

**BEFORE THE TARANAKI REGIONAL COUNCIL AND NEW PLYMOUTH
DISTRICT COUNCIL**

MT MESSENGER BYPASS PROJECT

In the matter of the Resource Management Act 1991

and

In the matter of applications for resource consents, and a notice of requirement by the NZ Transport Agency for an alteration to the State Highway 3 designation in the New Plymouth District Plan, to carry out the Mt Messenger Bypass Project

**SUPPLEMENTARY STATEMENT OF EVIDENCE OF ROGER JOHN
MACGIBBON (ECOLOGY MITIGATION AND OFFSETS) ON BEHALF OF THE
NZ TRANSPORT AGENCY**

17 July 2018

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INTRODUCTION

1. My name is Roger John MacGibbon.
2. My supplementary evidence is given in relation to applications for resource consents, and a notice of requirement by the NZ Transport Agency ("the **Transport Agency**") for an alteration to the State Highway 3 designation in the New Plymouth District Plan, to carry out the Mt Messenger Bypass Project ("the **Project**").
3. I have the qualifications and experience set out in my statement of evidence in chief ("**EIC**") dated 25 May 2018.
4. I repeat the confirmation given in my EIC that I have read the 'Code of Conduct' for expert witnesses and that my evidence has been prepared in compliance with that Code.
5. In this evidence I use the same defined terms as in my EIC.

SCOPE OF EVIDENCE

6. My supplementary evidence details the changes made to the Restoration Package since submission of my EIC, notably a change to the size of the proposed Pest Management Area. It also provides additional detail on aspects of the pest management methodology, pest management monitoring and the lizard compensation package that have arisen since my EIC was filed.
7. All other aspects of the Restoration Package stand as written in my EIC.

UPDATED RESTORATION PACKAGE

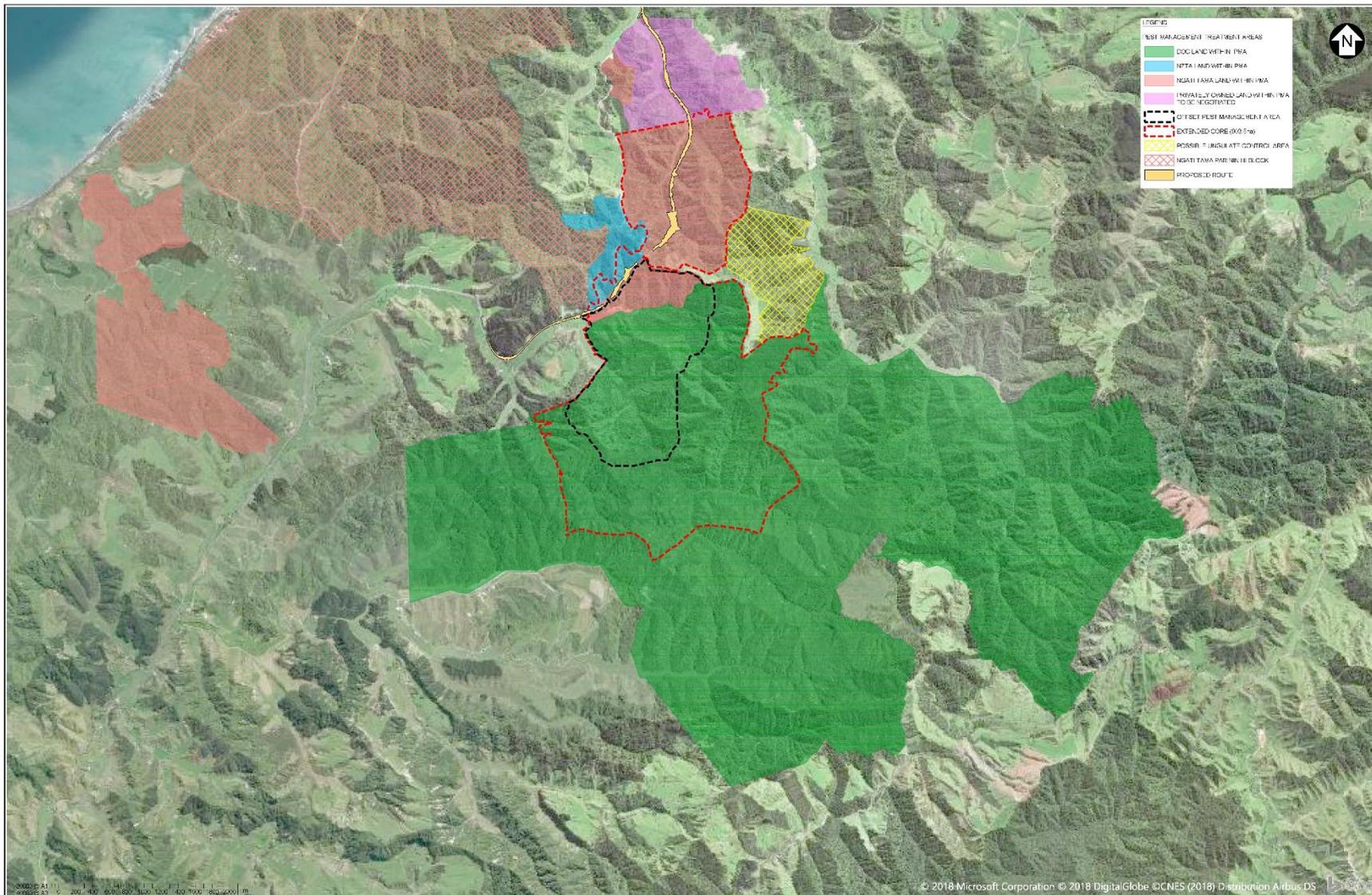
8. In summary, the Restoration Package now proposed for the Project, updated since the production of my EIC, is as follows:
 - (i) The Pest Management Area ("**PMA**") has been increased in size from 1085ha to 3650ha. Pest management over this enlarged PMA will be in perpetuity and will include the intensive management of rats, mustelids, possums, feral cats, goats and pigs, as well as the exclusion of all farm livestock.
 - (ii) 6ha of kahikatea swamp forest will be planted (unchanged from my EIC).
 - (iii) 9ha of mitigation planting (unchanged from my EIC).
 - (iv) Fencing and planting of 8.455km of stream (or 8153m² of stream surface area). This is a slight reduction from the figures supplied in my EIC (8.627km and 8157m²). The riparian planting will occupy an average of 10m each side of the stream which equates to 16.91ha (compared to 17.25ha in my EIC).

- (v) 200 seedlings will be planted of the same species as each of the significant trees that will be felled along the Project footprint. Seventeen significant trees have been identified so 3400 seedlings will be planted. This is unchanged from the Restoration Package stated in my EIC.
 - (vi) The residual ecological effects on lizards will be compensated for by the capture and translocation of striped skink and arboreal geckos salvaged during vegetation clearance to a pest proof fenced enclosure (to a minimum size of 1 ha) built around suitable habitat in an area where striped skink have recently been recorded. This is a refinement of approach outlined in my EIC.
 - (vii) Kiwi roadside barrier fencing will be built along areas of roadside margin that are considered to be locations where there is a high risk of kiwi attempting to cross the road during construction and road operation (unchanged from my EIC).
 - (viii) The bat vegetation removal protocol has been altered to include trees of 80cm dbh (diameter at breast height) or larger, or at the bat ecologist's discretion trees greater than 50cm dbh, rather than trees larger than 15cm dbh. This change has been made because the oldest/tallest/largest trees within the Project footprint, are those most likely to contain communal/maternity roosts and with the knowledge based on scientific literature that the 3650ha PMA will more than offset the residual effects caused to long tailed bats.
 - (ix) Establishment of a Pest Management Review Panel to review the pest management and monitoring programme and to provide guidance and recommendations in the event that the pest management programme fails to meet any performance targets in any 2 consecutive years. This is a refinement (including a name change – previously referred to as the Ecology Review Panel) from that presented in my EIC.
9. The component parts of the Restoration Package remain the same as stated in my EIC. However, following discussions with DoC during the adjournment period, while the NZ Transport Agency' ecology team remains of the opinion that the Restoration Package set out in my EIC appropriately responds to the effects of the Project, the NZ Transport Agency has increased the PMA from 1085ha to 3650ha. The rationale behind the enlarged pest management area proposed by the Transport Agency is explained in the Supplementary Evidence of Mr Chapman.
10. In addition to the change in size of the PMA additional detail is also provided on the following aspects of the Restoration Package:

- (a) The methodologies to be used for pest management, at least over the first few years of the programme, have been refined.
 - (b) The pest management monitoring programme has been modified to better align with recognised best practice.
 - (c) The nature and likely location of the lizard compensation has been determined.
11. The extent and preferred location of the enlarged PMA can be seen in Figure 1.
 12. The ELMP, including the Pest Management Plan ("**PMP**"), has been updated to reflect all of the changes to the restoration package. The implementation of the ELMP (and PMP) will ensure that the outcomes described in my evidence will be delivered by the Transport Agency.

Pest management methodology

13. Details of the proposed methods to be used to reduce and hold target pests at low densities, and the target densities to which they will be managed, can be found in Chapter 9 of the ELMP.
14. Aerial 1080 bait applications will occur over the full 3650ha PMA every 3 years (and ideally will be synchronised with the current cycle applied to the adjoining Parininihi pest management area).
15. An intensive ground-based bait station and trap grid network will be established across the full 3650ha PMA and used to hold pest densities down to target levels between the three yearly aerial 1080 drops. The grid will consist of cut and marked bait station and trap-lines which have been specifically located to ensure adequate coverage of pest control devices.
16. A detailed Pest Management Operational Plan will be developed by the appointed pest management contractor(s) in consultation with the Pest Management Review Panel prior to the commencement of the pest management programme. This Plan will apply recognised best practice approaches to all aspects of the programme. The elements to be included in this Plan can be viewed in Section 9.6 of the ELMP.
17. The Pest Management Review Panel will comprise pest control experts from each of DOC, Ngati Tama and the Alliance/Transport Agency.



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Figure 1: Intended extended 3650ha PMA. The solid coloured areas make up the PMA. The adjoining Parininihi block is shown in red cross-hatching.

18. An adaptive management approach will be adopted for each animal pest in the choice of pest management methods used and trap and/or bait station intensity. If target, or near target, pest density performance standards are not achieved with one method for two consecutive years (after excluding years when targets are not met due to severe natural events or circumstances beyond the Alliance's control), the method or approach will be reviewed by the Pest Management Review Panel and varied, based on experience and research, until target levels are consistently achieved.
19. The pest management performance targets for the PMA are (as stated in my EIC):
 - Possums – 5% or lower RTC (Residual Trap Catch Index) or 5% or lower CCI (Chew Card Index).
 - Rats – 5% or lower RTI (Residual Trapping Tunnel Index).
 - Mustelids – no detections.
 - Cats – no detections.
 - Goats – less than 1 kill/man day.
 - Pigs – less than 1 kill / man day then no fresh pig sign or pig detections.
 - Farm livestock – zero presence.
20. Achieving and holding rat densities to the target 5% residual rat tracking index threshold will be the most challenging target and it is likely, based on the experiences of other large-scale NZ rat control programmes undertaken in challenging terrain, that rat densities will not be lowered to 5% in some seasons due to weather or indeterminate reasons. Achievement of 10% rat RTI or lower is generally accepted as a successful outcome. While 5% RTI will remain the target for rats in the PMA, tracking indices above 10% in two consecutive years will trigger the need to review the method used.
21. For the other managed pest species, the trigger for re-assessment of the control methodology will be when the pest management performance targets for that species have been exceeded in two consecutive years.

Pest Management Monitoring Programme

22. I have further modified the pest monitoring proposed in my EIC to better reflect best practice. The ELMP has been updated accordingly.
23. Pest density performance monitoring will be undertaken in the PMA Area annually for 5 years following the commencement of the pest management programme. Annual monitoring in the first 5 years will include 3 sample points – the first immediately prior to the commencement of the bird/bat breeding season and two more through the summer period. After 5 years from the commencement of the programme monitoring will occur once annually immediately prior to the commencement of the bat and bird breeding season.

24. In situations where the performance target indices for a target species are exceeded in two consecutive years, triggering the need for a review and possible change to the pest management methodology, the monitoring regime will revert back to that required for the first 5 year period (ie. 3 monitoring points per year) until performance targets are achieved (for rats, while the target is 5% the trigger for review is 10%).
25. Performance monitoring indices will be generated from the area of the PMA that lies inside a buffer. The depth of this buffer varies with each pest as follows:
 - 200 metres from the PMA edge for rats and possums;
 - 500 metres from the PMA edge for mustelids and feral cats;
 - A defined core PMA for goats, pigs and farm livestock (as indicated by the green coloured area in the map of Mr Singer's supplementary evidence).
26. The PMA buffers are excluded from pest density monitoring because of expected reinvasion pressure from uncontrolled populations on neighbouring land.

Lizard compensation

27. A prioritised hierarchy of compensation options for striped skink was proposed in my EIC, as follows:
 - (a) mouse proof predator fence to be constructed around a known local population of striped skink and all striped skink salvaged from the footprint to be relocated to this enclosure; or
 - (b) mouse proof predator fence to be constructed around a known distant population of striped skink and all striped skink salvaged from the footprint to be relocated to it; or
 - (c) translocation of all captured lizards into a mouse proof predator fenced enclosure located within the PMA.
28. The Project's herpetologist, Mr Chapman, in communication with DOC's herpetologist, has identified a number of potential sites of known striped skink populations. Two of these sites are located approximately 24km east north east of the Project site and are currently being assessed for their suitability for construction of a pest (including mice) proof enclosure.
29. While discussions with Ngati Tama about the acceptability of translocation of lizards to this site are yet to occur, the intention is for any striped skink and arboreal geckos salvaged during tree clearance along the Project footprint to be released into the fenced enclosure.

30. The potential for progeny produced in the enclosed colony to be translocated back to the PMA at some time in the future will be discussed with DOC and Ngati Tama.

Riparian restoration

31. Mr Hamill has reworked the SEV calculations for riparian restoration requirements following the review of his SEV report. As a result of a variety of small changes the stream length and surface area required as offset has reduced slightly from 8627m (8157m²) to 8455m (8153m²). This change has no material effect on the location or nature of the riparian fencing and planting proposed, which remains essentially the same as stated in my EIC.

THE ECOLOGICAL EFFECTS OF THE PROJECT IN LIGHT OF THE UPDATED RESTORATION PACKAGE

32. The enlargement of the PMA to 3650ha has increased the forest area under perpetual intensive pest management by 336% compared to the 1085ha PMA initially proposed and, as a consequence, has substantially increased the magnitude and diversity of ecological recovery that will result.
33. The size, duration and intensity of the proposed pest management programme is unprecedented as mitigation or offset for the construction of a new road in New Zealand, and will, in my professional opinion, generate biodiversity gains that are significantly greater than the likely residual ecological effects of the Project.
34. By way of comparison, the proposed enlarged PMA is larger than the Maungatautari Ecological Island Sanctuary (3400ha), the largest fenced sanctuary in New Zealand, and larger than 3 of the 6 Department of Conservation Mainland Island sites where pests are managed intensively for multiple biodiversity benefits.
35. The forest and wetland environment through which the new road will pass is of high ecological value in terms of the age and stature of the forest and the quality of the habitat for a wide range of indigenous plants and animals. However, both the wetland and forested areas along and adjacent to the Project footprint, and the ecosystem processes occurring within them, have been significantly compromised for many decades by farm livestock and animal pests. Consequently, the abundance and diversity of indigenous flora and fauna is considerably less than would be expected in a healthy environment with low levels of animal pests.
36. Intensive enduring control of rats, possums, mustelids, feral cats, goats, and pigs and the exclusion of farm livestock will induce regeneration of many palatable plant species, measurable improvement in forest canopy condition, and increased recruitment of many bird species including kiwi, long tailed bats, many invertebrates, and some lizard species.

37. Even with a conservative estimate of the ability of browsing ungulates (goats, pigs) to penetrate into the PMA from the margins, Mr Singers has determined that a permanent very low pest density “core” area of 903.5ha can be established within 3 years of commencement of the pest management programme. He and Dr McLennan have emphasised that the sizeable buffer around this core means that the likelihood of successfully achieving and holding all pest densities to very low levels on a permanent basis is high.
38. Mr Singers states in his supplementary evidence that the anticipated vegetative conservation outcomes that will occur within the 903.5ha core area of the PMA is just under four times the area determined by the Biodiversity Offset Model to be necessary to achieve 'no net loss' by year 10. This core area is over 28 times the area of habitat lost in the Project. In addition, there will be significant ecological benefits generated in the 2746.5ha of the PMA that lies outside the core.
39. Dr McLennan has noted in his supplementary evidence that the enlarged PMA should benefit about three times as many forest birds as the original 1085ha PMA. In his estimate, the kiwi population in the enlarged PMA will increase by 1220 extra birds over 25 years (compared to an estimate of 379 extra kiwi over 30 years in the original 1085ha PMA), and kereru (amongst several forest bird species) should increase by about 360 individuals over 30 years.
40. Both Dr McLennan and Mr Singers highlight the fact that the long term benefits to biodiversity of the pest management programme will not be confined to the PMA. Offspring produced in the PMA will move into neighbouring areas and contribute to population growth in those areas, even in sites not receiving predator control.
41. As explained in Mr Chapman's Supplementary Evidence, on the basis of existing published research intensive pest management of an area of 3650ha can be expected to result in population scale recovery of long tailed bats, reversing the current decline that is occurring in areas of limited or no pest management, and well exceeding the requirement to achieve a no net loss outcome. This benefit is also likely to extend to the adjoining Parininihi where intensive pest management has been undertaken for a number of years.
42. The 8.455km of stream fencing and planting will create riparian and aquatic habitat that has not occurred at the proposed restoration sites since the land was cleared for farming, and will increase the amount of contiguous native fish friendly habitat that is connected to the forested parts of the Mangapepeke and Mimi catchment in a substantial way. As Dr Neale has noted in his evidence the ecological benefits from the proposed stream restoration have a high likelihood of occurring because the connected downstream sites will benefit from largely natural water quality and quantity regimes from upstream, together with a reliable source of animals to colonise the restored reaches.

43. The proposed striped skink pest-free enclosure will improve the long-term prospects for this “at risk: declining” species in the north Taranaki region. In time, assuming recruitment success within the enclosure, opportunities may arise for progeny to be reintroduced back to the PMA. To my knowledge this is the first time that a permanent pest-free lizard enclosure has been proposed as ecological compensation for the effects of a large-scale road construction project. Based on the success of pest-proof fenced enclosures built in Central Otago (Mokomoko Dryland Sanctuary, Alexandra and DOC sanctuary at Macraes Flat) for the protection and recovery of the grand and Otago skinks (both Nationally Critically Endangered), there is reason to have a high level of confidence that viable populations of lizards translocated from the Project site will be created within the enclosure.
44. Invertebrates generally will benefit from the expansion of the PMA to 3650ha by the substantial increase in the volume of habitat that will occur as a result of reduced browsing pressure, while many species are likely to benefit from reduced predation especially by rats.
45. In summary, the 2565ha increase in the size of the PMA will increase the biodiversity benefits likely to accrue for kiwi, many forest birds, palatable plant species and potentially some lizard and invertebrate species by greatly increasing the health and volume of habitat and by reducing predation. A PMA of 1085ha is sufficiently large to generate no net loss of biodiversity 10 years following road construction and a net gain in biodiversity by 15 years. A PMA of 3650ha can be expected to create substantial biodiversity gains by year 15, well in excess of the effects caused, and of a magnitude that is unprecedented as mitigation/offset for a road construction project in New Zealand.

Roger MacGibbon

17 July 2018