

**BEFORE THE PALMERSTON NORTH CITY, MANAWATŪ DISTRICT (MDC)  
AND TARARUA DISTRICT COUNCILS**

**IN THE MATTER** of the Resource Management Act 1991 (“the Act”)

**AND**

**IN THE MATTER** NOTICES OF REQUIREMENT by NZTA under s168 of the Act for the construction, operation, maintenance and improvement of approximately 11.5km of new State Highway between Ashurst and Woodville to replace the closed section of SH3 through the Manawatū Gorge and associated works, known as the Te Ahu a Turanga, Manawatū Tararua Highway Project (“the Project”)

---

**Kelvin Michael Lloyd**

**EVIDENCE ON BEHALF OF THE DIRECTOR-GENERAL OF CONSERVATION  
(Ecology)**

Dated: 15 March 2019

---

---

**COUNSEL:**  
SARAH ONGLEY  
Barrister  
Phone: (06) 7699400  
Fax: (06) 7699425  
Email: sarah@ongley.co.nz  
PO Box 8213  
New Plymouth 4342

## TABLE OF CONTENTS:

Section	Heading	Page Nos
1	Qualifications and Experience	1-2
2	Scope of Evidence	2-3
3	Biodiversity Offsetting	3-5
4	Applicant's approach to Mitigation and Offsetting	5-12
5	Robust Offsetting Approaches	12-13
5	Offsetting vs Compensation	13-15
6	Statutory Policy	15-16
7	Conclusion	16

### 1. QUALIFICATIONS AND EXPERIENCE

- 1.1. My full name is Kelvin Michael Lloyd.
- 1.2. I am a Principal Ecologist with Wildland Consultants Ltd, based in Dunedin. I have been employed as a consultant ecologist with Wildland Consultants since 2004.
- 1.3. I hold the qualifications of B.Sc. (Hons) and Ph.D. from the University of Otago, where my studies were undertaken at the Department of Botany. I was subsequently employed by Landcare Research to undertake a three-year post-Doctoral research project. I am author of 20 peer reviewed scientific research articles and I continue to collaborate on scientific research projects as time allows. I am an author of almost 250 contract reports prepared during my time with Wildland Consultants.
- 1.4. I have undertaken numerous ecological assessments of proposed developments throughout New Zealand and assisted councils with audits of large scale developments affecting ecological features and values, including large developments such as roading, mining, and energy generation consent applications. I routinely provide advice on options for avoiding, remedying, and mitigating the potentially adverse effects of development activities on ecological values.
- 1.5. I have considerable experience in biodiversity offsetting through work for the Department of Conservation's Biodiversity Offsetting

Programme and subsequent evaluation of biodiversity offsetting approaches used in resource consent applications.

- 1.6. This work included an assessment of biobanking currencies for a conservation NGO<sup>1</sup>, developing biodiversity offset currencies as a pilot study for the proposed Escarpment Mine<sup>2</sup>, reporting on attribute selection and weighting for offsetting approaches<sup>3</sup>, and summarising of offsetting pilot studies<sup>4</sup>. I also developed a biodiversity offsetting model that was used as a tool to gauge the sufficiency of mitigation for the proposed Castle Hill wind farm in the northern Wairarapa, and have critically reviewed offsetting approaches used in applications for large scale developments in natural areas.
- 1.7. I recently provided advice to New Plymouth District Council and Taranaki Regional Council on the offsetting approach used in the application for a designation to construct a new state highway through indigenous forest and wetland vegetation at Mt Messenger. I also recently provided advice to Otago Regional Council on offsetting and compensation policy relating to mining in the proposed Otago Regional Policy Statement.
- 1.8. I have read the Code of Conduct for Expert Witnesses 2006 and have complied with it in the preparation of this statement of evidence. Except where I state that I am relying upon the specified evidence of another person, my evidence in this statement is within my area of expertise. I have not omitted to consider any material facts known to me that might alter or detract from the opinions which I express below.

## 2. SCOPE OF EVIDENCE

- 2.1. The Department of Conservation commissioned Wildland Consultants (Wildlands) to provide independent assessment and advice regarding the proposed SH3 bypass of Manawatū Gorge. My role in the project

---

<sup>1</sup> Wildland Consultants 2011: Options for calculation and use of biodiversity credits generated by Yellow-eyed Penguin Trust Conservation activities. *Wildland Consultants Ltd Contract Report No. 2554b*. Prepared for Department of Conservation. 29 pp.

<sup>2</sup> Wildland Consultants 2011: Biodiversity offsetting models for the escarpment mine project, Denniston Plateau, Westland. *Wildland Consultants Ltd Contract Report No. 2653*. Prepared for Department of Conservation. 37 pp.

<sup>3</sup> Wildland Consultants 2012: Selecting and weighting attributes for use in biodiversity offsetting currencies. *Wildland Consultants Ltd Contract Report No. 2946*. Prepared for Department of Conservation, Wellington. 23 pp.

<sup>4</sup> Wildland Consultants 2012: Comparing and contrasting biodiversity offset pilot case studies for the Hunua Quarry, Tahī NZ Eco-Resort, and the proposed Escarpment Mine. *Wildland Consultants Ltd Contract Report No. 2857*. Prepared for Department of Conservation, Wellington. 48 pp.

has to be to provide expert advice on the principles of offsetting and compensation. My comments on the package put forward by the Applicant rely upon my review of the material below, and the evidence of Dr Tim Martin and Dr Nick Goldwater for the Director-General of Conservation.

2.2. I have reviewed the following material:

- a. The Joint Witness Statement (JWS) of Dr Forbes and Dr Martin (ecology experts) dated 22 February 2019.
- b. NOR Statement of Evidence of Dr Forbes "Te Ahu A Turanga: Technical Assessment #6 Terrestrial Ecology".
- c. Section 13 of the One Plan "Land Use Activities and Indigenous Biological Diversity".
- d. High level guidance on ecological aspects of the application, provided by Wildland Consultants dated December 2018.
- e. Dr Forbes' response to the high-level guidance document that Wildlands prepared for the Department of Conservation dated 1 February 2019.
- f. S42A report, ecology, of Mr James Lambie, dated 25 March 2019.
- g. Evidence in Chief of Dr Forbes dated 8 March 2019.

2.3. My evidence will deal with the following issues in relation to the NOR and resource consent application:

- a. A summary of biodiversity offsetting.
- b. The Applicant's approach to mitigation and offsetting.
- c. The difference between offsetting and compensation.
- d. An evaluation of the proposed positive actions against relevant statutory policy.

### **3. BIODIVERSITY OFFSETTING**

3.1. Biodiversity offsetting aims to measure the negative and positive effects of a development project on biodiversity, and determine when the positive effects outweigh the negative effects and thus are sufficient to demonstrate no net loss or a net gain of biodiversity.

3.2. Biodiversity offsetting was recently considered by the Business and Biodiversity Offsets Programme (BBOP), an international group of organisations including business companies, government departments, and NGOs. This group came up with a definition of biodiversity offsetting

that has been adopted widely, at times with slight modification. The current New Zealand guidance document on biodiversity offsetting<sup>5</sup> uses the following definition:

3.3. A biodiversity offset is:

*Measureable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been undertaken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground.*

3.4. The first word in this definition is a key one as measurability separates offsetting from more subjective assessments of mitigation sufficiency.

3.5. The Business and Biodiversity Offsets Programme also developed ten principles<sup>6</sup> that biodiversity offsetting needed to comply with. These principles remain current, and are:

1. **No net loss:** *A biodiversity offset should be designed and implemented to achieve in situ, measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity.*
2. **Additional conservation outcomes:** *A biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity to other locations.*
3. **Adherence to the mitigation hierarchy:** *A biodiversity offset is a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimization and on-site rehabilitation measures have been taken according to the mitigation hierarchy.*
4. **Limits to what can be offset:** *There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.*
5. **Landscape context:** *A biodiversity offset should be designed and implemented in a landscape context to achieve the expected measurable conservation outcomes taking into account available information on the full range of biological, social and cultural values of biodiversity and supporting an ecosystem approach.*
6. **Stakeholder participation:** *In areas affected by the project and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets,*

<sup>5</sup> Guidance on good practice biodiversity offsetting in New Zealand. New Zealand Government, 2014.

<sup>6</sup> BBOP 2009: Principles on biodiversity offsets. Business and Biodiversity Offsets Programme. Washington D.C.

*including their evaluation, selection, design, implementation and monitoring.*

- 7. Equity:** *A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognised rights of indigenous peoples and local communities.*
- 8. Long-term outcomes:** *The design and implementation of a biodiversity offset should be based on an adaptive management approach, incorporating monitoring and evaluation, with the objective of securing outcomes that last at least as long as the project's impacts and preferably in perpetuity.*
- 9. Transparency:** *The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner.*
- 10. Science and traditional knowledge:** *The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge.*

3.6. Biodiversity offsetting generally requires a currency (i.e. the units being traded) and an accounting model which determines the size of the offset required. The accounting model generally incorporates a discount rate which is used to take risk and uncertainty into account.

#### **4. APPLICANT'S APPROACH TO MITIGATION AND OFFSETTING**

4.1. Dr Forbes claims, in his NOR Evidence, that the proposed mitigation and offset package is likely to address adverse effects and offset residual adverse effects to a biodiversity net-gain position, and in his view, the offset package proposed will result in net benefits in respect of terrestrial ecology values<sup>7</sup>.

4.2. However, in a footnote, Dr Forbes explains that he rejected the use of a quantitative offsetting calculation due to his concerns about the ability of the model to adequately capture the complexity of the biodiversity attributes in this case<sup>8</sup>. This has led Dr Forbes to use a simplistic subjective approach, for which the same criticism can be levelled.

4.3. I am unsure why Dr Forbes has rejected a quantitative approach on the basis of its inability to capture complexity. In my opinion a well-

<sup>7</sup> Paragraph 15 of Dr Forbes' NOR evidence and Paragraph 16 of Dr Forbes EIC

<sup>8</sup> Footnote to paragraph 26 of Dr Forbes' NOR evidence.

structured offsetting currency, with detailed attributes and limited aggregation of attributes<sup>9</sup>, can do a much better job of capturing the complexity of biodiversity than the approach Dr Forbes has used.

- 4.4. Dr Forbes states that the offsetting principles contained in the Department of Conservation guidance on good practice offsetting<sup>10</sup> were applied, particularly the principle relating to limits to what can be offset. He goes on to state that old growth forest, forest containing swamp maire, and a rare seepage wetland are all highly vulnerable and relatively irreplaceable<sup>11</sup> would be incapable of appropriate mitigation or offsetting<sup>12</sup>, and would be inconsistent with the limits to offsetting principle<sup>13</sup>.
- 4.5. However he then states<sup>14</sup> that some adverse effects on these ecosystems would be consistent with offsetting.
- 4.6. For example, Dr Forbes suggests<sup>15</sup> clearance of up to 0.1 hectares of alluvial old growth forest would be acceptable, so long as it was not an effect of long term (25 year) duration. As an example of an effect of short-term duration, he suggests the limited loss of canopy or emergent tiers. In my opinion any loss of canopy trees or emergent trees would not be consistent with a short term (<25 years) effect. Loss of old trees typically takes centuries to address, as newly-planted tree species cannot replace the ecological functions of old trees, such as provision of cavities, structural complexity to allow epiphyte growth, or large fruit crops. Development of the full complexity and diversity of an old growth forest is not possible within 25 years.
- 4.7. Loss of old growth trees is generally an effect that cannot be offset, because of the very long period of time required for any planted trees to reach a similar stage.
- 4.8. Dr Forbes also states that pruning of Threatened-Nationally Critical swamp maire trees would not generate any permanent adverse effects on the overall character of the stand (or on any tree in it, apart from by

---

<sup>9</sup> Wildland Consultants 2012: Selecting and weighting attributes for use in biodiversity offsetting currencies. *Wildland Consultants Ltd Contract Report No. 2946*. Prepared for Department of Conservation, Wellington. 23 pp.

<sup>10</sup> Guidance on good practice biodiversity offsetting in New Zealand. New Zealand Government, 2014.

<sup>11</sup> Paragraph 51 of Dr Forbes NOR evidence.

<sup>12</sup> Paragraph 52 of Dr Forbes NOR evidence.

<sup>13</sup> Paragraph 54 of Dr Forbes NOR evidence.

<sup>14</sup> Paragraph 59 of Dr Forbes NOR evidence.

<sup>15</sup> Paragraph 59a of Dr Forbes NOR evidence.

way of canopy pruning)<sup>16</sup>. Canopy pruning can cause significant injury to trees, creating large wounds that are subsequently invaded by pathogens such as fungi, and potential for attack by wood-boring insects. As the level of canopy pruning is not defined, I would not describe this as an acceptable effect.

- 4.9. Dr Forbes also notes that there are no available options to avoid very high adverse effects on old growth forest in the 'Western QEII' site, yet considers that there are options for offsetting these effects<sup>17</sup>. Dr Forbes appears to conclude the loss of up to one hectare of old growth hill country forest is acceptable and could be offset by protection of non-cleared forests of this type<sup>18</sup>. In my opinion it would be very difficult or impractical to offset such a loss, due to the presence in these forests of large old trees.
- 4.10. While it may be technically feasible to achieve like-for-like replacement of tree canopy and subcanopy species **composition** over time (25 years) through planting of like-for-like species arrangements<sup>19</sup>, it is not technically feasible to achieve like-for-like **structure and complexity** over the same time frame.
- 4.11. Old growth trees represent outcomes of centuries of growth, and cannot be replaced by planting except over a similar period of time. As Mr Lambie notes, ecological attributes such as canopy height, epiphyte load, forest floor ecosystem, and dead wood load require generations to develop<sup>20</sup>. In addition, large trees provide a greater abundance of cavities for hole-nesting and hole-roosting fauna, and greater fruit crops due to their extensive canopies. In a two-year study of the habitat relations of forest birds in coastal Otago, that I helped design and implement, old growth forest was associated with greater abundance of frugivorous birds and lower abundance of exotic birds<sup>21</sup>.
- 4.12. Dr Forbes discusses environmental compensation ratios (ECRs) in Paragraph 82<sup>22</sup>. Dr Forbes claims that their range of values considers the spatial area and quality (including considerations of scarcity) of the

<sup>16</sup> Paragraph 59b of Dr Forbes NOR evidence.

<sup>17</sup> Paragraph 62 of C Dr Forbes NOR evidence.

<sup>18</sup> Paragraph 67 of Dr Forbes NOR evidence.

<sup>19</sup> Paragraphs 7 and 150 of the S42A evidence of Mr Lambie.

<sup>20</sup> Paragraph 151 of the S42A evidence of Mr Lambie.

<sup>21</sup> Wildland Consultants 2016: Habitat relationships of forest birds in a mixed production landscape in East Otago. *Wildland Consultants Contract Report No 4312a*. Prepared for the Landscape Connections Trust.

<sup>22</sup> Paragraph 82 of Dr Forbes NOR evidence.

ecosystem types affected, and makes provision for time lag in delivery, risk of failure, and uncertainty of outcome. These ECRs are based on subjective judgement and have no objective data to support them. They use area alone as a currency, but lack an objective means of determining how much area should be planted, and do not incorporate any measure of condition. The ECRs do not comprise offsetting outputs.

- 4.13. When area alone is used as an offsetting currency, there needs to be exchange restrictions to ensure that like-for-like outcomes prevail. Area contains no information on biodiversity, nor its condition, and use of area as a currency assumes that biodiversity is proportional to area. In reality, biodiversity is often patchy and does not necessarily scale proportionally with area.
- 4.14. Use of an offsetting accounting model to derive areas that needed to be planted would take account of time lags and risks of failure through discounting. A 1:1 replacement ratio is never likely to be an outcome of a robust offsetting approach, as planted sites generally start in poorer condition than the impacted sites, and a discount rate applied to the calculation to address time lags means that larger areas need to be planted than cleared.
- 4.15. In comparison, Dr Forbes' subjective ECR approach allows 1:1 or 1.5:1 ratios for younger successional vegetation types, and ECR's of 1:10 or 1:12 for old growth forest types.
- 4.16. Dr Forbes also incorporates pest and weed control as positive actions that he claims would ensure achievement of a net gain<sup>23</sup>. His assessment here is also subjective and provides no methodology by which the claimed enhancements could be verified. He does not identify the species that would benefit from pest and weed control nor the change in condition of these species that would occur. Dr Forbes claims that pest control would ensure that the permanent losses in biodiversity are permanently addressed, and that the net gain position in biodiversity is maintained in the long term<sup>24</sup>. These assertions have no basis in evidence.
- 4.17. In my opinion, the ECRs are very subjective and do not provide any degree of certainty that the planted areas would offset the adverse

---

<sup>23</sup> Paragraph 87c of Dr Forbes' NOR evidence.

<sup>24</sup> Paragraph 87c of Dr Forbes' NOR evidence.

effects of clearance and provide a net gain. They only quantify a gain in extent, but do not quantify a gain in condition, as would be consistent with a robust offsetting approach. If the ECRs are to be accepted, the areas to be planted and subject to pest and weed control should be considered to comprise compensation activities.

4.18. In the paragraphs below I assess the offsetting approach claimed by the Applicant against the ten BBOP principles for biodiversity offsetting.

**1. *No net loss:*** *A biodiversity offset should be designed and implemented to achieve in situ, measurable conservation outcomes that can reasonably be expected to result in no net loss and preferably a net gain of biodiversity.*

4.19. As described above, the claimed offsetting approach cannot reasonably be expected to result in no net loss or preferably a net gain of biodiversity. It lacks a quantitative basis that would provide evidence of consistency with this principle. The approach trades reduced wetland extent for supposed gain in wetland condition<sup>25</sup> and explicitly incorporates a net loss of wetland extent.

**2. *Additional conservation outcomes:*** *A biodiversity offset should achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place. Offset design and implementation should avoid displacing activities harmful to biodiversity to other locations.*

4.20. Aspects of the proposed positive actions do not appear to be fully additional. For example, Mr Lambie refers to areas where possum control is currently being undertaken and where canopy condition is healthy<sup>26</sup>, and notes that restoration sites may be located in areas where pests are well-controlled<sup>27</sup>. In addition, it may be hard to demonstrate additionality for wetlands which are currently dominated by indigenous cover<sup>28</sup>.

**3. *Adherence to the mitigation hierarchy:*** *A biodiversity offset is a commitment to compensate for significant residual adverse impacts on biodiversity identified after appropriate avoidance, minimization and on-site rehabilitation measures have been taken according to the mitigation hierarchy.*

---

<sup>25</sup> Paragraph 81 of the EIC of Dr Forbes.

<sup>26</sup> Paragraph 51 of the S42A evidence of Mr Lambie.

<sup>27</sup> Paragraph 127 of the S42A evidence of Mr Lambie

<sup>28</sup> Paragraph 156 of the S42A evidence of Mr Lambie

4.21. In my opinion it would be appropriate to avoid adverse effects on old growth forests and protected areas such as the Western QEII covenant. On that basis, the mitigation hierarchy has not been adhered to.

**4. Limits to what can be offset:** *There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected.*

4.22. In my opinion the residual effects of the project on old growth forests are an example of irreplaceable values that cannot be fully compensated for in a biodiversity offset. As discussed elsewhere in my evidence, time lags of many centuries mean that adverse effects on old growth trees are practically impossible to offset. Mr Lambie shares this opinion<sup>29</sup>.

**5. Landscape context:** *A biodiversity offset should be designed and implemented in a **landscape** context to achieve the expected measurable conservation outcomes taking into account available information on the full range of biological, social and cultural values of biodiversity and supporting an ecosystem approach.*

4.23. Positive activities proposed by the Applicant do aim to be implemented in the relevant landscape context insofar as they aim to reduce fragmentation and occur close to where the residual adverse effects happen. However, the only measureable outcomes relate to the areas in which these activities occur, pest control inputs, and composition of plantings. Important conservation outcomes, such as the response of indigenous fauna to these activities, and the growth and structural complexity of planted vegetation and habitat, are not measured.

**6. Stakeholder participation:** *In areas affected by the project and by the biodiversity offset, the effective participation of stakeholders should be ensured in decision-making about biodiversity offsets, including their evaluation, selection, design, implementation and monitoring.*

4.24. Stakeholders have opportunities for participation in the decision-making process, but it does not appear that stakeholder concern about the selection and design of the biodiversity offsetting approach have been taken into account. Involvement of stakeholders could resolve issues that Dr Forbes has with the need for expert judgement on which measures and metrics should be used in an offsetting framework<sup>30</sup>.

**7. Equity:** *A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among*

<sup>29</sup> Paragraph 15 of the S42A evidence of Mr Lambie.

<sup>30</sup> Paragraph 60 of the EIC of Dr Forbes

*stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognised rights of indigenous peoples and local communities.*

4.25. Like many development activities, the proposal trades a certain negative effect on biodiversity for an uncertain positive effect. Mr Lambie describes the potential for inappropriate trades such as a few less whitehead for a lot more fantail<sup>31</sup>. Mr Lambie also notes that there is no demonstration of equivalence relating to exchanges of invertebrates<sup>32</sup>, and does not consider that a net-gain outcome for invertebrates is likely<sup>33</sup>. In my opinion there is a strong risk that the proposal would result in a net loss of indigenous biodiversity.

**8. Long-term outcomes:** *The design and implementation of a biodiversity offset should be based on an adaptive management approach, incorporating monitoring and evaluation, with the objective of securing outcomes that last at least as long as the project's impacts and preferably in perpetuity.*

4.26. There is considerable uncertainty as to the long term outcomes that will occur. Legal protection would generally be required to ensure that the outcomes that do occur are secured.

**9. Transparency:** *The design and implementation of a biodiversity offset, and communication of its results to the public, should be undertaken in a transparent and timely manner.*

4.27. ECRs, which are the basis of the proposed offsetting approach, are not transparent, as they conceal trades in condition and habitat complexity.

**10. Science and traditional knowledge:** *The design and implementation of a biodiversity offset should be a documented process informed by sound science, including an appropriate consideration of traditional knowledge.*

4.28. In my opinion, Dr Forbes has excluded a scientifically robust offsetting framework from consideration when such an approach could easily have been used for younger stands of indigenous forest, scrub, and shrubland.

---

<sup>31</sup> Paragraph 167 of the S42A evidence of Mr Lambie

<sup>32</sup> Paragraph 200 of the S42A evidence of Mr Lambie

<sup>33</sup> Paragraph 201 of the S42A evidence of Mr Lambie

## 5. ROBUST OFFSETTING APPROACHES

- 5.1. A robust offsetting approach would provide a much better basis for assessing the quantum of mitigation. Condition-area currencies are the most commonly used in New Zealand. They have great utility for consenting, as they generally require vegetation plot data to provide an objective and measureable assessment of vegetation condition. Predictions of vegetation condition over time can be used directly as performance measures in conditions of consent. Vegetation plots can subsequently be measured in the planted or enhanced offset sites, providing independent and objective means to verify progress towards the performance targets.
- 5.2. Dr Forbes refers to the existence of such data from potentially affected areas of old-growth forest at the site<sup>34</sup>, but this information has not been used to provide baseline information for an offsetting currency.
- 5.3. It is more difficult to develop robust offsetting approaches for effects on indigenous fauna, because populations of indigenous fauna require greater effort to measure, but a robust offsetting approach would generally use measures of breeding success or population size as attributes.
- 5.4. Dr Forbes notes that quantitative bird counts were undertaken<sup>35</sup>, but has not used these to provide baseline information for an offsetting currency.
- 5.5. Offsetting would be most useful to determine the quantum of planting required to address adverse effects on the younger classes of affected vegetation at the site, such as mānuka and kānuka shrublands, kānuka forest, and secondary broadleaved forest and scrub. This is because there is a shorter time required for the planted vegetation to reach a similar state as that cleared, because the growth rates of planted successional vegetation are reasonably well known, and because there is reasonable certainty about the outcome of planted early successional species.
- 5.6. Unfortunately Dr Forbes has not taken this into account when concluding that quantitative sampling is not required and would add nothing to assessment of value or effects management<sup>36</sup>. Rather than using

---

<sup>34</sup> Paragraph 39 of the EIC of Dr Forbes.

<sup>35</sup> Paragraph 43 of the EIC of Dr Forbes.

<sup>36</sup> Paragraphs 40-41 of the EIC of Dr Forbes

subjective ECRs, robust offsetting frameworks could easily have been developed for the younger stands of indigenous woody vegetation at the site.

- 5.7. In summary, Dr Forbes' approach for assessing the required quantum of positive actions does not incorporate an accounting model and these actions should not be considered offsetting but rather a package of compensation actions, as discussed further below.

## 6. OFFSETTING VS COMPENSATION

- 6.1. The difference between offsetting and compensation is that offsetting must be on a like-for-like basis, is undertaken close to where the adverse effects occur, and is measurable, whereas compensation can include like-for-unlike transactions, be more remote from where the adverse effects are experienced, and is generally assessed subjectively.
- 6.2. These differences are important. Like-for-like transactions can, at least theoretically, be quantified, so that no net loss or a net gain of biodiversity can be demonstrated. On the other hand, like-for-unlike transactions trade certain loss of one feature of biodiversity in exchange for improvement in a different feature of biodiversity, and cannot achieve no net loss.
- 6.3. I agree with Mr Lambie that biodiversity offsetting outcomes can include trade-offs<sup>37</sup>, but these should never involve loss of important biodiversity attributes in favour of gain of unimportant biodiversity attributes. Important biodiversity attributes should always be captured in disaggregated currencies.
- 6.4. Dr Forbes claims that effects envelopes have allowed ecologically acceptable development<sup>38</sup>, but his opinion here is subjective, and not backed up by evidence such as a robust offsetting framework or demonstrated adherence to biodiversity offsetting principles.
- 6.5. In my opinion, compensation could result in a net gain but only if the adverse effect was small, and the positive effect overwhelmingly large. For example the clearance of a small area of regenerating forest, if compensated for by protecting a large example of a different and

---

<sup>37</sup> Paragraph 22 of the S42A evidence of Mr Lambie

<sup>38</sup> Paragraph 53 of the EIC of Dr Forbes

threatened forest ecosystem combined with a large scale planting project, could potentially result in a net gain to indigenous biodiversity.

- 6.6. This is known as 'trading up'. Mr Lambie describes exchanges of loss of biodiversity of lesser concern for gain of biodiversity of greater concern as a form of offsetting, but I disagree that this is the case. They are not consistent with the 'no net loss' principle, and there is no current metric that would allow these exchanges to be quantified.
- 6.7. As I describe above, I consider these to be cases of compensation that require a subjective assessment of net gain.
- 6.8. To my knowledge there are no objective tests for 'overwhelmingly large' in this context, thus requiring a subjective, informed judgement approach to assess the merits of such an approach.
- 6.9. The Department of Conservation, in their submission dated 13 December 2019<sup>39</sup>, requested a clear differentiation of matters to be addressed through environmental compensation vs biodiversity offsets, identification of all offset and compensation locations, and that any offset reasonably demonstrate net indigenous biodiversity gain and not rely on professional opinion.
- 6.10. In a response to this request, Dr Forbes stated that "we are currently working to define replacement planting and offset locations and this work will be undertaken in conjunction with DOC. We will provide an explanation of environmental compensation versus offsetting as part of this work"<sup>40</sup>.
- 6.11. As described above, the current package of positive actions does not constitute a biodiversity offset, and as such, claims of net gain have not been demonstrated. The package of positive actions proposed is consistent with environmental compensation, but its adequacy as compensation has not been demonstrated. In addition, as I set out in the next section of my evidence, offsets should be considered before compensation in the 'mitigation hierarchy' (compensation is not explicitly provided for in the Horizons One Plan).

---

<sup>39</sup> Department of Conservation submission to Palmerston North City Council regarding TE AHU A TURANGA: MANAWATU TARARUA HIGHWAY – NOTICE OF REQUIREMENT. 13 December 2019.

<sup>40</sup> Letter from Adam Forbes to Wildland Consultants, dated 1 February 2018, [note, this date should have been 2019].

## 7. STATUTORY POLICY

7.1. Policy 13.4 of the One Plan sets out a framework for activities affecting rare habitats, threatened habitats, and at risk habitats. I understand that a number of these habitats are present at the Manawatū Gorge site. Policy 13.4.b describes how effects should be dealt with, expressing a preference for avoiding more than minor effects, remedying or mitigating those effects at the point where the adverse effects occur, or otherwise offsetting those effects so as to result in a net gain of indigenous biodiversity. Policy 13.4.c sets out the requirement for the offset, including Policy 13.4.c.ii, which states that the offset must:

*Reasonably demonstrate that a net indigenous biological diversity gain has been achieved using methodology that is appropriate and commensurate to the scale and intensity of the residual adverse effect.*

7.2. Policy 13.4b sets up a mitigation hierarchy that favours options that pose less risk to indigenous biodiversity compared to approaches that pose more risk. As Mr Lambie sums up, the risk to biodiversity increases at each step along the effects management hierarchy, with avoidance posing little risk, and compensation the greatest risk<sup>41</sup>.

7.3. In this context I agree with Mr Lambie that adverse effects on the Western QEII area should have been preferentially avoided. In my opinion adverse effects on old growth forest are also preferentially avoided. This would enable a robust offsetting approach to focus on younger stands of indigenous forest and shrubland vegetation, to generate more certain predications of gain over time.

7.4. In my opinion, Dr Forbes has not reasonably demonstrated that a net gain will be achieved. The use of ECRs is a poor substitute for best practice offsetting. In particular, as the proposal stands there would be a net loss of old growth forest structure (and consequent loss of indigenous fauna habitat) that would take centuries to restore, net loss of wetland extent, and net loss of old growth forest invertebrate communities.

---

<sup>41</sup> Paragraph 132b of the S42A evidence of Mr Lambie.

## 8. CONCLUSIONS

- 8.1. Biodiversity offsets are measurable conservation outcomes that use currencies and accounting models to determine the quantum of positive actions required to address residual adverse effects.
- 8.2. Dr Forbes has explicitly ruled out use of an offsetting approach, and instead has subjectively determined planting ratios based on area to address loss and modification of indigenous vegetation. Pest and weed control are also incorporated as positive actions to address adverse effects, but these proposed actions have also not been quantified or formulated as biodiversity offsets.
- 8.3. Proposed positive actions described by Dr Forbes represent environmental compensation proposals, not biodiversity offsets. As such, claims that the positive actions would achieve a net gain are not supported by his evidence. In particular, there will be net loss of old growth forest structure that would take centuries to restore, net loss of wetland extent, and net loss of old growth forest invertebrate communities.
- 8.4. The differences between offsetting and compensation are important, and include whether the actions are like-for-like or not, whether there is an objective basis to determination of the offset quantum, and whether the actions are undertaken close or distant from where the adverse effects are experienced.
- 8.5. These differences mean that there is significantly more risk and uncertainty as to whether compensation activities sufficiently address residual adverse effects. The significant uncertainties related to this proposal are an example of this, and illustrate that it is a compensation approach that has been adopted.