

Before the Fast-track Panel

Under: Fast-track Approvals Act 2024

In the matter of: FTAA-2605-1236 – Remarkables Ski Area Upgrade and Doolans
Expansion

Statement of advice: Nicholas Harker
Herpetologist
DOC staff
12 October 2026



Department of
Conservation
Te Papa Atawhai

**Te Kāwanatanga
o Aotearoa**
New Zealand Government

Introduction

1. My full name is Nicholas Forbes Harker.

Instruction

2. I have been requested to provide expert advice to the Director-General of Conservation (DOC/the Department) for the purposes of his comments on the Remarkables Ski Area Upgrade and Doolans Expansion Project Fast-track application.
3. My advice will be used to inform DOC's s51 reporting and s53 comments on the application.

Qualifications and Experience

4. I am an Technical Advisor in the Fauna Advice team of the Department of Conservation working from the Auckland Office. I have a Bachelor of Science in Ecology, and Bachelor of Laws from the University of Auckland (2017) and a Bachelor of Science Honours (Biological Sciences) with Distinction from University of Auckland (2019). I have one years' experience as a Technical Advisor for the Department of Conservation, eight years' experience as a consultant ecologist / herpetologist for Bioresarches, and fifteen years experience as a herpetologist (operating under various DOC authorities). My role in this project to date has included review of both draft and substantive application documents, and attendance at two workshops relating to lizard management, and one relating to the Applicant's proposed compensation package on the 25th June, 21st August and 15th September 2026 respectively.
5. I am a co-author on two journal articles relevant to herpetology in New Zealand and am co-author of the New Zealand Herpetological Society 'Herpetofauna Index' which is the most comprehensive online resource for native herpetofauna.

6. I have a wide technical and general knowledge of the ecology of lizard species found in the Otago region and experience with lizards in the Remarkables Ecological District.

Code of conduct

7. Whilst it is acknowledged this is not an Environment Court Proceeding, I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. I have complied with the Code of Conduct in the preparation of this advice. Unless I state otherwise, this advice is within my area of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

Scope of advice and expert opinion

8. My expert advice relates to the following:
 - i. Adequacy of the applicant's assessment of the species and density of lizards present on site.
 - ii. Applicant's approach to the effects management hierarchy.
 - iii. Inadequacies of lizard management for the Car Park and Bus Hub
 - iv. Impact on McCann's skink.
 - v. Impact on other lizard species.
 - vi. Adequacy of the compensation proposed to address the residual effects.
 - vii. Comments on conditions.

Material Considered

9. In preparing this advice I have reviewed the following documents as part of the substantive application:

- i. A-18 Substantive Application Report Section 11 Approvals relating to Wildlife Act updated 3 September 2026.
- ii. B-05 Remarkables Ski Area Upgrade and Doolan Expansion – Car Park & Bus Hub Ecological Impact Assessment.
- iii. B-12 Terrestrial Ecological Impact Assessment 26 Aug 26.
- iv. B-13 Lizard Assessment and Management Plan updated (27 August 2026).
- v. H.02 Resource Consent Conditions updated 3 September 2026.
- vi. H.07 Wildlife Approval Conditions – Lizards.
- vii. Response to CODC re.B.13 Lizard Assessment and Management 27 Aug 26.

Site Visit

- 10. I previously visited the Rastus Burn side of the site on 4 March 2025 to assist with a student project. During this visit we observed McCann's skinks (*Oligosoma maccanni*), central-southern cryptic skinks (*O. aff. inconspicuum* "central southern"), and short-toed geckos (*Woodworthia* "southern mini").
- 11. I have not made a site visit to the LMP site in relation to the proposed ski field extension, as the site visit was organised prior to my engagement with the project.

Adequacy of the applicant's assessment of the species and densities of lizards present on site

- 12. Based on the applicants Terrestrial Ecological Impact Assessment, and Lizard Assessment & Management Plan (LMP), an extensive survey was undertaken across the area covered by the LMP, being the headwaters of the Rastus Burn and the Doolans Basin.
- 13. Some areas were not adequately sampled due to weather conditions (e.g. some lower areas on the Rastus Burn side of the earthworks footprint), but representative habitats were included elsewhere.

14. The survey used a combination of visual and manual searching and Gee's minnow traps. The tools we have available for lizard surveys (such as Gee's minnows traps) often lead to underestimations of the skink populations present. In the context of lizard salvages, machine assisted searches (supervised excavator clearance of habitat) often yield much greater numbers of lizards than survey equipment would suggest.
15. McCann's skink can live at very high densities depending on the predator guilds present and habitat complexity. One study in central Otago estimated densities of 1200 small skinks per hectare (a combination of McCann's, grass and cryptic skinks) in unmanaged sites (Wilson et. al., 2016).
16. It is likely that habitat complexity / suitability will vary within the earthwork's footprint. However, no surveys were conducted to specifically quantify the number of lizards that might be impacted by the activity (e.g. a mark-recapture survey).
17. As such, without further information, I consider that the applicant has adequately captured the species likely to be present within the LMP site (upper Rastus Burn and Doolans expansion) but may have underestimated the number / density of McCann's skinks present on site.

Applicant's approach to the effects management hierarchy

18. The standard hierarchy for lizard management involves a sequential framework to avoid, or remedy (mitigate) the impacts on lizard populations. There is general acceptance that where the effects cannot be avoided, or remedied to an acceptable level then offsetting or compensation is required.
19. The standard approach where lizard habitat cannot be avoided is to undertake salvage and relocation of lizards away from the impact site to minimise adverse effects. The applicant has suggested not conducting a lizard salvage for McCann's skinks (*Oligosoma maccanni*) – which are known to be present within the earthwork's footprint – and instead providing compensation for the residual effects.

20. The LMP suggests that conducting a lizard salvage for McCann's skinks would be unlikely to succeed due to the lack of suitable habitat which does not have existing populations of McCann's skinks, an inability to salvage the majority of McCann's skink from the impact site(s), and the poor success of mitigation translocations (lizard salvages) to date. McCann's skinks are also a 'Not Threatened' lizard species with large, secure populations elsewhere in the Remarkables Ecological District and other regions of the South Island, so the applicant considers the available resources would be better used to improve research and conservation outcomes for 'At Risk' and 'Threatened' species.
21. Mitigation translocations or lizard salvages (as opposed to conservation translocations) in New Zealand often suffer from a lack of monitoring and enforcement of monitoring where it is required, so we currently lack reliable data on their success rate. However, there is also little evidence that they are successful (on an individual or population level).
22. Skink translocations into existing populations of conspecifics have proven less successful than cases where they are relocated into unoccupied habitat. This is especially likely to be the case where populations at receiving sites are at or near carrying capacity.
23. The carrying capacity of a release site can be increased via pest control or habitat enhancement where additional suitable habitat can be created. However, where pest control ceases after a given period lizard populations are likely to decline to pre-management levels.
24. McCann's skinks, like other New Zealand skinks, fill an important role in the ecosystem as predators of invertebrates, prey to several species of birds, seed dispersers and likely pollinators of native plants. So, their presence / persistence is likely important for ecosystem function. Given their presence in several areas outside of the earthworks footprint I do not consider that their persistence within the LMP site will be threatened.
25. As such, I would consider the non-salvage of McCann's skinks to be justified in this situation, due to their status as 'Not Threatened', the logistical challenges with relocating skinks into existing populations which are likely at capacity (given

their occurrence in most suitable habitats nearby), and the uncertainty around positive outcomes were a salvage to be undertaken.

Inadequacies of lizard management for the Car Park and Bus Hub

26. *Document A-18 Substantive Application Report Section 11 Approvals relating to Wildlife Act updated 3 September 2026* states that a separate lizard management plan and associated wildlife permit will be required for the construction works associated with the Lower Car Park Transit Hub and the works occurring within Car Park 3 in the Rastus Burn; and that these will be sought separately to this FTAA application process.
27. The applicant's Car Park and Bus Hub Ecological Impact Assessment indicates the likely presence of low numbers of McCann's skink in the earthwork's footprint for this part of the development. However, there is no evidence that a site-specific survey was undertaken (as was done for areas of the upper Rastus Burn and Doolans Basin), and this was mostly based on a desktop assessment. Because no survey was conducted, I have less confidence in the presumed species-assemblage and density of lizards likely to be present in this area.
28. Several 'At Risk' species are known from nearby to the proposed Car Park and Bus Hub. These include central-southern cryptic skinks and Mountain beech geckos (*Woodworthia* "south-western") which are known from Jardine Park less than 5km away, and southern grass skinks (*Oligosoma* aff. *polychroma* "Clade 5") which are known from degraded habitat less than 5km away in Frankton (Samuel Purdie personal communication). These populations are known from similar or lower elevations nearby. This information is inconsistent with the assessment's assumption that cryptic skinks are only found at higher altitudes in the local area.
29. The Car Park and Bus Hub Ecological Impact Assessment also states that the lizards in this area will be salvaged and transferred to a suitable release site in accordance with an existing lizard management plan. However, that LMP has not been made available.
30. It is unclear whether the impact on native lizards present in this location was factored into the compensation package that has been proposed by the applicant (as this appears to only be relevant to the defined 'LMP site'). The area for the Car

Park and Bus Hub encompasses an additional three hectares of grey scrubland and rank grassland which could provide habitat for several 'At Risk' species as well as the 'Not Threatened' McCann's skink.

Impact on McCann's skink

31. McCann's skinks are among the most-common species in New Zealand, and one of only a small number of New Zealand lizard taxa (5 of 147) that are considered 'Not Threatened'.
32. There are large numbers of McCann's skinks present in adjacent areas within the Remarkables ecological district, and large / secure populations elsewhere in the South Island. As such, the works are unlikely to threaten the persistence of McCann's skinks locally or nationally. However, the impact on individual lizards within the works area would be significant (likely resulting in injury or death), and the magnitude of impact could be greatly underestimated (as mentioned previously there could be a larger number of McCann's skinks present within the earthworks footprint than what was estimated).
33. The applicant's LMP includes staged habitat reduction within the earthwork's footprint. This is intended to gradually remove vegetation cover and encourage skinks to naturally disperse away from the area. This method is not considered best practice for lizard salvage, as lizards may be more prone to predation while dispersing, will likely face issues with site capacity (due to relocation into areas already occupied by conspecifics), and may linger in any sub-optimal habitat that remains within the earthworks footprint rather than dispersing post vegetation-clearance. However, in the present context where no salvage is proposed, I would consider this method may reduce the magnitude of lizard deaths and/or injuries as a result of the earthworks if it encourages dispersal.
34. The applicant has also proposed to include habitat creation (rock pile construction with associated planting) in 14 sites along the earthworks footprint. The suggested construction of these within the earthworks footprint should limit any further damage to natural habitat that lizards (and other flora / fauna) may be using. Depending on the target species, artificially created habitat can take several years before it provides favourable refugia for lizards. However, given their

generalist nature, McCann's skinks have been known to occupy recently disturbed and degraded habitats, and it's possible they may re-colonise these sites in the short to medium term.

35. Because the works will likely result in the injury and death of hundreds of McCann's skinks (possibly the low thousands), and the reduction of lizard habitat within the earthworks footprint, there is a need for compensation to address the residual effects.

Impact on other lizard species

36. Several other species are known from alpine areas in the wider landscape including three 'At Risk' species, namely Central-southern cryptic skink (*Oligosoma* aff. *inconspicuum* "central-southern"), southern grass skink (*O. chionochoescens*) and short-toed geckos (*Woodworthia* "southern mini"); and two 'Threatened' species, namely Orange-spotted gecko (*Mokopirirakau* "Roy's Peak") and Lakes skink (*O. aff. chloronoton* "West Otago). In addition to these there is a museum specimen of an unidentified large skink which is alleged to have originated from the Remarkables area. Experts have suggested this to be either a grand skink (*O. grande*) or barrier skink (*O. judgei*), both species are regarded as threatened, and any extant populations located within the Remarkables area would be highly significant.
37. The only species other than McCann's skink which is moderately likely to be present within the earthworks footprint is the central-southern cryptic skink, with the other species being more remote possibilities. Based on the lizard surveys undertaken by the applicant, if other species are present they are only likely to be present in low numbers.
38. The applicant has suggested that they will deal with species other than McCann's skink under incidental discovery protocols (the project herpetologist will be contacted to identify any lizards found), and they would need to seek a separate Wildlife Act Authority for those species. Given the paucity of records for species other than McCann's skink within the LMP site and earthworks footprint.
39. However, in the event lizards other than McCann's skink are present within the earthworks footprint, I have concerns about the feasibility for incidental discovery

protocols to be adequately implemented and provide protection for these species (given the challenges around observing and locating any lizards that are displaced or disturbed during earthworks in an alpine environment). Alternatively, having a herpetologist present for any lizard habitat clearance would mitigate these concerns.

40. I am unaware of any studies into the ongoing impact of skifield activities on populations of lizards in the surrounding environment (separate to construction). However, increased human activity is likely to result in increased disturbance of lizards / lizard habitat, or higher densities of mammalian pests, which will negatively impact on lizards (especially At Risk species, but likely also McCann's skinks).

Adequacy of the compensation proposed to address the residual effects

41. The applicant has proposed conducting an eDNA study to validate this method as a tool to determine presence of various lizard species in an alpine environment. The study sites would include known locations of Orange-spotted geckos and Lakes skink, as well as several locations with suitable lizard habitat within the LMP site and wider Remarkables Ecological District. The study would also aim to compare the efficacy of eDNA tunnels with traditional detection methods (such as manual searching).
42. Similar studies have already been conducted with skink species at lower altitudes, and proven more effective at confirming presence than traditional methods (e.g. Reeves et al., 2025). However, this tool has yet to be validated on geckos which – given their difference in scale morphology – may be less detectable than skinks using this method.
43. The benefits of this study would be to validate the efficacy of this tool in detecting species of gecko, and to potentially gain a greater understanding of the lizard species assemblage in the Remarkables Ecological District. However, due to the lack of tangible outcomes, I would not consider this study alone to adequately compensate for the loss of McCann's skinks and lizard habitat.
44. I am aware that Southern Lakes Sanctuary (SLS) has been proposing to do similar work on orange-spotted geckos in the region, both testing the utility of eDNA as a

tool to detect geckos, but also to assess the feasibility of using eDNA work for occupancy modelling of orange-spotted geckos. However, I am not aware of them securing funding for this work.

45. Since lodging the application, in addition to the eDNA study, the applicant has also proposed to fund a translocation of Lakes skink (*O. aff. chloronoton* “West Otago”) to the Whakatipu Lizard Sanctuary. This species has potentially been extirpated from the Remarkables Ecological District, but almost certainly occurred in the area historically. Currently, there are no populations of this species which are secured in pest-free sanctuaries or on islands, so a successful translocation would represent a significant conservation benefit for this species.
46. A translocation of Lakes skink to the Whakatipu Lizard Sanctuary is also an initiative that SLS have been working towards, as they are involved with the Whakatipu Lizard Sanctuary, and have started doing some preliminary surveys looking for appropriate source populations as well as drafting a translocation proposal. I am not aware of SLS securing funding for this work, or that they have submitted a translocation proposal to DOC.
47. I note that the application as lodged dedicated \$80,000 to the eDNA study. With the addition of the Lakes skink translocation to the compensation measures post-lodgement, the monetary amount dedicated has however remained at \$80,000. A better approach would be to commit to outcomes rather than a limited pool of funding. It is also unclear how the applicants quantified that \$80,000 figure. Additionally, prior to a translocation occurring, surveys will need to be undertaken to ascertain how many skinks could be collected from each source population without threatening their persistence at these sites. This will incur additional costs against the limited \$80,000 sum offered.
48. The LMP suggests an additional \$20,000 would also be payable if the applicant did not comply with the requirements of the LMP around temperature thresholds or removal or vegetation cover in the earthwork’s footprint. This \$20,000 does not however appear in the proposed resource consent conditions. Occasional breach of the temperature thresholds may reasonably be expected due to the unpredictable and changeable weather in alpine environments. However, the failure to remove vegetation cover in the manner suggested would be a

foreseeable breach, that would likely increase the number of lizard mortalities. There may be a risk that the \$20,000 penalty is not a sufficient disincentive to avoid breaching these protective conditions of the LMP.

49. Assuming that both projects can be covered by the funding provided, I consider that this adequately compensates for the impact on McCann's skinks. I have not costed, however, whether the funding would be sufficient.

Conclusions

50. I consider that the applicant has identified the species most likely to be present within the LMP site (upper Rastus Burn and Doolans expansion).
51. However, I consider it moderately likely that central-southern cryptic skinks are also present within the Alpine LMP earthworks footprint (in opposition to the applicant's assessment), but unlikely that other local species are present.
52. It's possible that the applicant may have underestimated the number of individual McCann's skinks that are likely to be impacted by this activity, as no mark-recapture surveys have been conducted, and this species is capable of living at higher density (than what the applicants have suggested), at other unmanaged sites.
53. In the event that species of lizard other than McCann's skink are present within the Alpine LMP earthworks footprint, I have concerns about the feasibility of incidental discovery protocols to protect any lizard species which are not covered by this plan (species other than McCann's skink), unless they have a herpetologist overseeing habitat clearance.
54. I do not consider that the eDNA study on its own adequately compensates for the loss of lizards and lizard habitat, because it will not generate any tangible conservation outcome in the short-term. However, combined with the additional translocation of Lakes skink to a site with long-term protection (Whakatipu Lizard Sanctuary) should result in a net-benefit for lizard conservation – assuming logistics allow and the amount of money put forward is sufficient to cover the costs of these two projects.
55. The earthworks associated with the Car Park and Bus Hub (and possibly Car Park 3) are not covered in the existing Lizard Management Plan provided. I would also consider the lizard values at this site(s) to not be adequately assessed given the lack of a lizard survey at this location, and the presence of several At Risk species within 5km of the site at similar elevations.

References:

Reeves, T., Purdie, S. A., Wilkiinson, S. P. & Whitmore, N. (2025). No longer a pipe dream: monitoring a cryptic, endangered skink population (*Oligosoma otagense*) using passive eDNA detection devices. *New Zealand Journal of Ecology*, 49(1).

Wilson, D. J., Mulvey, R. L., Clarke, D. A., & Reardon, J. T. (2017). Assessing and comparing population densities and indices of skinks under three predator management regimes. *New Zealand Journal of Ecology*, 41(1), 84-97.