

**BEFORE THE HEARINGS COMMISSIONERS FOR THE WAIKATO DISTRICT
COUNCIL**

UNDER the Resource Management Act 1991

AND

IN THE MATTER of hearing submissions and further
submissions on the Proposed Waikato
District Plan

PARTIES REPRESENTED **MIDDLEMISS FARM HOLDINGS LTD**

BUCKLAND LANDOWNERS GROUP

RURAL TOPIC – HEARING 18

**STATEMENT OF EVIDENCE FROM DR VAUGHAN KEESING FOR
MIDDLEMISS FARM HOLDINGS LIMITED AND
THE BUCKLAND LANDOWNERS GROUP**

9 September 2020

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MAY IT PLEASE THE PANEL

1. My name is Vaughan Francis Keesing.
2. I am a Senior Ecologist and Partner with the consulting firm of Boffa Miskell Ltd, Wellington. I have been a practising ecologist for the last 25 year. I hold the qualifications of Doctor of Philosophy (PhD) in Ecology, BSc (Hons 1st class) zoology, and a Diploma in Research Statistics.
3. My skills lie in ecology. I have specialist skills in the areas of limnology, entomology, zoology and botany and have worked extensively in freshwater and terrestrial habitats.
4. I have been practising as a consulting ecologist for the last 22 years, and have worked in a variety of locations including the West Coast, Canterbury, Central North Island, Lower North Island, the Far North, Auckland Region and the Bay of Plenty.
5. During my time as a practicing consultant ecologist I have been engaged in a wide number of small and very large projects and have undertaken assessments and work that has led to the preparation and delivery of over 60 briefs of evidence, 30 of those at the Environment Court.
6. This work has included significance assessments for councils such as wetlands of the West Coast Region, SNAs of the Ashburton District, PNAP of the Rangitikei, for large scale developments, (e.g. Omaha subdivision, Pegasus Bay development, ALPURT motorway, Transmission Gully motorway, Mackays to Peka Peka motorway, Long Bay Structure plan, and many ecological assessments requiring the use and interpretation of significance criteria.
7. In addition, and relevant to this evidence, I have undertaken over 120 conservation "bush" lot assessments for Conservation lots in the Franklin District since 2000, and at least 50 in the Bay of Plenty for the Western Bay of Plenty Council, including a number of sites requiring restorative actions to raise their ecological value. I have assessed a wide array of wetland types, conditions and localities in the upper central North Island Districts and a small number in Waikato District. I have prepared and

measure a number of bush and wetland restorative and creation projects. I also prepared evidence for the FDC District Plan process related to the value and sizing of conservation lots and riparian revegetation considerations.

8. I am thus very familiar with measuring ecosystems, interpreting data with regard to values, uniqueness and sensitivity, interpreting plan requirements for conservation of indigenous biodiversity and measuring the success of these.
9. I am familiar with the professional and evidentiary standards required of consultants providing expert resource management planning opinion evidence. In particular, I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person.

Introduction

10. This evidence is presented in relation to the appeals of the Middlemiss Farm Holdings Limited on the proposed Waikato District Plan and primarily about mechanisms in the plan to incentivize indigenous biodiversity gain, and stream and water quality protection and enhancement.
11. A focus of my evidence will be that while the proposed plan recognises a process around identifying SNA and protection of those, this is insufficient to counter the long term indigenous biodiversity loss in the landscape in the district and the proposed plan does not have mechanisms to incentivise landowners to both conserve and enhance existing indigenous biodiversity and habitat, or undertake to increase, through active recreation, more indigenous habitat (be that terrestrial bush, wetlands or riparian habitat).
12. I have found it true over the years that substantive restorative and protection of indigenous systems only happens under particular

circumstances, those being where there is a remnant feature that has particular species and character that “stir” the owner, or adjacent public, to value and adopt that feature, or where there is a gain to those would-be restorers / savours or recreators. This, in the main is because those activities come with a real costs (either in loss of opportunity to use the land, or through costs to buy plants and plant them, fencing and weed and pest management and ongoing maintenance).

13. Conservation lots have been a traditional and very successful approach in plans (e.g. Franklin, Thames-coromandel, Waikato, Western Bay of Plenty). In very depleted landscapes such as Franklin even small scale conservations lots (0.5-2 ha) create substantive gains in helping secure indigenous species and a mosaic of fragments across the landscape that assist in the transmission of species and genetic material. They are critical to retain the potential for more substantive habitat enhancement into the future, but that value is restricted when the only features that can be used are already SNA. If a district loses the sources of potential colonists, recreation at a future date becomes extremely problematic.

Ecological Context

14. Lowland native forest fragments are one of the most damaged and threatened indigenous ecosystems in New Zealand (Craig et al. 2000¹; Ewers et al. 2006²).
15. Extensive destruction of the original forests during two human colonisation events has left a depauperate landscape (sensu McIntyre & Hobbs 1999³) in which remnant native vegetation components are subject to repeated, severe, perturbation events.
16. Aside from the habitat loss and fragmentation process itself; these perturbations have included selective harvesting of certain canopy

¹ Craig J, Anderson S, Clout M, Creese B, Mitchell N, Ogden J, Roberts M, Ussher G 2000. Conservation issues in New Zealand. *Annual Review of Ecology and Systematics* 31: 61–78.

² Ewers RM, Kliskey AD, Walker S, Rutledge D, Harding JS, Didham RK 2006. Past and future trajectories of forest loss in New Zealand. *Biological Conservation* 133: 312–325.

³ McIntyre S, Hobbs R 1999. A framework for conceptualizing human effects on landscapes and its relevance to management and research models. *Conservation Biology* 13: 1282–1292.

dominant trees (Nicholls 1979)⁴ and certain genotypes of those species of trees. In the Franklin District case this has included substantial loss of puriri, swamp maire, totara, kahikatea, kauri and miro. It is similar in the Waikato District too.

17. Continuing effects include intermittent to continuous browsing and soil disturbance by domestic livestock (Jane 1983)⁵. Both are damaging but more importantly stop regeneration of indigenous plants. Also, there is the introduction of pest mammals e.g. possums, and plants (Craig et al. 2000, Te Mana o Te Taiao 2020), which also stop processes and destroy habitat. Elevated rates of inorganic nutrient input via agricultural fertiliser drift and/or animal transfer (Stevenson 2004)⁶, assist weed incursions into indigenous fragments (and pollute waterways); and altered hydrological regimes (from drainage of the surrounding pastoral land) add to fragment stress (Whaley et al. 1997)⁷. Exposure to agricultural herbicides is another stressor that weakens the resistance of fragmented communities to other pests and to the environmental conditions (e.g. wind dehydration).
18. As a result of the combined effects of multiple perturbations, the structure and functioning of native forest fragment ecosystems and small wetlands in production landscapes have been highly modified.
19. What is left is surprisingly resilient (persisting as it does with the challenges) but not typically sustainable long term.
20. It is my opinion (as well as other ecologists worldwide⁸) that without protection and security of as many fragments as possible, especially in a landscape which only has a small number of fragments, that such a

⁴ Nicholls JL 1979. Ecological survey of New Zealand's indigenous forests. Forest Service Mapping Series 6. Sheet 4: Waikato. Forest Research Institute, New Zealand Forest Service.

⁵ Jane G 1983. The impact of introduced herbivores on lowland forests in the North Island. In: Thompson K, Hodder APH, Edmonds AS eds Lowland forests in New Zealand. Hamilton, University of Waikato. Pp. 135–152.

⁶ Stevenson BA 2004. Changes in phosphorus availability and nutrient status of indigenous forest fragments in pastoral New Zealand hill country. *Plant and Soil* 262: 317–325.

⁷ Whaley PT, Clarkson BD, Smale MC 1997. Claudelands Bush: ecology of an urban kahikatea (*Dacrycarpus dacrydioides*) forest remnant in Hamilton, New Zealand. *Tane* 36: 131–155.

⁸ Whaley, P.T; Clarkson, B; Smale, M. 1997. CLAUDELANDS BUSH: ECOLOGY OF AN URBAN KAHIKATEA (*DACRYCARPUS DACRYDIOIDES*) FOREST REMNANT IN HAMILTON, NEW ZEALAND. *Tane* 36: 131-155. ; Saunders, D.A.; Hobbs, R.J. & Margules, C.R. 1991: Biological consequences of ecosystem fragmentation: a review. *Conservation biology* 5: 18-32.. Fahrig, L. 2002. Effect of habitat fragmentation on extinction thresholds: A synthesis. *Ecological applications*. 12: 346-353.

condition will eventually result in a loss of most of the indigenous species in that landscape.

21. The Waikato District has some 689 SNA features recognised (Wiea van der Zaan & Keesels (2017)) totalling 71,312 ha in a total district area of 434,000 hectare, or 16.4% of the area remains in indigenous habitat recognised as significant.
22. Wiea van der Zaan & Keesels (2017) however, recognised 1,599 possible SNA sites (may very small) indicating that there are a large number of vegetation communities while not significant currently, that have the potential to be restored to significance (noting that they only sum to a further 7000 ha). It is likely that there are a substantive number of even poorer remnant features in the landscape that would also be favourable to restore.
23. Today indigenous habitats (vegetation communities) are highly under represented with only around 10.72% (Wiea van der Zaan & Keesels 2017) still containing primary forest and wetland. This places considerable emphasis on the need to re-create, not just protect and restore existing features (SNA), if representativeness of indigenous biodiversity is to rise to the theoretic 20-30% resilience level (Walker et al 2004⁹).

The Proposed Plan

24. How does the proposed WDC plan do this? It doesn't.
25. Chapter 3 states that the objective is to maintain or enhance indigenous biodiversity (IB) values and life-supporting capacity. That (in policies) the plan should **enable** activities that maintain or enhance IB including planting, pest management and biosecurity and to “consider” adverse effects to IB.
26. It does not currently appear to have much in the way of mechanisms and methods to incentivise or promote IB recreation or restoration of not

⁹ Walker, S; Lee, B.; Willoughby, J.; Newsome, P. 2004. Representativeness of protected areas for biodiversity in the south island high country. LINZ report Landcase Research contract No. LC0304/086

current SNA, and only has a focus on SNA identification (which has largely been done (Wiea van der Zaan & Keesels (2017) and their protection (by rules in the plan).

27. Policy 3.2.7 identifies that the plan promotes the management of SNA that protects their long-term functioning and IB values. It mentions conservation subdivision, (3.2.7(a)(1) but otherwise highlights actions a landowner **should** undertake (i.e. exclude stock, pest control, avoiding effects) as opposed to an incentive path, or assistance or ways that these actions are promoted (caused to happen).
28. Under policy 3.2.8 it raises the incentive subdivision whereby the legal and physical protection of SNA can be undertaken to achieve a level of subdivision (3 lots for SNA feature > 10ha) and I am unclear how this is different from the current (and historic) conservation lot provision. In any case it only focuses on SNA (those features already in existence and in reasonably good condition), an important thing to do, but not one that will promote the increase or the enhancement of IB in the landscape.
29. At rule 22.4.1.6 the plan addresses conservation lots and rules that the feature must be an SNA and be of continuous area. It restricts the number of lots attainable and proportions that limited ability to areas of SNA to be protected. This is overly conservative and too limited. This is as it has been for a long time and, in my opinion, is a good provision for securing features already Significant and not otherwise managed appropriately to be sustained. But I see no reason to have an upper limit and it should simply increase prorate the area to be protected if the protection of SNA is of importance.
30. This rule, however, does nothing for the many features that are currently not SNA, or the recreation of habitat which are the only places where IB gain can be attained (as opposed to maintained).
31. A policy such as that found in the Kapiti proposed district plan (policy 3.6 - incentives), would create a better appropriate opportunity. In that example increased scale of development is the reward for substantive increase in indigenous revegetation and protection (beyond any effects based mitigation or offset). This plan has guidance around this in

its Appendix 3.1. Where that development is not on good soils this is a very successful approach to attaining large areas of new indigenous habitat and long-term management.

32. Transferable development rights appear to be prohibited in the proposed plan. It is my experience that transferable rights allow the uptake of a lot/s using restoration / protection incentives without compromising: the location where there may be further ecologically sensitive values, the soils (which may be productive) or other landscape, character and amenity values in the area of the SNA or even the incentive were higher value returns at the transferable lot location are attainable. While such rights may require a more sophisticated planning response, they are very sensible from an ecological and soil conservation perspective.
33. In todays world, as we recognise the diminished indigenous biodiversity in urban and rural landscapes, and water quality and wetland and waterway habitat condition issues, a more progressive plan with greater emphasis on helping restore IB through incentives is surly a more progressive approach.
34. It may be that where the NPS for indigenous biodiversity progresses unchanged that virtually all indigenous vegetation will be recognised as significant and so fall under the subdivision incentive / conservation lot rules, but if that does not occur the current plan largely ignores non-SNA features and so must fail to cause, in any meaningful way, an increase in indigenous biodiversity habitat. It certainly does not incentive or promote habitat recreation.
35. There may be an argument that near SNA features can, with effort and work, be fostered into SNA (especially wetlands), and this was a practice common in the Franklin District before the plan change which increased the minimum size of a SNA for consideration. However, and I was involved in many such attempts as the success reviewer, the then Franklin Council became increasingly resilient to such "attempts" such that it became a considerable difficulty to improve a feature to a level of Significance even though the criteria were found to be meet. In one example it took 8 years for a wetland feature to be improved to the

satisfaction of the Council to afford a lot, whereas had the feature, after 4 years, been surveyed by an ecologist independent of the lot process, the feature would have been found to be significant. I encountered numerous such examples of resistance to restoration creating SNA. And so, the focus on SNA is not conducive at all to promote or incentivise habitat recreation or restoration unless the feature is already SNA.

36. Where IB enhancement and riparian and wetland restoration and improved water quality protections are serious plan goals then more progressive incentivisation needs to be in place to foster landowner uptake and long-term management of IB, even if it is at the "expense" of allowing further rural housing and small scale (hamlet etc) developments, so long as there is also recognition of the protection of valuable soils.

Proposed Plan Improvement

37. Mr Hartley, in his brief of evidence, promotes a range of better potential outcomes for indigenous biodiversity related to development / subdivision than the proposed plan. They include changes to policies and rules. Those related to my area of knowledge and expertise seek an ability to transfer development rights, changes to the conservation lot rules, restoration enhancement planting, and revegetation conservation rules.
38. I concur with Mr Hartley's proposed changes to the Conservation lot rules (still focusing on SNA), but I maintain that there should be no limit to the number of lots that can be created (or transferred) where additional indigenous biodiversity was continuing to be created.
39. I agree with the restoration (enhancement planting) rules he has proposed whereby SNA features under size can be added to too meet subdivision lot minima, but note in the past this has been a contentious issue in terms of time to reach the satisfaction of the Council and generally acceptance of the new condition as being secure (in terms of canopy cover and species etc). Clear and more accepting criteria need to be in place around such an endeavour.

40. I applaud the insertion of the “revegetation conservation lot subdivision”. This is an ideal approach to supporting and saving small or fragmented remnant features (non-SNA) as well as entirely new vegetation / habitat creation and is the only way more indigenous habitat will come into being in the district. I think the size-lot ratio (2ha:1 lot) proposed is ok, but I would reduce the wetland to a 1ha for 1 lot ratio as wetlands are rarer and smaller sizes more viable than terrestrial habitat, and I would not limit the “natural regeneration” lot number attainable.
41. Mr Hartley's proposed approach I think better reflects the proposed indigenous biodiversity NPS and the NPS Freshwater management publications, where these seek to protect, maintain and increase IB.

Conclusion

42. I am of the opinion that given the depauperate indigenous habitat state in the district the objective to maintain and enhance IB, development opportunities should be available related to appropriate habitat recreation, as well as non-SNA restoration, and less or no limit on conservation lot development. A more progressive approach than the old maintenance of SNA.
43. I consider Mr Hartley's proposed rule changes to be a reasonable but still conservative, way forward which is more progressive than the Councils' proposed “status quo” one in terms of incentivising indigenous biological diversity recreation, and suggest that the Council should adopt those opportunities he lays out in his evidence.
44. While there may be challenges with administration and managing more development infrastructure and population needs in currently rural settings, I see no other reasonable way to foster greater indigenous habitat creation.

Dr Vaughan Keesing

Boffa Miskell Limited.

9th September 2020