behaviour of the species, the aim of the study is to provide some empirical information about this aspect that may assist understanding of wind turbine collision risk for the species. We recognise that there are significant uncertainties associated with assessment of potential effects of wind energy on the population of South-eastern Red-tailed Black-Cockatoo and they are discussed in this report.

The report provides background information about the population as a context for subsequent details about the rationale and findings of our study. It concludes with a consideration of implications for the proposed Wombelano Wind Farm.

As always, I am more than happy to discuss any aspects.

Cheers,

Ian Smales

Principal Zoologist

Biosis Pty Ltd
Melbourne

38 Bertie Street
Port Melbourne VIC 3207

Phone: 03 8686 4800
Fax: 03 9646 9242

ACN 006 175 097
ABN 65 006 175 097

Email: melbourne@biosis.com.au

biosis.com.au

Summary of Red-tailed Black-Cockatoo flight behaviour investigation for Wombelano Wind Farm

26 October 2020

Background

Key information about the South-eastern Red-tailed Black-Cockatoo *Calyptorhynchus banksii graptogyne* is detailed in the *National recovery plan for the South-eastern Red-tailed Black*-Cockatoo (Commonwealth of Australia 2007) and a background document to the plan. The following background information is extracted from those sources.

This subspecies of the Red-tailed Black-Cockatoo occurs as a single population in a small area of south-eastern Australia bounded by Keith, Lucindale and Mt Gambier in South Australia, and Portland, Casterton, Toolondo, Natimuk, Dimboola, Nhill and Kaniva in Victoria. The total extent of occurrence is approximately 18 000 km² with about 28% of this area occupied. The population is widespread but rare within this range and breeds across much of it.

The annual co-ordinated count of South-eastern Red-tailed Black-Cockatoos in May 2019 recorded 1193 birds. Counts recorded 839 in 2018 and 810 in 2017. A limited count only was made in 2020 due to COVID-19 restrictions (South-eastern Red-tailed Black-Cockatoo Recovery Program website: http://www.redtail.com.au/news/138/72/Locals-Look-to-the-Skies-for-Red-tailed-Black-Cockatoos.html).

The population is restricted to Desert Stringybark *Eucalyptus arenacea* and Brown Stringybark *E. baxteri* woodlands occurring on deep aeolian sands in the Glenelg, Wimmera and Naracoorte Plains, and adjacent woodlands of River Red Gum *E. camaldulensis,* Yellow Gum *E. leucoxylon* and Buloke *Allocasuarina luehmannii.*

The subspecies is highly specialised, feeding primarily on the seeds of the two closely related eucalypt species, Desert and Brown Stringybark, and seasonally on the seeds of Buloke. The birds feed both in blocks of forest and scattered paddock trees. They feed almost entirely on the stringybark species that has fruited most recently and there are marked periods of food shortage between new seed crops which have a profound effect on the birds' annual distribution, movements, and nesting success.

The population does not make routine annual movements but apparently moves throughout the range in response to changes in the availability of stringybark and Buloke seed. In some years, most birds occur in the northern part of the range as they feed on Buloke and *E. arenacea*, and in other years most occur in the southern part of the range and feed on *E. baxteri.*

Red-tailed Black-Cockatoos require very old, large, hollow eucalypts for nesting. Over 95% of known nest sites are within 2km, and all are within 5km, of >5ha blocks of stringybark. They prefer hollows in dead trees (81%), but also use live trees. Nests are most often found in farmland with scattered live and dead Red Gums. The breeding season starts in September and nests with eggs are frequently found up to December, however, they may nest successfully in any season.

Uncertainties associated with risk assessment for Red-tailed Black-Cockatoo

Wind energy presents some level of risk to fauna, particularly the potential for injury and death of birds and bats due to collisions with the moving blades of wind turbines.

The Victorian Government's *Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria* (State of Victoria 2016) notes that:

> *Impacts on flora and fauna species and habitat from wind energy facilities and associated infrastructure can be minimised through siting and design measures at the project planning stage. Project specific impacts can vary widely with location and species. The assessment of a proposed development must carefully examine any risk to flora and fauna species and project design and adaptive management measures should be applied where necessary.*

The *Policy and Planning Guidelines* also prescribe a number of areas of Victoria from which wind energy facilities are excluded. The range of the Red-tailed Black-Cockatoo is not among the exclusion areas. In light of the broader potential for wind energy development proposals within the subspecies' range, it was deemed prudent to consider how assessment for the subspecies may proceed and particularly, how uncertainties may be addressed. It is worth noting that under relevant Victorian Planning Schemes there is a Schedule to the Environmental Significance Overlay specifically for protection of Red-tailed Black-Cockatoo habitat areas. It is substantially focussed on measures to protect vegetation for the subspecies.

There are a number of uncertainties related to knowledge of the South-eastern Red-tailed Black-Cockatoo at the population or landscape-scale and over long timeframes. Hence, while improved understanding of these aspects may be beyond the scope of an assessment for a small wind farm, some of them could be addressed in a collaborative manner between the wider wind energy industry and DELWP, as was done for the recently completed investigation of Brolgas in western Victoria. The proposal by Wind Projects Australia for Wombelano Wind Farm could be a first catalyst for useful further investigations that have potential to inform wind energy proposals that are likely to be made more broadly within the range of Red-tailed Black-Cockatoos.

It is also worth noting that many of the types of uncertainty about aspects such as widespread movements and population dynamics are common to many other threatened species that are routinely considered in ecological assessments for development proposals, including for wind energy projects. Dealing with similar types of uncertainty has been integral to the assessment processes for a significant number of wind energy developments in Australia for species such as the Orange-bellied Parrot and Swift Parrot and for bats such as the Spectacled Flying-fox, Bare-rumped Sheathtail Bat and Southern Bent-wing Bat.

In the impact assessment process the usual approach to dealing with such uncertainties is to clearly define those risks that may be avoided or managed and those that remain uncertain and/or residual. This process of definition and articulation allows planning authorities to give informed consideration to various risks.

There are a number of sources of uncertainty associated with ascribing risk for Red-tailed Black-Cockatoos. In summary, the following aspects contribute to this uncertainty:

- The small size of the population and particularly the number of breeding birds within it.
- The unpredictability of the birds' movements in the short or longer-term, across a total distribution of approximately 18 000 km².

- Social behaviours in which the birds may variably occur as two or three individuals or in much larger flocks.
- Variable availability of nest sites and the consequent effects on local occurrence of the birds.
- A lack of basic information about flight behaviours, in particular the relative frequency with which the birds may fly at different heights and how this might vary in response to environmental variables and circumstances.

The flight heights of birds are of particular relevance to turbine collision risk. This is becoming an important aspect as increasingly larger turbines are available and the height of rotor blades above the ground has considerable capacity to increase. We note that Wind Projects have suggested that turbines at Wombelano may have a lower tip height of 50 metres or higher above ground-level, which is substantially higher than the majority of wind turbines currently installed in Australia that generally have lower tip heights in the range of 20 – 35 metres. Over the past 20 years Biosis has collected flight height data for many bird species at multiple wind farm sites in south-eastern Australia and elsewhere. The data demonstrates that, while all birds occasionally fly particularly high or low, the great majority of flights by most species are within fairly tight height bands that respond to their ecologies and key behavioural traits. Where the blades of turbines are above the routine flight heights of a given species, the risk of collisions is reduced accordingly. We consider that due consideration of turbine collision risk for Red-tailed Black-Cockatoos for Wombelano Wind Farm can be informed, at least to some extent, by flight-height information for the subspecies and, based on past experience, we anticipate that decision-makers in the planning process will expect this aspect to have been considered.

The present study was designed to provide some data about heights at which Red-tailed Black-Cockatoos naturally fly. Prior to this investigation there was no known quantitative data about flight behaviour of the subspecies, and the aim of the study was to provide some empirical information about this aspect that may assist understanding of wind turbine collision risk for the subspecies. It is recognised that there are limitations to the results (see Methods: Limitations, below).

Methods

Information about the localities where Red-tailed Black-Cockatoos were recorded in May 2020 was obtained from the South-eastern Red-tailed Black-Cockatoo Recovery Program website [http://www.redtail.com.au/news/138/72/Locals-Look-to-the-Skies-for-Red-tailed-Black-Cockatoos.html].

Flight data for Red-tailed Black-Cockatoos was recorded during fieldwork on 13-16 July 2020 and on 24-27 July 2020 (dates inclusive) in the Edenhope area, Victoria. The fieldwork covered suitable habitat in the region of the Wombelano Wind Farm site. It extended approximately 25 km to the west of the site (to Edenhope); approximately 17 km to the north-west; 9 km to the north-east and 20 km to the south.

Groups of birds were detected on the basis of the most current location records from Birdlife Australia online data and personal communication with Richard Hill (DELWP Casterton). DELWP habitat modelling and information about locations where the species had been frequently noted by DELWP Forest Fire Management, Edenhope were used to explore similar suitable habitat in the region when looking for additional groups of birds. The fieldwork was undertaken by Daniel Gilmore and Kristen Campbell, of Biosis. Vehicle tracks within suitable habitats were driven slowly while looking for fresh signs of the birds in the area. These include freshly broken off leaf clusters and chewed fruits of Desert Stringybark. The vehicle was stopped every 50 - 100 meters and turned off to listen for calls of the species.

On any given day, observations commenced when Red-tailed Black-Cockatoos were first found and continued until birds were observed to have moved from areas of active foraging to overnight roost locations. First observations were between 0930 hrs and 1045 hrs on five days and were between 1430 and 1530 on four days. Last observations were between 1600 and 1750 hrs on all days. Once a group was detected, observers sat quietly approximately 50 meters away from the group and recorded flight movements of the group for the day. It was not possible to observe movements of all members of feeding groups, since the flock was typically dispersed across many hectares of woodland habitat. Hence, observers could only record flight behaviours of those birds closest to them (generally up to 50 metres). However, when observations were made of groups of birds flying to roost and drinking sites, these observations generally recorded flights of the entire group.

Locations where Red-tailed Black-Cockatoos were found were recorded, as were locations where they were observed to roost. Locations were also recorded where evidence of their recent past presence in the form of feeding debris was found. These data will be submitted to the Victorian Biodiversity Atlas.

Dusk counts and flight movements were undertaken at sites that had been observed as roost sits or were suspected to be roost sites by the observers. Dusk counts involved the two observers standing or sitting under the cover of a tree and recording flights of the birds along with keeping a tally of individual birds as they flew into the roost or drinking site.

Flight data recorded for the subspecies included: number of movements, number of birds, distance from observer and height of flight. Flights out of woodland patches over open country such as adjacent paddocks and roads were noted. Distance from observer and flight height was calibrated between observers by initially using a rangefinder and clinometer to determine dome reference distances and heights for each site against which flights could be compared during the observation period.

To minimise disturbance to the birds, observers never approached to closer than 50 meters of a feeding group of birds. Often the birds would become accustomed to the observer's presence and passively move closer to the observer themselves.

Limitations

The study was undertaken during the month of July, which is a time of year when Red-tailed Black-Cockatoos tend to aggregate into relatively large flocks. This time was chosen in order to maximise capacity to obtain a body of flight data. We recognise that during the breeding season the subspecies tends to break up into more widely dispersed pairs and their flight behaviours may differ somewhat. It is also known that the population responds to the availability of food resources and that these vary temporally and across the geographic range of the population such that the concentration of the population can alter substantially between years. During the present study, a large portion of the known population was concentrated in the Edenhope area, close to the site of the proposed Wombelano Wind Farm and it was confirmed by DELWP staff that the great majority of the known population have been present in the northern portion of the subspecies' range in 2020.

Summary results

The South-eastern Red-tailed Black-Cockatoo Recovery Program notes that in May 2020, the greatest numbers of birds (approximately 450) were found near Ullswater, Victoria. Birds were also found in Victoria near Benayeo and Meereek, close to the South Australian border.

In our investigation, Red-tailed Black-Cockatoos were found and observed in Arnolds State Forest, approximately 10 km north-west of the proposed Wombelano Wind Farm site; at Yalakar State Forest, approximately 11 km south of the site; and on private property on Allnuts Road approximately 15 km south of the site. Roost sites were documented at the first two of these woodlands.

The Arnolds State Forest location is near Ullswater and is likely to represent at least a portion of the area where birds were reported to the Recovery Program in May 2020.

In addition to the locations where birds were observed, signs of recent feeding by the subspecies were recorded at four areas of woodland between Edenhope, Connewirricoo and Wombelano. These included two areas of woodland immediately east of Goroke-Harrow Road from the Wombelano Wind Farm site.

Red-tailed Black-Cockatoos were counted as they moved to roost locations. At each of Arnolds and Yalakar State Forests there were approximately 180 individuals, while there were approximately 20 recorded at Allnuts Road. Hence observations were of a total of approximately 380 birds.

Red-tailed Black-Cockatoos spent the majority of each day feeding amongst the canopy of stringybarks in woodlands. Occasional movements out of foraging areas in woodlands were observed for birds moving between feeding patches or large groups flushed out of the woodland by a bird of prey. When flushed, Red-tailed Black-Cockatoo would form a tight group and circle above the woodland for several minutes emitting alarm calls.

Flights during feeding were typically small distance movements between trees or branches. Typically the birds spent the majority of the day in small feeding groups in a single area. At around 1500 hours the birds became restless and begun to become what can be described as playful. Hanging upside down off branches, performing complicated aerials amongst the branches and courtship behaviour (males head bopping and making a raspy call). The birds started moving towards the edge of the woodland at around 1500 hours. When observing roost sites, it was noted that birds started to gather on the edges of stringybark woodland at around 1630 hours. Most direct flights from the woodland over paddocks to roost sites occurred between 1720 and 1750 hours, it was noted that these flights occurred later each day with longer daylight.

A total of 1001 observations of Red-tailed Black-Cockatoo were documented and included a total of 3639 flights (i.e. the records included multiple instances of flights by more than one individual).

During the course of their observed activities, Red-tailed Black-Cockatoos flew infrequently and they spent the great majority of their daily activity foraging while perched and climbing amongst tree canopies. Of the 3639 recorded Red-tailed Black-Cockatoo flights, 2006 (55%) were over paddocks and 1633 (45%) were within or over woodlands. While the relative proportion of flights over open ground is high, they consisted of one or two flights per day by individual birds as they moved to roost or drinking locations in the late afternoon. Other flights within woodlands were almost all very short fights made between trees. Three instances, involving 88 flights by Red-tailed Black-Cockatoos, were recorded in which the birds were disturbed by the presence of a Wedge-tailed Eagle. In these cases, the cockatoos flew above the woodland tree canopy to maximum heights respectively, of 15, 20 and 30 metres.

The heights of Red-tailed Black-Cockatoo flights recorded during the study are summarised in Table 1 for each of open country (i.e. over paddocks) and within woodlands.

Table 1 Heights of 3639 Red-tailed Black-Cockatoo flights recorded near Edenhope in July 2020

Height of flights above ground (metres)	Number of flights over open country (% within this environment)	Number of flights within / over woodland (% within this environment)
0 - 19	1110 (55%)	1341 (82%)
20 - 29	530 (26%)	278 (17%)
30 - 39	354 (18%)	6 (0.4%)
40 - 49	3 (0.2%)	0 (0.0%)
50 - 54	9 (0.4%)	8 (0.5%)

Table 1 also shows the percentage of flights within various height-bands for each of the two environments. Over open paddocks, 99% of all flights were between the ground and 39 metres high. Within woodlands, 99% of all flights were between the ground and 29 metres high and this appeared to be in response to the nature of flights that were primarily simply between trees in that environment. The highest flight documented was 54 metres above the ground.

Implications to assessment of Wombelano Wind Farm

DELWP Biodiversity (letter of 2nd August 2019) has expressed the view that targeted surveys for Red-tailed Black-Cockatoos at the site of the proposed Wombelano Wind Farm are unlikely to provide useful information about the presence of the species or its use of the site. In addition they have said that in light of the irregular flight path pattern of Red-tailed Black-Cockatoos, the inherent risk of population level impacts is unlikely to be further informed by the completion of any reasonable survey effort as this may not discount the probability that a significant proportion of the population will fly across the project area over the life of the wind farm.

We agree with the DELWP assessment that it will not be feasible to accurately predict the likely use of the Wombelano Wind Farm site by Red-tailed Black-Cockatoos over the life of the proposed wind farm. Nonetheless, our field investigation provides some empirical information about the subspecies' use of the local area in July 2020 and demonstrates that data for the subspecies' presence and activities were able to be documented during that short period. It is usual practice for an impact assessment to be informed, at least qualitatively, by both historical records and current information about a species use of the local area, including the site itself if there are relevant data, and we anticipate that both the Victoria and Commonwealth regulators will expect that Wind Projects Australia will demonstrate that effort has been put into obtaining information about the subspecies in the local area. It is pertinent that the South-eastern Red-tailed Black-Cockatoo Recovery Program has co-ordinated an extensive network of observers and annually documents the locations and counts of the subspecies. Nevertheless, we agree that it is improbable that sufficient data could be obtained from field studies to represent the vagaries of the subspecies' possible use of the site over the potential 20 – 30 year life of the proposed wind farm. For this reason we do not consider that any level of flight data for the subspecies gleaned from the site would be sufficiently representative of the long-term to be used in quantitative collision risk modelling.

Our investigation demonstrated that Red-tailed Black-Cockatoos utilised woodland in the area local to the proposed wind farm site at least during a period of 2020. While no attempt has been made to document

the subspecies possible use of, or movements through the site itself, evidence clearly demonstrates that the population uses suitable habitat in close proximity to the site. Our observations of the site indicate that it contains stands of Buloke and trees with hollows representing potential nest sites , so it seems likely that Red-tailed Black-Cockatoos would visit it on occasions.

The flight-height data collected by the study cannot be taken as a definitive indication of the heights at which the subspecies might fly through the wind farm site. However, the dataset is the only known quantification of flight-heights for the subspecies and results for the period of the study were that the very great majority of flights were below the rotor-swept height of turbines proposed for the wind farm. If it is indicative of the routine behaviours of Red-tailed Black-Cockatoos as they fly over open country like the site, the probability of them colliding with turbines proposed for the wind farm would be very low.

References

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