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- Fauna surveys
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COMMENTS ON THE WINTERBOURNE WINDFARM PROPOSAL

I refer to the document Winterbourne Wind Farm Bird Utilisation and Raptor Surveys 2020-2022 (Nature Advisory 2022) that was used to inform the Biodiversity Assessment Report (BDAR, Appendix C) and EIS for the project. A second bird/raptor use survey was conducted in March 2022 (BDAR, Appendix C: ERM 2022).

As background, in December 2022/January 2023 I visited the northern slopes of Blue Mountain in the vicinity of proposed turbine numbers B001 to B003; inspected a 1-km section of roadside woodland on Blue Mountain road between Hazeldene Road and Winterbourne Road within or adjacent to the windfarm footprint; and made slow reconnaissance drives on sections of Hazeldene Road, Winterbourne Road, Bark Hut Road, Old Brookmount Road, Moona Plains Road, Rowleys Creek Road and Chinnocks Road that fall within the footprint.

The BDAR raptor surveys, being conducted in March/April, October and January, were not conducted at the optimal time for detecting nesting Little Eagles (a listed Vulnerable species in NSW), which are most active and vocal at nest sites during the nest-building phase in early August to early September. In October half the adult breeding population (i.e. females) is closely attending nests rather than flying; in January only successful nests or territories might be detected on the basis of active, vocal juveniles (with about 30% of nests having failed before then); and by March or April juveniles have dispersed from the local population (Debus *et al.* 2007a; Debus 2017a; Larkin *et al.* 2020). Little Eagle nests are known from near the windfarm footprint, e.g. at Eastlake on Hillview Road (successful nest in 2021, i.e. NOT displaced by the Sea-Eagles there) and at Petali on Thunderbolts Way. Given the BUS record of a Little Eagle at Moona Plains, Little Eagles are possible throughout the footprint area, and I observed potential nesting and foraging habitat in the better woodland patches on lower ground in and near the footprint. More diligent survey for nesting Little Eagles, at the most appropriate time of year, is desirable, as recommended by the BDAR.

Wedge-tailed Eagle breeding density around Armidale is of the order 60 square km or less per pair, or between 4 and 7 km between neighbouring active nests (Debus *et al.* 2007b; Debus 2017a). My recent reconnaissance of the windfarm footprint and project area suggests that eagle densities are higher towards the gorge rims, with the likelihood of nest sites in secluded, wooded gullies running off, for instance, the northern slopes of Blue Mountain (based on observation of display behaviour above a suitable gully) and other wooded hills in the footprint. Indeed the BUS and raptor surveys conceded higher numbers of Wedge-tailed Eagles in the Winterbourne footprint than known for other windfarms elsewhere, but did not detect breeding activity or nests, other than indicative carrying of nesting material. The lack of detection of nests or breeding is probably because surveys were conducted in October, when indicative flight behaviour is minimal, and in January when juveniles are already mobile, and because specific nest searches were not conducted. Surveys in autumn detected peak numbers of eagles, when juveniles are independent and dispersing, and using the updrafts on ridges and gorge rims to assist their movements. Nevertheless, most BUS points were not located close enough to the gorge rims to detect the maximal numbers of eagles likely to be present in the footprint, and thus the risk to eagles was probably underestimated (BDAR Appendix E, collision risk assessment). Together with a risk assessment for a revised rotor-swept area (RSA) based on 6-Mw (not 2-Mw) turbines (see below), it is apparent that all figures for eagle numbers, movements through the RSA and collision risk should be recalculated, and searches for Wedge-tailed Eagle nests conducted at the appropriate time of year. Claiming ‘negligible’ impact on Wedge-tailed Eagles (EIS and BDAR) may be premature

My reconnaissance on roads through the project area detected Wedge-tailed Eagle pairs with fledged juveniles on Winterbourne Road between Blue Mountain Road and Old Brookmount Road, and on Old Brookmount Road approaching the windfarm footprint, and I observed multiple Wedge-tailed Eagles from most roads within the project area or footprint, including Hazeldene Road, Bark Hut Road, Moona Plains Road and Chinnocks Road. Applying estimated densities (as above), there would be at least three or four breeding pairs within the 22,000-ha project area plus offspring, immature birds and a large population of mobile eagles attracted by the topography and the updrafts at the gorge rims. It is apparent from my work and surveys throughout NSW and in other states that the New England Tablelands are a hotspot for breeding Wedge-tailed Eagles and Little Eagles.

A further issue for collision risk, particularly for raptors, is that the Winterbourne BDAR risk assessment was based on 2-Mw turbines of rotor-swept area (RSA) up to 150 m above ground. However, the newer, larger 6-Mw turbines likely to be installed in new windfarms have a much larger rotor-swept area to 230 m above ground. Thus, many of the raptor records in the Winterbourne BDAR and appendices, discounted as being above the RSA, may in fact be within the RSA and therefore incur a higher collision risk, if 6-Mw turbines are installed. Given that painting one blade (of the three) black on turbines significantly reduces the incidence of raptor collisions by making the moving turbines more visible, mandating such a strategy would seem desirable but there is no discussion of its inclusion in mitigation strategies. Likewise the ‘smart’ camera systems overseas that recognise eagle silhouettes and shut down a turbine if an eagle approaches within 1 km.

For other Australian windfarms (in Tasmania) it was claimed that eagle breeding success at and away from windfarms was similar, but that study was flawed, with breeding productivity lower at than away from windfarms (Debus 2017b). More rigorous studies with better sample sizes and design find lower eagle breeding productivity at windfarms than away from windfarms, and the driving factor is turbine mortality of breeding adults (e.g. Balotari-Chiebao *et al.* 2016). For long-lived, slowly reproducing species such as large eagles, adult mortality is a key factor in population dynamics, and local windfarm mortalities potentially create a continental-scale population sink (Katzner *et al.* 2016). In Australia, this may particularly be the case with cumulative impacts, such as potentially arise from the multiple windfarms proposed for the tablelands adjoining the Winterbourne proposal, although each windfarm proposal is assessed separately on a case-by-case basis. Furthermore, limited carcass surveys beneath a small sample of turbines underestimate the eagle collision rate, being only a proportion or index of the total toll, because of the number of injured eagles escaping and dying off site, as well as failure to find all carcasses on site (Mooney 2012). Wedge-tailed Eagle mortalities are known for other New England windfarms, and the BDAR concedes that Little Eagles are occasional mortalities at windfarms elsewhere.

Another raptor that deserves greater attention with respect to windfarm collision risk is the Brown Falcon, recorded by the BDAR in the Winterbourne footprint. Unfortunately, news was received too late for inclusion in a major review of Australian falcons (Debus 2022) that this species suffers catastrophic collision mortality at onshore Tasmanian windfarms, which intercept its trans-Bass Strait migrations to Victoria. Such recent mortality is in the hundreds (Mooney 2022) – I heard a verbal quote of 500 – which may partly explain the recorded 80% decline in its limited island population in Tasmania (Debus 2022). As Mooney noted, there is no official concern because the falcon is not listed as threatened, but that level of impact is how a species becomes threatened; an 80% decline would qualify it for Endangered status in Tasmania. In NSW, the Brown Falcon declined by about 50% in the 20 years to 2006 (Debus 2022); if the decline is continuing, and mortality from burgeoning windfarms increases, it would qualify for at least Vulnerable status, 50% being the threshold for Endangered.

Daytime surveys of bird utilisation of the windfarm footprint and rotor-swept areas take no account of the fact that waterbirds, particularly waterfowl and shorebirds, as well as some migratory bush birds, often fly at night on migration or when commuting to feeding grounds. Among the shorebirds are intercontinental migrants listed as Migratory under the Commonwealth *Environment Protection and Biodiversity Conservation Act*, many also increasingly as Vulnerable or worse under federal and state legislation. A typical example regularly using the New England Tablelands lagoons is Latham's (Japanese) Snipe, but the endangered Australian Painted Snipe may also commute between New England lagoons, as do other threatened and/or migratory waterfowl and shorebirds. Local examples of such lagoons include Dangars and Racecourse Lagoons at Uralla, which attract large numbers of waterfowl and shorebirds.

At least some woodland patches within or adjacent to the footprint are valuable remnants supporting a diversity of eucalypt species and birds. A typical example is the roadside patch on Blue Mountain Road between Hazeldene Road and Winterbourne Road. As well as elements of the Critically Endangered Ecological Community Yellow Box-Blakely's Red Gum grassy woodland, it contains elements of the Endangered Ecological Communities Ribbon Gum-Mountain Gum-Snow Gum grassy woodland, and New England Peppermint on basalts or sediments, and some trees appear to be the rare eucalypt Bendemeer White Gum *Eucalyptus elliptica* (requiring verification by a botanist). Such patches could be lost to the widening of roads for traffic and transport associated with construction of turbines and other infrastructure. Some of these trees are crucial habitat (hollow-bearing) trees for fauna, and hundreds of years old, antedating European colonisation. Furthermore, patches such as the Blue Mountain Road corridor (contiguous with nearby hillside woodland) and others are inhabited by threatened woodland birds such as the Glossy Black-Cockatoo, Little Lorikeet, Varied Sittella, Speckled Warbler, Dusky Woodswallow, Scarlet Robin and Diamond Firetail, all recorded by the BUS reports and all susceptible to habitat loss. Increase road traffic on widened, higher-speed roads could also increase the risk of road kill for some of these species that feed on or near the ground, notably the last four, as well as the above-mentioned raptor species that feed on road killed animals, a 'resource' likely to increase (i.e. rabbit, hare and kangaroo/ wallaby road carrion). Prey and carcasses beneath turbines may also attract scavenging raptors.

The project area is characterised by the EIS/BDAR as already cleared and fragmented habitat, implying low habitat value. However, even small patches can have high conservation value (Debus *et al.* 2006). Further habitat clearing and fragmentation for the turbines and other infrastructure (roads, powerlines) will be incremental, worsening the problem for threatened and other declining woodland birds and other fauna, including increasing the impact of Noisy Miners which competitively exclude other birds from small and linear fragments. This at a time when other work on the tablelands is trying to reverse the problem by habitat restoration and re-connection. Ancillary works for the turbines will also increase the risk of bird (notably raptor) collisions with and electrocutions on powerlines and pylons or poles.

The Winterbourne windfarm footprint is close enough to Oxley Wild Rivers National Park to suggest the risk of compromising the Park's primary purpose, i.e. its conservation values, because of the impact of clearing, habitat fragmentation and more 'hard' edge on and near the Park's western boundary, and the risk of increased mortality of protected and threatened fauna using the Park and adjoining lands.

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