

MT MESSENGER BYPASS PROJECT: SUMMARY OF EVIDENCE OF CORINNE HANNAH WATTS (TERRESTRIAL INVERTEBRATES) FOR THE NZ TRANSPORT AGENCY

1. I am an Invertebrate Ecologist at Manaaki Whenua – Landcare Research, Hamilton. Since November 2016, I have provided expertise on terrestrial invertebrates within the Project.
2. My participation in the Project has included carrying out a desktop assessment which was followed by fieldwork and surveys between February and December 2017. From this work I have gained a comprehensive understanding of the terrestrial invertebrate community and their values within the wider Project area.

Terrestrial invertebrate investigation methodology

3. Initially I carried out a desktop assessment based on a detailed literature and database review, and discussions with experts. I made field assessments of the habitat quality for invertebrates of the two different alignment options (including the alignment now proposed for the Project).
4. A more detailed field assessment was carried out in October to December 2017. Three types of invertebrates sampling occurred including (1) malaise traps to collect flying insect fauna inhabiting foliage, (2) pitfall traps to sample the ground-dwelling fauna, and (3) below-ground sampling focussing on earthworms. Invertebrate sampling occurred within 11 plots (10 x 10 m) placed within the Project footprint (where sites could be safely accessed) in areas of native forest and scrub habitats.

Terrestrial invertebrate investigation results

5. As with many parts of New Zealand, little is known about the invertebrate fauna inhabiting the Project area and the wider Mt Messenger area. The desktop review found 179 invertebrate taxa record in the general vicinity of Mt Messenger. These records included only three important records of invertebrate taxa (though as discussed in my evidence it is not clear that these three species are currently present in the project footprint.¹
6. When observing the habitat quality for invertebrates I conclude that the ecological condition of the forest within the Project footprint is considered poorer, with fewer palatable plant species, less diversity of ground cover plants and spare leaf litter, compared to the nearby Parininihi (to the west of the existing SH3). This is probably due to the absence of consistent animal pest control and presence of grazing stock.

¹ See paragraph 40 of my EIC.

7. The late-2017 sampling programme provided a 'snap-shot' of the invertebrate species actually present within the Project footprint. The one month sampling period is a routine period, and was appropriate to obtain a robust dataset.
8. The surveys found 7,417 invertebrates from 439 taxa. It was a diverse fauna, dominated by native taxa, from a range of trophic groups.² The invertebrate fauna is considered 'typical' of communities inhabiting native forests of southern North Island and northern South Island.
9. Two species of peripatus, *Peripatoides suteri* and *Peripatoides novaezealandiae* were found within the Project footprint. The record of *P. suteri*, classified as 'Vulnerable' on the IUCN Red List of Threatened Species, in two plots is important. However, neither of these species have a threat classification under the New Zealand Threat Classification System. Accordingly, a draft Peripatus Management Plan (Chapter 10 of the ELMP) has been prepared. The plan outlines the recommended procedure for pre-translocation survey in 'high-risk' habitat areas, site preparation, translocation timing, peripatus and habitat transportation, and the re-positioning of peripatus-occupied material.

"Unmitigated' effects assessment

10. My evidence outlines the unmitigated effects of the Project on terrestrial invertebrates values as 'High' combined with an unmitigated magnitude of effects assessment of 'Low' to 'Moderate' correlates to a conservative overall level of unmitigated effects of 'High' under the EclA Guidelines.³
11. The actual unmitigated effects of the Project on terrestrial invertebrates are likely to be lower than what has been conservatively assumed because:
 - (a) the invertebrate fauna is representative of communities inhabiting native forests of southern North Island and northern South Island;
 - (b) the ecological condition of the forest within the proposed route is considered poorer compared to the nearby Parininihi;
 - (c) approximately 1% of the available habitat in the wider Project area will be affected by the Project; and
 - (d) it is likely that the taxa most affected by mammalian predation are already extinct in the Mt Messenger area.

² See paragraph 54 of my EIC.

³ See paragraphs 54 – 55 of my EIC.

Measures to avoid, mitigate and offset potential effects on invertebrates

12. A range of measures to avoid, minimise, mitigate and offset potential effects on terrestrial invertebrate have been put in place or are proposed for the Project.⁴ These measures include pest control, habitat enhancement and restoration planting, as well as measures that specifically target invertebrates (including the Peripatus Management Plan). The proposed fenced enclosure for lizards will also likely have benefits for invertebrates by removing mice as a predator within that particular environment.⁵
13. There is strong correlation between the health of vegetation communities and the health of invertebrate assemblages indicating that enhancements to habitat quality will benefit invertebrates. As outlined in my evidence, I support the mitigation and offset package which has been proposed, which in my opinion represents a sound and appropriate response to the effects of vegetation removal potentially affecting the terrestrial invertebrate communities during construction activities.
14. As explained in my evidence, I consider that any effects of the Project on invertebrates are likely to be negligible (and may be positive) in the medium term.

Response to submissions and the NPDC Section 42A Report on terrestrial invertebrates

15. I am of the view that during and post-construction monitoring would have little benefit. I support actions to prevent the introduction of invasive invertebrate species, such as Argentine ants, which are outlined in Chapter 11 of the ELMP.
16. Concerns were raised about effects on invertebrate values in the Mangapepeke Valley floor associated with the vegetation type “WF8”. I note that the “WF8” habitat in the Mangapepeke catchment is highly degraded from grazing and agriculture, resulting in a ground cover of predominantly exotic rushes and pasture species.⁶ In addition, these induced pasture-rushland communities are common throughout the valleys of humid north Taranaki and western Waikato.⁷ The invertebrate species found in this vegetation type are commonly found and widely distributed. In my opinion, the planned replanting of absent plant species to restore this habitat type, currently in a highly degraded state, and its invertebrate community, will adequately replace the WF8 habitat being modified and lost.
17. My evidence responds to issues of the risk to invertebrates arising from sedimentation that needs to be managed through erosion and sediment control, and that proposed pest management may lead to mouse plagues with unintended consequences for

⁴ See paragraphs 56 – 83 of my EIC, as well as paragraphs 93 – 95 in response to the DOC submission.

⁵ As discussed in my supplementary evidence.

⁶ AEE Technical Report 7a (Vegetation).

⁷ Nick Singers, pers. comm.

invertebrates. As explained in my evidence, those issues will be minimised through erosion and sediment control measures, and mouse control is unfeasible over such a large area and within the difficult terrain at Mt Messenger.⁸

18. Gaps in the aquatic macroinvertebrate fauna were addressed in the terrestrial invertebrate monitoring, as malaise traps collected the adults of freshwater taxa.⁹
19. Lepidoptera are closely associated with vegetation and they can contribute significant biodiversity in the Project area. No Lepidopterists were available to carry out a targeted survey within the timeframes of the Project. However, some sampling did occur as Lepidoptera were common (424 specimens from six species) in the malaise traps. During fieldwork within the Project footprint, no signs of adult or larvae activity of the threatened forest ringlet were detected. The Wildlands invertebrate ecologist (Brian Patrick) and I agreed during formal meetings that the forest ringlet is unlikely to be present in the vicinity of the Project footprint.¹⁰
20. To address any adverse effects of the creation of new forest edge (3845 m) and general forest disturbance as a result of the road, monitoring and response strategies for *Vespula* and *Polistes* wasps along the new road margins are discussed in my evidence.¹¹

Correction

21. In Paragraph 10 of my EIC, I refer to 3 specimens of *P. suteri*. This should read “2” specimens of *P. suteri*.

⁸ See paragraphs 97– 100 of my EIC in response to the DOC submission.

⁹ See paragraphs 102– 106 of my EIC in response to the Forest and Bird submission.

¹⁰ See paragraph 109 of my EIC in response to the NPDC Section 42A Report.

¹¹ See paragraphs 110– 113 of my EIC in response to the NPDC Section 42A Report.