

**Before the Expert Panel appointed  
under the Fast-track Approvals Act 2024**

**Under** the Fast-track Approvals Act 2024  
**(Act)**

**And**

**In the Matter of** an application for approvals by  
Matakanui Gold Limited to establish,  
operate, rehabilitate and ultimately  
close an open pit and underground  
gold mining operation known as the  
Bendigo-Ophir Gold Project

**Statement of Evidence of  
Dr Matthew James Baber on behalf of  
Matakanui Gold Limited in response to  
Section 53 Feedback**

Terrestrial Ecology

Dated: 17 April 2026

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## INTRODUCTION

1. My name is Dr Matthew James Baber.

### Qualifications and Experience

2. I am currently employed as Principal Ecologist and Director at Alliance Ecology and have held that position since 2019.
3. I hold a Bachelor of Zoology from the University of Otago, a Master of Science (Hons) in Conservation Ecology from the University of Auckland, and a PhD in Ecology from Florida International University.
4. I have 24 years' professional experience as an ecologist, working in academia, local government and consulting in the United States and New Zealand.
5. My previous work experience includes eight years at Tonkin + Taylor, most recently as Project Director and the Technical Director (Ecology) and Group Manager (Ecology). Prior to that I held roles at Auckland Council including Biodiversity Team Leader.
6. I have completed the Ministry for the Environment Making Good Decisions course and was recertified as an independent hearing commissioner in December 2021.
7. I am a member of the New Zealand Ecological Society, the Ornithological Society of New Zealand, the Society for Research on Amphibians and Reptiles in New Zealand, the National Wetland Trust, and the Environment Institute of Australia and New Zealand (**EIANZ**). I hold a DOC Wildlife Authority to undertake lizard surveys and capture in the Auckland region since 2005.
8. Since 2006, I have appeared as an expert witness before numerous council hearings, the Environment Court and a Board of Inquiry in relation to consent applications for infrastructure projects. I am also involved in numerous Fast-track Approvals applications. My specialist expertise includes assessing ecological effects, and designing and implementing mitigation / biodiversity offset and compensation packages, ecological restoration initiatives, and monitoring programmes.

9. Of relevance to this project, I am an Expert Panel member for two applications under the Fast-track Approvals Act 2024: The Point Solar Farm and Haldon Solar Farm and I have recently served as the lead project ecologist or expert witness Member for the following large infrastructure applications:
- (a) Oceana Gold Macraes Stage 4 Project: Internal Ecology Peer Review ecologist representing Oceana Gold for the Fast-track Approvals application.
  - (b) Buller Plateaux Continuation Project: Co-lead ecologist (Residual effects management/ Lizard Management and Biodiversity Outcome Monitoring) representing Bathurst Resources for the Fast Track Approvals application.
  - (c) King's Quarry Expansion Project (King's Quarry Ltd). Peer review ecologist for the Fast-track Approvals application.
  - (d) Kaihiku Wind Farm (Lochindorb Wind Limited Partnership): Lead terrestrial ecology expert (vegetation, lizards, and invertebrates) for the Fast-track Approvals application.
  - (e) Oceana Gold Waihi North Project: Co-lead ecologist representing Hauraki District Council for the Fast-track Approvals application.
  - (f) Glenbrook water discharge resource consent renewal (New Zealand Steel): Lead terrestrial and wetland ecologist through the application stage and council hearing process.
  - (g) Auckland Regional Landfill (Waste Management New Zealand): Lead terrestrial and wetland ecologist, and Environment Court expert witness.
  - (h) Huia Water Treatment Plant Upgrade: Terrestrial ecology expert representing the Auckland Tree Council in Environment Court mediation.
  - (i) Pakiri sand mine resource consent application for Auckland Council (2022-2024): Environment Court expert witness in relation to coastal birds.

10. This statement is given as part of Matakānui Gold Limited's (**MGL**) response to comments on the BOGP made under Section 53 of the FTA. This statement responds to specific comments raised by:
- (a) Mike Harding, independent consultant representing Central Otago District Council (**CODC**), Statement of Evidence *Terrestrial Ecology* 10 April 2026.
  - (b) Max Crowe, independent consultant representing Department of Conservation (**DOC**), Statement of Evidence *Vegetation and Flora* 10 March 2026.
  - (c) Rebecca Teale, E3S representing Otago Regional Council (**ORC**), Technical Review *Terrestrial Ecology* 18 March 2026.
  - (d) Nick Head, independent consultant representing Environmental Defence Society (**EDS**), Statement of Evidence *Terrestrial Ecology* 10 April 2026.
  - (e) Dr Justyna Giejsztowt, Wildlands representing DOC, Statement of Evidence *Biodiversity and Monitoring* 9 April 2026.
  - (f) Geoffrey Rogers, independent consultant representing Sustainable Tarras, Statement of Evidence *Terrestrial Ecology* 2 April 2026.
  - (g) Dr Mandy Tocher, representing DOC, Statement of Evidence *Lizards* 10 March 2026 in relation to lizards
  - (h) Sam Purdie, representing Forest and Bird (F&B) in relation to lizards
  - (i) Jade Watkin, independent consultant representing Kā Rūnaka, Statement of Evidence *Ecology and Kāi Tahu Cultural Values*, 10 April 2026.
11. My original findings are provided in full in the following:
- (a) B.08 - Alliance Ecology Consulting - Assessment of Ecological Effects.
  - (b) G.02 Ecological Management Plan Framework.
  - (c) G.03 Habitat Impact Management Plan.
  - (d) G.04 Avifauna Management Plan.
  - (e) G.05A Lizard Management Plan.
  - (f) G.12 Biodiversity Outcome Monitoring Plan.

12. The following technical reports have informed my technical report entitled B.08A Alliance Ecology Consulting Assessment of Effects Terrestrial Ecology and therefore should be read in conjunction with the following technical reports and management plans that have been prepared by other ecological experts representing MGL:
- (a) B.09 Habitat NZ Mammalian Pest Survey.
  - (b) B.10 Habitat NZ Native Bat Survey.
  - (c) B.11A Habitat NZ Terrestrial Invertebrate Survey.
  - (d) B.12 RMA Ecology - Wetland Values Assessment .
  - (e) B.13A RMA Ecology Vegetation Values Assessment.
  - (f) B.14A RMA Ecology Avifauna Values Assessment.
  - (g) B.15A RMA Ecology Lizard Values Assessment.
  - (h) B.16 Manaaki Whenua Landcare Research - Applied Research Plan for Conservation Management, Rehabilitation and Expansion of Cushionfield.
  - (i) G.06 Terrestrial Invertebrate Management Plan.
  - (j) G.07A Landscape and Ecological Rehabilitation Management.
  - (k) G.07B Landscape and Ecological Rehabilitation Management Plan Appendices.
  - (l) G.08 Ardour Restoration Area Management Plan.
  - (m) G.09 Matakanui Sanctuary Management Plan.
  - (n) G.10 Mammalian Pest Management Plan.
  - (o) G.11 Biosecurity and Plant Pest Management Plan.

13. I have prepared this statement within the limited timeframe available for MGL to respond to comments under the Act. I respond to comments made by technical experts on behalf of government agencies, environmental groups, and Kā Rūnaka that relate to matters on which I have advised MGL on the BOGP. Due to these time constraints, I have focused my response on the issues I consider most material and that fall primarily within my area of expertise. The absence of comment on other matters should not be interpreted as agreement or acceptance, nor should it necessarily be considered as disagreement. If the Panel requires further elaboration on any matters raised in this statement, I am available to provide additional information on request.
14. Although this is not an Environment Court proceeding my confirmation of compliance with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2023 is included in Substantive Application Document A0.2B.

## **RESPONSE TO COMMENTS OVERVIEW**

15. In summary, I agree with the following matters raised by ecological experts representing the invited parties:
- (a) as described in my Assessment of Ecological Effects (B.08A):
    - (i) while the Direct Disturbance Footprint (DDF) is highly modified, it remains ecologically significant and includes threatened and high-value vegetation communities, as well as habitats for nationally threatened or at-risk species;
    - (ii) for some values, the project will result in high or very high residual effects after avoidance, minimisation, and remediation measures are taken into account;
    - (iii) for some values, there will be net loss outcomes, ranging from negligible to very high magnitude residual effects, even after offset and compensation measures are taken into account; and
    - (iv) for some values, the project is unlikely to meet the limits to offsetting or compensation, as it will result in significant adverse effects on irreplaceable or vulnerable values that cannot be demonstrably offset or compensated for.

- (b) the consent conditions and management plans require further work to:
  - (i) improve ecological outcomes and address iwi-related concerns and recommendations; and
  - (ii) provide increased certainty that the stated outcomes will be achieved and maintained via conservation management actions and legal protection mechanisms.
- 16. In broad terms and despite areas of agreement above, ecological experts representing the Department of Conservation, Otago Regional Council, Central Otago District Council, Environmental Defence Society, and Forest & Bird contend that my assessment of ecological effects underrepresents ecological values and impacts, and that the proposed effects management package overstates its benefits. I do not accept this characterisation and consider that my assessment is appropriate and objective, both in evaluating ecological effects and in determining the extent to which the proposed effects management package addresses those effects. This is illustrated in the following paragraphs.
- 17. The survey effort was comprehensive, spanning two field seasons, and was generally accepted as appropriate in most respects by section 53 parties, subject to notable exceptions, e.g. lizards. These exceptions are addressed in the evidence of other ecologists representing the applicant.
- 18. Ecological values were assessed appropriately, with demonstrable instances of conservatism. For example, ecological value for species was assigned based on the highest applicable threat classification (whether regional or national), rather than relying solely on national threat status as directed by the Ecological Impact Assessment Guidelines (EclAG). For 25 plant and bird species, this resulted in ecological values being assigned at a higher level than would have occurred under a national-only classification. In turn, this elevated the assessed level of effect for approximately half of these species.
- 19. The magnitude of residual effects was assessed with a focus on proportional loss within the immediate surrounding landscape, rather than at broader spatial scales (e.g. the wider landscape or ecological district), resulting in a more conservative (i.e. higher) assessment of effect magnitude. Specifically, proportional effects were primarily derived from the percentage loss within the Direct Disturbance Footprint (**DDF**) relative to the 4,776 ha Surrounding Landscape (**SL**), which together comprise the 5,386 ha Ecological Study Area (**ESA**). In addition, the ESA was quantitatively characterised, to the extent practicable, to improve the robustness of the assessment.

20. The assessment of effects and the proposed effects management package are based on a 610 ha DDF, within which complete habitat clearance has been assumed for assessment purposes. In my opinion, this approach is appropriate, as it accounts for potential indirect effects; however, in terms of habitat loss, it represents a conservative (i.e. overestimated) disturbance scenario for the following reasons:
- (a) Of the 610 ha, the actual disturbance footprint is approximately 483 ha (79%), with the remaining 21% (127 ha) comprising buffers to account for indirect effects and to provide contingency for a relatively small amount of additional clearance if required as described further in the evidence of Mr Spring;
  - (b) Despite existing impacts from consented mine exploration activities undertaken by the Applicant, the assessment of vegetation characteristic and values and assessment of effects are based on a pre-exploration baseline on the basis:
    - (i) All 610 ha assessed as lost has been assigned a vegetation or habitat category despite the presence of existing infrastructure (including Thomson Gorge Road, existing farm tracks, and areas subject to approved mining exploration permits). The combined length of these roads or tracks in the DDF is over 33 km which means that the actual disturbance footprint is less than 483 ha.
    - (ii) Any selected vegetation plots that were located on or partially on existing infrastructure were de-selected and moved to the nearest location not impacted by existing infrastructure.
  - (c) The 610 ha footprint of the DDF assumes that the Come in Time (**CIT**) Pit (23.26 ha) will be mined, although except for a small early disturbance area, disturbance of the remainder of the CIT Pit will only occur if consent conditions relating to spring annuals are met.<sup>1</sup> If the CIT Pit is not mined, disturbance would reduce to approximately 463 ha (c. 76% of the DDF), with the remaining 24% (147 ha) retained as buffer but still assessed as lost; and
  - (d) There is a small amount of habitat loss outside the DDF, most notably the additional 2.7 ha associated with construction of the pest exclusion fences for the Bendigo and Ardgour Sanctuaries. However, when this is considered, it does not materially alter the overall conclusion that the assumed quantum of loss is conservative.

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<sup>1</sup> Refer to Condition 111 of *D.01 CODC Land Use Consent Conditions* in the Substantive Application.

21. A substantial level of effort has been applied to effects management:
- (a) efforts to avoid effects on high value habitats, through:
    - (i) repositioning of the footprint of several key mine components during optioneering; and
    - (ii) avoidance of mining the CIT pit unless it can be verified that <1% of the known population of spring annuals in the Ecological District would be impacted as required by consent conditions.
  - (b) while there are valid concerns regarding the salvage and relocation programme for invertebrates, and particularly lizards, the level of effort proposed is, to my knowledge, unprecedented, including a commitment to salvage approximately 102,000 lizards. Moreover, for both lizards and invertebrates, it has been conservatively assumed that there will be no reduction in effect severity, given the absence of robust evidence demonstrating success;
  - (c) the ecological rehabilitation programme is the most comprehensive I am aware of in a comparable context and assumptions on stated outcomes have been conservative as set out in the evidence of Dr Simcock and Dr Ussher;
  - (d) the proposed offset and compensation package is substantial and multifaceted, including 2,219 ha of ecological restoration and habitat enhancement. The assumptions underpinning the stated outcomes are conservative, as set out in the evidence of Dr Ussher, and are informed by the considerable site knowledge and collective experience of myself, Dr Ussher, Dr Simcock, Dr Norton, Mr Barber, Mr Milner, and Mr Loering;
  - (e) the Applied Research Programme for the conservation, management, rehabilitation and expansion of cushionfields will make a meaningful contribution to understanding the spatial distribution and conservation management of cushionfields and associated spring annual communities, including nationally threatened species within the landscape; and
  - (f) The 35-year biodiversity outcome monitoring programme, designed to verify outcomes and inform adaptive management and contingency responses, is the most comprehensive I am aware of for a project of this nature.

22. In addition to the demonstrable instances of conservatism applied in the assessment of effects, and the substantive efforts to address those effects, I consider that my assessment of ecological effects and the adequacy of the proposed effects management package to be transparent and objective.
23. At the time of lodgement, I concluded that the proposed effects management package constitutes a comprehensive suite of measures expected to deliver broad and enduring ecological benefits that address most, but not all, adverse effects. I also identified that the project will result in the permanent loss of certain irreplaceable and vulnerable species or habitats, and that such losses cannot be fully offset.
24. In conclusion, I consider that there is no evidential basis to materially amend my assessment of effects, my conclusions, or the anticipated outcomes of the proposed effects management package. My response to the section 53 comments provides further clarification and supporting information but does not alter those conclusions.

## **MATERIAL ISSUES RAISED**

### **Depleted Herbfield (cushionfield) and Grassland**

25. As stated in my assessment of effects, I consider the project to have a Very High level of residual effects on depleted herbfield (cushionfield) and grassland, which is the highest level of residual effects category. I have concluded that these effects and associated effects on nationally threatened spring annuals are unlikely to meet the limits to offsetting principle; in other words, they constitute significant adverse effects on irreplaceable or vulnerable values that cannot be demonstrably offset or compensated for.
26. Given that this represents a worst-case scenario assessment, any issues raised by experts from invited parties in relation to my assessment of effects for this habitat type do not materially affect my conclusions.
27. I adopted a conservative approach in my assessment of this habitat type and associated spring annuals due to the considerable information gaps at the time of lodgement. However, spring annual surveys undertaken in Spring 2025 validate this approach, in that:
  - (a) numerous individuals and localised populations were identified, confirming the area as a local, regional, and national hotspot for nationally threatened spring annuals; and

- (b) while many additional spring annual populations were recorded outside the DDF, particularly on Ardgour Station, the proportional level of impact remains broadly similar.
- 28. The implications of these survey results are addressed in further detail in the evidence of Mr Milner.
- 29. I remain of the opinion that the most significant unresolved ecological issue is the materiality of effects on depleted herbfield (cushionfield) and grassland habitats, and their associated species, particularly spring annuals.
- 30. In my opinion, it is likely that:
  - (a) cushionfield habitats on Ardgour Station and Bendigo Station, outside the DDF, will be protected from ongoing decline and will benefit from the cessation of topdressing and oversowing, together with targeted weed control as part of ecological restoration and habitat enhancement activities; and
  - (b) the Applied Research Plan will deliver tangible, evidence-based benefits for cushionfields and spring annuals.
- 31. However, there is limited empirical evidence to support this, and the extent of any ecological benefit remains uncertain, including for species such as *Ceratocephala pungens* and *Myosotis brevis*.
- 32. The acquisition or legal protection (e.g. covenanting) of a substantial area of high-value cushionfield habitat on private land, via the existing BOGP Biodiversity and Heritage Fund, would – while not reducing the severity of effect – represent the most tangible means of counterbalancing, at least in part, the loss of this habitat type and its associated species. The focus would be on locations where such habitat is currently subject to ongoing loss as a permitted activity under the Central Otago District Plan (e.g. land use change or vineyard development), thereby constituting an averted loss offset.

## Lizard Surveys, Assessment of Effects and Proposed Effects Management

33. The following invited parties generally consider that lizard values and impacts on those values have been underplayed and that benefits associated with ecological rehabilitation have been overstated:
- (a) Mr Purdie representing Forest and Bird.
  - (b) Dr Tocher representing the Department of Conservation.
  - (c) E3 representing ORC.
34. As stated in my assessment of effects on lizards, I have assessed the level of residual effects, following the application of mitigation measures, as “High” for Kawarau gecko and southern grass skink, both of which are classified as At Risk (Declining) at national and regional levels, and “Low” for McCann’s skink, which is classified as Not Threatened at both the national and regional level.
35. Further to this, Dr Ussher and I have clarified through workshop discussions and a subsequent response to a request for information (**RFI**) that a “High” level of effect remains, with a stated net loss outcome (“High magnitude”) for both At Risk (Declining) species, after ecological rehabilitation and compensation measures are considered.
36. Dr Ussher addresses concerns raised by experts from invited parties in relation to the adequacy of the lizard surveys while I have focused on my assessment of effects on lizards and the adequacy of proposed effects management.
37. In summary, I agree with lizard experts from invited parties that the anticipated high magnitude of net loss for lizard species represents a significant issue.
38. Further, I agree that the proposed salvage and operational measures do not meaningfully reduce the severity of effects, and that an alternative approach is required to achieve improved outcomes for salvaged lizards.
39. However, in broad terms, I do not agree with the sentiment that lizard values and impacts are understated or that benefits are over-stated and I consider there to be no comments raised by experts from invited parties that materially change my assessment of effects.
40. A key reason why invited party experts consider my assessment to understate impacts relates to Dr Tocher’s evidence. At paragraph 37, Dr Tocher states that effects on Kawarau gecko are likely to be significant at both local and potentially national scales.

At paragraph 42 of her evidence, Dr Tocher estimates a potential loss of 'up to 7%'. Mr Purdie appears to have misinterpreted this evidence at paragraph 20(v), referring to a purported impact of 'approximately 7%' of the Kawarau gecko's entire habitat.

41. Indeed, if the project were likely to impact up to, or approximately, 7% of the species' total habitat, I would agree with Dr Tocher's statement that such an effect would likely influence the extinction risk for this species. However, this is simply not the case.
42. This proportional impact provided by Dr Tocher is based on the assumptions in Dr Tochers evidence that:
- (a) '700 ha of habitat would be permanently lost' (Paragraph 41 of Dr Tochers evidence).
  - (b) 'The range is estimated at ca 10,000 – 100,000 ha'. (Paragraph 39 of Dr Tochers evidence).
43. Dr Tocher's focus on 'up to 7%' assumes that the entire known range of Kawarau gecko is only 10,000 ha, which is less than twice the size of the Ecological Study Area (5,386 ha) that was surveyed. However, based on records in the DOC data base and on inaturalist (accessed on 12 April 2026), this species has a distributional range of at least 500,000 ha. This is supported by the statement on the New Zealand Herpetological Society website page for Kawarau gecko which states that:<sup>2</sup>
- This species can be found in the Dunstan Mountains, Cairnmur Range, Old Woman Range, near Queenstown (Gibston Valley and Crown Range), Wanaka, and Ruby Island in Lake Wanaka. This species is known from both lower elevations (in the rugged Otago valleys) and high elevations (rarely up to 1300 m).*
44. Of lesser importance, Dr Tocher assumes a 700 ha permanent loss whereas the expected loss is < 500 ha and while there will be some permanent loss, most of this loss will be rehabilitated and will no doubt provide habitat for Kawarau gecko in time as discussed further below.
45. On a more likely, albeit still conservative, assumption that the species' distributional range is approximately 400,000 ha – recognising that not all habitat within this range will be suitable – and that habitat loss is approximately 500 ha, the proportional loss would be closer to 0.1%, which is substantially less than "up to 7%".

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<sup>2</sup> <https://www.reptiles.org.nz/herpetofauna/native/woodworthia-cromwell> accessed on 12 April 2026.

46. I also note that for Kowarau gecko the habitat quality within the DDF is not of exceptionally high quality and certainly of lower quality compared to that found across Bendigo Station and the Bendigo Scenic Reserve as well as other areas across the distributional range.
47. In relation to Southern grass skinks and at Para 47 Dr Tocher states that in her experience '*southern grass skinks are not ubiquitous on the western slopes of the Dunstan Mountains, as claimed by the Applicant*'. Instead, 'they are largely restricted to wet or heavily shaded habitats' On this basis, Dr Tocher, contends that if approximately 700 ha of shared habitat within the DDF is permanently removed, southern grass skink populations may experience locally significant medium to long-term effects that could impact on its extinction proneness.
48. As stated, I consider the level of residual effects on southern grass skink to be High, and that the resulting net loss outcome (High magnitude) is a matter that requires resolution.
49. However, it is inconsistent in my view for Dr Tocher to assert on the one hand, that southern grass skinks are not ubiquitous and are largely restricted to wet or heavily shaded habitats in the surrounding landscape, while on the other hand assuming that the removal of approximately 700 ha equates to the loss of 700 ha of suitable habitat for southern grass skinks. Notwithstanding the fact that the expected extent of habitat loss is <500 ha not 700 ha. Further to this, in my view, the proportion of wet or heavily shaded habitat elsewhere on Bendigo Station and within the adjacent Bendigo Historic Reserve include a higher proportion of suitable habitat for Southern grass skinks than is present within the DDF.
50. Dr Ussher addresses issues relating to the adequacy of the lizard survey effort and the possibility that jewelled gecko, Lake's skink, and orange-spotted gecko may be present but undetected. In response, I note that:
- (a) Targeted surveys for these species were undertaken. While their continued presence was considered unlikely, it was acknowledged that it could not be definitively ruled out, as absence cannot be proven.

- (b) In the unlikely event that one or more of these species are present, population sizes - and therefore the proportional impact – is likely to be low. I also note that additional survey effort has been undertaken as part of the baseline biodiversity outcome monitoring programme, including a further 280 person-hours of manual searching across 280 monitoring stations within the collective offset and compensation sites (2,219 ha). This programme is implemented under G.12 Biodiversity Outcome Monitoring Plan and Condition 101 of D.01 CODC Land Use Consent and Conditions. A review of preliminary data indicates that 1,765 lizards were detected during these surveys, with no detections of species not already recorded within the DDF or the SL.
- (c) I consider jewelled gecko and orange-spotted gecko to be highly unlikely to be present. If either species were detected, the Bendigo Sanctuary would represent an appropriate offset or compensation measure.
- (d) However, if Lake’s skink (Threatened – Nationally Vulnerable), which Dr Tocher identifies as the species most likely to occur and of highest conservation concern, were to be detected, the current effects management package would be insufficient and net loss outcomes would likely arise. I agree that this represents a potential issue and should be a focus for achieving improved outcomes for lizard species.
51. Dr Ussher addresses the expected outcomes for lizards associated with the ecological rehabilitation programme. However, noting that I am engaged by OceanaGold in an ecology peer review capacity for their upcoming fast track application, I also respond to Dr Tocher’s comments regarding Macraes.
52. Dr Tocher suggests that the limited success of ecological rehabilitation at Macraes in providing habitat for kōrero gecko indicates that Kawarau gecko are unlikely to re-colonise or utilise rehabilitated habitats within the DDF. I do not agree with this statement on the basis that:
- (a) Kawarau gecko is a smaller and more habitat-generalist species compared to kōrero gecko, occurring across a much wider range of habitats, including all habitat types present in the DDF, even intensively farmed cropland, so it would not be unexpected for this species to recolonise ecologically rehabilitated sites within the DDF. By contrast, kōrero gecko at Macraes, and at other sites in Southeast Otago, are largely restricted to rocky tors or dense boulderfields.

- (b) Ecological rehabilitation at Macraes has been primarily focused on agricultural rehabilitation, rather than ecological rehabilitation, which differs from the approach proposed by MGL and as set out in the LERMP.
  - (c) A range of experimental rock stack designs are present at Macraes, and kōrero gecko have been recorded utilising the more sophisticated rock stack structures. The proposed rehabilitation design within the DDF is intended to adopt and build on these design elements that have proven to be suitable for kōrero gecko and that would be highly suitable for Kawarau gecko.
53. I agree with Mr Purdue's position in f 20(1) of his evidence that under the principles of biodiversity compensation, the trade-up principle can technically only be satisfied if the trade-up doesn't relate to lost values for Threatened or At Risk species. That said, in the absence of being able to feasibly demonstrate net gain outcomes for impacted lizards, the translocation of nationally Threatened or At Risk species that are highly likely to be extirpated in the landscape would undoubtedly:
- (a) constitute a significant benefit to lizard values within the local landscape and to the recovery and long-term persistence of those species, and
  - (b) go a considerable way towards counter-balancing the loss of less threatened locally abundant species.

### **Assessment of Effects**

54. In broad terms, ecological experts representing the DOC, ORC, CODC, EDS, and F&B contend that my assessment of ecological effects as it relates to habitats is flawed though there appears to be considerable differences in views among experts from invited parties on why that is the case and to what degree. I do not accept this general contention and stand by my assessment of effects for reasons articulated below.
55. In contrast to the views of Mr Harding (CODC), Mr Crowe (DOC) and Mr Head (EDS), I consider the EclAG framework, on which I have based my assessment of effects, to be fit for purpose and note that it is widely used in ecological effects assessments. Ignoring this in exchange for a bespoke, untested approach to assessing effects, would in my view be counter-productive and generate more issues than it would solve. While I am aware of Mr Harding's long-standing concerns regarding the EclAG, I note that I have applied the EclAG framework across more than 50 projects involving assessment of effects processes, acting for applicants, regulatory authorities, and invited parties/submitters. This is the first occasion on which I have personally encountered concerns with the framework, let alone with my application of it.

56. I do not agree with Mr Harding, Mr Crowe and Mr Head that the application of the National Policy Statement for Indigenous Biodiversity (**NPSIB**) significance criteria in place of the EciAG ecological value framework is a statutory requirement, or is warranted or appropriate, for the following reasons:
- (a) The significance criteria in the NPSIB are primarily directed toward identifying areas of ecological significance and delineating Significant Natural Areas. While this is relevant, it serves a different purpose from an assessment of effects and is not a statutory requirement in this regard.
  - (b) While both frameworks rely on similar criteria, the EciAG enables a more nuanced assessment through multiple ecological value categories (i.e. negligible, low, moderate, high, and very high). In contrast, the significance criteria in the NPSIB are binary (i.e. significant or not significant), which I consider overly coarse and therefore inappropriate for evaluating ecological value within an effects assessment context.
  - (c) In assessing ecological value, the EciAG applies fundamentally the same underlying sub-criteria as the NPSIB ecological significance assessment – namely representativeness, diversity and pattern, rarity and distinctiveness, and ecological context – albeit with some differences in application.
  - (d) As set out in my assessment of effects, ecological significance has been explicitly considered. I have assessed the entire DDF as ecologically significant, and ecological context – one of the four sub-criteria used to determine ecological value – captures aspects such as ecological connectivity, sequencing, and buffering, which have been incorporated into the assessment.
57. Ecological experts representing ORC have particular concerns regarding my assessment of representativeness, which is one of the four sub-criteria used to assess ecological value.
58. Representativeness is assessed by determining how well a vegetation community or habitat type for flora or fauna reflects what is characteristic of its type noting that assigned value *'thresholds may need to be lower where all examples of a type are strongly modified'*, attributes to be considered when assessing representativeness are set out in Table 4 of the EciAG and relate to the degree to which habitats:

- (a) *Have typical structure and composition*
- (b) *Are indigenous dominant*
- (c) *Have the expected species and tiers present*
- (d) *Have representative species and species assemblages that are typical of that habitat*
- (e) *Indigenous species occur in most of the guilds expected for that habitat type*

59. I have applied the 'representativeness' sub-criteria to assign ecological value categories ('Very Low', 'Low', 'Moderate', or 'High') habitats for vegetation and fauna based on my professional judgement. Specifically:

- (a) I assessed native-dominated habitats within the DDF as generally having 'Moderate' representativeness. I did not assign a 'High' rating, as these habitats are less representative than equivalent habitat types elsewhere in the ESA, wider landscape or Ecological District, where less modified and fragmented habitats are present, including those benefit from livestock exclusion or lower stocking rates. Although still modified, those habitats typically exhibit greater indigenous dominance and retain expected species assemblages and structural tiers (including more palatable plant species) compared to native-dominated habitats within the DDF.
- (b) I have generally assessed mixed native/exotic habitat types as having 'Low' representativeness, and habitats heavily dominated by exotic species as having 'Very Low' representativeness, as my assessments are benchmarked against native-dominated counterparts where they exist. For example, mixed scrubland is benchmarked against the best examples of indigenous dominated scrubland within the Ecological District. It could be argued that representativeness should instead be assessed relative to the best examples of each habitat type irrespective of whether there is an indigenous-dominated counterpart or not. However, this approach would result in, for example, exotic-dominated intensively managed grassland that is among the best examples of that habitat type within the Ecological District being assigned a 'High' representativeness rating. I do not consider this to align with the intended purpose of representativeness assessment.

- (c) Despite being exotic-dominated, I assessed mixed depleted herbfield (cushionfield) and grassland habitat as having 'Moderate' representativeness. This accords with the need to 'lower thresholds where all examples of a habitat type are strongly modified', and reflects the fact that, despite exotic dominance, these habitats can still retain indigenous species assemblages, structural characteristics, and associated ecological functions. However, in considering my assessment of representativeness for this habitat type further, I consider a 'High' rating to be more appropriate, on the basis that the DDF includes among the best examples of this habitat type within the Ecological District. Notwithstanding this revision, the assigned ecological value for this habitat type remains Very High; accordingly, this change is immaterial to the overall assessment of effects.
60. While I have taken the degree of modification into account and have referred to pre-human condition as contextual information and a descriptor, as outlined above, I have not used a pre-human or 1840 baseline as the reference point for assessing representativeness. Had such a benchmark been applied, native-dominated habitats would likely have been assessed as having low or very low representativeness, as present-day indigenous-dominated vegetation/ habitat within the DDF bears little resemblance to pre-human conditions or the 1840 baseline.
61. Finally in regard to the representativeness assessment:
- (a) In most instances, increasing the assigned representativeness value does not alter the overall value score, nor does it change the level of residual effects. In no cases does it alter the stated outcome.
- (b) I reiterate that the overall ecological values have been assessed as follows:
- (i) *High* or *Very High* for all native-dominated habitats, including mixed depleted herbfield (cushionfield), grassland habitats, and swamp/ marsh habitats.
- (ii) *Moderate* for mixed native/exotic habitats and exotic-dominated seepages and fens.
- (iii) *Low* for only one habitat type: exotic pasture and herbfield.
- (c) I consider that two key factors are likely to have contributed to the differences in representativeness assessment scores reported in the RMA Ecology Wetland Values Assessment (Substantive Application, Part B Technical Reports, B.12):

- (i) the inclusion of fauna habitat in my assessment as required by the EciAG, rather than focusing solely on vegetation; and
- (ii) that my assessment was on vegetation and habitat types within the DDF, as opposed to an assessment of vegetation values across the entire ESA. In this context, it is noted that habitat located outside the DDF but within the ESA generally exhibits higher representativeness values. This includes the Bendigo Historic Reserve and Ardour Conservation Area.

62. Mr Head, Mr Harding, Mr Crowe and Dr Giejsztowt consider the use of broad-scale habitat delineations to be one of the reasons why ecological values have been under-stated. As we understand it, this recommendation arises from the B.08A Alliance Ecology Consulting Assessment of Effects Terrestrial Ecology where it is stated that small-scale patches or sparsely scattered native tussock, scrub, or herbaceous species occur within areas mapped as exotic pasture and herbfield habitat, which has been assessed as having Low ecological value. I do not agree with this contention on the basis that:

- (a) The heterogeneous nature of the mapped habitat types coupled with the spatial scale of the Ecological Study Area (approx. 50 km<sup>2</sup>) makes mapping at finer scales extremely challenging, with some habitat patches less than several metres in extent, or arguably comprising a single plant, e.g. a single desert broom within exotic pasture.
- (b) This does not mean that habitat delineations are erroneous or underplay ecological values. This is because the issue goes both ways, i.e., patches of exotic grassland, exotic scrub, or exotic herbaceous vegetation are present within habitats mapped as native-dominated and assessed as having 'High' or 'Very High' ecological value, such as native tussockland, native shrubland, or taramea–native shrubland communities.
- (c) Furthermore, if habitat boundaries were hypothetically delineated at a much finer spatial scale, the overall areal extent of habitat mapped as exotic would likely increase substantially, with a corresponding reduction in the area mapped as native habitat. This pattern is readily apparent when onsite.

63. As stated, Ms Teale mostly agrees with the assigned magnitude of residual effects after management measures have been considered (Table 16 in the B.08A Alliance Ecology Consulting Assessment of Effects Terrestrial Ecology), provided *'the assumptions around the Ecological District impacts are better justified'* (e.g., that proposed proportional loss percentages should be based on knowledge of the distribution of the community within the Ecological District).

I consider my assessment of the proportional effects on each habitat type, relative to the Ecological District, to be appropriate. I also note that:

- (a) The only proportional percentages provided are those describing habitat loss relative to the Surrounding Landscape (i.e., the ESA surrounding the DDF). This area, encompassing several thousand hectares, was mapped and quantitatively surveyed to provide an appropriate and evidence-based context for assessing the magnitude of effects.
- (b) The Dunstan Ecological District, at approximately 90,000 ha, is substantially larger than the defined Surrounding Landscape. Determining proportional loss at this scale with an acceptable level of accuracy is not practicable, particularly for habitat types that are difficult to reliably map using desktop methods (e.g., small seepage wetlands, cushionfields, and certain shrubland types). Accordingly, a categorical approach (negligible, low, moderate, high, or very high) has been adopted to assess proportional loss relative to habitat availability across the Ecological District.

64. I consider that the magnitude of effect assessment approach I have taken to be entirely appropriate and do not agree with Mr Head (EDS) that proportional impact (loss relative to availability) should all but be ignored. Understanding whether a loss constitutes a negligible proportional effect relative to the surrounding landscape or total loss provides context to a magnitude of effects assessment. Likewise I do not agree or understand Mr Head's view that assessing the level of residual effects after consideration of mitigation constitutes double counting. I note that assessment of the level of effects before mitigation measures is less relevant because that is not what is proposed.
65. I do not agree with Mr Head's alternative assessment of effects presented in Table 1 of his evidence, which ultimately concludes that all habitat loss – other than exotic pasture and herbfield – exceeds the limits to offsetting and is therefore non-offsettable.
66. Firstly, there is no transparency or process evident in how Mr Head assessed ecological value, magnitude of impact or level of effect so I can't possibly respond to his alternative views. Secondly, in my view, an exceedance of the limits to offsetting occurs where there is a significant adverse effect on a vulnerable or irreplaceable biodiversity value that cannot be demonstrably offset or compensated for. At the extreme, this includes impacts that significantly increase the risk of species extinction. At a lesser, but still critical level, it includes situations where the risk of local extirpation of a habitat type or species is materially exacerbated.

67. I certainly do not consider the intent of the limits to offsetting principle to include instances where there are habitats that are not irreplaceable or vulnerable or that can be demonstrably offset or for which the magnitude of impact is low. For instance, I do not agree with Mr Heads assessment that the loss of taramea herbfield and shrubland constitutes a limit to offset exceedance when the areal extent of direct loss is up to 1.9 ha which:
- (a) Constitutes 1.2% of habitat available in the Surrounding Landscape, dropping to a negligible proportion of the habitat available within the wider surrounding Landscape and Ecological District.
  - (b) Will be ecologically rehabilitated (2 ha), which will go some way towards reducing the severity of effects.
  - (c) Will be offset or compensated via conservation actions undertaken in 79 ha of the same habitat type within the 2,219 ha subject to offset/compensation and which is expected to result in a net gain in ecological value based on the application of a quantitative Biodiversity Offset Accounting Model.
68. For similar reasons I do not agree with Mr Head's assessment of all other habitat types with the notable exception of Depleted cushionfields where we hold the same views.
69. E3 consider the proportional magnitude of loss on Mixed depleted herbfield (cushionfield) and grassland to be 'Very High' due to the large proportion of this habitat being affected and the highly experimental nature of the rehabilitated. I do not agree that the proportional magnitude of loss is 'Very High' on the basis that:
- (a) The 103.4 ha of loss constitutes 20.54% (or 14.6% if the CIT pit is not mined) of the ESA and a considerably lower although unknown proportion of the wider landscape and Ecological District.
  - (b) These proportional losses accord with the magnitude of effect category definition of "High' (the low end of High) rather than 'Very High' magnitude of effect. As stated in Table 8 of the EciAG:
    - (i) A Very High Magnitude of Effect equates to:
 

*Total loss of, or very major alteration to, key elements/features/ of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/ OR Loss of a very high proportion of the known population or range of the element/feature*

- (ii) A 'High' magnitude of effect equates to

*Major loss or major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature*

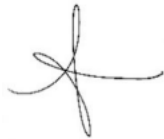
Further to this, assignment of the magnitude of effect on Mixed depleted herbfield (cushionfield) and grassland as 'High' rather than 'Very High' makes no difference to the overall level of residual effect which is stated as 'Very High' and one of the key reasons for the development and implementation of the Applied Research Programme as required by consent conditions.

70. E3 state that for notable species, there is a lack of information to support assumptions that have been made regarding the proportional effect of the proposal on notable flora in the Ecological District and use my assessment of the proportional effect on *Colobanthus brevisepalus* where I state in Table that the "*proportional effect is unclear and effects on the total population are assumed to be minimal*". I agree that more information on the proportional effect at larger scales would be useful however in no instances would this change the magnitude of effects assessment, noting that:

- (a) The focus of the proportional magnitude of effect assessment was at the local landscape scale, which is the most ecologically conservative scale to assess against, e.g. the magnitude of impact on *Colobanthus brevisepalus* was assessed as 'High' despite the expectation that the proportion effect at the wider landscape level was assumed to be minimal.
- (b) I state for several notable plant species assessments at large scales that the "*proportional effect is unclear and is assumed to be minimal*" only because it is difficult to precisely determine proportional effects at larger scales without quantitative surveys. The wording I use reflects this uncertainty though arguably, I have been too precautionary. For instance, in the case of *Colobanthus brevis* used by E3 as an example, this is an At Risk declining species with dozens of recordings in the Dunstan and surrounding Ecological Districts and beyond. I apply this same approach and degree of conservatism to the magnitude of effects assessment for all notable species at larger scales with these assessments based on desktop assessment of available databases and information, such as naturalist and DOC threat classification assessments. As stated this was based on the provision of further information would not change the magnitude of effects assessment.

(c) To provide more detailed quantification of impacts would require further field surveys. I consider the level of survey effort to be appropriate and uncertainties in relation to impacts, the success or rehabilitation or compensation measures and the overall assessment of biodiversity outcomes to be appropriately accounted for, noting that despite the quantum of proposed rehabilitation and compensation efforts, I have assumed net loss outcomes for 25 of the 49 notable species impacted and uncertain outcomes for 3 species.

71. I provide a report below as a direct response to requests from invited party experts for further information on the magnitude of predicted net loss outcomes for terrestrial biodiversity values affected by the BOGP. Table 2 of the report supersedes Table 26 in G.08 Assessment of Ecological Effects: Terrestrial Ecology.

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke extending to the right.

**Dr Matthew James Baber**

**17 April 2026**

April 2026



Assessment of the magnitude of net loss  
outcomes

## **BENDIGO-OPHIR GOLD PROJECT**

Prepared for Matakanui Gold Limited



[allianceecology.co.nz](http://allianceecology.co.nz)

## Introduction

This report provides a direct response to requests from invited party experts for further information on the magnitude of predicted net loss outcomes for terrestrial biodiversity values affected by the Bendigo–Ophir Gold Project.

The purpose of this information is to assist experts and the Panel in understanding the materiality of those predicted net loss outcomes where they are expected to occur. In doing so, **Table 2** below supersedes **Table 26** in *G.08 Assessment of Ecological Effects: Terrestrial Ecology*.

## Methods

Expected biodiversity outcomes are assessed for residual effects once the benefits associated with the proposed residual effects management package are considered, with expected outcomes assigned as follows:

- Net gain: where a net gain is predicted as supported by the application of a disaggregated Biodiversity Offset Accounting Model using quantitative data.
- Net Positive: where biodiversity compensation is expected to deliver a positive outcome for the ecological value based on professional judgement.<sup>1</sup>
- Uncertain: where the success of an action cannot be predicted with sufficient confidence to assign as Net Positive or Net Loss.
- Net Loss: where, based on current information, a negative outcome is assumed. In such cases—despite proposed restoration or enhancement measures—the benefits cannot be demonstrated (without further research) to adequately address the residual adverse effects within a 35-year time frame.

Where a Net Loss outcome is identified once compensation actions are taken into account, the scale of that Net Loss for impacted habitat types is further described using a qualitative scale (negligible, low, moderate, high, or very high). While applied for a different purpose in the Ecological Impact Assessment Guidelines (EciAG), Table 8 in the guidelines also provides a means for contextualising the scale of Net Loss, rather than as an additional formal effects test (see **Table 1** below).

The key difference is that the EciAG magnitude-of-effect table describes an effect *before* offset or compensation measures has been applied, whereas for the purposes of this report, this table is adapted to assign a magnitude of loss that remains after all aspects of the effects management hierarchy have been exhausted. That is, after all effects have been avoided, minimised, remedied, or compensated for, and any other relevant positive ecological effects considered.

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<sup>1</sup> This expectation is based on professional judgement, rather than the application of a biodiversity offset accounting model, due to challenges in obtaining or interpreting quantitative data or measurable responses to habitat restoration or enhancement measures.

**Table 1. Criteria for describing the local magnitude of loss for impacted habitat types after residual effects management measures have been considered (Adapted from EclAG Table 8)**

Magnitude of net loss	Description
<b>Very high</b>	Total loss of, or very major alteration to, key elements/features of the existing baseline <sup>1</sup> conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature
<b>High</b>	Major loss or major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature
<b>Moderate</b>	Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature
<b>Low</b>	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances or patterns; AND/OR Having a minor effect on the known population or range of the element/feature
<b>Negligible</b>	Very slight change from the existing baseline condition. Change barely distinguishable, approximating the 'no change' situation; AND/OR Having negligible effect on the known population or range of the element/feature

<sup>1</sup>Baseline conditions are defined as 'the conditions that would pertain in the absence of a proposed action' (EIANZ, 2018).

**Table 2: Expected biodiversity outcomes for vegetation/habitats within 35 years of approval being granted including for species not impacted by Project activities**

Habitat type	Ecological value	Level of residual effect	Residual effects management measures (offsetting/compensation)	Expected biodiversity outcome (and limits to offsetting outcome)
<b>Vegetation/habitat type</b>				
Exotic pasture or herbfield (79.3 ha)	Low	Low	Weed management, livestock management, mammalian pest management, native plantings and rock habitat enhancement as detailed in the various Management Plans.	Net gain for native elements
Mixed depleted herbfield (cushionfield) and grassland (103.8)	Very high	Very high	Weed management, livestock management, and mammalian pest management as detailed in the various Management Plans.	Net loss: Very High Magnitude and  Limits to offsetting/compensation principle unlikely to be met
Mixed tussock shrubland and exotic grassland (187.4)	Moderate	Moderate	Weed management, livestock management, mammalian pest management, native plantings and rock habitat enhancement as detailed in the various Management Plans.	Net gain for native elements
Mixed scrubland (124.1 ha)	Moderate	Moderate	Weed management, livestock management, mammalian pest management, native plantings and rock habitat enhancement as detailed in the various Management Plans.	Net gain for native elements
Native-dominant tussockland (25.6 ha)	High	High	Weed management, livestock management, mammalian pest management, native plantings and rock habitat enhancement as detailed in the various Management Plans.	Net loss in extent: low magnitude / net gain in condition
Native taramea herbfield and shrubland (1.86 ha)	High	Moderate	Weed management, livestock management, mammalian pest management, native plantings and rock habitat enhancement as detailed in the various Management Plans.	Net gain in extent and condition

Habitat type	Ecological value	Level of residual effect	Residual effects management measures (offsetting/compensation)		Expected biodiversity outcome (and limits to offsetting outcome)
Native-dominant scrubland (85.6 ha)	Very high	Very High	Weed management, livestock management, mammalian pest management, native plantings and rock habitat enhancement as detailed in the various Management Plans.		Net gain in extent and condition
Seepage wetlands (including drawdown effects outside the DDF) (0.19 ha)	Moderate	Moderate	Weed management, livestock management, mammalian pest management, native plantings are likely to benefit indigenous biodiversity values but there is likely to be a loss in extent as many wetlands are fully or partially induced by cattle pugging		Net loss: moderate magnitude
Gully fens (including drawdown effects outside the DDF) (0.84)	Moderate	Moderate	Weed management, livestock management, mammalian pest management, native plantings are likely to benefit indigenous biodiversity values but there is likely to be a loss in extent as many wetlands are fully or partially induced by cattle pugging		Net loss: moderate magnitude
Marsh/swamp wetlands (including open water)(2.42 ha)	High	Positive <sup>2</sup>	Not applicable as swamp/marsh wetlands will be rehabilitated to a net gain standard within the DDF so no offsetting/compensation required		Net gain in extent and condition
Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
<b>Species for which level of residual effect is assessed as Moderate or higher</b>					
<b>Plant species</b>					

<sup>2</sup> Excludes assessment of the potential for adverse effects on wetlands outside the project footprint that may arise from drawdown or degradation of water quality. It is therefore unclear if the expected net gain outcome in extent and condition would still apply if these effects were taken into account.

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
Tiny forget-me-not - <i>Myosotis brevis</i>	Threatened – Nationally Vulnerable	Threatened –Regionally Endangered	Very high	No evidence that potential residual effects management measures will benefit this species	<b>Net loss: Very High Magnitude</b>  <b>Limits to offsetting/ compensation principle unlikely to be met</b>
<i>Carex talboti</i>	At Risk – Declining	Threatened –Regionally Vulnerable	Very high	No evidence that potential residual effects management measures will benefit this species and may in fact adversely affect this species within offset/compensation sites	<b>Net loss: Very High Magnitude</b>
<i>Colobanthus brevisepalus</i>	At Risk – Declining	Threatened –Regionally Vulnerable	Very high	No evidence that potential residual effects management measures will benefit this species	<b>Net loss: Very High Magnitude</b>
<i>Raoulia beauverdii</i>	At Risk – Declining	Threatened –Regionally Vulnerable	Very high	No evidence that potential residual effects management measures will benefit this species	<b>Net loss: Very High Magnitude</b>
<i>Hypericum involutum</i>	At Risk – Declining	Data deficient	Very high	No evidence that potential residual effects management measures will benefit this species	<b>Net loss: Very High Magnitude</b>
Desert poa - <i>Poa maniototo</i>	At Risk – Declining	At Risk - declining	Very high	No evidence that potential residual effects management measures will benefit this species	<b>Net loss: Very High Magnitude</b>

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
<i>Ceratocephala pungens</i>	Threatened – Nationally Critical	Threatened – Regionally Critical	Very High	No evidence that potential residual effects management measures will benefit this species	<b>Limits to offsetting/ compensation principle unlikely to be met (updated from potentially not met based on 2025 survey data)</b>
<i>Lagenophora barkeri</i>	At Risk – Declining	Threatened – Regionally Endangered	High	No evidence that potential residual effects management measures will benefit this species	Net loss: High magnitude
NZ Mousetail – <i>Myosurus minimus n-z</i>	At Risk – Declining	Threatened – Regionally Endangered	High	No evidence that potential residual effects management measures will benefit this species	Net loss: High magnitude
Celadon mat daisy – <i>Raoulia parkii</i>	At Risk – Declining	Threatened – Regionally Vulnerable	High	No evidence that potential residual effects management measures will benefit this species	Net loss: High magnitude
<i>Rytidosperma maculatum</i>	At Risk – Declining	Threatened – Regionally Vulnerable	High	No evidence that potential residual effects management measures will benefit this species	Net loss: High magnitude
Common scabweed – <i>Raoulia australis</i>	At Risk – Declining	At Risk – declining	High	No evidence that potential residual effects management measures will benefit this species	Net loss: High magnitude
<i>Rytidosperma buchananii</i>	At Risk – Declining	At Risk – declining	High	No evidence that potential residual effects management measures will benefit this species	Net loss: High magnitude

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
<i>Colobanthus strictus</i>	Not Threatened	At Risk - declining	High	No evidence that potential residual effects management measures will benefit this species	Net loss: High magnitude
Pincushion grass - <i>Agrostis muscosa</i>	Not Threatened	At Risk - declining	High	No evidence that potential residual effects management measures will benefit this species	Net loss: High magnitude
<i>Poa lindsayi</i>	Not Threatened	At Risk - declining	High	No evidence that potential residual effects management measures will benefit this species	Net loss; High magnitude
Bladder Fern - <i>Cystopteris tasmanica</i>	Not Threatened	At Risk - Naturally Uncommon	Moderate	Planting, weed control and livestock removal	Net loss: Moderate magnitude
<i>Luzula leptophylla</i>	At Risk - Naturally Uncommon	At Risk - Naturally Uncommon	Moderate	No evidence that potential residual effects management measures will benefit this species	Net loss: Moderate magnitude
<i>Myosotis antarctica subsp. antarctica</i>	At Risk - Naturally Uncommon	At Risk - Naturally Uncommon	Moderate	No evidence that potential residual effects management measures will benefit this species	Net loss; Moderate magnitude
Hot rock fern - <i>Pellaea caldirupium</i>	At Risk - Naturally Uncommon	At Risk - Naturally Uncommon	Moderate	No evidence that potential residual effects management measures will benefit this species	Net loss: Moderate magnitude
Rock fern - <i>Cheilanthes sieberi sieberi</i>	Not Threatened	At Risk - Naturally Uncommon	Moderate	Planting, weed control and livestock removal	Uncertain

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
<i>Myriophyllum pedunculatum</i> ss <i>novae-zelandiae</i>	Not Threatened	At Risk – Naturally Uncommon	Moderate	No evidence that potential residual effects management measures will benefit this species	Net loss: Moderate magnitude
Feldmark grass – <i>Rytidosperma pumilum</i>	Not Threatened	At Risk – declining	Low	No evidence that potential residual effects management measures will benefit this species	Net loss: Low magnitude
<i>Chaerophyllum ramosum</i>	Data deficient	Not Threatened	Low	Planting, weed control and livestock removal	Net loss: Low magnitude
Coastal woodrush – <i>Luzula banksiana</i> var. <i>rhadina</i>	Data Deficient	At Risk – Naturally Uncommon	Low	No evidence that potential residual effects management measures will benefit this species	Net loss: Low magnitude
<i>Juncus distegus</i>	Not Threatened	At Risk – declining	Positive	Planting and expected to expand through removal of livestock	Net positive
Buchanan's Sedge – <i>Carex buchananii</i>	At Risk – Declining	Threatened – Regionally Vulnerable	Positive	Planting, weed control and livestock removal	Net positive
Mikimiki – <i>Coprosma virescens</i>	At Risk – Declining	Threatened – Regionally Vulnerable	Positive	Planting, weed control and livestock removal	Net positive
Blue Wheat Grass – <i>Anthosachne aprica</i>	At Risk – Naturally Uncommon	Threatened – Regionally Vulnerable	Positive	Planting, weed control and livestock removal	Net positive
<i>Epilobium hectorii</i>	At Risk – Declining	At Risk – declining	Positive	No evidence that potential residual effects management measures will benefit this species except for rock and rock rubble deployment	Net positive
<i>Olearia lineata</i>	At Risk – Declining	At Risk – declining	Positive	Planting, weed control and livestock removal	Net positive

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
Scented tree daisy <i>Olearia odorata</i>	At Risk – Declining	At Risk – declining	Positive	Planting, weed control and livestock removal	Net positive
<i>Styphelia nana</i>	At Risk – Declining	N / A	Positive	Deployment of rock stacks and livestock management	Net positive
<i>Pimelea aridula aridula</i>	At Risk – Declining	Threatened – Vulnerable	Positive	Planting, weed control and livestock removal	Net positive
Bristle grass <i>Rytidosperma corinum</i>	Data Deficient	Not threatened	Positive	No evidence that potential residual effects management measures will benefit this species	Net positive
<i>Carex diandra</i>	Not Threatened	At Risk – Naturally Uncommon	Positive	Planting, weed control and livestock removal	Net positive
<i>Festuca mathewsii subsp. mathewsii</i>	Not Threatened	Data deficient	Positive	Planting, weed control and livestock removal	Net positive
<b>Bird species</b>					
New Zealand falcon – eastern form*	Threatened, nationally vulnerable	Threatened, vulnerable	Moderate	Mammalian pest management	Net positive
New Zealand pipit*	At Risk, declining	Not threatened	Moderate	Mammalian pest management	Net positive
Silvereye*	Not threatened	At Risk, declining	Moderate	Mammalian pest management and native plantings	Net positive
<b>Lizard species</b>					
Tussock skink	N/A*	At Risk – declining	High	Mammalian pest elimination and rock deployment noting that evidence on the effectiveness of pest control is lacking and reversion of open or low stature habitats to woody shrubland will reduce habitat suitability in the long term.	Net loss: High magnitude

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
Kawarau gecko	At Risk - declining	At Risk - declining	High	Mammalian pest elimination and rock deployment noting that evidence on the effectiveness of pest control is lacking and reversion of open or low stature habitats to woody shrubland will reduce habitat suitability in the long term.	<b>Net loss: High Magnitude</b>
<b>Invertebrate species</b>					
<i>Pseudocoremia cineracia</i> (moth)	Threatened: Nationally Vulnerable	N/A	Very high	Uncertain whether there will be net loss or net positive outcomes but potential benefits through Olearia plantings (host plants)	Uncertain: if net loss occurs magnitude of loss is uncertain
<i>Harpalus</i> new sp. (ground beetle)	Potentially Threatened	N/A	Very high	Generally uncertain whether there will be net loss or net positive outcomes - pest elimination may benefit suitability for other species.	Uncertain: if net loss occurs magnitude of loss is uncertain  <b>Limits to offsetting/ compensation principle unlikely to be met</b>
<i>Inophloeus</i> new sp. (weevil)	Potentially Threatened	N/A	Very high	Generally uncertain whether there will be net loss or net positive outcomes for invertebrates - mammalian pest elimination may benefit this species.	Uncertain: if net loss occurs magnitude of loss is uncertain  <b>Limits to offsetting/ compensation principle potentially not met</b>

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
<i>Phaulacridium otagoense</i> (grasshopper)	At Risk, declining	N/A	Very high	Generally uncertain whether there will be net loss or net positive outcomes for invertebrates – mammalian pest elimination may benefit this species.	Uncertain: if net loss occurs magnitude of loss is uncertain
<i>Elachista helonoma</i> (moth)	At Risk, declining	N/A	Very high	Generally uncertain whether there will be net loss or net positive outcomes for invertebrates – planting of tussocks (host plants) may benefit this species	Uncertain: if net loss occurs magnitude of loss is uncertain
<i>Ichneutica toroneura</i> (moth)	At Risk, declining	N/A	Very high	Generally uncertain whether there will be net loss or net positive outcomes for invertebrates – planting of tussocks (host plants) may benefit this species.	Uncertain: if net loss occurs magnitude of loss is uncertain
<i>Megadromus</i> new sp. 1 (ground beetle)	Potentially Threatened	N/A	High	Generally uncertain whether there will be net loss or net positive outcomes though elimination of mammalian pests may benefit this species.	Uncertain: if net loss occurs then magnitude will be less than very high
<i>Megadromus</i> new sp. 2 (ground beetle)	Potentially Threatened	N/A	High	Generally uncertain whether there will be net loss or net positive outcomes though elimination of mammalian pests may benefit this species.	Uncertain: if net loss occurs then magnitude will be less than very high

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
<i>Scythris</i> sp. 1 (moth)	Not assessed, of importance	N/A	High	Generally uncertain whether there will be net loss or net positive outcomes for invertebrates – planting of <i>Carmichaelia</i> (host plants) may benefit this species.	Uncertain: if net loss occurs then magnitude will be less than very high
<i>Sporophyla oenospora</i> (moth)	Threatened – nationally critical	N/A	Moderate*	Generally uncertain whether there will be net loss or net positive outcomes for invertebrates	Uncertain: if net loss occurs then magnitude will be less than high
<i>Homodotis</i> sp. A (NZAC (CO)) (moth)	Threatened – nationally endangered	N/A	Moderate*	Generally uncertain whether there will be net loss or net positive outcomes for this species	Uncertain: if net loss occurs then magnitude will be less than high
<i>Pasiphila</i> sp. 'Olearia' pug moth	Threatened: Nationally Vulnerable	N/A	Moderate*	Uncertain whether there will be net loss or net positive outcomes but potential benefits through Olearia plantings (host plants)	Uncertain: if net loss occurs then magnitude will be less than high
<b>Species for which level of residual effects is assessed as low, very low, or positive</b>					
<b>Plant species</b>					
<i>Chaerophyllum ramosum</i>	Data Deficient	Not Threatened	Low	No evidence that potential residual effects management measures will benefit this species	Uncertain: if net loss occurs then magnitude will be less than moderate
<i>Epilobium hectorii</i>	At Risk – Declining	At Risk – Declining	Positive	No evidence that potential residual effects management measures will benefit this species	Net positive
<i>Rytidosperma corinum</i>	Data Deficient	Not Threatened	Low	No evidence that potential residual effects management measures will benefit this species	Net loss: low magnitude

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
<i>Kōwhai Sophora microphylla</i>	Not threatened	Not threatened	Low	Weed management, livestock management, mammalian pest management and native plantings.	Net positive
<i>Geranium potentilloides</i>	Not Threatened	Data deficient	Positive	No evidence that potential residual effects management measures will benefit this species	Net positive
<i>Vittadinia australis</i>	Not Threatened	At Risk - Naturally Uncommon	Positive	No evidence that potential residual effects management measures will benefit this species	Net positive
<i>Rumex flexuosus</i>	Not Threatened	At Risk - Naturally Uncommon	Positive	No evidence that potential residual effects management measures will benefit this species	Net positive
Bidibid / piripiri - <i>Acaena buchananii</i>	At Risk - Declining	Threatened - Vulnerable	Positive	Weed management, livestock management, mammalian pest management and native plantings.	Net positive
Spineless Acaena - <i>Acaena inermis</i>	Not Threatened	At Risk - declining	Positive	Weed management, livestock management, mammalian pest management and native plantings.	Net positive
<i>Carex kaloides</i>	At Risk - Declining	Threatened - Regionally Endangered	Positive	Weed management, livestock management, mammalian pest management and native plantings.	Net positive

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
<i>Carmichaelia petrei</i>	At Risk – Declining	At Risk – declining	Positive	Weed management, livestock management, mammalian pest management and native plantings.	Net positive
<i>Geranium aff. microphyllum</i>	At Risk – Naturally Uncommon	Not Threatened	Positive	No evidence that potential residual effects management measures will benefit this species	Net positive
<i>Olearia bullata</i>	Not Threatened	At Risk – Naturally Uncommon	Positive	Weed management, livestock management, mammalian pest management and native plantings.	Net positive
<i>Pimelea notia</i>	Not Threatened	At Risk – Naturally Uncommon	Positive	Weed management, livestock management, mammalian pest management and native plantings.	Net positive
<i>Pimelea prostrata subsp. prostrata</i>	Not Threatened	Threatened regionally vulnerable	Positive	Weed management, livestock management, mammalian pest management and native plantings.	Net positive
<b>Bird species</b>					
Black-fronted tern	Threatened, nationally endangered	Threatened, regionally endangered	Low	Proposed residual effects management measures unlikely to benefit this species	Net loss: low magnitude
Black-billed gull	At Risk, declining	Threatened, regionally vulnerable	Low	Proposed residual effects management measures unlikely to benefit this species	Net loss: low magnitude
South Island pied oystercatcher*	At Risk, declining	Threatened, regionally vulnerable	Very low	Proposed residual effects management measures unlikely to benefit this species	Net loss: very low magnitude

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
Bellbird	Not threatened	Not threatened (locally uncommon)	Very Low	Livestock management, mammalian pest management and native plantings are expected to benefit this species as detailed in the various Management Plans.	Net positive
Black shag	At Risk, relict	Threatened, regionally endangered	Very low	Proposed residual effects management measures unlikely to benefit this species	Net loss: very low magnitude
Little shag	At Risk, relict	Threatened regionally vulnerable	Very low	Proposed residual effects management measures unlikely to benefit this species	Net loss: very low magnitude
<b>Lizard species</b>					
McCanns skink	Not threatened	Not threatened	Low	Uncertain if proposed residual effects management measures will benefit species overall	Net loss: low magnitude
<b>Invertebrate species</b>					
<i>Agrotis admirationis</i> (moth)	At Risk, declining	N/A	Low	Generally uncertain whether there will be net loss or net positive outcomes for this species.	Uncertain: If Net loss occurs magnitude will be less than moderate
<i>Asaphodes recta</i> (moth)	At Risk, declining	N/A	Low	Generally uncertain whether there will be net loss or net positive outcomes for this species.	Uncertain: If Net loss occurs magnitude will be less than moderate
<i>Nyctemera annulata</i> (moth)	At Risk, declining	N/A	Low	Generally uncertain whether there will be net loss or net positive outcomes for this species.	Uncertain: If Net loss occurs magnitude will be less than moderate

Species	National threat status	Regional threat status	Level of residual effect	Residual effects management measures	Expected outcome
<i>Ichneutica sistens</i> (moth)	Uncommon	N/A	Low	Generally uncertain whether there will be net loss or net positive outcomes for invertebrates – planting of tussocks (host plants) may benefit this species.	Uncertain: If Net loss occurs magnitude will be less than moderate
<i>Meterana exquisite</i> (moth)	Uncommon	N/A	Low	Generally uncertain whether there will be net loss or net positive outcomes for invertebrates – planting of <i>Olearia odorata</i> (host plants) may benefit this species.	Uncertain: If Net loss occurs magnitude will be less than moderate
<i>Paranotoreas fulva</i> (moth)	At Risk, declining	N/A	Very low	Uncertain whether there will be net loss or net positive outcomes potentially achieved through rock stack and rubble pit creation.	Uncertain: If Net loss occurs magnitude will be less than moderate