

**MT MESSENGER BYPASS PROJECT: SUMMARY OF EVIDENCE OF RHYS BURNS  
(AVIFAUNA) FOR DOC**

**Potential adverse effects**

1. Eight native bird species have been found within or adjacent to the Project Area that have a New Zealand conservation threat classification status (Townsend et al. 2008) of Threatened or At Risk, meaning they respectively face a high risk of extinction in the wild or a comparatively slower rate of decline. Another five Threatened or At Risk bird species could be expected to be present in the Project Area but haven't yet been detected by the Applicant.
2. In my opinion, the Project is likely to have a high impact on several native or threatened bird species. Such effects could lead to a decrease in the abundance of birds, and a subsequent decline in the ecosystem processes provided by birds.
3. The main proposals that would mitigate or compensate for effects on avifauna are:
  - a. Pre-construction radio-tracking of kiwi in or adjacent to the road corridor and possible movement of kiwi and translocation of kiwi eggs during construction;
  - b. Control of introduced mammalian pests to reduce predation events on birds to low levels; and
  - c. A fence to protect kiwi from vehicle strike and underpasses to allow kiwi passage and dispersal.
4. Successful mitigation and compensation for avifauna will primarily depend upon the success of pest management.
5. I agree with Dr McLennan that the increase in the PMA has made the attainment of desired bird increases in the PMA much more certain. I did not consider the previously proposed 1085 ha PMA to be sufficient to address all adverse effects on avifauna. Subject to my comments below regarding kiwi, if the proposed pest animal targets are achieved, I consider the proposed management of 3650ha would benefit forest and wetland birds.

**Kiwi**

6. For effects on kiwi, I consider the PMA is relatively small to have high confidence that this will provide compensation (i.e. a considerably enhanced population) and would only be acceptable if a number of requirements are met. For this reason, I consider a robust

adaptive management regime through an Ecological Review Panel would also be essential.

7. For kiwi, I consider that the 6% annual growth figure used by Dr McLennan is overly optimistic when considering the likely outcome of the proposed actions of the PMP within the 3650 ha PMA.
8. As Dr McLennan states, the differences between us largely relate to the expected rate of subadult dispersal and the carrying capacity (maximum density) of adult pairs that can be expected to accumulate within the PMA. When the subadult dispersal rate reaches a critically high level, the population will slowly decline as older kiwi die and are not replaced by sufficient young kiwi (that is, too many young will have dispersed outside the predator protected area to sustain the population). If subadult kiwi disperse to an area that is not subject to effective predator control, while they themselves should survive (assuming there are no ferret or dog predation events) their offspring are unlikely to survive, resulting in a long-term population decline.
9. I model an approximate 0.5% annual compound growth rate of kiwi in the PMA over the first 30 years. This is a large distinction from Dr McLennan's figure, as percentage growth is compounded year upon year to the population, giving exponential numerical increases. Even a small difference of percentage population growth rate can lead to large differences in absolute numbers of kiwi over time.
10. In my model, I used population parameters generated by Dr Robertson (DOC) in a long-running study of Western brown kiwi at Tongariro forest. Dr McLennan used data, also from Dr Robertson, as co-author of the Innes *et al* 2015 Report.
11. Ultimately, I agree with Dr McLennan that the proposal should have benefits for kiwi - but at a lesser rate of population growth. My approach indicates there is little room for 'error' so that any effects of the Project that are slightly greater than I have assumed in my population model could result in large population differences over time, including a static or perhaps even declining kiwi population. If monitoring shows that the erection of a fence to prevent vehicle strike and/or the underpasses (culverts) are not successful, or if stochastic events occur in the landscape (also referred to by Wildlands' Supplementary Report page 19), gains may not be achieved. This may mean that further intensive pest management for mustelids across a larger contiguous area would be required in order to adequately compensate for the deaths of adult kiwi and/or dispersing juveniles.

### **Pest Management Area**

12. Animal pest targets are 5% tracking tunnel index for rats and 5% Residual Trap Catch Index (RTCI) or 5% Chew Card Index (CCI) for possums, in an area 200m or greater from the perimeter of the entire PMA. For stoats, the target is zero detections, 500 m or greater from the perimeter.
13. The Applicant has clarified that the proposed 3650ha PMA would be intensively managed for all target animal pests including goats and pigs, but that these perimeter areas will be excluded when determining performance monitoring outcomes. While I agree that incursions into the perimeter area could provide for adverse monitoring results, I still have a concern that if the perimeter area is not the subject of performance measures there is some doubt as to success of pest management there.
14. I consider that best practice methods involving trapping and pest animal monitoring would be difficult to achieve - largely due to the difficult terrain. This means that the Ecological Review Panel would have an important adaptive management function.
15. I consider it vital that the location (including size and shape of the PMA) be known in order to assess the likely outcomes of the proposed mitigation. Size and shape, and the status of adjacent land, are essential in order to predict net benefits to avifauna, and the likely rates of pest incursions into the PMA. (Inappropriately designed management areas with high perimeter to area ratios let more pests in, and let more birds out through dispersal.) I note that Wildlands also considers the location of the PMA needs to be known to better predict outcomes (Wildlands Supplementary Report at page 24, 2.16.8).

### **Bittern**

16. I understand that the Applicant has agreed to install an automatic sound recorder in each of the Mimi and Mangapepeke catchments in spring 2018, and to undertake an 'adaptive management' response if bittern are found. I agree this method should be effective if bittern use the Project Area to breed. I do not consider it to be effective if bittern use the site intermittently or during autumn/winter. I suggest greater survey effort for bittern be undertaken for this purpose.

### **Other conditions**

17. I agree with Wildlands that *"It is clear that the Project footprint is within post-translocation dispersal distances of kokako"*. An annual pre-construction kōkako survey is appropriate. I agree with Wildlands that management needs to occur if a kōkako pair have a nest, or an established territory, within an area to be cleared of vegetation (page

13 Supplementary Report). Wildlands recommends (page 31 Supplementary Report) a condition be added to the designation addressing the action(s) required if an established kōkako territory/breeding pair were to be found within the Project footprint. I also consider the Ecology Review Panel should provide guidance on appropriate actions when any kōkako are recorded as occurring at the Project Area or PMA, on an ongoing basis.

18. I agree with Wildlands (pages 6 and 31 Supplementary Report) that details need to be provided on performance measures for the kiwi exclusion fences, and the proposed locations of the fences. I consider these fences should be provided for along the entire length of the road on both sides. The Applicant previously committed to finalising the design of fences/barriers in consultation with DOC [Attachment to my EIC].
19. I agree with Wildlands (Page 18 Supplementary Report) that monitoring for forest birds other than kiwi should not cease after 3 years even if the first 3-yearly survey results show 20% increases are met. I agree monitoring should occur for 12 years to demonstrate any increases are maintained.
20. For kiwi, I expect the PMA kiwi population to stabilise and then slowly increase. After 30 years, I estimate the PMA to be producing 100-140 kiwi chicks per year, which should result in approximately 13 surviving chicks establishing territories as adults within the PMA per year. The monitoring approach for kiwi should reflect this slow increase (that is, long-term monitoring should be provided for).