BEFORE THE WAIPĀ DISTRICT COUNCIL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of Proposed Plan Change 20 – Airport Northern Precinct Extension to the Operative Waipā District Plan

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REBUTTAL STATEMENT OF EVIDENCE OF GEORGIA THELMA ROSE CUMMINGS

(ECOLOGY – LONG-TAILED BATS)

10 March 2023

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INTRODUCTION

1. My name is Georgia Thelma Rose Cummings. I am an ecologist and bat specialist at Tonkin & Taylor Ltd (T+T), Environmental and Engineering Consultants in Hamilton.

2. My qualifications and experience were set out in my Primary Statement of Evidence dated 28 February 2023. I repeat the confirmation in my Primary Statement of Evidence that I have read and agree to comply with the Code of Conduct for Expert Witnesses.

3. In this statement of rebuttal evidence, I respond to the evidence of Ms Thurley on behalf of the Director-General of Conservation ("DOC").

4. The fact that this rebuttal statement does not respond to every matter raised in the evidence of a submitter within my area of expertise should not be taken as acceptance of the matters raised. I have focussed this rebuttal statement on the key points of difference that warrant a response.

RESPONSE TO MS THURLEY

The classification of agricultural areas as preferred habitat

5. Ms Thurley consistently refers to 'rural' or 'agricultural' land as the "second-most preferred habitat" of long-tailed bats in Hamilton.[1] This assessment of habitat preference appears to have been derived from a habitat analysis presented in Davidson-Watts Ecology (Pacific) Ltd (2019), the long-tailed bat radio tracking baseline report prepared as part of the Southern Links project. I henceforth refer to this report as the ("SL report").

6. The SL report includes two methods of habitat use analysis and in both methods the habitat types generally described in para [7.8] of Ms Thurley's evidence are used. These being: industrial, lifestyle, urban, agricultural, native/exotic trees, parkland, river/open water. [2] However, I have read the study and I cannot discern any reference to "most preferred habitats", "second-most preferred habitats", and "least preferred habitats" as outlined in para [7.8] of Ms Thurley's evidence.

7. I assume Ms Thurley's groupings of "most-preferred habitats", "second-most preferred habitats", and "least preferred habitats" are in relation to rankings presented in Approach 2 of the habitat analysis which ranked habitat types in sequence from most to least used as follows:

[1] Ms Thurley's EIC paras [4.5, 8.2, 8.3, 9.5, 11.1]
[2] Refer to Table 2 (page 8) in Davidson-Watts Ecology Ltd. (2019). Long-tailed Bat Trapping and Radio Tracking Baseline Report 2018 and 2019 Southern Links, Hamilton. Prepared for AECOM.

"Native and exotic trees > river and open water >>> lifestyle > parkland > agricultural >>> industrial > urban." [3]

8. Under the above ranking, agricultural land[4] is the fifth (out of seven) most used habitats, but a statistically significant difference was not found between agricultural, parkland and lifestyle habitat types (the ">>>" symbol denotes a statistically significant difference).

9. The key point here is that the words *used* and *preferred* have different meanings. The SL report does not include the term preferred. While agricultural land was used more than urban or industrial habitats, the data does not show that it is *preferred*. Figure 1 below is a graph of the habitat usage versus habitat availability derived from the habitat analysis (Approach 2) in the SL report. This is the data used to perform the compositional analysis that ranked the habitat types as quoted in the paragraph above (from which I'm assuming Ms Thurley derived the habitat preference groupings she outlines in para 7.8 of her EIC).

10. Figure 1 illustrates that agricultural habitat was used considerably less compared to its availability in the landscape, suggesting that this habitat was avoided by the radio-tracked bats. Figure 1 suggests that the only habitats that could be considered "preferred" (i.e., used more compared to their availability in the landscape, implying these habitats were actively selected by the radio-tracked bats) are native/exotic trees, river/open water, and parkland habitat. None of these habitats are present at the PC20 site.

[3] Refer to para 3.3.4 (page 22) in Davidson-Watts Ecology Ltd. (2019). Long-tailed Bat Trapping and Radio Tracking Baseline Report 2018 and 2019 Southern Links, Hamilton. Prepared for AECOM.
[4] The habitat type which best describes almost all of the PC20 site. For a description of the habitat types refer to Table 2 (page 8) in Davidson-Watts Ecology Ltd. (2019). Long-tailed Bat Trapping and Radio Tracking Baseline Report 2018 and 2019 Southern Links, Hamilton. Prepared for AECOM.

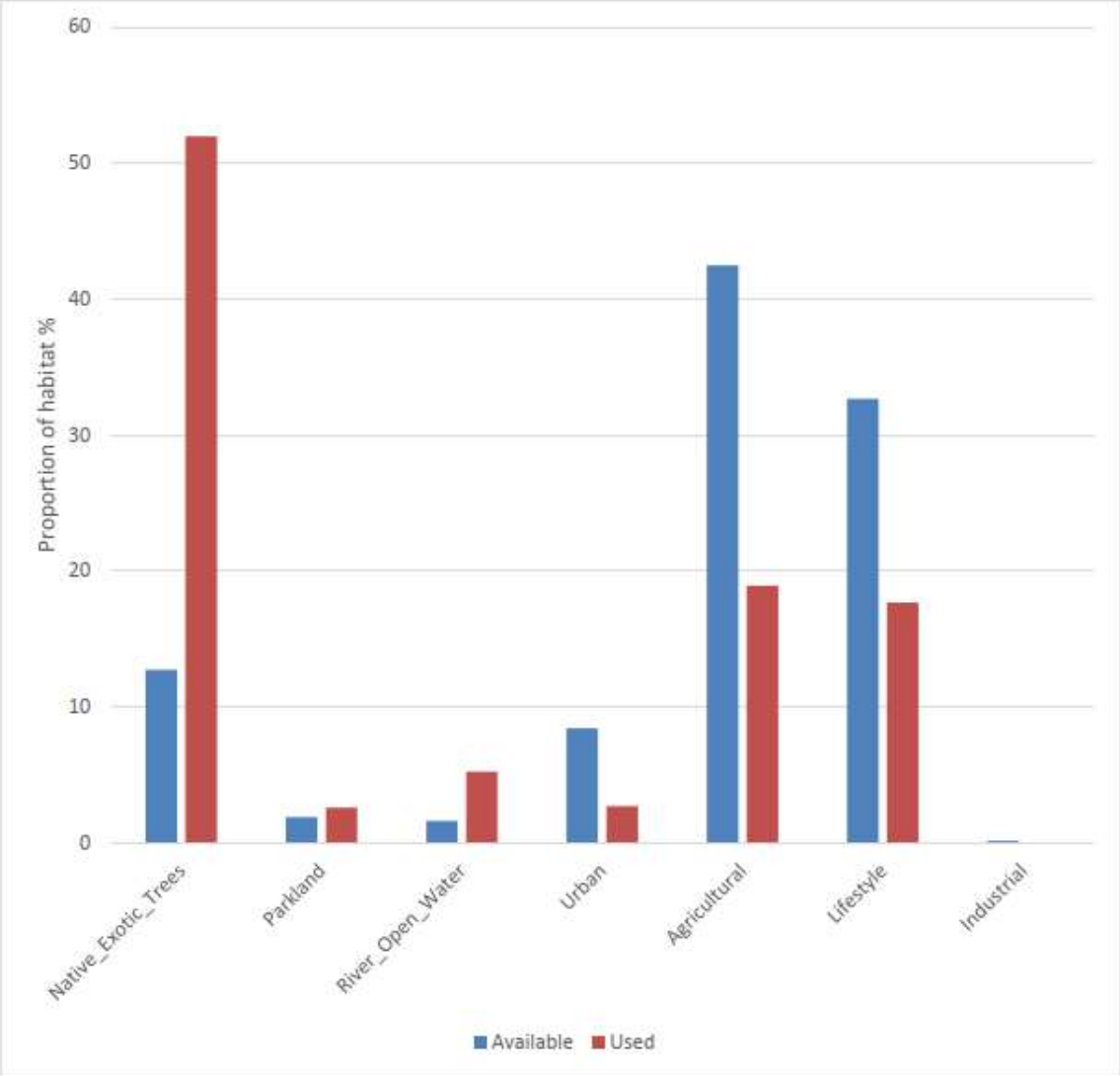

Figure 1: This graph is from Davidson-Watts Ecology Ltd. (2019) - the SL report. It shows habitat selection by long-tailed bats radio-tracked during the study: comparisons of habitat available (MCPs) vs. habitat used (locations with 50m buffer) (mean percentage area).

11. Habitat usage is meaningless without a comparison with the availability of each habitat in the landscape. Without a meaningful comparison of use versus availability, a bat could be moving completely randomly through the south Hamilton landscape and the likely outcome would be that the individual's habitat usage would indicate that it is 'preferring' agricultural habitat (even though it is moving randomly). In fact, the individual would just be encountering agricultural land more because it is the most common habitat type in the landscape.

The cumulative effects of urbanisation across bat population's range will 'squeeze' long-tailed bats from the area

12. Ms Thurley refers to lack of space cumulating from multiple developments squeezing out the bat population.[5] I agree with Ms Thurley that long-tailed bats are wide ranging. However, I do not consider that agricultural habitat is a limiting resource for long-tailed bats, a review of aerial imagery clearly shows it is the predominate land type in the wider landscape. Furthermore, *open* agricultural land (i.e. pasture/cropland with the occasional scattered tree) appears to be primarily used for commuting[6] to access key vegetated habitats (such as forest remnants) that are located within the agricultural matrix.

13. Key bat habitats such as native and/or exotic forest remnants, occur within the matrix of agricultural and/or rural land south of Hamilton which is earmarked for future growth (such as land between Southern Links and Peacocke). Mr Inger's rebuttal evidence identifies that it is not for PC20 to address the potential future effects of growth in these areas and that this would need to be considered through other statutory processes in future. [7] Although I recognise that it is outside of the PC20 process, it is my opinion that these key habitats need to be protected and other areas enhanced to create more 'high-value' bat habitat in the landscape. The habitats need to be connected via habitat corridors to ensure bats can continue to move between these habitats as development progresses in the surrounding landscape. I do not consider that a 'do nothing' approach is the best way to protect this population. Many of the key habitats are on private land, much of which is currently farmed. Under the status quo it is a permitted activity to remove mature exotic trees anywhere in the Waipa District and to remove indigenous trees outside of Significant Natural Areas, bush stands and biodiversity corridors identified in the Waipa District Plan, and there are no incentives to set aside productive land for bat habitat restoration and/or enhancement.

14. As outlined in paras [39] – [41] of my EIC, bats are regularly using core habitat immediately adjacent to urbanised areas. Figures 1 and 2 in Ms Thurley's evidence also demonstrate that bats are present in areas surrounded by urbanisation. Figure 1 demonstrates that while the home ranges of individual bats cover large expanses of mostly agricultural land, the core areas are centred on comparatively small clusters of vegetated areas including kahikatea remnants, parks, and vegetated gullies.

[5] Ms Thurley's EIC para [11.5].
[6] Refer to para [30] in my EIC.
[7] Inger Rebuttal para [21].

15. Figure 4a in Ms Thurley's EIC shows existing urbanised areas within the combined home range of the radio tracked bats in the SL report. If you contrast Figure 4a with the areas used by bats in Figures 1 and 2 in Ms Thurley's EIC, it demonstrates the points made in paras [39] and [41] of my EIC - if habitat is provided among urbanised areas and connectivity is maintained, bats will continue to use the habitat.

16. It should be noted that the habitats currently used by bats amongst urbanised areas were not created for the purpose of providing long-tailed bat habitat. The BHAs and the compensation site proposed as part of the PC20 effects management package will be restored and/or enhanced through bespoke design with the specific aim of enhancing habitat for long-tailed bats.

17. The restoration and/or enhancement for the BHAs and compensation site will be detailed at a later stage as required under proposed Rule 10.4.2.14B(i) and (vi). The restoration would include the provision of multiple tree lines and clusters of trees interspersed with meadow-type areas. For the BHA corridor, this is shown on Figures 1 and 2 which are landscape diagrams that are included in Appendix S10 and referred to in Rule 10.4.2.14B(i). There are also potential opportunities to naturalise stormwater networks within the BHAs and the existing drains within the compensation site to form areas of open water. This will result in a considerable increase the 'edge' habitat available, improving the quality of the BHA and compensation site for foraging in particular, as well as future roosting in the medium to long-term.

18. As such it is my opinion that long-tailed bats don't necessarily need large swathes of open grassland/cropland (which is the predominant sub-habitat within the agricultural habitat type) to persist. Instead, core habitats need to be protected and connective pathways between these habitats maintained. Furthermore, the restoration and/or enhancement of lower value habitats can provide additional foraging, commuting and potential roosting (in the medium to long-term) habitat in the landscape. The intention of such restoration and/or enhancement is to mitigate or compensate for the loss of what I consider to be lower value habitats.

19. In paras [8.8] and [9.7] Ms Thurley states that PC20 will remove 8% of remaining habitat from the bat population's combined home range west of the river. There are a few things to note here:

    (a) The river is not a barrier to long-tailed bats, I'm not sure why Ms Thurley has decided to focus solely on the habitat remaining *west* of the river;

(b) As noted by Ms Thurley in para [6.6] the population's combined home range, from which Ms Thurley's calculations are based on, is likely an underestimate;

(c) As demonstrated by Figures 1 and 2 in Ms Thurley's evidence, urbanisation does not completely exclude bats from an area; and

(d) As noted in para [13] above, Mr Inger's rebuttal evidence identifies that it is not for PC20 to address the potential future effects of growth across the bat population's range.

Significance of the PC20 site under the WRPS

20. Ms Thurley and I agree that long-tailed bats are wide ranging.[8] However, research shows that long-tailed bats do not use all habitat within their home ranges equally and they have 'core' areas where they spend most of their time. In the case of the Hamilton population, these core areas are generally associated with mature woody vegetation such as the vegetated gully systems associated with the Waikato River, forest remnants, and parkland.[9]

21. I agree that APP5 of the WRPS does not specifically include thresholds for habitat value. Long-tailed bats are wide ranging and move between core areas that are often kilometres apart. They are opportunistic, generalist foragers that have demonstrated their ability to adapt to a modified landscape. A prime example being their use of single lines of trees such as shelterbelts as edges to forage along. Sites that have any habitat value, or are located between high-value habitats in a landscape occupied by long-tailed bats, will generally record at least some bat activity on a regular basis. I have observed this through my own work.

22. Ms Thurley's approach to applying Criterion 3[10] appears to set the threshold for significance as the presence of bats. The logical outcome of this approach is that all areas within the bat home ranges shown in Figure 1 of Ms Thurley's EIC being classed significant habitat for indigenous biodiversity under the WRPS. As noted in para [6.6] of Ms Thurley's EIC, the home ranges shown in Figure 1 are likely an underestimate. There are also many other known populations of long-tailed bats in the Waikato region. Such an outcome is discussed in para [61] of my EIC, areas deemed significant using this

[8] Ms Thurley's EIC para [6.6].
[9] Davidson-Watts Ecology Ltd. (2019). Long-tailed Bat Trapping and Radio Tracking Baseline Report 2018 and 2019 Southern Links, Hamilton. Prepared for AECOM.
[10] Criterion 3 in Table 28 in APP 5 of the WRPS.

reasoning would include urbanised areas such as parts of the suburbs surrounding the Mangakotukutuku Gully and Hamilton Lake.

23. The WRPS has been used to determined Significant Natural Areas (SNAs) across the Waikato Region, including the Waipa and Waikato Districts. Professional judgment was used in these assessments to identify key areas likely to be used by bats[11] rather than the 'blanket' approach advocated by Ms Thurley. As discussed in paras [62] and [63] of my EIC, professional judgement was used to classify parts of the Peacocke Structure Plan area as significant with reference to long-tailed bats. This approach has been accepted by the independent hearing panel in the PC5 decision. I have based the significance assessment outlined in my EIC on this accepted approach. I consider this to be more appropriate than classifying large expanses of an already highly modified landscape as significant.

The potential impact of noise on long-tailed bats

24. As noted in my EIC, two studies specific to the south Hamilton bat population have not found that noise significantly impacts long-tailed bat behaviour. Ms Thurley discusses a third study which "appears to have found a negative effect of noise on long-tailed bat activity." [12] The results of this paper are not publicly available (in preparation). As such I was not previously aware of this study, and I cannot comment further.

25. As noted in para [9.6] of Ms Thurley's evidence, the site is already subject to aircraft noise. Mr Bell-Booth at para [27] of his EIC describes the environment as an active area with associated noise which is largely influenced by aircraft and road traffic and that aircrafts are a considerable source of noise. He notes that Southern Links will introduce more traffic noise. At para [39] of his EIC Mr Bell-Booth states that the 2 to 3 decibel noise increase likely to be experienced by the neighbours is 'barely perceptible'. While I accept Mr Bell-Booth's EIC focusses on noise effects on humans, I consider it unlikely that the proposed changes in the noise environment will have a considerable impact on bats given that they already use the area in the presence of aircraft noise, and other parts of their range are immediately adjacent to urbanised areas.

[11] Kessels Ecology. (2017). Significant natural areas of the Waikato District: terrestrial and wetland ecosystems. Waikato Regional Council Technical Report 2017/36. Report prepared for Waikato Regional Council; Kessels & Associates Ltd. (2012). Significant natural areas of the Waipa district: terrestrial and wetland ecosystems. Waikato Regional Council Technical Report 2013/16. Report prepared for Waikato Regional Council.

[12] Ms Thurley's EIC para [6.4].

Uncertainty that bats will continue to use the PC20 site

26. As I have agreed in the JWS, urbanisation of an area will increase the uncertainty that bats will continue to use that area. However, based on observations of how this bat population is currently using the landscape, bats will use habitat adjacent to urban areas where habitat connectivity is maintained.[13]

27. In para [10.2] Ms Thurley expresses uncertainty that bats will use the BHAs because of their proximity to urban areas, the presence of roads and the size of the BHAs. I do not consider the size of the BHAs to be an issue in and of itself as many of the key habitats identified in the vicinity of the PC20 site (e.g., the kahikatea remnants) are smaller than the combined area of the proposed BHAs. I do however agree that the BHAs must be appropriately buffered from the proposed urbanisation to facilitate the continued use of these habitats by bats. Paras [91] – [101] in my EIC step through the avoidance and mitigation measures that will be enacted to protect and enhance the BHAs. The size and width of the BHAs is similar to equivalent areas in Peacocke under PC5.

28. As outlined in para [118] of my EIC, roads in vicinity of the BHA cannot be avoided, but I note that several large road corridors currently surround the PC20 site. Ohaupo Road (SH3, classified as a Major Arterial Route) traverses the area to the west of the site. The site is bounded to the east by Hamilton Airport and SH21 (a Major Arterial Road) immediately beyond. Raynes Rd (a Local Road) borders the site to the north.

Adequacy of the compensation package

29. Ms Thurley does not consider that the compensation package is adequate relative to the extent of habitat removal associated with PC20. She cites a study from the UK which suggests that creating bat habitat at least the size of the area of development could mitigate the effects of urbanisation.[14] This study modelled the activity of several species (data collected through citizen science monitoring) in relation to hypothetical scenarios of land development. The results of the urbanisation scenarios differed between the bat species depending on their habitat preferences and adaptations. I don't support reliance on a broad concluding statement from single study of overseas bats for quantifying the effects management package for PC20 over the BCM model. In his evidence in reply Mr Markham outlines why he considers the BCM to be the most reliable, transparent, and

[13] Refer to paras [39] – [41] in my EIC.
[14] Ms Thurley's EIC at para [11.6].

robust approach.[15] He also summarises how the BCM has been used and accepted in Environment Court hearings and council hearings (including PC5).[16]

30. As outlined in Mr Markham's EIC,[17] the level of impact, and hence residual effects, cannot be adequately determined at the plan change stage. As such the assessment in Mr Markham's evidence is preliminary and it is proposed that the compensation package is detailed in the Bat Management Plan ("BMP") required under rule 10.4.2.14B(a)(vi).

31. In paragraph 11.4 Ms Thurley points out that, while no bat surveys have been undertaken at the compensation site, it is likely already used by bats for foraging and commuting. I agree this is likely, and if that is the case then para [104(a)] of my EIC where I discuss habitat restoration and/or enhancement of the compensation site is for the purpose of "establishment of commuting and foraging corridors for long-tailed bats" should be amended to reference 'protection and restoration' of commuting and foraging corridors. The site now is in productive use comprised of cropping interspersed with scattered mature trees which are mostly exotic specimens that are not legally protected. While not detailed at this point, I outline likely restoration and/or enhancement actions in para [17] above. These actions will result in a considerable increase in the 'edge' habitat available on the site, improving the quality of the site for foraging in particular, as well as future roosting in the medium to long-term.

32. As outlined in my EIC, I support the proposed effects management package for PC20. It is my opinion that compensation site provides an excellent opportunity to contribute to a multi-agency approach to expand connective linkages for bats through the landscape. In addition to its 11ha size, the location of the site between the Waikato River and other key habitats which are currently isolated in a matrix of agricultural and lifestyle land uses, make it a particularly strategic location to initiate the formal protection and enhancement of a habitat linkage. The fact that it likely already used by bats means protection of existing mature trees and enhancement of the remainder of the site is even more important.

Monitoring bat activity in the BHAs

33. I agree with Ms Thurley that monitoring of the BHA areas will be useful and should inform the assessment of residual effects.[18] A monitoring programme will be included in the Bat

[15] Mr Markham's EIR para [10].
[16] Mr Markham's EIR para [7].
[17] Mr Markham's EIC para [54].

[18] Ms Thurley's EIC para [12.2] and [12.3].

Management Plan ("BMP") as per proposed Rule 10.4.2.14B(a)(viii). The BMP will be regularly reviewed, and results of the monitoring should inform adjustments to the offset/compensation package as per proposed rule 10.4.2.14B(a)(vi) and (ix).

34. I do note that as per paras [141] – [143] of my EIC, due to the wide-ranging nature of long-tailed bats, there are limitations to attributing the cause of any changes in bat activity at the PC20 site *solely* to development activities occurring at the site. However, I agree that site-specific monitoring is required within the BHAs, and the results of this monitoring should inform reviews of the BMP (as well as co-ordinating with and contributing to landscape level monitoring).

Georgia Cummings
10 March 2023