
Under	the Fast-track Approvals Act 2024 ('FTAA')
In the matter of	a substantive application under the FTAA for an alteration to an existing designation, resource consents, a wildlife approval, archaeological authorities and a complex freshwater fisheries activity, to construct, maintain and operate the Belfast to Pegasus Project
By	New Zealand Transport Agency Waka Kotahi Applicant

Statement of Evidence of Dr Jamie MacKay
(terrestrial ecology)

Dated 15 May 2026

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Statement of evidence of Jamie MacKay

1 Introduction

- 1.1 My full name is Jamie William Booth MacKay.
- 1.2 I am a Senior Ecologist at Tonkin & Taylor Ltd (T+T).
- 1.3 I hold a Bachelor of Science with Honours in Ecology from the University of Edinburgh (2004), a Master of Science in Applied Ecology and Conservation from the University of East Anglia (2005), and a Doctor of Philosophy in Ecology from the University of Auckland (2011). I am currently registered as a Certified Environmental Practitioner (CENVP). The CENVP programme is run by the Environment Institute of Australia and New Zealand (EIANZ) and requires its members to act in a professional manner at all times in compliance with the EIANZ Code of Ethics and Professional Conduct.
- 1.4 I have been practising as an ecological consultant for over 11 years. Prior to joining T+T, I worked as a consultant ecologist at Wildland Consultants Ltd between March 2014 and August 2022. Prior to that, I worked for two years as a post-doctoral researcher at the University of Auckland.
- 1.5 My relevant experience includes many ecological investigations throughout Aotearoa New Zealand. This work has included inputs into project design, designing and implementing field surveys, preparing effects assessments, and preparation and implementation of ecological management plans. My work is largely in the field of terrestrial ecology, but I also have a good understanding of freshwater ecology. I have acted as an expert witness at Council-level hearings and have provided technical peer review services for resource consent applications to regional and district councils.
- 1.6 I co-authored the following reports lodged in support of the Belfast to Pegasus fast-track application (**'Application'**):
 - a Ecological Impact Assessment (Volume 3I); and
 - b Wildlife Approval Report (Volume 3J).

1.7 I have been asked by the New Zealand Transport Agency ('**NZTA**') to provide a response to the specific matters contained in the written comments on the Application from persons invited by the Panel to comment under section 53 of the Act:

- a Department of Conservation ('**DOC**'); and
- b Canterbury Regional Council ('**CRC**').

1.8 I have prepared this statement within the limited time available to me. Consequently, it is necessarily at a high level. I am able to provide a more fulsome response on the issues covered in this statement if the Panel requires further assistance.

2 Code of conduct

2.1 I confirm that I have read the Code of Conduct for Expert Witnesses as contained in section 9 of the Environment Court Practice Note (2023), and have complied with it in preparing this evidence. I confirm the issues addressed in this evidence are within my area of expertise, and I have not omitted material facts known to me that might alter or detract from my evidence.

3 Scope of evidence

3.1 This evidence addresses the following:

- a Lizard habitat values within the project area; and
- b Management of residual effects.

4 Executive summary

4.1 This evidence addresses two key matters:

- a the appropriate ecological valuation of "rank grassland" as lizard habitat within the project area, and
- b whether the proposed compensation adequately addresses residual effects associated with the loss of moderate-value habitat for Canterbury grass skink.

- 4.2 DOC and CRC contend that rank grassland has been undervalued and should be assessed as moderate value, however, in my professional opinion, rank grassland should be treated as low-value habitat for Canterbury grass skink due to reasons associated with habitat instability, regular disturbance regimes, and limited protective cover. Importantly, lizard salvage and translocation will occur across all potential lizard habitat within the Project area, regardless of habitat value. This provides assurance that lizard salvage outcomes will not depend on whether rank grass is classified as low or moderate value.
- 4.3 To address residual effects associated with the loss of 0.66 ha of moderate-value lizard habitat within the CRC scope area and new areas of the designation, compensation will be provided through enhanced landscape planting, including approximately 5 ha of “lizard-friendly” species and placement of log habitat features within the designation. In my professional opinion, these measures are sufficient, and the project will achieve no net loss of lizard habitat as a result.

5 Lizard habitat values

- 5.1 Both DOC and CRC have raised concerns regarding the use of the Ecological Impact Assessment Guidelines (EclAG¹) to assess habitat value in relation to rank grassland within the project area. In the view of CRC and DOC’s technical specialists, the ecological value of rank grassland has been undervalued and should be considered of **moderate** value rather than **low**. I disagree with CRC and DOC’s technical specialists, and I consider an ecological value of **low** is appropriate for the reasons outlined in subsequent paragraphs.
- 5.2 When assigning an ecological value to rank grassland, I considered the value of and quality of the habitat from a botanical and a habitat provision perspective. Botanically, the vegetation comprises almost entirely exotic species and I assigned it an ecological value of **negligible**. This has not been challenged by DOC or CRC. I assigned rank grassland an ecological value of **low** from a lizard habitat provision perspective

¹ Roper-Lindsay, J., Fuller S.A., Hooson, S., Sanders, M.D., Ussher, G.T. (2018). Ecological Impact assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

(particularly Canterbury grass skink, 'At Risk-Declining²'), which has been challenged by DOC and CRC.

- 5.3 Assigning value to a habitat from a botanical perspective is generally straightforward. Assigning value from a habitat provision perspective is more nuanced and relies more heavily on professional judgement and expert opinion. Simply working through tables provided in the EclAG can lead to habitats being over or under valued, which is why it is vital that assessments under the EclAG are made by experienced practitioners using their own professional judgement.
- 5.4 I acknowledge that Canterbury grass skink utilise some (but not all) areas of rank grass within the Project area³, as determined through the presence/absence surveys conducted by Wildlands. However, I do not consider that the periodic presence of an 'At Risk' species alone is sufficient to increase the ecological value of rank grass. When assigning value to a habitat under the EIANZ criteria, it is important to consider habitat quality as well as species presence. I do not consider that rank grass provides moderate quality habitat for Canterbury grass skinks for the reasons outlined in the paragraphs below.

Habitat stability

- 5.5 Rank grass habitats within the project area are dynamic, not protected and are at constant risk of being disturbed or removed entirely by landowners or land occupiers. Rank grass habitat is primarily found either within or on the margins of grazed paddocks, as well as road verges and property boundaries. Several areas mapped as rank grass where lizards were detected by Wildlands (during surveys between December 2024 and March 2025), were no longer rank grass when inspected by T+T ecologists in August 2025 due to mowing and/or grazing regimes.
- 5.6 The exotic grassland/scrub mosaic habitats that I have assessed as having moderate ecological value using the EIANZ framework are also

² Hitchmough, R., Barr, B., Knox, C., Lettink, M., Monks, J. M., Patterson, G. B., Reardon, J. T., van Winkel, D., Rolfe, J., Michel, P. (2021). Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Department of Conservation, Wellington. 15 p.

³ Wildland Consultants. (2025a). Lizard Survey Report for State Highway 1, North Canterbury, Woodend Bypass Project (Belfast to Pegasus). Wildland Consultants Contract Report No. 7351e.

not protected. However, the presence of woody vegetation indicates that the habitats are disturbed less frequently making them a more stable environment, with greater microhabitat diversity for lizards. These areas are more structurally complex, with greater ground cover complexity, including leaf litter layers, low-stature scrub cover and offer more opportunity for refuge. In my opinion, this increases the quality of the exotic grassland/scrub mosaic habitat for lizards.

Protective cover attributes

- 5.7 A monoculture of rank grass provides less protective cover for lizards than a mosaic of habitats that includes rank grass and cover objects such as rocks and logs, putting lizards at higher risk of predation, leading to high predation pressure on any skinks living in this habitat. Research in Wellington suggests that the presence of rank grass reduced the benefits of habitat enhancement (planting and addition of rock piles) within a study area, likely due to high pest densities (Herbert et al, 2025)⁴.
- 5.8 High mouse numbers were recorded in rank grass by Wildlands during initial surveys⁵ and during early works lizard salvage (S. King, Wildland Consultants Ltd, pers. comm.). While mouse numbers are also likely to be high in exotic grassland/scrub habitats, these habitats are more likely to provide protective cover and refuge opportunity, thus increasing the habitat quality.
- 5.9 A lack of protective cover may make lizards more conspicuous, leading to higher detection rates during surveys. It may also increase the likelihood of lizards using artificial cover objects (ACOs) deployed as part of survey methods (Herbert et al. 2025), thereby further increasing detectability. However, higher detectability of lizards in rank grass habitats does not necessarily indicate higher population density.

⁴ Herbert, S.M., Kelly, F.B., Panteleeva, E., Dean, S.M., Hartley, S. and Nelson, N.J., 2025. Short-term responses of terrestrial skinks to habitat enhancement in a pest-invaded landscape on mainland New Zealand. *New Zealand Journal of Zoology*, 52(5), pp.914-933.

⁵ Wildland Consultants. (2025a). Lizard Survey Report for State Highway 1, North Canterbury, Woodend Bypass Project (Belfast to Pegasus). Wildland Consultants Contract Report No. 7351e.

Summary

- 5.10 Overall, I consider that the transient nature and disturbance regimes of rank grass habitat within the project area, and the lack of protective cover provided, are indicative of the habitat being of low quality for Canterbury grass skink. As such, I consider that an ecological value of **low** under the EIANZ framework is appropriate.
- 5.11 It should be noted that all lizard habitat, regardless of the habitat value assessment, will be subject to a lizard salvage and translocation programme (as detailed in the Lizard Management Plan⁶). If lizard salvage numbers within low value rank grass habitats are higher than anticipated, contingency measures within the salvage and relocation programme allow for additional trapping and salvage, for at least three additional days, which aligns with the trapping and salvage effort required for areas of moderate value habitat. If lizards are still being caught beyond the additional three days, further trapping will be undertaken at the Project Herpetologist's discretion. This provides confidence that, regardless of habitat valuation under the EIANZ framework, salvage effort will be sufficient to maximise relocation of the resident lizard population.

6 Management of residual effects

- 6.1 Linked to the disagreement around the ecological value of rank grass within the project area, both CRC and DOC raise concerns around the quantum of compensation being offered to address residual effects associated with the loss of moderate value lizard habitat. It is noted that DOC's comments regarding habitat loss are outside of the scope of the Wildlife Approval process (which focuses on the lizards themselves). Accordingly, this evidence focusses on the habitat concerns raised by CRC.
- 6.2 For the avoidance of any doubt, lizard salvage measures outlined in the LMP will be implemented in all potential lizard habitat within the DOC/Wildlife Approval Area mapped in Figure 1 in **Appendix A**.

⁶ Tonkin & Taylor (2026). State Highway 1 North Canterbury – Woodend Bypass Project (Belfast to Pegasus) Lizard Management Plan

Compensation will be undertaken to address residual effects associated with the loss of 0.66 ha of moderate value lizard habitat:

- a Within the CRC Scope area, which is 10 metres either side of waterbodies; and
- b Within the proposed new areas of designation (**Figure 1**).

6.3 As outlined in Section 7.1 of the EclA⁷ and this statement of evidence, compensation measures will address the loss of 0.66 ha of moderate-value lizard habitat within the Project areas described above (Figure 1).

6.4 Compensation for the loss of 0.66 ha of moderate value lizard habitat will be provided for through the addition of “lizard friendly” plant species and log piles in landscape planting areas throughout the designation. Standard plant schedules for landscape planting were enhanced to include additional “lizard friendly” species and log piles specifically to compensate for the residual effects of moderate value lizard habitat loss. As these additional species and log piles were not required for landscape purposes, this is considered to meet the additionality principle of the offsetting and compensation principles.⁸

6.5 Approximately 5 ha of low stature “lizard friendly” planting and habitat enhancement will be undertaken across ~16.3 ha of low and medium stature landscape planting areas. The quantum of planting initially proposed in section 7 of the EclA⁹ included the establishment of up to 6 ha of lizard-friendly planting as compensation for moderate-value habitat loss. Following refinement of the landscape and mitigation design, this has been reduced to 5 ha. Notwithstanding this refinement, in my opinion, the proposed planting extent remains sufficient to compensate for the loss of 0.66 ha of moderate-value lizard habitat. Table 1 outlines the lizard friendly plant species included in the landscape planting specifications and ecological benefits for Canterbury grass skink.

⁷ Tonkin & Taylor (2025). State Highway 1 North Canterbury – Woodend Bypass Project (Belfast to Pegasus) Ecological Impact Assessment

⁸ <https://www.doc.govt.nz/globalassets/documents/our-work/biodiversity-offsets/the-guidance.pdf>

⁹ Tonkin & Taylor (2025). State Highway 1 North Canterbury – Woodend Bypass Project (Belfast to Pegasus) Ecological Impact Assessment

- 6.6 In addition to planting, a minimum of 12 m / ha of manageable portions of stockpiled logs will be deployed into landscape planting areas (i.e. a minimum total amount of 72 m across the 5 ha). Log material will be placed in locations where it is unable to be dislodged into streams. Logs are to be a minimum of 40 cm diameter and cut into 0.5 to 1.5 m lengths.

Table 1: Lizard-friendly plants included in low and medium stature landscape planting

Plant Species	Common name	Total number of plants	Estimated lizard habitat area (ha)	Benefits to lizards
<i>Austroderia richardii</i>	South Island toetoe	3,000	0.3	Cover, Retreat, Invertebrates
<i>Carex buchananii</i>	Buchanan's sedge	13,826	0.9	Cover, Invertebrates
<i>Coprosma crassifolia</i>	Mingimingi	15,132	1.0	Cover, Nectar, Fruit, Invertebrates
<i>Coprosma propinqua</i>	Mingimingi	5,078	0.3	Cover, Nectar, Fruit, Invertebrates
<i>Festuca novae-zelandiae</i>	Fescue tussock	5,619	0.3	Cover, Invertebrates
<i>Muehlenbeckia astonii</i>	Pohuehue	18,434	0.9	Cover, Retreat, Nectar, Fruit
<i>Muehlenbeckia axillaris</i>	Creeping pohuehue	5,619	0.3	Cover, Retreat, Nectar, Fruit
<i>Poa cita</i>	Pātītī Silver tussock	21,118	1.1	Cover, Invertebrates
Total		87,826	5.1	

- 6.7 Implementing these measures will increase the value of the planting areas to Canterbury grass skinks and I consider that this appropriately compensates for the loss of 0.66 ha of moderate value exotic grassland/scrub mosaic habitat (Figure 1).
- 6.8 It should also be noted that most of the 16.3 ha of low and medium stature plantings will provide habitat for Canterbury grass skink. These areas will be subject to far lower levels of disturbance than existing

habitats and will provide protective cover throughout. In addition, landscape plantings will link retained areas of existing lizard habitat and adjoin existing lizard habitat outside of the project area, producing increased connectivity through the wider landscape.

7 Conclusion

- 7.1 In my opinion, rank grass within the project area offers low-quality habitat for Canterbury grass skink. As such, I consider that an ecological value of **low** under the EIANZ framework, combined with my professional judgement, is appropriate. There is also sufficient contingency within the lizard salvage and relocation programme to increase the trapping and salvage efforts/duration in low value rank grass habitat, if required.
- 7.2 Enhancement of standard landscape plantings to incorporate ~5ha of lizard habitat species and additional lizard habitat features will appropriately address the residual effects associated with the loss of 0.66 ha of moderate-value habitat. This will result in no net loss of lizard habitat.

Dr Jamie William Booth MacKay
15 May 2026

Appendix A

Figure 1: High level map showing areas of terrestrial ecology scope

High level map showing areas of terrestrial ecology scope



Proposed Designation

DOC/Wildlife Approval Area

ECAN Scope: Land areas within 10m from all waterbodies

WDC Scope: New areas of designation

High level map showing areas of terrestrial ecology scope



Proposed Designation

DOC/Wildlife Approval Area

ECAN Scope: Land areas within 10m from all waterbodies

WDC Scope: New areas of designation