

**IN THE MATTER** of the Resource Management Act  
1991

**AND**

**IN THE MATTER** of applications by Meridian Energy Limited to Manawatū-Whanganui Regional Council, Greater Wellington Regional Council, Tararua District Council and Masterton District Council for resource consents to enable the construction, operation, and maintenance of a new wind farm on Mount Munro, located approximately 5km south of Eketāhuna

**SECTION 87F REPORT OF JAMES STUART LAMBIE – TERRESTRIAL ECOLOGY**

**MANAWATŪ-WHANGANUI REGIONAL COUNCIL, GREATER WELLINGTON  
REGIONAL COUNCIL, TARARUA DISTRICT COUNCIL AND MASTERTON DISTRICT  
COUNCIL**

**15 March 2024**

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## **A. OUTLINE OF REPORT**

- 1 This report, required by section 87F of the Resource Management Act 1991 (**RMA**), addresses the issues set out in sections 104 to 112 of the RMA, to the extent that they are relevant to the applications lodged with the Manawatū-Whanganui Regional Council (**Horizons**), Greater Wellington Regional Council (**GWRC**), Tararua District Council (**TDC**) and Masterton District Council (**MDC**).
- 2 The resource consents applied for, by Meridian Energy Limited (**Meridian**), are required to authorise the construction, operation and maintenance and improvement of a new wind farm on Mount Munro, located approximately 5km south of Eketāhuna. The project is known as the Mt Munro windfarm project (the **Mt Munro Project**).
- 3 In this report I address terrestrial (including wetland) ecology effects in relation to the resource consent applications lodged with Horizons and GWRC (the **Regional Councils**) and TDC and MDC (the **District Councils**).
- 4 While this report is pursuant to section 87F of the RMA, I have in accordance with section 42A(1A) and (1B) attempted to minimise the repetition of information included in the application and where I have considered it appropriate, adopt that information.

## **B. QUALIFICATIONS / EXPERIENCE**

- 5 My name is James Stuart Lambie. I am an independent ecologist and biosecurity policy advisor. I have held this position since 2017. Prior to this, I was employed by Horizons; first, in the role of Research Associate (ecology), then Environmental Scientist (ecology), then finally, as the Science Coordinator, for 11 years. Prior to Horizons, I was a biosecurity officer with GWRC.
- 6 I hold the qualification of Bachelor of Science (Massey University) and a Master of Applied Science in Resource Management (Lincoln University). I am a member of the New Zealand Ecological Society and member of the New Zealand Biosecurity Institute.

- 7 I have over 18 years' ecological effects assessment experience. I regularly assess resource consent proposals in relation to effects on terrestrial and wetland ecosystems, including reviewing the ecological evaluation of affected habitats, flora and fauna, the evaluation of the scale of effects, and proposed effects management regimes.
- 8 Past projects of relevance include the assessment of applications for Project Central Wind windfarm and Mt Munro windfarm (original application), post-consent assessment of Puketoi windfarm and Turitea windfarm ecological monitoring and management plans, and a review of the Te Rere Hau re-powering application.
- 9 I am familiar with site and surrounding area. I visited the site along with other experts of the Regional Councils on 23 June 2023 where I specifically looked at affected wetlands, potential wetland offset sites, and remnants of indigenous vegetation adjacent to areas of proposed activity.

**C. CODE OF CONDUCT**

- 10 I confirm that I have read and agree to comply with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. This technical report has been prepared in accordance with that Code. In particular, unless I state otherwise, the opinions I express are within my area of expertise, and I have not omitted to consider material facts that might alter or detract from the opinions that I express.
- 11 I have addressed the following issues in this report:
- (a) The identification and management of wetland loss; and
  - (b) The management of effects on certain native fauna.
- 12 With the exception of assessing the magnitude of effect on native bats and vulnerable flora, I have all the information necessary to assess the application within the scope of my expertise and am not aware of any gaps in the information or my knowledge. I discuss this further below.

13 I note with regard to bats that I am not an expert in bat conservation for which there is an established body of specialist training. However, I am very familiar with the EIANZ assessment framework and its application to the assessment of the magnitude of effect on vulnerable fauna including bats.

**D. EXECUTIVE SUMMARY**

14 The key conclusions of my report include:

- (a) The identification of the terrestrial and wetland ecological habitat values potentially affected by the proposal in the ecological assessment is sound.
- (b) Any potentially significant areas of terrestrial vegetation or habitat of flora and fauna are avoided. The effects of habitat loss are confined to vegetation types that do not meet significance thresholds in the Manawatu-Whanganui One Plan (**One Plan**) or the Greater Wellington Natural Resources Plan (**NRP**) and therefore do not require mitigation or offset for loss under the planning frameworks.
- (c) Nevertheless, there is potentially the total loss of 0.32 hectares of hydrological extent of features that are identifiable as natural inland wetlands. The National Policy Statement Freshwater Management 2020 (**NPS-FM**) requires management of this loss following the effects hierarchy. Being 'specified infrastructure', the project has the opportunity to offset that loss with improvement in the ecological condition of another wetland within the site. I have considered the offsetting proposal and conclude that the effects hierarchy has been followed, and that the proposal likely results in a net biodiversity gain. The calculation of the offset is simplistic, but I conclude that it is commensurate with the scale of loss.
- (d) An assessment on vulnerable flora is missing from the terrestrial ecological assessment and I identify three species that are potentially within the effects envelope. Further consideration of the management of the effects on these species is warranted. In the

absence of the information, I have proposed conditions requiring effects management should it be discovered through investigation that the flora are impacted.

- (e) The assessment of the effects on vulnerable fauna is sound. However, in my view there are further opportunities to mitigate the effects on lizards and avifauna to ensure that they remain at the low to very low end of the effects spectrum. On review of the terrestrial ecological assessments and/or the section 92 responses, I am of the view that these mitigations can be enforced through conditions which include pre-construction site walk overs (and transfer if necessary) of lizards within specific lizard areas, five year of post-construction avifaunal effects monitoring (and response if necessary) and specific procedures for avoiding effects on pipit. I have proposed conditions to this effect.
- (f) There is a difference of opinion on the use of the EIANZ framework to assess ecological value and level of effect on bats. However, I reach the same conclusion as in the terrestrial ecological assessment. The effects are likely to be low but the limitations of the current understanding of the effect of windfarms on long-tailed bats requires a precautionary approach. I agree with the proposal for adaptive management which involves five years of bat acoustic monitoring and a response to mitigate, offset, or compensate for effects if necessary. The conditions are recommended to provide an informed response should adverse effects on bats become evident.
- (g) I identify that there is a need to consider biosecurity and identify several species for which a conditioned management response would be appropriate. The species are: field horsetail; yellow bristlegrass; myrtle rust; plague skink; and didymo.
- (h) Overall, subject to specific qualifications, I agree that the overall potential effects on terrestrial and wetland ecological values and threats to fauna and flora are low.

**E. SCOPE OF REPORT**

15 My report focuses only on issues related to effects on terrestrial and wetland habitat and effects on indigenous flora and fauna. It covers the following topics:

- (a) A broad level overview of indigenous vegetation and native flora and fauna, the level of ecological value of these and overall levels of effect;
- (b) A review of the terrestrial ecology assessment, expanding on issues related to:
  - (i) The appropriateness of wetland offsetting;
  - (ii) Vulnerable flora;
  - (iii) Managing effects on lizards;
  - (iv) Managing effects on avifauna generally and pipit specifically;
  - (v) The level of (and management of) effects on long-tailed bats;
  - (vi) Dust; and
  - (vii) Biosecurity;
- (c) Proposed conditions; and
- (d) Submissions as they related to terrestrial ecology matters.

16 I have reviewed and relied on the information provided by:

- (a) Mt Munro Wind Farm Resource Consent (**the Application**);
- (b) Assessment of Environmental Effects on behalf of Meridian Energy Limited - Mt Munro Windfarm Project (**the AEE**);

- (c) Ecological Assessment, Boffa Miskell, 19 May 2023 (**Appendix C** of the Application);
- (d) Long-tailed Bat Assessment, Tonkin and Taylor, May 2023 (**Appendix L** of the Application);
- (e) Meridian’s response to the Regional Council request for further information dated 7 September 2023 (**RFI#1 Response 1**);
- (f) Meridian’s response to the Regional Council request for further information dated 23 February 2024 (**RFI#2 Response 3**); and
- (g) Meridian’s clarification of response to the Regional Council request for further information (Fill Disposal Areas Plan) dated 25 October 2023 (**Fills Map**).

17 In preparing this report, I have reviewed the reports of:

- (a) Dr Forbes (freshwater ecology); and
- (b) Mr Pearce (erosion and sediment control);
- (c) Mr Curtis (air quality).

**F. BACKGROUND – TERRESTRIAL ECOLOGY OVERVIEW**

18 The description of the Mt Munro Project, including design, existing environment, and potential effects on indigenous habitats flora and fauna is set out in the AEE. The supporting technical documentation (Appendix C and Appendix L) are appended to the Application.

19 The native vegetation within the site includes rushlands (with wet pasture), divaricating shrublands, regenerating manuka/kanuka shrublands, and mid-stage regenerating forest and remnant treeland dominated by mahoe. The chosen route and construction footprint (**the effects envelope**) largely avoids these areas of indigenous-dominant vegetation, although the ecological assessment identifies that around 1.28 hectares of rushland and wet pasture and 1.36 hectares of mahoe-dominated treeland, shrubland



and/or forest lies within the effects envelope.<sup>1</sup> The ecological assessment does not provide an appraisal of the ecological value of native forest remnants on the whole, but concludes that the value of the remnant portions falling within the effects envelope as being negligible<sup>2</sup> and not of ecological significance.<sup>3</sup> The ecological consequence of the loss is considered by the ecological assessment as very low.<sup>4</sup>

- 20 In addition to this, there is a patch of around 200 square metres of mixed exotic and native riparian vegetation along a Makakahi River tributary which lies within the effects envelope. This is considered of some ecological importance,<sup>5</sup> although it is not vegetation identified as being associated with a Site of Significance - Aquatic (SOS-A) under the One Plan, and therefore is not considered a rare, threatened, or at-risk habitat type under One Plan Schedule F.
- 21 The assessment does not identify any significant inland natural wetlands within the site,<sup>6</sup> but acknowledges that there are six wetland features (summing to 0.32 hectares) of negligible ecological value directly affected by the proposal.<sup>7</sup> The assessment of the wetland features identifies that they are a product of land modification and are not representative of the natural indigenous state.<sup>8</sup> The ecological consequence of their loss is considered in the ecological assessment to be very low.<sup>9</sup> Nevertheless, the features are identifiable as 'inland natural wetlands' and it is proposed that the effects be offset by restoring indigenous dominance to one or more of the other wetlands of negligible ecological value that can be found within

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<sup>1</sup> Appendix C, Table 11.

<sup>2</sup> Appendix C, Section 6.1 paragraph 2 (page 65).

<sup>3</sup> Appendix C, Section 7.1.

<sup>4</sup> Appendix C, Section 8.1.1 (page 72).

<sup>5</sup> Appendix C, Section 8.1.1 paragraph 3 (page 72).

<sup>6</sup> Appendix C, Section 7.2 (pages 69-70).

<sup>7</sup> Appendix C, Section 8.2.1 paragraph 1 (page 73).

<sup>8</sup> Appendix C, Section 5.2 paragraph 2 (page 31).

<sup>9</sup> Appendix C, Section 8.2.1 (page 73).

the project site.<sup>10</sup> The offset is at a ratio of 1:1, based on loss of areal extent.<sup>11</sup>

22 While the Port to Site route requirements identify the need for vegetation removal,<sup>12</sup> none of the vegetation is specifically identified as a significant area of native vegetation or wetland within Greater Wellington or Horizons regions. I have not verified that the affected vegetation is not ecologically significant.

23 With regard to threatened flora or fauna within the effects envelope:

(a) The assessment does not specifically identify the presence of any vulnerable flora or assess effects on populations;

(b) The review of the Bioweb data provided by the Department of Conservation (DOC)<sup>13</sup> does not identify any potential for the presence of native frogs; and

(c) RFI#1 Response 1 affirms that there are no habitats of threatened invertebrates within the effects envelope.<sup>14</sup>

24 Northern grass skink (*Oligosoma polychroma*) is present within the site in low densities.<sup>15</sup> The general lack of suitable habitat throughout the site reduces the likelihood of other species being present, although the absence of other species is not definitive. Due to the low probability of lizard presence and low potential for significant adverse effects if they were discovered, mitigations are not proposed. However, it is acknowledged that the potential for disturbance of lizards exists<sup>16</sup> and that authorisation under

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<sup>10</sup> Appendix C Section 9.2 paragraph 4 (page 92).

<sup>11</sup> Note, in explaining the 1:1 ratio of offset, Appendix C Section 9.2 paragraph 4 (page 92) paragraph incorrectly asserts that the 1:1 offset of 0.32 hectares of wetland “would be in the order of **320m<sup>2</sup>** of creation or restoration of indigenous wetland.” 0.32 hectares is 3200 square metres. The error is repeated in the AEE summary of ecological effects.

<sup>12</sup> Port-to site considerations relating to transport from port of large turbine components.

<sup>13</sup> Appendix C, Section 3.3.1 (page 16).

<sup>14</sup> Appendix 12, Item 77.

<sup>15</sup> Appendix C, Section 5.4.2 (page 54).

<sup>16</sup> Appendix C, Section 8.4.1 (page 80).

the Wildlife Act 1953 is likely to be needed.<sup>17</sup> It is expected that any Wildlife Act permit will require some management of effects on lizards.

25 Several threatened native bird species are present within the site including North Island kākā (*Nestor meridionalis septentrionalis*), kārearea bush falcon (*Falco novaeseelandiae*), pihoihoi pipit (*Anthis novaeseelandiae*), and koekoeā long-tailed cuckoo (*Eudynamys taitensis*). The ecological assessment includes a species summary (Table 21).<sup>18</sup> An assessment against the habitat requirements for each species identifies that the effects of vegetation disturbance are likely to be very low, accounting for the degree to which the species use the habitat within the effects envelope and the effect that the proposed loss of vegetation will have on the known population or range of each species. The habitat loss effect on avifauna are summarised in Table 35.<sup>19</sup> The ecological assessment also notes for pipit that the construction of gravel roads and infrastructure will create bare patches and/or short sward that will likely provide new habitat for that species.<sup>20</sup>

26 The effect of construction disturbance on avifauna is also assessed to have a low to very low effect due to the species pattern of use of the site and the assumed levels of disturbance that will occur. Table 36 summarises the construction disturbance effect on avifauna.<sup>21</sup>

27 Collision with operational turbines is identified as a potential risk for avifauna,<sup>22</sup> but when accounting for threat status, flight behaviour, and site use, the ecological assessment concludes that the overall effect on native birds is likely to be low to very low. Similarly, collision with the transmission line or electrocution is assessed as having a low to very low effect on the indigenous avifauna that use, or potentially use the site.<sup>23</sup>

28 The pekapeka tou-roa or long-tailed bat (*Chalinolobus tuberculatus*) is confirmed as present in the wider landscape and very occasionally uses the

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<sup>17</sup> Appendix C, Section 9.4 (page 95).

<sup>18</sup> Appendix C, Table 21, (page 56).

<sup>19</sup> Appendix C, Table 35, (page 82).

<sup>20</sup> Appendix C, Section 8.5.1, paragraph 3 (page 81).

<sup>21</sup> Appendix C, Table 36 (page 83).

<sup>22</sup> Appendix C, Section 8.5.3.1, paragraph 4 (page 85).

<sup>23</sup> Appendix C, Table 39 (page 91) summarises the potential level of effect on avifauna.

site (Appendix L). Due to the threat status of long-tailed bats (Threatened – Nationally Critical), their ecological value status is very high. However, due to the very low level of use of the site,<sup>24</sup> the ecological value of the site itself is considered low.<sup>25</sup> Like the avifauna, the loss of habitat, disturbance during construction, and collision with turbines are all factors considered when assessing the effect of the proposal on long-tailed bat populations. The bat assessment concludes that, due to the very low use of the site and (limited) research that indicates that long-tailed bats potentially avoid wind turbines, that these effects are likely to be low.<sup>26</sup> However, as high levels of bat fatality have been recorded at wind farms overseas and data specific to long-tailed bats is limited, an adaptive management framework is recommended to manage unforeseen effects.<sup>27</sup>

29 Overall – accounting for the minimal loss of indigenous-dominant vegetation, the minimal disturbance of the terrestrial and wetland habitat of native flora and fauna, and the low-level (or highly specific) use of the site by lizards, threatened bird species, and long-tailed bats – the AEE concludes that the potential effects of the project will be less than minor and can be appropriately addressed through best practice construction management along with offset measures to address the loss of wetland extent.<sup>28</sup>

## **G. ASSESSMENT OF APPLICATION**

30 In addition to the application, I have reviewed<sup>29</sup> the online information available from MDC (significant natural areas), online information available from GWRC (significant wetlands and key native ecosystems) and in-house data provided by Horizons (Potential Biodiversity Sites). These, along with

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<sup>24</sup> The AEE indicates that single bat pass was detected (Section 5.6.6, paragraph 1 page 104). However, the further survey referred to in that report (culminating in the production of Appendix L) identifies two further bat passes. This is still a very low level of use in the context of the many hours of survey that were undertaken but is appreciably higher than just one pass.

<sup>25</sup> Appendix L, Section 4.5 paragraph 4 (page 23).

<sup>26</sup> Appendix L, Section 6.3 (page 30).

<sup>27</sup> Appendix L, Section 7 (page 30-31).

<sup>28</sup> AEE Section 5.6.7 (page 105).

<sup>29</sup> I note there are no SNAs listed in the Tararua District Plan.

my own observations<sup>30</sup> concerning the remnant indigenous-dominant vegetation within the site lead me to conclude that the effects envelope avoids significant areas of indigenous woody vegetation and that the impacts on wetlands are limited to sites of negligible ecological value.

- 31 I agree with the descriptions of and the level of ecological value attributed to terrestrial and wetland vegetation types and their significance assessment. I also generally agree that the overall potential effects on terrestrial and wetland ecological values and threats to fauna and flora are low. However, in my view, there is need to qualify some aspects of this position with regard to the loss of terrestrial native vegetation, effects on vulnerable flora, the proposed wetland offset, the management of effects on lizards, the management of effects on pipit, the level of effect (and management thereof) on long-tailed bats, dust effects, and biosecurity.

#### **Loss of terrestrial native vegetation**

- 32 I largely agree that the overall effects upon terrestrial native vegetation are likely to be very low. As long as consideration is given to adequate management of effects on the flora and fauna that potentially inhabit the vegetation proposed to be cleared, the loss of an estimated 1.36 hectares of low-value native woody vegetation does not specifically warrant replacement in order to maintain terrestrial biodiversity.
- 33 However, where it relates to the provision of riparian habitat, the scale of response to the proposed loss of terrestrial native vegetation requires further consideration of aquatic ecosystems and associated natural character. Dr Forbes has assessed these matters for the Regional Councils, and identifies shortfalls in the freshwater biodiversity assessment, such that he is not confident that the proposed aquatic offsets meet key regulatory requirements.<sup>31</sup>

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<sup>30</sup> For clarification; There is a *Potential Biodiversity Site* indicated within the Horizons region located in exotic-dominated vegetation immediately south of the dwelling located at 168 Old Coach Road. The site is not predominantly indigenous vegetation.

<sup>31</sup> Section 87F Report, Adam Forbes, 15 March 2024, Executive Summary.

## Vulnerable flora

34 The assessment does not specifically identify the presence of any vulnerable flora or assess effects on populations. I consider this is a minor oversight due to the site being overwhelmingly unsuitable habitat for rare or threatened flora given the history of grazing and pastoral development. Nevertheless I have identified three species of conservation concern that are potentially within the site and may be within the effects envelope. These are:

(a) *Sphagnum perchaetiale*. At risk (naturally uncommon).<sup>32</sup> A wetland moss listed in the wetland plot data in abundance in Gully/feature 20 (plots 13 and 14) and Gully/feature 26 (plot 22) but also features in Gully/feature 23 and 23b. (Appendix 3, sub-appendix 3). The species is of moderate value as assessed under the EIANZ framework.

(b) *Luzula leptophylla*. At risk (naturally uncommon).<sup>33</sup> A wetland sedge listed in abundance in Gully/feature 3 (Appendix 3, sub-appendix 3). The species is of moderate value as assessed under the EIANZ framework.

(c) *Solanum aviculare* var *aviculare*. (Poroporo). Threatened (nationally vulnerable).<sup>34</sup> A fast-growing woody shrub of disturbed forest margins. The ongoing decline of this once common agricultural weed is as yet unexplained. It is still common in the Wairarapa. The species is of very high value as assessed under the EIANZ framework.

35 As the gully features / wetland plots<sup>35</sup> are not labelled, I have not been able to ascertain whether the sites with *Sphagnum perchaetiale* and *Luzula leptophylla* are within the effects envelope. If these wetlands / gullies are not

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<sup>32</sup> JR Rolfe, AJ Fife, JE Beever, PJ Brownsey & RA Hitchmough (2014). Conservation Status of New Zealand Mosses, 2014. New Zealand Threat Classification Series 13. New Zealand Department of Conservation.

<sup>33</sup> PJ de Lange, JR Rolfe, JW Barkla, SP Courtney, PD Champion, LR Perie, SM Beadel, KA Ford, I Breitwieser, I Shoenberger, R Hindmarsh-Walls, PB Heenan & K Ladley. (2017). Conservation Status of New Zealand Indigenous Vascular Plants, 2017. New Zealand Threat Classification Series 22. New Zealand Department of Conservation.

<sup>34</sup> Ibid.

<sup>35</sup> Appendix 3, Maps 11, between pages 40 and 41.

impacted, then the threat to the populations of these species is negligible and the level of effect is very low. On the other hand, if the plots are from impacted wetlands, then the loss of habitat and impact on populations is a quantum of effect which deserves further assessment. In my view the level of effect could potentially be managed to “low” by directly transferring propagules from the affected wetlands into the recipient offset sites. Further assessment where effects are identified could potentially form part of a specific management plan dealing with wetland propagule transfer.

- 36 I identified a poroporo on the very edge of the effects envelope in an area of felled pine along the Old Coach Road, roughly 150m south-west of the dwelling at 168 Old Coach Road (refer to Figure 1 in Section J below). It was not flowering and it was unclear if the plant is *Solanum aviculare* or the more common (not threatened) *Solanum lacinatum*. If it is *Solanum aviculare* there is a possibility that the species occurs within the marginal shrubland areas that fall within the effects envelope. Such loss is potentially a significant effect and, in my view, whether it is within the effects envelope should be confirmed. While the species is threatened, the plant it is easily raised from seed and grows to maturity very quickly. Therefore, if it were to be removed, the level of effect of its removal could potentially be managed to “low” with 1:1 replacement of plants into an appropriate recipient site.

#### **Effects on wetlands and wetland offsetting**

- 37 Including the six wetland features that lie directly within the effects envelope, there are 34 gully features within 100m of the Turbine Envelope and Turbine Exclusion zones that have been identified as natural inland wetlands on the basis of their vegetation and hydrological characteristics. Notwithstanding my concern for potential effects on *Sphagnum perchaetiale* and *Luzula leptophylla*, I agree with the view that none of the features are significant wetland habitats.
- 38 With regard to the wetlands outside the effects envelope, the main threat is excessive sediment discharge into the gullies arising from poorly controlled earthworks (including fills). Subject to robust performance standards and ongoing monitoring of erosion and sediment control

measures, Mr Pearce is of the view that the discharges from the Project will likely be less than minor.<sup>36</sup> I agree.

39 With regard to the six impacted features, the effects mainly stem from their physical loss as wetland habitats. Presuming that effects on the rarity of *Sphagnum perchaetiale* and *Luzula leptophylla* can be adequately addressed through wetland soil transfer (if appropriate), I am of the view that the impacted wetland features are not so vulnerable or irreplaceable that the loss of wetland extent will cause reduction in indigenous biodiversity. The features potentially provide ecosystem services that maintain the quality of freshwater ecosystems, such as nutrient assimilation and sediment capture. However, in the context of the scale of loss in contrast to the remaining extent of similar in-stream wetlands throughout the site, the potential reduction in such services is unlikely to lead to noticeable deterioration in water quality.

40 I therefore agree with the wetland offsetting proposal in principle. However, national policy expectations (and to some degree – the regional policy expectations of GWRC) require no further loss of ‘inland natural wetland’, irrespective of the inherent biodiversity value. This expectation is interpreted to mean no further loss of hydrological extent and no further loss of indigenous biotic representation.

41 The opportunity to enhance the biotic condition of remaining wetlands at the expense of the hydrological existence of others is highly limited under national direction on the development and maintenance of specified infrastructure. A proposal involving specified infrastructure has the opportunity under the NPS-FM to effectively swap the loss of hydrological extent for improvement in biodiversity condition elsewhere (the offset as proposed) as long as:

(a) The *Project* can demonstrate the effects hierarchy is followed; and

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<sup>36</sup> Section 87F Report of Kerry Pearce – Erosion and Sediment Control (15 March 2024) at 64.



(b) The offset achieves no net loss (and preferentially net gain) in indigenous biodiversity.

42 As explained in RFI#1 Response 1,<sup>37</sup> all of the wetland features identified in the Greater Wellington region can be avoided, and the other features (all with the Horizons region) will be avoided where possible. Effecting an approach of ‘avoidance where possible’ (in this case) falls back to the implementation of proffered Condition 9<sup>38</sup> and ecologist input into the design of the Specific Environmental Management Plans (**SEMPs**) to “...avoid, remedy or mitigate adverse environmental effects...”. This condition is indicative of an intent for further avoidance and thus an intent to follow the effects hierarchy. However, in my opinion it is unsatisfactory to rely on a post-consent SEMP to demonstrate adherence in the first instance. The 1:1 ratio approach to offsetting is more useful in this regard, as it offers flexibility for implementing an offset scaled to a lesser effect, potentially encouraging further avoidance, and demonstrating an inherent intent to do so.

43 Nevertheless, without more detailed design, we are left to assess the scale of actual loss of wetland hydrological extent as 0.32 hectares.<sup>39</sup> This is smaller than the additional 0.84 ha of natural inland wetland in very close proximity to a berm or construction affected area,<sup>40</sup> further demonstrating that avoidance is the preferred approach. However, proffered condition 16<sup>41</sup> does not assure that the scale of wetland loss is limited to 0.32 hectares and in fact, provides scope for a higher level of loss. In my view, Condition 16 should impose an upper limit of 0.32 hectares of loss of wetland extent in the Horizons Region and zero loss of wetland extent in the Greater

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<sup>37</sup> Appendix 12, Item 78.

<sup>38</sup> AEE, Section 8.2 (page 133).

<sup>39</sup> RFI#1 Response 1, Appendix 12 response 78 indicates that the “...current identified possibly affected wetland sums to less than 0.3 ha.” but does not provide an update of the effects envelope to show why this number is less than the 0.32 hectares presented in Appendix C. My presumption of the upper extent of wetland loss remains at 0.32 hectares.

<sup>40</sup> AEE, Section 8.2.1 (page 73).

<sup>41</sup> AEE, Section 8.2 Condition 16 (page 135).

Wellington Region.<sup>42</sup> I am satisfied that this results in the effects hierarchy being followed under the circumstances.

44 RFI#1 Response 1 confirms Dr Keesing's view that the 1:1 ratio is a standard approach used often for degraded wetlands and which has stood up well when contrasted (for example) with the Biodiversity Offset Accounting Model.<sup>43</sup> I have tested whether the 1:1 approach will yield a net gain under the Biodiversity Offset Accounting Model (**BOAM**) using a very simplistic model involving native species percentage cover and native species count.

45 My test makes basic assumptions of the baseline condition of the affected and recipient sites, and offset outcomes. These assumptions are:

- (a) The measure of native species cover prior to offset is around 13% in the affected and recipient wetlands. This is based on the average percentage cover of native species from the wetland plot data (Appendix C; sub-appendix 3);
- (b) The native species count within affected and recipient wetlands prior to offset is two species. This is based on the average count of native species (Appendix C; sub-appendix 3) per plot;
- (c) The benchmark for native species cover in the ideal situation is at least 80% and this is set as the canopy cover target for the offset;
- (d) The benchmark for species count is 13 - this being the total count of native species listed in Appendix C; sub-appendix 3. However, not all are readily available from nurseries and so I set the offset diversity target to nine native species (seven re-introduced into the recipient site and two pre-existing);

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<sup>42</sup> Zero loss specified for the Greater Wellington wetlands also helps overcome a policy implementation issue with regard to Greater Wellington PNRP Schedule G2 (4) (a). The proposed offset wetland locations are not in the same catchment and are not in the same ecological district as the wetlands in the Greater Wellington region, and so the offset locations as proposed would fail to meet this policy expectation.

<sup>43</sup> RFI#1 Response 1, Appendix 12 Item 79 (pages 10-11) and footnote 3 (page 11).

- (e) 0.32 hectares of wetland vegetation loss is replaced with 0.32 hectares of wetland vegetation improvement (i.e. follows the 1:1 ratio of extent loss and replacement); and
- (f) Achieving 80% indigenous canopy cover, by planting seven readily available native species<sup>44</sup> in addition to the two species that are assumed to naturally occur in the recipient wetland, is attainable within 5 years with a modest (75-90%) degree of confidence.

46 Under this scenario the BOAM yields a positive net present value, indicating net gain. The 1:1 ratio appears sound when compared to this simple biodiversity offset model. It is important to note that this simple modelling exercise lacks appreciation of other factors such as structural diversity and species richness, and assumes an average for the present cover and species count in the affected and recipient wetlands rather than reflecting the actual values. It is possible that a more sophisticated model would reveal that the 1:1 ratio does not produce a positive outcome. However, considering the very small scale of loss and the very low level of ecological value presented by the wetlands, I am of the view that this analysis is commensurate with scale and intensity of the effect. On this basis, I consider the 1:1 ratio offered for wetland offsetting to be an acceptable approach in this particular case.

47 One final aspect of the offset is to be assured that there is sufficient space available within the site to implement it. Figure 15 of Appendix C<sup>45</sup> portrays three potential areas summing to one hectare. I understand the preferred site is for the northmost feature adjacent to “*Hamishes Woolshed*”.<sup>46</sup> In reviewing further information provided (the Fills Map), I note that drawing no. 1016884.1000-16 depicts fill number 20 in very close proximity to the offset site. On closer inspection using GIS, I estimate that the proposed fill overlaps around 900 square metres (nearly 0.1 hectare) of the wetland opportunity. This reduces the entire offsetting opportunity to around 0.9 hectares. However, as long as the total amount of wetland loss is capped at

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<sup>44</sup> E.g. *Carex secta*, *Carex virgata*, *Phormium tenax*, *Leptospermum scoparium*, *Cordyline australis*, *Dacrydium dacrydioides*, and *Laurelia novaeseelandiae*.

<sup>45</sup> At page 93.

<sup>46</sup> Appendix C, Figure 15 (page 93).

0.32 hectares, there is still almost three times as much space available as needed. This means there is sufficient room to implement the offset.

- 48 I have considered and agree with the assessment that the affected wetlands have a low level of natural character and that the effects on the natural character of wetlands will be very low. The loss of wetland extent will inevitably result in the complete loss of the wetland biophysical character of the affected sites, but I am of the opinion the biodiversity offset will also offset this loss with a marked improvement in the indigenous natural elements of the recipient site(s).

#### **Management of effects on lizards**

- 49 I agree with the identified types and levels of effect on lizards. However, I am of the view that there is a void in the consented management of effects with regard to the low-moderate value habitat in the vicinity of the western end of the transmission line (along Kaiparoro Road) where northern skink have been found. I am of the opinion that the effects could and should be mitigated using a condition requiring pre-clearance inspection of the vegetation at the western end of the transmission line along with a lizard transfer protocol should lizards be captured during the pre-clearance survey. Given the low, but not zero, potential for lizards throughout the site, an accidental discovery and transfer protocol for lizards is also advisable.

#### **Management of effects on avifauna in general and pipit specifically**

- 50 I agree with the assessment of the types of effects on avifauna. I note that the assessment of effects on birds follows the framework for assessing risks to falcon that was especially developed for New Zealand wind farms (Seaton and Barea; 2012),<sup>47</sup> adding a further level of assurance that industry-leading approaches have been taken to assess the effects. I am comfortable with the assessed levels of effect on avifauna in the ecological assessment. I am also comfortable with the applicant's proffered condition, except to suggest that the monitoring period be increased to 5 years and that an annual

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<sup>47</sup> R Seaton & LP Barea (2013) The New Zealand falcon and wind farms: a risk assessment framework, *New Zealand Journal of Zoology*, 40:1, 16-27.

reporting requirement be added. Further strategies for effects management for pipit should be considered. These strategies ensure that the potential improvement in pipit habitat arising from the activity does not result in a corresponding increase in harm.

- 51 When considering the level of bird strike at the West Wind Farm wind farm site (as described in the ecological assessment), it is worth noting that the conditions of that consent<sup>48</sup> do not require any form of avifaunal effects mitigation at the outset. Instead, the resource consent relied on monitoring for significant effects that, if they were to arise, were to be managed after the fact. To my knowledge there have been no active remedies or mitigations put in place at Project West Wind that deal with turbine strike. Therefore, the evidence – which includes population increases of species known to strike the turbine blades (e.g. black-backed gulls and harrier hawk) and null effect on species that are present in the greater environment but not frequently within the farm (e.g. morepork, falcon, and kaka) – demonstrates good ecological outcomes having been achieved without purposeful remedies or mitigations in place.
- 52 The Project West Wind analysis thus provides some comfort that the effects of turbine strike are as low as anticipated. The authors of the Project West Wind study<sup>49</sup> point out that differences in sites and species composition mean that the estimated levels of turbine strike at West Wind may not be representative of other sites. The results of the study should be treated with some level of caution. Nevertheless, the study identifies that the monitoring approach taken at Project West Wind forms a good basis on which to continue to refine mortality estimates.
- 53 I am of the view that bird-strike monitoring would lead to a more precise account of these effects, potentially leading to more refined recommendations for remedy, mitigation, or offsetting as necessary. I therefore support the recommendation made by the project ecologists for post-construction bird strike monitoring of the wind farm and transmission

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<sup>48</sup> Decision W059/2007 NZ EnvC 218 (20 July 2007).

<sup>49</sup> LS Bull, S Fuller & D Sim (2013). Post-construction avian mortality monitoring at Project West Wind. *New Zealand Journal of Zoology* Vol 40:1 28-6.

line with an appropriate response in the event that there are unanticipated adverse effects. However, as with the Project West Wind farm approach, it is my preference that the monitoring be undertaken over five years, to precautionarily account for possible differences between how birds behave at the Mt Munro site compared to Project West Wind. The results should be reported to the Councils and DOC annually as a means of tracking compliance with the monitoring condition and for peer review of the interpretation of the observed levels of effect.

- 54 The threat status of pipit is “at risk – declining” and the species is valued as “high”. The species is present within the site in low numbers.<sup>50</sup> It is my view that the assessment of habitat loss is fair<sup>51</sup> and I agree that the project may actually lead to more pipit habitat within the site. However, while I agree that the level of construction disturbance would probably have a negligible effect on the known population (leading to the conclusion that the overall level of effect is “very low”), I note that pipit has an affinity for nesting in rough pasture next to areas of bare ground. I am therefore concerned that the construction of gravelled tracks and temporary exclusion of livestock from the works creates opportunities for pipit to nest within the construction area during construction season, putting the birds at risk. When considering whether construction effects could be avoided, Dr Keesing recommends a condition requiring appropriate pasture management within the proposed construction envelope.<sup>52</sup> I agree with this approach. I am also of the view that a condition for pipit should include pre-clearance checks for nesting pipit if the grass is suitably tall enough. This is a contingency in the event that pasture management fails to dissuade pipit from nesting within the construction area.
- 55 The formation of the access network could also create better access by predators - particularly cats and mustelids. There is potentially an ecological cascade related to the provision of new bare habitat and the associated increase in predation risk specifically related to pipit. I consider the effect is

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<sup>50</sup> Appendix C, Section 5.5.1.1 (starting at page 58).

<sup>51</sup> Appendix C, Section 8.5. paragraph 3 (page 81).

<sup>52</sup> RFI#1 Response 1, Item 81 (page 11).

likely to be low, having a low to negligible effect on the known range or population of the species. Nevertheless, it is an effect that could be managed by monitoring pipit populations with an appropriately tailored response if it is found that increased predation pressure is likely to be the cause of pipit declines within the project area. It is difficult to relate the natural fluctuation in bird numbers back to predation pressure with just one year of monitoring, particularly as pipit are infrequently seen within the site. Five years of pipit monitoring would be needed to detect trends that can be related to increased predation over the background noise caused by seasonal fluctuation and the potential influence of bird strike. This approach fits with the general turbine strike bird monitoring proposed above, if my recommendation to increase the monitoring to five years is acceptable.

### **Long-tailed bats**

- 56 The assessment for long-tailed bats follows a similar framework to that of the birds and I am of the view that all potential effects on bats have been traversed in Appendix L.
- 57 Given the very low levels of bat activity within the site, the assessment of the bat habitat value is low. I am comfortable with that conclusion. However, this is a separate matter to the ecological evaluation of the bats themselves, which is ‘very high’ due to their threat status (EIANZ, Table 5).<sup>53</sup> The analysis of effects asserts that “...*the primary effect of the project on bats is injury or mortality associated with bats interacting with the blades of operating turbines...*”.<sup>54</sup> I consider this to be a species-type effect (turbine strike), not a habitat loss-type effect. I am of the view that the EIANZ assessment of the value of the site (“low”) has been incorrectly applied to yield the ecological value of the bats themselves also as “low”.<sup>55</sup> To my mind, the source of the effect (turbine strike) directly impacts on the value of the species (very high) regardless of the low habitat value associated with the low use of the site. For a species that is listed as nationally critical due to a

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<sup>53</sup> Roper-Lindsay et al. 2018. Presented in Appendix C, Section 3.7 (pages 23 – 25).

<sup>54</sup> Appendix L, Executive Summary, page ii.

<sup>55</sup> See Appendix L, Section 6.3 (page 30).

forecast predicted decline of >70%,<sup>56</sup> the loss of even one bat is of very high conservation concern.

58 Appendix L assesses the magnitude of the effect is assessed as “moderate”.<sup>57</sup> This level is based on the precaution that a long-tailed bat could be killed by turbine strike, rather than expected fatalities where emerging evidence is that long-tailed bat populations are not significantly affected by windfarms. When combining a “moderate” magnitude of effect with the “very high” value of the species, the EIANZ framework ascribes this as a “high” overall effect. This is a residual effect of significance, which (if following the effects hierarchy) would require more substantial effects management than the proposed post-consent monitoring framework.

59 Yet, in the context of research that indicates that long-tailed bats may avoid turbine interaction and the very low level of site use suggesting it is highly unlikely that there will be any bat fatalities, if I apply EIANZ guidelines<sup>58</sup> to assess the magnitude of the effect on long-tailed bat populations, I conclude that the potential is more likely to be a “negligible” effect on the known population or range of the species. Following the EIANZ guidelines for a very high value species encountering a negligible magnitude of effect, I conclude that the overall residual level of effect would likely be low, requiring no further effects management. Nonetheless, taking into consideration that turbine strike cannot be completely ruled out, I am of the view that the overall residual level of effect assessment should then be increased to “moderate”, which triggers the need for further effects management to address that uncertainty specifically.

60 I therefore agree with the conclusions in Appendix L (but for different reasons) – that is, the overall effect on long-tailed bats is likely to be low, but there needs to be some form of response to address the uncertainty relating to turbine strike. A response could take many forms including the suggested curtailment as a mitigation. Arguably, avoidance is the first port

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<sup>56</sup> CFJ O’Donnell, KM Borkin, J Christie, I Davidson-Watts, G Dennis, M Pryde & P Michel (2022). Conservation status of bats in Aotearoa New Zealand, 2022. New Zealand Threat Classification Series 41. Department of Conservation.

<sup>57</sup> Appendix L, Table 6.1 (pages 29-30).

<sup>58</sup> See Appendix C, Table 7 (page 25).



of call, but assuming that the risk to the bat population is as low as anticipated, not building the windfarm seems a drastic response. An offset involving predator control and habitat enhancement within roosting sites to enhance the local bat population is also an ecologically attractive scenario. However, without any information as to the location or number of roosts near the site and an evaluation of the level of enhancement that can be achieved, such a proposal is presumptive and compensatory in nature. An adaptive management framework to refine the risk and response is preferred.

- 61 The recommendation in Appendix L is that bat activity monitoring is undertaken at all turbines for five years post-construction, with an adaptive management programme to be implemented to mitigate more than minor adverse effects. I agree that this recommendation is a practical and sensible response to the evidence. To that end I agree with the proffered condition.

#### **Dust effects**

- 62 An assessment of the effects of dust on the native vegetation is presented in RFI#2 Response 3. I am comfortable with this assessment indicating that the ecological sensitivity to dust of native vegetation within 50 metres of the works areas and main access is low.<sup>59</sup> However, as I highlight below, this does not necessarily translate to a low level of ecological concern.
- 63 Based on experience, I am of the view that, as long as dust is actively managed below human nuisance thresholds, dust deposition has only minor effects on adjacent native vegetation. However, as RFI#2 Response 3 concludes that the main risk (and thus point of active management) of dust effects are associated with construction traffic using Old Coach Road,<sup>60</sup> the report does not guarantee to me that human-related nuisance dust suppression will be undertaken across the whole project area. This means I cannot conclude that the effects on native vegetation are likely to be low using this guideline alone. If (for example) the magnitude of effect were to be “very high”, then the EIANZ framework would lead to the conclusion that

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<sup>59</sup> Dust Assessment, Appendix 1, page 4.

<sup>60</sup> Dust Assessment, Appendix 1, page 10.

the overall residual effect on “low” value habitat is “moderate”, which is an effect to be managed.

64 However, Appendix L helpfully identifies that “...construction related activities such as noise and dust disturbing the bats during the day is extremely unlikely”.<sup>61</sup> As this statement is given after consideration of preferred habitat that occurs on the edge of the Turbine Envelope Zone<sup>62</sup> (i.e. immediately adjacent to the effects envelope), it provides a level of comfort that the dust effects on vegetation outside the effects envelope, at least on bat habitat, has been considered and subsequently dismissed as not significant. Adding to this, a “very high” magnitude of effect is one that leads to total loss or very major alteration of the vegetation, which I think is unlikely.

65 At magnitudes of effect below the scale of “very high” (i.e. “high” or lower), the EIANZ framework leads to the conclusion that the effects on low value habitat are “low”. Having considered that the native woody vegetation outside the effects envelope is not significant native vegetation or significant habitat of flora or fauna, and having considered that it is unlikely that there will be effects directly related to fauna, I am of the view that effects management of dust for ecological reasons is not warranted.

### **Biosecurity**

66 The body of the site is remarkably free of environmental weeds. Wattle, gorse, blackberry, and broom are mentioned in the ecological assessment but this is in direct relation to the riparian vegetation of the Makakahi River and tributaries. The spread of weeds species already within the project area is very low-risk and can be adequately managed through conditions relating to the maintenance of wetland offset sites and riparian plantings.

67 In my view, it is also necessary to consider other pests that could be spread by the activity. This includes unwanted organisms listed in the Official New Zealand Pest Register that are present in either the Horizons or GWRC region

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<sup>61</sup> Appendix L, Section 6.1.2.3, page 29.

<sup>62</sup> Appendix L, Section 1.3.1, page 3.

or any other regions where machinery is arriving from, and any exclusion, eradication, and progressive containment (where the activity is occurring outside the containment zones) pest plants that are listed in the relevant Regional Pest Management Plans (RPMPs).

68 Of particular concern is the spread of field horsetail (*Equisetum arvense*) through gravel resources and yellow bristle grass (*Setaria pumila*) which can be spread by mowers (presuming mowing may be necessary to reduce the threat to pipit). Both are pastoral pests that are difficult to eliminate once established and prevention of incursion is advised. In my view, this risk should be managed through pre-construction survey of the presence of the pests at material supply sites and a quarantine protocol for machinery entering the sites.

69 Also of concern is the potential introduction of plague skinks (*Lampropholis delicata*) and myrtle rust (*Austropuccinia psidii*) in plant material transported to the site for offset planting. The risk of both should be managed through diligent plant inspection and /or obtaining material from suppliers who have procedures for avoiding the spread of these pests.

70 To avoid the spread of *Didymosphenia geminata* (known as didymo), there are standard procedures for machinery, vehicles, clothing and footwear that should be followed when working between different catchments.

71 I recommend the above requirements should be conditions of consent.

## H. SUBMISSIONS

72 A number of submissions raise the issue of **the effect of light pollution on wildlife**.<sup>63</sup> The Application identifies that there will be limited artificial night-time lighting during construction and then during operation, lighting on and in the vicinity of the wind turbines is mainly limited to the red aviation lights on top of the nacelles. The main concern with artificial night-time lighting is the effect that this may have on drawing bats and nocturnal birds into the construction site. As the need for lighting is limited to short-duration works

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<sup>63</sup> Submissions #8, #13, #21, #56, and #57.

and is not associated with operational turbines, I am of the view that the impact on bats and birds will be temporary and minor. The aviation lights are red, which is not visible to insects and therefore they are not attracted to them. Therefore, I do not consider the aviation lighting presents any more risk to night-feeding insectivores such as morepork or long-tailed bats.

- 73 Some submissions<sup>64</sup> also suggest that **insects attracted to the lights will drop to the ground and provide a new habitat for ground feeders and associated predators**. As I highlight above, because the aviation lights are red, the night lights are unlikely to attract insects (including moths) and so the ecological cascade described in these submissions is not likely to occur. I am also unaware of any large-scale ecological cascades directly associated with increased insect rain being detected at operational windfarms in New Zealand, although acknowledge that the literature is lacking in this regard. The submissions do not describe the species of concern and, as there are a number of native bird species in the existing environment that feed on insects on the ground, I cannot ascertain whether the submissions are concerned with ground feeding birds in general or vulnerable bird species that would disproportionately be affected by increased predation. While I do not expect the scenario described in these submissions to occur, the pipit (as a vulnerable ground-nesting insectivore) would be a useful indicator species if the windfarm were to cause the phenomenon.<sup>65</sup>
- 74 One submission<sup>66</sup> queries **how many native trees will be lost during construction**. The generally accepted approach to account for habitat loss is based on the hectare coverage of vegetation being removed rather than a count of individual trees. This explains why the actual number of trees is not provided in the ecological assessment. The number of trees is of relevance to an impact assessment where (for example) there is a need to account for vulnerable flora (as I have for poroporo), tree types that are critical habitats of vulnerable fauna (such as large old-growth trees suited to bat nesting), if the affected habitat is a threatened habitat type of treeland where

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<sup>64</sup> Submissions #8 and #13.

<sup>65</sup> See para 55 where I discuss monitoring of predation of pipit for different reasons.

<sup>66</sup> Submission #57.

individual trees are all that remain, or if the effect involves the disproportionate loss of a signature canopy tree species (such as extractive native forest harvest). But, aside from a potential risk to individual plants of vulnerable species (which as I propose do get counted individually), none of the affected habitats in the Mt Munro site present the need for individual tree counts to account for the loss.

75 The same submission<sup>67</sup> also raises the issues of **noise and wind pollution on wildlife and habitat**. Another submitter<sup>68</sup> raises the issue of the effect of noise on kereru and other birds. A related submission<sup>69</sup> is concerned that having turbines in the area could disrupt the peaceful environment in which the birds and the reptiles live, although it is not specific on whether this disruption is noise-related or some other effect. In response:

- (a) The issue of construction noise effects on avifauna and bats is briefly traversed along with the other construction effects in the ecological assessments. I am satisfied that there will be a low or lesser level of ecological effect of construction noise due to the limited duration and the ability (for the birds) to temporarily move away and (for the bats) the activity mainly occurs during the day and away from roost sites. The level of ecological effect of construction noise on lizards is also low, confined to the activity of establishing the western end of the transmission line within the specific area of habitat where they are found. As I have identified, the translocation of lizards away from the construction zone is likely to further mitigate the level of effect.
- (b) The issue of operational windfarm noise is not traversed in detail in the ecology assessments. However, in my view, it can be assumed that the limited use of the site by vulnerable species transcribes to limited exposure to operational noise effects. The behaviour of common and vulnerable avifauna living in or adjacent to operational windfarms, as described in the ecology assessments, suggests that operational noise is not a significant issue affecting the birds and

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<sup>67</sup> Ibid.

<sup>68</sup> Submission #58.

<sup>69</sup> Submission #61.

that they will continue to use the site. The turbine avoidance behaviour of bats might suggest noise is a factor, but it appears not to limit bat use of the rest of the site. Operational noise is unlikely to be a problem for the lizards, considering that they are subjected to road noise from SH2.

(c) I cannot comment on wind pollution.

76 A number of submissions<sup>70</sup> identify that the **impact on native birds** will be significant or is otherwise undesirable. The submissions record that Mt Munro is habitat for many native bird populations and/or the proximity to Pukaha / Mt Bruce National Wildlife Centre poses a threat. I am satisfied the ecological assessment traverses the avifaunal risks identified in these submissions.

77 One submitter<sup>71</sup> identifies that there will be undesirable **impacts on insect life**, although is not specific as to the nature of effect. Another submission<sup>72</sup> features insects as wildlife of concern but does not provide details. A further (more specific) submission<sup>73</sup> identifies that they have yellow, orange, and green moths and is concerned that the turbines could disrupt that environment. Unfortunately, without specifics on species and location, it is difficult to gauge whether these submitters identify effects on invertebrates that are not otherwise appropriately managed by limiting the scale of loss of native vegetation. Given the scarcity of indigenous vegetation on the site and the limitation on native vegetation clearance, I am satisfied that the levels of effect on native insects, particularly rare species, is likely to be low.

78 One submission<sup>74</sup> identifies that **long-tailed bat** were observed during the previous ecological assessment of the Mt Munro site and states that this “...was a major issue...”. The results of the investigation undertaken at Te Uku Wind Farm (as described in Appendix L) suggest that long-tailed bat populations are not as susceptible to windfarm fatality as originally

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<sup>70</sup> Submissions #5, #17, #33, #41, #44, #47, #56, #58, #68.

<sup>71</sup> Submission #68.

<sup>72</sup> Submission #47.

<sup>73</sup> Submission #61.

<sup>74</sup> Submission #47.

assessed. I am comfortable that the adaptive management approach will adequately manage the risk (such as it is understood) to long-tailed bats.

79 More generally, there is a submission<sup>75</sup> which makes mention of impacts on wildlife and another submission<sup>76</sup> that refers to toxic runoff impacting wildlife and the project's effects on native birds and insects. These aspects are not deeply discussed by these submitters and I cannot make any further comment other than reiterating my earlier conclusions regarding the assessment and level of ecological effects for the Mt Munro Project.

#### I. CONDITIONS

80 I have reviewed the conditions proffered by the Applicant and consider there are improvements that can be made to the conditions as proposed, as well as further conditions necessary to better address the effects associated with the Mt Munro Project. While drafting improvements are required to make conditions more certain and enforceable, I understand this will be addressed through an updated set of conditions on behalf of the Councils.

81 To manage potential effects on *Sphagnum perchaetiale* and *Luzula leptophylla*, there should be a requirement, if these species are within the wetlands affected by loss in extent, for a transfer of wetland material containing these species into an appropriately suited habitat within the recipient wetland sites. It would be useful for the process of transfer (such as volume and method) not to be dictated by consent, so there was sufficient opportunity for a suitable qualified wetland botanist to determine the most appropriate course of action. However, for compliance enforcement and peer review, the process should be documented (possibly within the "as built" plans for the offsetting sites) and submitted to the regional councils for certification prior to construction. In any event, should the transfer fail to establish a population of the affected species in the offset wetland(s) within 1 year of the transfer, then replacement planting of the

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<sup>75</sup> Submission #40.

<sup>76</sup> Submission #24.

species should be undertaken the following spring using propagules sourced from elsewhere.

- 82 To manage potential effects on poroporo, there should be a requirement that any *Solanum aviculare* var. *aviculare* over 1m in height that is removed is replaced 1:1.
- 83 In addition to the 1:1 ratio of wetland replacement specified in proffered condition 16, I consider there must be an upper limit of 0.32 hectares of loss of wetland extent in the Horizons Region and zero hectares loss of wetland extent in the Greater Wellington Region.
- 84 Furthermore, the wetland offset condition needs specific wording around the target level of canopy cover (I recommend at least 80%) to be achieved within a 5-year time frame. This condition should also make reference to a planting plan which itself must specify the extent of planting, number of plants, and plant species to be included. The number of plant species should not be less than seven native hydrophytic species. The condition also should contain a clause that requires review at year five along with any recommendations for further planting in the event of failure to achieve the 80% canopy cover target. Given the 5-year lag, it would be my preference that the condition requires any extension of the offset to be re-calculated using the Biodiversity Offset Model (or similar quantitative tool) that accounts for lag. The condition should also make reference to an appropriate scale for ecosourcing plant material, which I suggest being the Pahiatua Ecological Region.
- 85 Rather than relying on compliance with a wildlife permit from DOC, I recommend a requirement for pre-clearance inspections for lizards of the vegetation for the transmission line and the formation of a lizard transfer protocol. Given the proximity of the confirmed skink observations along Kaiparoro Road to the W.A. Miller Memorial Reserve, the condition could specify this site as the recipient site to aid certainty that the transfer will occur into an established protected natural area.



- 86 I also recommend a condition requiring a more general accidental discovery and transfer protocol for lizards to be applied across the whole site.
- 87 To manage the potential effects on avifauna, I recommend avifaunal monitoring for bird strike with the turbines and transmission lines for five years to be undertaken post-construction, with reporting (including recommended response) of any unanticipated adverse effects and a management response to those effects.
- 88 To avoid effects on pipit, I recommend a condition set that first seeks to maintain grass to a height of less than 200mm long between the months of August to March (inclusive) and, should the grass exceed this height, require pre-construction survey of the construction area for nesting pipit.
- 89 To determine if there is an unanticipated increase in predation on pipit, I recommend that reporting on the avifaunal monitoring (while primarily directed to bird strike) also report on (and if necessary, respond to) pipit predation.
- 90 With respect to long-tail bats, bat activity monitoring should be undertaken at all turbines for five years post-construction, with an adaptive management programme to mitigate effects to be implemented if regular bat activity is recorded.
- 91 A biosecurity conditions set should be required, specifically identifying procedures for the avoidance of incursions of plague skink, myrtle rust, Didymo, field horsetail, yellow bristlegrass.

**James Lambie**

**15 March 2024**

J. FIGURES



**Figure 1:** Approximate location of a poroporo shrub, possibly *Solanum aviculare* var *aviculare*.

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