

Before the Independent Hearing Panel

at Taupo

in the matter of: Proposed Plan Change 36 to the Taupo District Plan –
Request under Schedule 1 of the RMA to rezone Rural
Land to Residential at Whareroa North by The
Proprietors of Hauhungaroa No. 6

to: **Taupo District Council**

Applicant: **The Proprietors of Hauhungaroa No.6**

Statement of Evidence by **Chris Wedding** on behalf of The Proprietors of Hauhungaroa No.6

Date: 29 April 2020

1. INTRODUCTION

Name and qualifications

- 1.1. My full name is Christopher James Wedding
- 1.2. I am a Senior Ecologist and Manager of Bioresearches, an Ecology Consultancy and subsidiary of Babbage Consultants Limited.
- 1.3. I have 14 years' professional experience and am qualified with the degrees of Bachelor of Science in Zoology and Environmental Science (2004), and Master of Science with First Class Honours in Conservation Biology from Massey University (2008).
- 1.4. I am a member of the New Zealand Ecological Society, the Society for Research on Reptiles and Amphibians in New Zealand, and am a former President (2012 – 2017) and current officer of the New Zealand Herpetological Society.
- 1.5. My expertise is in terrestrial ecology, valuing vegetation and fauna habitats, ecological impact assessments, and the restoration and mitigation of adverse effects on ecological values.
- 1.6. I have undertaken assessments of ecological values, throughout the North Island and in the Pacific, for residential subdivisions, quarries, marinas and large scale roading projects.
- 1.7. I have provided independent review of ecological assessments and management plans for local governments across the North Island, including Auckland Council, Hamilton City Council and Greater Wellington Regional Council. I recently (2019) provided independent review for certification of the Southern Links Project's Environmental Management and Monitoring Plan for Hamilton City Council.
- 1.8. Locally, I have been involved with the ecological assessments (bats and lizards) and proposed mitigation package (bats, lizards, restoration and offset planting) for a nearby subdivision proposal at Kuratau since 2009.
- 1.9. I confirm that I have read the "Code of Conduct for Expert Witnesses" contained in the Environment Court's Consolidated Practice Note 2014 and agree to comply with the Code in giving evidence in this proceeding. Except where I state that I am relying on evidence of another person, this written evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in this evidence.

2. EXECUTIVE SUMMARY

- 2.1. The proposed Plan Change 36 for Whareroa North would provide for residential development and requires road access through SNA062.

- 2.2. The indigenous biodiversity values within SNA062 comprise communities of common native scrub vegetation and bird species, with intermittent use by 'At Risk' long-tailed cuckoo and New Zealand falcon.
- 2.3. The potential adverse biodiversity effects resulting from the proposed Plan Change are generally associated with access provisions through the SNA that would result in loss of indigenous vegetation, fauna and their habitats, fragmentation of the SNA and associated edge effects, and increased proximity of human activity to wildlife habitats contributing to some level of permanent habitat degradation.
- 2.4. I consider that these effects can be avoided, remedied, mitigated, or offset with best practice management and restoration methods detailed herein and that therefore positive biodiversity outcomes, including a net environmental gain, can be achieved in this case.

3. BACKGROUND

- 3.1. I have been asked by The Proprietors of Hauhungaroa No.6 to review reports and correspondence and prepare evidence in relation to the ecological effects and proposed mitigation for the proposed Plan Change 36 for Whareroa North (the Project).
- 3.2. In preparing this evidence I have reviewed the application documents, submissions and associated reports of other experts relevant to my area of expertise, including:
 - 3.2.1. Ecological Characteristics of The North Side Development Area and Adjoining Whareroa Stream Riparian Habitat (Bioresarches 2005).
 - 3.2.2. Report on the long-tailed bat (*Chalinolobus tuberculatus*) survey conducted at Pt Hauhungaroa 6A Block, Whareroa North (Te Ngahere 2008).
 - 3.2.3. Report on the Lizard Survey conducted at Pt Hauhungaroa 6A Block, Whareroa North (Te Ngahere 2008).
 - 3.2.4. Whareroa Village Subdivision Vegetation Report (Bioresarches 2019).
 - 3.2.5. Comments on Ecological Aspects of the Proposed Whareroa Private Plan Change (Wildlands, April 2020).
 - 3.2.6. The Evidence of Mr. William Bruce Shaw, on behalf of Taupo District Council. Dated 22 April 2020.

4. INVOLVEMENT IN PROJECT

- 4.1. My first involvement with the Whareroa Project was in November 2019 when I visited the site with my colleague Jillana Robertson (M.Sc), who undertook the comparative vegetation assessment, which I oversaw and reviewed.
- 4.2. I then visited the site a second time with project engineers in February 2020 to gain an understanding of the requirements of bridge construction over the Whareroa Stream.

4.3. I have been asked by The Proprietors of Hauhungaroa No.6 to prepare this evidence, as I have taken over the lead ecologist role from my former manager, Graham Don, who is an author of the Bioresarches (2005) report. I am familiar with the project, as described in paragraphs 3.2, 4.1 and 4.2 of my evidence.

5. BIORESEARCHES REPORTS – 2005 *Ecological Characteristics of The North Side Development Area and Adjoining Whareroa Stream Habitat*

5.1. Ecological assessments were carried out over multiple site visits by Bioresarches (Dr. Rhys Gardner; Graham Don, M.Sc (Hons)) in July and August, 2005 (vegetation and fauna).

North Side Development Area

5.2. The area referred to in Bioresarches' 2005 report as the 'North Side Development Area' is an area of high, generally level ground north of Whareroa Stream that is partially vegetated and flanked by vegetated scarps that face east (towards Lake Taupo) and south (towards Whareroa Stream).

5.3. The vegetation within the North Side Development Area is described (2005, and mapped in Figure 1, below) as five different vegetation types, being:

5.3.1. 'pasture' along the north west of the site (Area 1);

5.3.2. 'low scrub of bracken and shrubs', which consisted predominantly of 1.5 m tall bracken with some native and weedy shrubs up to approximately 5 m tall at the north eastern edge of the pasture (Area 2);

5.3.3. 'tall scrub of fivefinger and kanuka', which consisted of 6 m – 16 m tall regenerating vegetation that covers the eastern scarp and an area south of the 'low scrub' and above the southern scarp (Area 3);

5.3.4. 'scrub of steep slope above stream', which consisted of 8 m – 16 m tall vegetation dominated by kanuka and fivefinger, and covers the southern scarp and its foot / floodplain to the stream banks. There are taller groves of kanuka, an oxbow lake, and abundant weed infestations (Area 4).

5.3.5. 'scrub of steep slope above Lake', which consisted of low-stature fivefinger and kohuhu, with various common native and exotic herbs and shrubs at the base of the scarp. Weeds, including blackberry and crack willow were abundant in this area (Area 5).

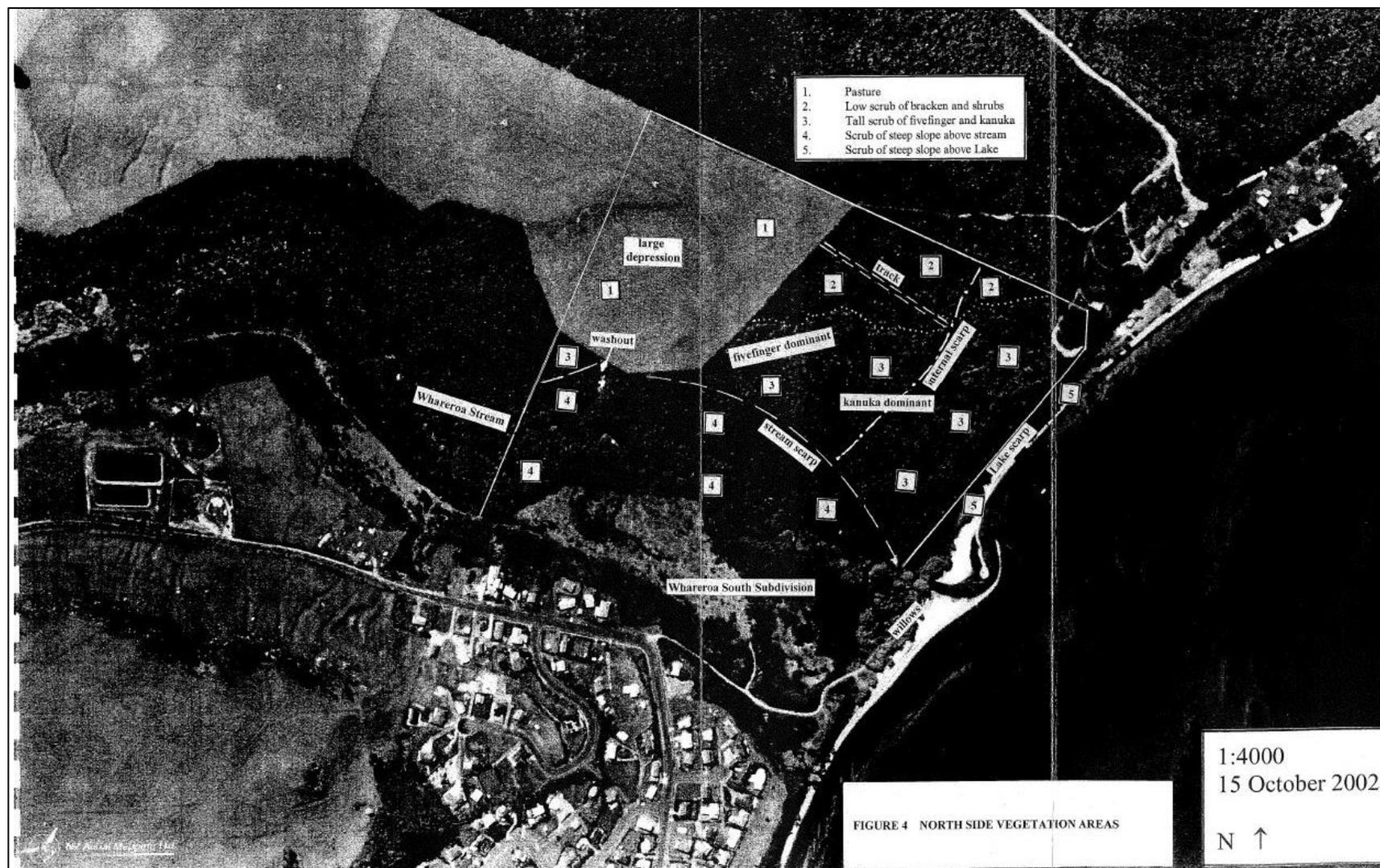


Figure 1. Vegetation areas as described by Biosearches (2005)

- 5.4. Most of these areas are within SNA 062, with exceptions being the ‘pasture’ (see point 5.3.1 of my evidence) and ‘low scrub of bracken and shrubs’ (5.3.2 of my evidence).
- 5.5. The Bioreserches (2005) report undertook avifauna surveys using replicated five-minute bird counts at 9 locations and two acoustic recorders set over two nights. These are standard, good practice methods applied nationally for assessments of similar projects.
- 5.6. The avifauna survey recorded seven common native and five introduced species and concluded a ‘moderate’ diversity of species with a relatively high number of native / endemic individuals (silvereeye, bellbird).
- 5.7. Overall, no threatened flora or fauna were recorded from the surveys, although intermittent use by long-tailed cuckoo (*Eudynamys taitensis*, At Risk, Naturally Uncommon) is considered likely, given the presence of their brood host, whitehead (*Mohua albicilla*), and potential hunting habitat for New Zealand falcon (*Falco novaeseelandiae*, At Risk, Recovering), for which there are records in the surrounding landscape. Breeding by falcon was considered unlikely due to the absence of suitable habitats (‘cliff ledge, slip face, under rock overhang, under fallen log, high in tall tree’).
- 5.8. I note that since the Bioreserches (2005) report, the threat classifications of falcon and kereru (New Zealand pigeon, *Hemiphaga novaeseelandiae*) have been changed to ‘At Risk, recovering’ and ‘Not Threatened’, respectively (Robertson et al. 2017). Therefore, neither species are ‘Threatened’, as the Wildlands (2020) report states.
- 5.9. The Bioreserches (2005) assessment considered the North Side Vegetation to meet criteria 4 and 9 of significance, according to significance criteria (at that time) for vegetation and habitats of fauna in the Waikato Region (Wildland Consultants 2002). Criterion 4 addresses vegetation that is underrepresented (10% or less is known of its likely original extent) in its Ecological District (ED), given large scale scrub clearances within the Taupo ED over the last 60 years due to farming and land development. Criterion 9 addresses ‘Representativeness’, which applies to the ‘best’ examples of an ecosystem type based on the intactness of its structure, composition and ecological processes. While the 2005 assessments recorded only moderate values, noting pest damage and some vegetation dieback, ‘Representativeness’ was considered to apply to the North Side Development area on the basis that the vegetation type was underrepresented.
- 5.10. I concur with these assessments of ecological values, the methods used to determine those values, and the findings of those assessments. I would further add that under the current criteria for determining significance of indigenous biodiversity (Waikato Regional Policy Statement (WRPS), Part B, Chapter 11A), Criteria 3, 7 and 11 also apply.
- 5.11. Criterion 3 requires that habitat use by ‘At Risk’ as well as ‘Threatened’ species should be considered to determine significance. Therefore, the probable intermittent presence of long-tailed cuckoo, New Zealand falcon, and the presence of kanuka and manuka trees would also qualify the vegetation and habitats as significant. I note that the latter two of these species (kanuka and manuka) recently underwent significant status changes, from ‘Not Threatened’ to ‘Threatened- Nationally Vulnerable’ (de Lange et al. 2018)¹. The rationale for these changes was precautionary and driven by the recent emergence and spread of an infectious disease that

¹ De Lange, P.J.; Rolfe, J.R.; Barkla, J.W.; Courtney, S.P.; Champion, P.D.; Perrie, L.R.; Beadel, S.M.; Ford, K.A.; Breitwieser, I.; Schonberger, I.; Hindmarsh-Walls, R.; Heenan, P.B.; Ladley, K. 2018. Conservation status of New Zealand vascular plants, 2017. New Zealand Threat Classification Series 22. New Zealand Department of Conservation, Wellington

affects *Myrtaceae* (Myrtle) plants (de Lange et al. 2018)¹. However, both kanuka and manuka remain common and widespread throughout the Waikato Region and the wider North Island.

- 5.12. As discussed earlier, kereru are 'Not Threatened' (Robertson et al. 2017)² as described by Wildlands (2020) and were not recorded from the surveys but were considered to be potential intermittent visitors to the North Side Development area.
- 5.13. I also add that, in accordance with Criterion 4 (underrepresented, vegetation type is 10% or less is known of its likely original extent), scrub vegetation cover, as occurs within SNA 062, in the Taupo ED appears to have increased and is now classed as having 10-20% cover under the Threatened Environment Classification system (TEC, Walker et al. 2007). However, it is still significant in accordance with Criterion 4 of the current WRPS (Part B, Chapter 11A) because it is 20% or less of its original extent, and therefore would still be considered 'representative' (Criterion 9, WRPS (Part B, Chapter 11A)).
- 5.14. Criterion 7 addresses indigenous vegetation that is "*large relative to other examples in the Waikato Region of similar habitat types, and which contains all or almost all indigenous species typical of that habitat type*" (WRPS, 11A, Part B). On the basis that SNA 062 is well over 500 ha and is comprised of representative vegetation that is underrepresented in the Taupo ED, I consider that this criterion would be met.
- 5.15. I also consider that SNA 062 meets Criterion 11 because it forms an ecological corridor, linkage between and buffer to SNAs 233 (to the north) and 232 (to the South).

Whareroa Stream Riparian Habitat

- 5.16. The area referred to in Bioreserches' 2005 report as the 'Whareroa Stream Riparian Habitat' is a contiguous extension of the southern scarp vegetation of SNA 062, assessed by Bioreserches (2005) as 'scrub of steep slope above stream' (addressed in Section 5.3.4 of my evidence). It is described as tall fivefinger and kanuka scrub with an understorey of bracken, ferns and weedy infestations of blackberry and Himalayan honeysuckle. This description is consistent with the fivefinger and kanuka scrub that occurs in the North Side Development area.
- 5.17. The avifauna survey, using the same methods as per the North Side Development area, recorded 10 common native and six introduced species and concluded a 'moderate' diversity of species with a relatively high number of native / endemic individuals (silveryeye, tui).
- 5.18. As with the North Side Development area, no threatened flora or fauna were recorded from the surveys, although intermittent use by long-tailed cuckoo and New Zealand falcon was considered likely. Breeding by falcon was considered unlikely due to the absence of suitable habitats.
- 5.19. As with the North Side Development area, the Bioreserches (2005) assessment considered the Whareroa Stream Riparian Habitat to meet significance criteria 4 (underrepresented vegetation) and 9 (representativeness), and I would also add that under the current WRPS, Criterion 3 (11A, Part B, WRPS) acknowledges the presence of kanuka and manuka, and probable intermittent use of the habitats by 'At Risk' long-tailed cuckoo and New Zealand falcon.

² Robertson, HA; Baird, K; Dowding, JE; Elliott, GP; Hitchmough, RA; Miskelly, CM; McArthur, N; O'Donnell, CFJ; Sagar, PM; Scofield, RP; Taylor, GA. 2017. Conservation status of New Zealand birds, 2016. New Zealand Threat Classification Series 19. New Zealand Department of Conservation, Wellington

- 5.20. Overall, the Biosearches (2005) assessment concluded that both the North Side Development area and the Whareroa Stream Riparian Habitat had moderate wildlife values, including avifauna that would use the large adjacent areas of lake edge habitat.
- 5.21. I concur with the assessments of ecological values, the methods used to determine those values, and the findings of those assessments.

6. TE NGHAREHE LIZARD AND LONG-TAILED BAT SURVEY REPORTS

- 6.1. The lizard and bat surveys were undertaken over November and December, 2007; when temperatures are generally suitable for sufficient lizard and bat activity to enable their detection from appropriate survey effort.
- 6.2. Survey coverage was appropriate for both the bat and lizard surveys and no bats or lizards were detected. However, it is important to consider that non-detection of either bats or lizards from surveys, cannot necessarily be interpreted as absence.
- 6.3. I generally concur with the commentary provided by Wildlands (2020) on bats and lizards.

7. PLAN CHANGE 36: WHAREROA

Request from TDC

- 7.1. In September, 2019, Council's Ecologist advised that "*something reasonably basic would do*" (W .Shaw, 2019³) in response to a request by the applicant's planner (Ms. Lewis) for an expected scope for updating the application's ecological information. Mr Shaw requested "*commentary on the current state of the site compared to when the ecological assessments were undertaken*" (W .Shaw, 2019) and informed that "*The bat and lizard stuff should still be OK.*" (W .Shaw, 2019).
- 7.2. The Biosearches (2019) assessment was therefore based on a revisit to the North Side Development Area in November 2019 to reassess the vegetation values. Overall, the vegetation composition has not changed substantially since the 2005 assessment. Notably, the 'low scrub of bracken and shrubs', outside SNA 062 in the North Side Development area, now has canopy cover consistent with surrounding vegetation, and pest animal damage is still evident throughout the site, across the forest floor from pig rooting, and to foliage, including some die-off probably as a result of possum browse.
- 7.3. The Biosearches (2019) assessment does not specifically describe the Whareroa Stream Riparian Habitat. However, I observed that it supported five-finger and kanuka scrub, and given that little apparent change in species composition of five-finger and kanuka scrub has occurred throughout the rest of the site, including that above the Whareroa Stream as described in 2019, I consider that little change, other than some increase in stature, would have occurred in the 14 years since the 2005 assessment.
- 7.4. I consider that an ecological mitigation and offsetting proposal, provided with the application for resource consents for Stage 1 (which includes the access elements), should also include a reassessment of ecological values, including the Whareroa Stream Riparian vegetation and fauna values, particularly lizards, birds and bats. This information should be collected using standardised, repeatable methods and serve to provide quantifiable measures against which a biodiversity offset could be measured. For example, with removal or control of pest animals,

³ Email correspondence from Willie Shaw, Principal Ecologist, Director, 27 September 2019.

including rodents, possums and pigs, natural forest regeneration and measurable recoveries of indigenous fauna could be measured at a point in time to determine the progress or outcome of a biodiversity offset.

8. ASSESSMENT OF EFFECTS AND RECOMMENDATIONS

- 8.1. I consider that the potential adverse effects of the proposed plan change would result from the removal of significant indigenous vegetation causing loss and degradation to biodiversity values, where the provision of access to the residential area involves a road and bridge crossing of Whareroa Stream through SNA 062. I also consider that there would be adverse effects on fauna and habitat quality as a result of increased human activity in close proximity to indigenous habitats if no mitigation or environmental off-set planting is done.
- 8.2. In my opinion, the removal of indigenous vegetation to provide for access through SNA 062 would have adverse ecological effects on SNA 062, including loss of indigenous vegetation, fauna and their habitats; fragmentation of the SNA and edge effects. An edge effect is the influence of increased light, wind, noise, humidity and weedy propagule pressure felt at the edge of a forest.
- 8.3. I also add that in my opinion, the permanent loss of vegetation for the access road, alone, would not compromise the overall significance of the SNA, including its provision of habitat to whitehead, long-tailed cuckoo and falcon (Criterion 3), status as an underrepresented vegetation type (Criterion 4), overall large size (Criterion 7), its representativeness (Criterion 9), or provision of buffer to or ecological linkages between other SNAs (Criterion 11). However, I consider that the cumulative potential adverse effects of vegetation loss, edge effects and habitat degradation would be significant if not managed or offset.
- 8.4. In my experience, best practice management and restoration methods, including, but not limited to careful timing of any vegetation removal, wildlife relocations, habitat replacement and enhancement, pest predator control, dense buffer planting and revegetation would, in my view, contribute to achieving a Net Environmental Gain and positive biodiversity outcomes.

The Mitigation Hierarchy

- 8.5. I consider that an important aspect of any ecological effects assessment should guide actions that demonstrate adherence to the 'mitigation hierarchy' of avoid, remedy and mitigate, with any residual adverse effects to be offset or compensated in accordance with principles of best ecological practices for mitigation and biodiversity offsetting in New Zealand to achieve positive biodiversity outcomes and a Net Environmental Gain.
- 8.6. Where 'avoidance' is the first attribute to be considered in the mitigation hierarchy, I understand that the access road would not be able to avoid SNA vegetation. However, I understand that the bridge structure will be designed and located so that it would avoid potential effects of the proposal on the Whareroa Stream and riparian vegetation. I also consider that all cut / fill batters for road construction within the SNA should be remediated with like-for like revegetation, from the riparian and floodplain to the taller scrub above the scarp.
- 8.7. Mitigation is the third attribute in the 'Mitigation Hierarchy' and involves actions to minimise actual and potential adverse effects. There are a range of standard mitigation measures used nationally to minimise effects on fauna that I consider could successfully be applied to any vegetation removal within SNA 062. These include careful timing of vegetation removal so as to avoid effects on important fauna life cycles (such as bird breeding), or to coincide with fauna

capture and relocation (such as lizards); habitat enhancement, pest predator control and dense buffer planting at newly created vegetation edges.

- 8.8. I consider that potential fragmentation effects associated with a permanent road and bridge would be minor in nature, with respect to fauna use of the SNA. Whitehead, a small forest bird that is the brood host to 'At Risk' long-tailed cuckoo, tend to avoid crossing open areas and so are considered to be particularly sensitive to fragmentation. However, in my opinion the level of fragmentation that a road and bridge would create would be minor to whitehead using SNA 062, and that whitehead would continue to use habitats on both sides of a permanent two lane road, as well as the large areas of SNA to the north. While I do not consider that such a road would prevent whitehead from crossing overhead, I do consider that any potential fragmentation effects on whitehead behaviour at the road edge would be mitigated through provision of future canopy trees within buffer plantings to promote canopy connectivity above the road, within the areas identified along the road in **attached** appendix 8.

Habitat degradation

- 8.9. Habitat degradation effects associated with human activity are harder to measure than physical loss, and include effects such as noise, lighting, human disturbance (bush track creation, rubbish dumping, weed spread) and predation pressure by rodents and domestic cats. These effects contribute to some level of reduced habitat use by wildlife, although the scale and permanence of these effects would be dependent on a range of variables that would be considered in an offset model, including the number and sensitivity of the species affected, the habitat structure, the amount of human activity and the number of domestic cats owned by surrounding residents. That offset model is appropriately part of the subdivision design stage.
- 8.10. The fauna values identified from the North Side Development Area and the Whareroa Habitat are moderate, comprising communities of common native birds and probable intermittent use by 'At Risk' long-tailed cuckoo and New Zealand falcon. These species are likely to be subject to a full suite of pest predators, including rodents, mustelids, possums and pigs, with evidence of the latter two observed in damage to the forest floor and defoliation or foliage die back in 2005 and 2019. I therefore consider that provision of dense buffer planting and a robust, ongoing pest animal control programme would sufficiently mitigate potential degradation effects and enhance the ecological integrity of SNA 062 within the North Side Development area, providing substantial benefits to indigenous wildlife values in adjacent habitats within the North Side Development and Whareroa Stream Habitat.

Offsetting

- 8.11. In my opinion, there would be significant residual adverse effects of the proposed plan change associated with vegetation removal for road construction on ecological values, following measures I've described to avoid, remedy and mitigate. This is because some of the vegetation and habitats that would be removed would be permanently lost. These values could not be remediated after construction and would need to be offset at another location.
- 8.12. The principles of best ecological practice for biodiversity offsetting in New Zealand are designed to achieve positive indigenous biodiversity outcomes by way of determining measureable losses and gains of biodiversity attributes. The biodiversity offset 'accounting system' provides a transparent model involving explicit calculations of quantifiable losses and gains to compare and balance biodiversity attributes, providing greater certainty of No Net Loss or Net Gain at a set point in time.

- 8.13. In my experience, biodiversity offsets in New Zealand often achieve no net loss of indigenous biodiversity through revegetation in part, and require a multiplier to recognise the risk inherent in the temporal lag between loss and gain. In effect, a greater area is therefore revegetated and protected than is lost, which provides for an overall increase in indigenous vegetation and habitat with formal protection.
- 8.14. Following my site visits and a brief desktop review, I have identified more than 20 ha of restoration and enhancement opportunities (Figure 2) within and around SNA 062 that would support a biodiversity offset that meets the principles of best ecological practices for mitigation and biodiversity offsetting in New Zealand.

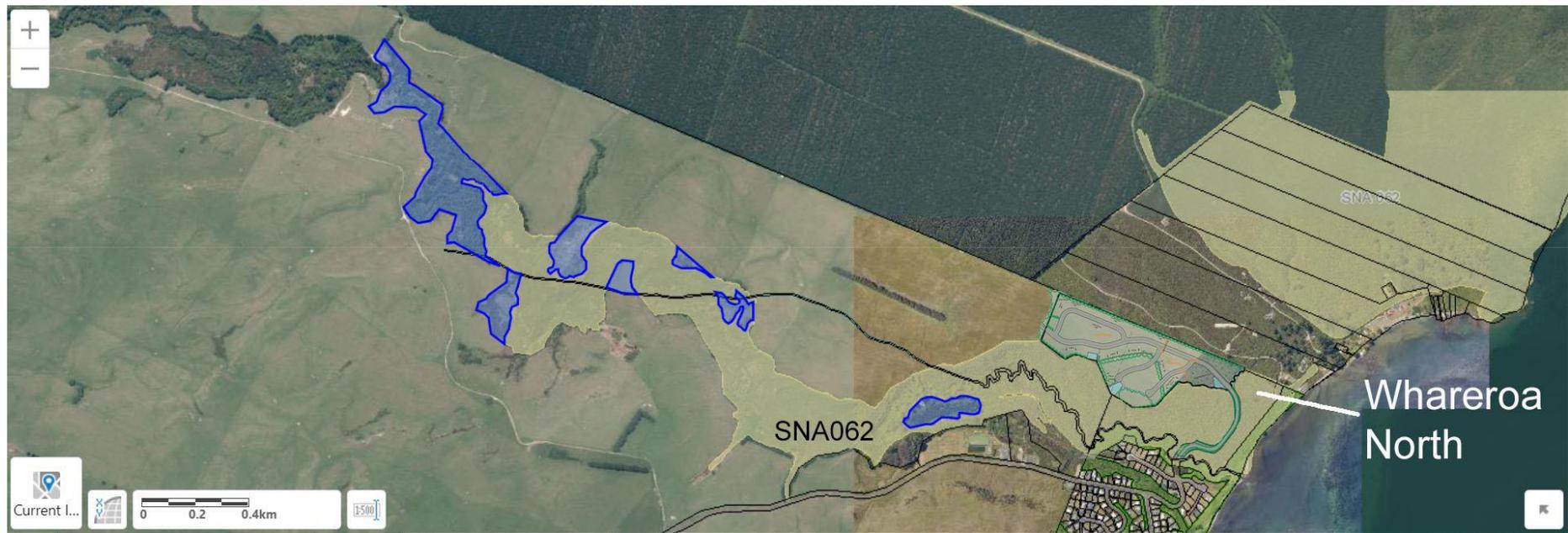


Figure 2. Non-SNA areas (blue) within and around SNA 062 that could contribute to a biodiversity offset.

9. RELEVANT PLAN POLICIES AND OBJECTIVES

- 9.1. The Waikato Regional Policy Statement (WRPS, S 6A(k)) states that new development should promote positive indigenous biodiversity outcomes and protect significant indigenous vegetation and significant habitats of indigenous fauna. Further, WRPS policy 11.2 is that *“Significant indigenous vegetation and the significant habitats of indigenous fauna shall be protected by ensuring the characteristics that contribute to its significance are not adversely affected to the extent that the significance of the vegetation or habitat is reduced”*. As discussed in 8.2 of my evidence, I consider that the permanent loss of vegetation for the access road, alone, would not compromise the overall significance of the SNA vegetation or its habitats, including its provision of habitat to ‘Threatened’ (but common and widespread) kanuka and manuka, intermittent ‘At Risk’ fauna, representativeness and underrepresented vegetation. Further, I consider that these characteristics would be enhanced through provision of an ongoing pest animal control programme that targets species such as pigs and possums, which appear to have been degrading the vegetation and habitats since before 2005; and rodents, hedgehogs and mustelids, which are likely to be present and predating on indigenous fauna. I also consider that implementation of a biodiversity offset would likely result in an increase in area of protected vegetation that is ‘underrepresented’ and ‘representative’ under WRPS criteria for determining significance (WRPS Part B, Chapter 11A).
- 9.2. I consider that measures to remedy and mitigate, and also biodiversity offsetting (as provided for in WRPS 11.2.2), in accordance with best practice principles, as I have described above, would enhance ecological integrity of SNA 062 within and around the North Side development area and wider SNA 062. In particular, ongoing pest predator control, would support natural regeneration within SNA 062, where pig rooting, foliage damage and die-back was evident in 2005 and 2019. I consider that pest animals may also be reducing breeding success and abundance of indigenous birds and potentially also indigenous Lizards, as suggested by Wildlands in the 2020 report.
- 9.3. I note also that the principles of best ecological practice for mitigation and biodiversity offsetting in New Zealand are consistent with the Taupo District Plan to avoid, remedy or mitigate more than minor adverse effects of vegetation clearance on the ecological values of Significant Natural Areas (TDP 3i.2.1(i)) and provides for consideration of scale of any effect on important attributes such as diversity, riparian areas, rare and threatened fauna, pest impacts and threats ((TDP 3i.2.1(ii)).
- 9.4. Positive biodiversity outcomes and maintenance of ecological integrity are important requirements of the WRPS (objectives 3.12 (a); 3.16 (b(ii)); 3.19) and in my opinion, actions to restore, enhance and offset biodiversity attributes that may be lost or degraded as a result of the proposed plan change and construction of an access road, would achieve these objectives.
- 9.5. As I stated in para 8.11 of my evidence, a multiplier would likely be incorporated into an offset model to recognise temporal lag of the offset, providing for a greater area of indigenous vegetation and habitat with formal protection than what would be lost (TDP 3i.4(iii)).

Appendix 8

- 9.6. I have had input into **attached** Appendix 8 of the Plan Change proposal, and provided the development is undertaken in accordance with it, I consider that the positive biodiversity outcomes and Net Environmental Gain as I have discussed, can be achieved.

10. SUBMISSIONS⁴

10.1. Some submitters have cited concerns about the ecological environment in relation to the proposed subdivision in the Whareroa North Side Development Area. Those submissions generally relate to concerns around removal of indigenous vegetation and associated loss or degradation of biodiversity values, where the provision of access for a road and bridge crossing of Whareroa Stream would connect the residential area through SNA 062.

10.2. I consider that I have generally addressed submitters concerns in my evidence, however I provide comments regarding specific submissions below:

Submitter	Submission Points	Rebuttal
Sutcliffe, Ian	<p><u>Adverse environmental effects generally</u></p> <p>The extent of land proposed to be rezoned and the related access to the land across the Whareroa Stream will result in unacceptable and inappropriate adverse environmental effects on the ecology, and natural characteristics of the environment.</p> <p><u>Removal of Native Vegetation</u></p> <p>The extent to which the development requires removal of native vegetation and the reliance on mitigation is yet to be identified.</p>	<p>In my experience, potential adverse effects associated with vegetation and habitat removal can be effectively minimised, mitigated or offset, provided that such actions meet the principles of best ecological practices for mitigation and biodiversity offsetting in New Zealand.</p>
Skipper Whanau (Skipper, Cory)	<p><u>Adverse environmental effects generally</u></p> <p>Oppose the plan change because of the impact it will have on the immediate and surrounding environment. Such development would be detrimental to the habitat of many endemic creatures of New Zealand.</p> <p>The native trees and shrubs are very necessary for the birds and many other creatures and to make Whareroa village separate to Poukura Marae. The</p>	<p>As above, but also I consider that provision of dense buffer planting and a robust, ongoing, pest animal control programme would provide substantial benefits to indigenous vegetation and wildlife values in adjacent, surrounding habitats within the North Side Development and Whareroa Stream Habitat areas.</p>

	land and bush is very special and what little that is left must be looked after.	
Waikato Regional Council (“WRC”)	<p><u>Significant Natural Area concerns in relation to Access to Subdivision</u></p> <p>In accordance with the WRPS, new development should promote positive indigenous biodiversity outcomes. The development does not include information on access provisions through an identified Significant Natural Area (SNA062).</p> <p>WRPS Policy 11.2 requires that SNAs are protected and that activities avoid loss in preference to remediation or mitigation. The WRPS then considers employing a hierarchy of remediation, mitigation and then applying biodiversity offsets for residual adverse effects that cannot be avoided, remedied or mitigated. It would be useful to know and understand as part of the plan change process how and where within the applicant’s site adverse effects on SNAs are to be avoided, and how and where to employ mitigation and offsetting measures.</p> <p>The applicant has not demonstrated that access can be provided to the proposed subdivision. An indicative route up the steep slope on the northern side of the Whareroa Stream has been provided, but this route does not currently form part of the plan change under consideration.</p> <p>An assessment of the biodiversity of the subject site was included as part of the proposal. However, this assessment does not adequately consider the wider locality, in particular the possible ecological connections which exist along the western shores of lake Taupo and span towards Hauhungaroa Ranges to the west.</p> <p>The route goes through a Taupo District Plan Significant Natural Area – SNA 062 Te Kokomiko Point, Poukara Pa Bush, Whareroa Stream. SNA 062 meets criterion 3 (habitat for threatened species) due to the presence of NZ falcon and long-tailed cuckoo. Long-tailed cuckoo (or koekoea), an ‘At Risk’ naturally uncommon endemic species, relies upon whitehead (popokatea), its ‘At Risk’ declining North Island host. Whitehead are found in the SNAs along the western shores of Taupo, particularly where strong connections exist to the Hauhungaroa Ranges to the</p>	<p>I agree that efforts to avoid ecological features is an important aspect of any effects assessment and demonstrates adherence to the ‘mitigation hierarchy’ where avoidance is the first attribute to be considered. I understand that the access road cannot be sited to avoid SNA vegetation, although the design and location of the bridge structure minimises potential effects of the proposal.</p> <p>I would support a condition that requires any impact caused by construction of the road and bridge to employ the mitigation hierarchy of avoid, remedy and mitigate, with any residual adverse effects to be offset or compensated in accordance with principles of best ecological practices for mitigation and biodiversity offsetting in New Zealand to achieve positive biodiversity outcomes and a Net Environmental Gain.</p> <p>I consider that an important attribute of any mitigation or offsetting associated with this proposal is that it should all occur within or contiguous with SNA 062, thereby benefitting the same biodiversity communities that are potentially affected, resulting in a high chance of it being completed successfully.</p> <p>Large areas of SNA vegetation span the western edges of Lake Taupo and these areas support habitat of ‘At Risk’ falcon and Long-tailed cuckoo, a brood parasite of the whitehead, a small gregarious forest bird that is recorded from these SNAs, including the Whareroa North Development area. Whitehead occur in native forest, dense shrubland and pine plantations within their ranges where they typically use canopy vegetation. Whitehead tend to avoid crossing open areas and so are considered particularly sensitive to fragmentation. I</p>

	<p>west. If formed, the access at this site would contribute to the cumulative fragmentation of the functional corridor that connects the bulk</p> <p>of this SNA to the western ranges. Access to the proposed development is contingent upon clearance of the vegetation that forms this important habitat.</p> <p>WRPS Development Principle 6A(k) states that new development should <i>“promote positive indigenous biodiversity outcomes and protect significant indigenous vegetation and significant habitats of indigenous fauna”</i>.</p>	<p>consider that the level of fragmentation that a road and bridge would create would be minor to SNA 062. In my opinion, whitehead would continue to use SNA 062 and the large areas to the north. Habitat connections / wildlife corridors to the west, towards Hauhungaroa Ranges would also be enhanced with offset actions as identified in Figure 2 of my evidence, including revegetation and pest control. I consider that the existing Whareroa Village is likely to have a greater fragmentation effect between SNA 062 and Rangitukua Reserve to the South. My involvement with a subdivision proposal in the nearby settlement of Kuratau indicates that the Kuratau River wildlife corridor is also of very high significance for fauna moving between the western edges of Lake Taupo and the Hauhungaroa Ranges. Similarly, I have proposed restoration and enhancement measures to habitat connections along the Kuratau River for that proposal.</p> <p>I consider that the effect of fragmentation of avifauna habitat by a roadway is low. However, in my opinion, potential fragmentation effects would be mitigated through provision of future canopy trees within buffer plantings to promote canopy connectivity above the road.</p>
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11. COUNCIL SECTION 42A REPORT

11.1. Mr. Shaw’s evidence states that the National Policy Statement (NPS) Freshwater Management is potentially relevant because the activities could affect the stream and/or the receiving environment of the lake. I understand that the bridge structure will be designed and located so that it would avoid potential effects of the proposal on the Whareroa Stream and riparian vegetation. However in my opinion, stringent erosion and sediment control measures should be in place throughout construction to avoid any adverse effects on Whareroa Stream, its aquatic habitats and the receiving environment of the Lake.

11.2. Mr Shaw’s evidence generally raises that there is no assessment of effects or assessment of how any adverse effects would be avoided, minimised, mitigated, offset or compensated. I consider that I have addressed such effects and recommendations in my evidence, however Mr Shaw raises an additional concern in relation to the potential for ‘tracking’ and clearance of indigenous vegetation immediately adjacent to the site.

- 11.3. I have recommended dense, 2 m wide buffer planting within the ecological setback along the edge of the SNA where it adjoins the proposed residential developments as shown in **attached** appendix 8. I consider that the ecological purpose of such a buffer would minimise potential for some human disturbance effects such as rubbish dumping, 'garden escapees', vegetation clearance and track creation. In my experience, a fence along these areas can reduce habitat quality for some species and encourage some activities such as rubbish dumping. Therefore, I would not recommend a fence.
- 11.4. Mr. Shaw comments that a brief follow up survey of lizards could be justified, given the time elapsed since the original surveys and to confirm lizard habitat conditions remain the same. I concur with this recommendation and add that an additional purpose to such a follow up survey should serve to provide a quantifiable measure against which a biodiversity offset could be measured. For example, with removal of pest animals, including rodents, possums and pigs, some residual populations of indigenous skinks or geckos could show measurable recovery with a repeated, standardised survey method at a point in time to measure the progress or outcome of a biodiversity offset. The same process should also be applied to avifauna and be part of the values addressed in a biodiversity offset.
- 11.5. In Council's Landscape evidence, Ms. Rebecca Ryder suggests 'strengthening canopy vegetation in the existing native bush' as mitigation by way of native plantings. I consider that such planting would have an overall enhancement effect on the existing vegetation and habitats in the long term given that the SNA scrub within the North Whareroa development area appears to be lacking in future climax forest species, such as totara (*Podocarpus totara*), rimu (*Dacrydium cupressinum*) and kahikatea (*Dacrycarpus dacrydioides*). I have provided recommendations to strengthening canopy vegetation to minimise edge effects created by the proposed road and bridge, identified in the **attached** appendix 8, however any further enhancement plantings within the existing vegetation could be incorporated into a biodiversity offset package that would provide for a range of enhancement measures such as pest control, weed removal and revegetation.

12. CONCLUSION

- 12.1. Overall, the indigenous biodiversity values within the North Side Development Area and Whareroa Stream Riparian Habitat are associated with SNA062 and comprise communities of common native scrub vegetation and bird species, however intermittent use by long-tailed cuckoo and New Zealand falcon is also probable.

The biodiversity values are qualified as significant on the basis that the vegetation type is habitat to 'At Risk' species (Criterion 3), is an underrepresented vegetation type (Criterion 4), is a relatively large example of its type and contains almost all species typical of that habitat (Criterion 7), is representative (Criterion 9) and provides a buffer to or ecological linkages between other SNAs (Criterion 11).

- 12.2. The potential adverse biodiversity effects resulting from the proposed Plan Change would not compromise the overall significance of the SNA and are generally associated with access provisions that would result in loss of significant indigenous vegetation, fauna and their habitats;

fragmentation of the SNA and edge effects. Increased proximity of human activity to wildlife habitats would also contribute to some level of permanent habitat degradation.

- 12.3. I consider, however, that these effects can be avoided, remedied, mitigated and offset with best practice management and restoration methods, including, but not limited to careful timing of any vegetation removal, wildlife relocations, habitat replacement and enhancement, pest predator control, 2 m wide dense buffer planting, and other restoration activities that follow the hierarchy of mitigation to avoid, remedy and mitigate; followed by offsetting or compensation of any significant residual adverse effects in accordance with best ecological practice to achieve a Net Environmental Gain.
- 12.4. I consider that an important attribute of any mitigation or offsetting associated with this proposal is that it should all occur within or contiguous with SNA062, thereby benefitting the same biodiversity communities that would be affected, resulting in a high chance of it being completed successfully.
- 12.5. Provided the proposed plan change development is undertaken in accordance with **attached** Appendix 8, I consider that the positive biodiversity outcomes and Net Environmental Gain referred to in my evidence can be achieved.

Chris Wedding