IN THE MATTER

of the Resource Management Act 1991

<u>AND</u>

IN THE MATTER

of an application by Tararua Wind Power under section 88 of the RMA for the Kaiwaikawe Wind Farm, to construct, operate and maintain up to 19 wind turbines within a defined project envelope on the property at 379 Maitahi Road, Omamari legally described as Lot 1 DP 201886.

SUPPLIMENTARY EVIDENCE OF EMMA MARIA WILLIAMS FOR THE DIRECTOR-GENERAL OF CONSERVATION

21 January 2022

Department of Conservation PO Box 842 Whangarei 0140 Counsel Acting: Lisa Sutherland Email: Isutherland@doc.govt.nz Telephone: 0272 750826 Department of Conservation PO Box 10 420 Wellington 6011 Counsel Acting: Shona Bradley Email: sbradley@doc.govt.nz Telephone: 02748071443

1. INTRODUCTION

- 1.1 My full name is Emma Maria Williams.
- 1.2 My qualifications and experience are set out in my Statement of Evidence dated 9th August 2021

2. PROPOSED AMENDMENTS TO CONDITIONS

2.1 It has come to my attention that the latest draft of Conditions does not include population monitoring for matuku within a 5 km radius of the proposed Windfarm envelope **that remains in place for the lifetime of the Windfarm**. I would like it to be noted that it is my recommendation that this is included. It is my understanding that this was originally in the Conditions and I'm not aware of agreeing to its removal. I note that I was unable to attend one Caucusing meeting due to sickness, which is perhaps when this omission occurred. Either way, I recommend it is reinstated.

3. SUMMARY OF MATUKU MONITORING WORK UNDERTAKEN SINCE LAST HEARING

3.1 Supplementary monitoring – methods undertaken

Acoustic Recording Devices (ARD's), which are devices that can record the calls of male matuku during the breeding season, were deployed at Omamari wetland, Omamari station and Maitahi wetland. These ARDs were deployed separately by Boffa Miskell (on behalf of the applicant; Orange points denote deployment locations in Maps A, A1, A2, A3 and A4) and the Department of Conservation (Lime green points denote deployment locations in Maps A, A1, A2, A3 and A4). Before deployment, both organisations conferred to try to coordinate monitoring efforts to maximise coverage and interpretation of results. Boffa Miskell's ARDs were deployed on the 23rd September 2021 to 22nd October 2021, while the Department of Conservation's ARDs were deployed between 20th October 2021 to 14th November 2021. Sound files were shared across both parties in December 2021 and analysed using the protocols in O'Donnell and Williams (2015). Boffa Miskell and DOC also exchanged results on 14th January 2022. Results presented here are from both datasets combined. ARDs were only placed at the three largest wetlands at the site (and not placed on any of the >100 small ponds and wetlands also present in the Project Area).



Map A – Overview of sites showing where Acoustic Recording Devices (ARD's) were deployed. Orange points denote ARDs deployed by Boffa Miskell (on behalf of the applicant), Lime Green points denote ARDs deployed by the Department of Conservation. Squares 1, 2, 3 and 4 show the locations for Maps A1, A2, A3 and A4 below.



Map A1 –Acoustic Recording Devices (ARD's) deployed at Omamari Wetland. Orange points denote ARDs deployed by Boffa Miskell (on behalf of the applicant), Lime Green points denote ARDs deployed by the Department of Conservation. This map relates to Square #1 denoted in Map A.



Map A2 –Acoustic Recording Devices (ARD's) deployed at Omamari Station. Orange points denote ARDs deployed by Boffa Miskell (on behalf of the applicant). The Department of Conservation did not have any ARDs deployed at this site. This map relates to Square #2 denoted in Map A.



Map A3 –Acoustic Recording Devices (ARD's) deployed on the Westside of Maitahi Wetland. Orange points denote ARDs deployed by Boffa Miskell (on behalf of the applicant). This map relates to Square

3 denoted in Map A. Note that this map (Map A3) and Map A4 (below) are adjacent and separate sides of the same wetland.



Map A4 –Acoustic Recording Devices (ARD's) deployed on the Westside of Maitahi Wetland. Lime Green points denote ARDs deployed by the Department of Conservation. This map relates to Square # 4 denoted in Map A. Note that this map (Map A4) and Map A3 (above) are adjacent and separate sides of the same wetland.

3.2 National matuku monitoring undertaken by the Department of Conservation (standalone and in collaboration with others)

Additional to this monitoring, the Department of Conservation undertakes annual monitoring of matuku at several sites nationally. The purpose of this monitoring is to establish trends in matuku populations across time and in response to management practises that are being trialled at each of the sites. Monitoring methods used at these sites are either the Acoustic Triangulation method or using ARD's as per O'Donnell and Williams (2015). Several of these sites were chosen for monitoring by the Department of Conservation because they are within regions considered significant to stronghold matuku populations (O'Donnell and Robertson, 2017). This suggests these sites are important to the resilience and persistence of the species. Regions considered to have stronghold populations include Northland, Auckland and the Waikato in the North Island, as well as Canterbury and West Coast in the South Island (O'Donnell and Robertson, 2017).

4. RESULTS FROM SUPPLEMENTARY MATUKU MONITORING

4.1 Call activity rates at Omamari Wetland, Omamari station and Maitahi wetlands in relation to national monitoring results

Key results from supplementary monitoring are as follows:

- Matuku were recorded booming (calling) at 12 out of 20 survey locations (See Map B). Calling rates were variable among nights, which is normal for matuku calling rates (Figure 1). Four of these locations were in Omamari Wetland, one at Omamari Station and seven at Maitahi Wetland, with particularly high calling rates heard at Maitahi Wetland (maximum call rates of 16 calls per 15 mins), Omamari wetland (maximum call rates of 19 calls per 15 mins). Matuku call rates typically correlate closely to the numbers of male matuku present (Williams *et. al.,* 2018). Based on my knowledge of matuku calling patterns, and the method used to analyse sound files, these calls were produced by no less than 4 individual male matuku (most likely to be more like a minimum of 5 birds).
- This number of 4-5 birds does not account for any female or non-breeding males that may
 also have been present (as these birds do not boom/call), so is likely an underestimate of the
 total number of matuku present. Males are polygynous meaning that they can have more than
 one female within their booming territory.



Map B – Monitoring locations with high matuku calling-rates at the proposed Kaimaikawe Wind Farm site. Larger, darker coloured circles represent locations with the highest calling rates. Small white circles represent no calls detected. Areas monitored included: 1) Omamari Wetland, 2) Omamari Station, and 3) Maitahi Wetland. The green hashed area is the Kaimaikawe Project area.

Call activity levels at sites associated with the proposed Kaiwaikawe Wind Farm (Omamari Wetland, Omamari Station and Maitahi Wetlands) were comparable with activity levels recorded at other sites nationally that have significant, though declining, matuku populations (Figure 2). The calling-rate for sites in the area of the proposed Kaiwaikawe Wind Farm (Lime green triangle in Figure 2) in 2021 is within the range of calling rates observed at other stronghold sites in 2020¹.



Figure 1: Matuku call rate patterns peak at separate times for three sites, in the area of the proposed Kaiwaikawe Wind Farm. Graph shows booming peaks separately at different sites suggesting birds may be moving between sites during the breeding season. 'Average number of calls' on the Y-axis is the mean number of calls heard per 15 mins across all recorders deployed at that site.

¹ Note that we are unable to directly compare national results within the same year for 2021 because it typically takes several months to process all the sound files required. This means that monitoring undertaken in the 2021 season will typically be processed by DOC between December 2021 to March 2022, with results expected in April 2022. However, it is reasonable to expected 2021 calling-rate figures to be lower or comparable to 2020 figures given existing declines.

Stronghold Sites:

- Waikato Whangamarino Wetland
- Canterbury Te Waihora/Lake Ellesmere
- 🔶 Canterbury O Tu Wharekai
- Northland Proposed Kaiwaikawe Windfarm Site
- Northland Pouto Wetland

Non-Stronghold Sites:

- Southland Awarua/Waituna Wetland
- Bay of Plenty All sites



Figure 2: Mean calling rates from Kaiwaikawe Windfarm are comparable with those observed at other stronghold and non-stronghold sites nationally, and in line with activity levels that are expected of a site that has a significant matuku population given the population declines observed nationally.

Patterns from call activities suggest the matuku population in and around the proposed Kaiwaikawe Wind Farm are likely to be highly mobile (as matuku are in other sites studied around New Zealand). In Figure 1, peaks in calling rate are staggered across different sites. For example, you can see the matuku call rate at Omamari Wetland peaks at 5.95 calls per 15 mins around the 25th October and 1st November 2021, while matuku call rates at Maitahi Wetland peak at 3.5 calls per 15 mins around the 15th October 2021. I have found that variable peaks in calling rates of matuku at other sites nationally coincided with matuku moving around other wetlands, presumably to look for potential mates, both in the breeding and nonbreeding seasons (see examples in my Statement of Evidence of 9 August 2021). Although the monitoring to date at the proposed Kaiwaikawe Wind Farm site has been brief, and only during the booming season, I see no evidence to suggest that movement behaviour would be any different in this area to other sites where I have studied matuku. In addition, given the proximity of the locations with calling matuku to numerous smaller wetlands and ponds in the Project Area, it is likely that the matuku recorded, and potentially additional birds, also use these other wet sites at least from time to time (as described in my Statement of Evidence 9th August 2021).

All matuku populations currently monitored nationally show steep population declines (as inferred from changes in calling-rate over time; Figure 3). This is despite intensive experimental management at many of these sites.

Stronghold Sites:

- Waikato Whangamarino Wetland
- Canterbury Te Waihora/Lake Ellesmere

- Canterbury O Tu Wharekai
- Northland Proposed Kaiwaikawe Windfarm Site
- Northland Pouto Wetland

Non-Stronghold Sites:

- Southland Awarua/Waituna Wetland
- Bay of Plenty All sites



Figure 3: Mean call rates have declined over the last decade at all matuku sites monitored, including stronghold (denoted with a solid line) and non-stronghold sites (denoted with a dotted line). The green triangle in 2021 denotes the mean calling rate from all locations monitored as part of the recent supplementary monitoring Boffa Miskell and DOC undertook in and around the proposed Kaiwaikawe Wind Farm area.

THREATS AND CAUSES OF DECLINE 5.

My Statement of Evidence, dated 9th August 2021, outlines the threats known to affect matuku populations. Figure 3, above, demonstrates that many matuku populations continue to decline despite extensive attempts to manage threats and address population declines. Matuku declines are difficult to address because of the number of threats associated with the species and the fact that many of these threats interact (Figure 4), conflating and potentially amplifying a population's decline.



Figure 4. A conceptual model showing current threats and causes of decline associated with matuku populations. Arrows show how threats can interact and compound, effectively amplifying the rate of decline. Diagram courtesy of Dr. Colin O'Donnell.

Possible actions that can be taken to address threats are outlined in Figure 4. Attempts to manage matuku populations to date using these actions, indicate that unless the full suite of threats that limit a population can be addressed, then the decline is difficult to reverse. Introducing additional new threats, that are of an unknown magnitude (such as collisions with wind turbines), complicate this situation further and can impede or prevent conservation efforts from succeeding. Furthermore, the large home range sizes shown by tagged matuku, as outlined in my Statement of Evidence (dated 9 August 2021), suggest that scale of management is also important and potentially an issue with regard to restoration efforts. This is because, in order to be effective and provide the desired results of no net loss or a net gain for the species, management practices would need to be applied across a matuku's full home range and throughout their full annual life cycle. In the case of matuku, this requires the network of sites used by the species to be identified, managed and protected.

6. CONCLUSIONS

- 6.1 Monitoring results confirm that matuku are present in and around the Kaiwaikawe proposed Windfarm in numbers that are relatively high compared to many wetlands surveyed in the past.
- 6.2 Calling rates at the Kaiwaikawe proposed Windfarm site are comparable with those seen at other stronghold sites nationally. This supports the concerns I raise in my Statement of Evidence dated 9th August 2021 that the matuku population within the area of the proposed Windfarm is significant nationally.
- 6.3 Changes in call patterns between Omamari Station, Omamari Wetland and Maitahi Wetland are similar to those I have observed elsewhere in the country at sites and times when the change in calling rate could be attributed to birds being highly mobile. Caution is required with this interpretation of results, it is only based on a brief window of the breeding season in one year for Omamari and Maitahi, and has been collected without a means to identify individual matuku (i.e. by tagging birds). However, this observation combined with national knowledge of behaviours supports the concerns I raise in my Statement of Evidence dated 9th August 2021 that birds are likely to be flying regularly between habitats in and around the proposed Windfarm, thus risking collisions and deaths, and that further investigation of this risk is warranted.
- 6.4 Matuku are critically endangered. Based on the evidence I have seen so far; it is still my opinion that it is preferable not to locate a windfarm in the middle of a matuku habitat network. If mortalities occur, birds cannot confidently be replaced with current technology and knowledge, and this would contribute significantly to the decline of this critically endangered species and could reduce or prevent recovery efforts. The magnitude of the effects could potentially be catastrophic for the Northland matuku population if displacements and collisions occur. Given rates of decline are steep for matuku in other parts of the country, a catastrophic loss in Northland could be irreversible.
- 6.5 In my opinion, it would be very unwise to introduce a new threat of an unknown magnitude (i.e. collisions with turbines) to a stronghold site of a critically endangered species. Such an additional threat would be in place for a long period of time (the life of the wind farm) at a time when national recovery methods for the species are still in their infancy.

Dated 21 January 2022

the

Emma Maria Williams

REFERENCES

- O'Donnell C.F.J.; Robertson, H.A. 2017. Changes in the status and distribution of Australasian bitterns (*Botaurus poiciloptilus*) in New Zealand, 1800s–2011. Notornis 63: 152-166.
- O'Donnell, C.F.J.; Williams, E.M. 2015. Protocols for the inventory and monitoring of populations of the endangered Australasian bittern in New Zealand. Department of Conservation Technical Series No 38. Department of Conservation, Wellington.
- Williams EM, O'Donnell CFJ, Armstrong DP 2018. Cost benefit analysis of acoustic recorders as a solution to sampling challenges experienced monitoring cryptic species. Ecology and Evolution 8: 6839-6848.