NZSki Remarkables Ski Field Expansion Updated Terrestrial Ecology Review

Prepared for:	Central Otago District Council	Reviewed and approved for release by:	Justyna Giejsztowt Principal Ecologist – Biodiversity and Modelling Specialist
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1.0 Introduction

NZSki Ltd (NZSki) has lodged a Fast Track application for works to upgrade and expand the infrastructure at The Remarkables Ski Field, including an expansion into the adjacent basin of Doolan Creek (the Doolans). The existing ski field is located within Rastus Burn Recreation Reserve, in Queenstown Lakes District, while the proposed expansion into the Doolans crosses over into the Remarkables Conservation Area (Central Otago District). The Doolans expansion works include construction of a gondola, a base building, a combined ski slope and access road, and water take infrastructure (including a reservoir).

Central Otago District Council (CODC) have engaged Wildland Consultants Ltd (Wildlands) to review the terrestrial ecology components of the project. Wildlands has previously peer-reviewed the draft Terrestrial Ecology and Freshwater Ecology Impact Assessments (e3Scientific, 2026a, 2026b, Wildlands 2026a), and the initial lodged versions of the Terrestrial Ecology Management Plan, Lizard Assessment and Management Plan, and Resource Consent Conditions (e3Scientific, 2026b; Lemon, 2026; Wildland Consultants, 2026b). Following review of the lodged materials, many of the application documents have been updated, and additional response documents have been prepared that address issues raised in CODC's feedback. This memo reviews these updated documents, highlighting any remaining issues or information gaps.

1.1 Author qualifications and experience

The lead author of this review is Dr Luke Liddell. Luke is a Senior Vegetation Ecologist at Wildland Consultants Ltd (Wildlands); he holds a PhD in Biological Sciences and BSc (Hons) in Ecology and Environmental Science from the University of Auckland. Luke has nine years' experience working as a terrestrial ecologist across the commercial and academic sectors. Luke has worked as an ecological consultant since 2024, and gained wide experience in vegetation/habitat mapping, ecological significance assessments, Ecological Impact Assessments (EcIAs), wetland methodologies, and development of management plans and prioritisation tools. Luke has worked on a number of large-scale biodiversity projects focusing on Otago wetlands and alpine/subalpine ecosystems. Luke attended a site visit to the proposed ski field expansion area on 1 September 2026.

Samantha King prepared a review of the Lizard Assessment and Management Plan (LMP) and reviewed the response to the LMP Response and revised LMP. Samantha is an Associate Principal Ecologist and Herpetologist at Wildlands and holds a Bachelor of Science from Victoria University of Wellington, a Post Graduate Diploma in Environmental Management from Auckland University and a Master of Science in Conservation Biology from Massey University. Samantha is currently acting as the South Island Regional Manager, but typically leads the South Island herpetofauna team, as well as provides mentoring and training both internally within the national Wildlands team, and externally. Samantha has over 14 years' experience working as an ecologist. Samantha is a member of the Society for Research on Amphibians and Reptiles in New Zealand (SRARNZ) and is considered a suitably qualified

herpetologist under the guidelines set out by the Department of Conservation (DOC) Lizard Technical Advisory Group.

Cameron Thorp prepared a response to the LMP Response and revised LMP. Cameron is a herpetologist at Wildlands and holds a Master of Science with Honours in Environmental Science from the University of Nottingham (UK) and a Post-graduate Diploma in Endangered Species Recovery from the Durrell Conservation Academy (Mauritius). Cameron has over seven years' experience working as a herpetologist in New Zealand. Cameron is widely experienced in undertaking lizard surveys and salvages, as well as preparing survey reports, herpetological components of EcIAs, and has prepared and implemented numerous LMPs. Cameron serves as a Council Member of SRARNZ and is considered a suitably qualified herpetologist under the guidelines set out by the DOC Lizard Technical Advisory Group.

Oversight and technical input was provided by Dr Justyna Giejsztowt. Justyna is a Principal Ecologist (Biodiversity and Modelling Specialist) at Wildlands. She holds a PhD in Ecology and Biodiversity from the Victoria University of Wellington, a MSc in Applied Ecology from the University of Poitiers (France) and Christian-Albrechts University (Germany), and a BSc in Biology and Geography from the University of Canterbury. She is an experienced terrestrial ecologist with more than 15 years' professional experience working across government, commercial and academic sectors. Justyna has particular expertise in alpine and subalpine plant communities. Justyna routinely undertakes peer reviews of EcIAs, including in the Fast Track process.

This memo is written in the first person plural tense throughout. Section 6.0 of this memo reflects the opinions of Samantha King and Cameron Thorp. Sections 4, 5, 7, and 8 reflect the opinions of Dr Luke Liddell, with oversight from Dr Justyna Giejsztowt and is written in first person single tense. The conclusions in Section 9 reflect the summarised opinions of all the reviewers.

We confirm that we have read and comply with the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. Unless stated otherwise, this report is within our areas of expertise, and we have not omitted to consider material facts known to us that might alter or detract from the opinions expressed in this report.

2.0 Project Scope

This memo primarily reviews the following lodged documents:

- The updated Terrestrial Ecology Impact Assessment (referred to as the "TEcIA";e3Scientific, 2026d; B.12).
- The applicant's Response to CODC re B-12 Terrestrial Ecology Impact Assessment (referred to as the "Terrestrial Ecology Response"; e3Scientific, 2026h).
- The updated Lizard Assessment & Management Plan (referred to as the "LMP"; e3Scientific, 2026c; B.13).
- The applicant's Response to CODC re B.13 Lizard Assessment and Management (referred to as the "LMP Response"; e3Scientific, 2026h).
- The updated Resource Consent Conditions (H.02).
- The applicant's Effects Management and Compensation Overview Addendum (Mitchell Daysh, 2026a; A-21).
- The updated Terrestrial Ecology Management Plan (referred to as the "TEMP"; Lemon, 2026; F.01) has not been updated since it was last reviewed in Wildlands (2026b). All relevant feedback from that review is included here.

Other documents that were checked where relevant included the updated Doolans Creek Water Take Assessment of Effects (e3Scientific, 2026b; B.08), the updated Tracks, Crossings, Stormwater Freshwater Ecological and Hydrological Impact Assess (e3Scientific, 2026d; B.14), and the updated Approvals Relating to the Resource Management Act (Mitchell Daysh, 2026b); A.16).

The scope of this memo is restricted to the terrestrial ecology of the proposed expansion into the Doolans. Reporting associated with the proposed works in the Rastus Burn and at the Remarkables Base Car Park are not reviewed. Freshwater ecology is also outside the scope of this memo. Wetlands are considered in this report. The wetlands on-site support high vegetation and fauna values.

Background

Initial information and context on this project were provided via a series of workshops that Wildlands attended on behalf of CODC in late March 2026. This was followed by a site visit to the Rastus Burn and Doolans basins on 1 April 2026, with NZSki and e3Scientific staff in attendance to guide the visit and answer questions. Wildlands' review of the pre-application Terrestrial and Freshwater EcIAs was provided in May 2026 (Wildland Consultants, 2026a). Following the lodgement of the substantive application, Wildlands reviewed the application documents, focussing primarily on the Terrestrial Ecology Impact Assessment, Lizard Assessment & Management Plan, and Resource Consent Conditions (Wildland Consultants 2026b); the review memo was provided to CODC on 6 July 2026. In August 2026, feedback meetings were held with the applicant's ecologists to discuss issues relating to freshwater and wetlands (4 August 2026), terrestrial ecology (7 August 2026), and lizards (20 August 2026). The current round of feedback in this memo is informed by all previous review activities listed above.

3.0 General Comments

Inconsistency Between Tables and Documents

The TEMP and Resource Consent Conditions include many large tables and figures, which cover connected and sometimes overlapping aspects of effects management, monitoring, reporting, and conditions. There were many apparent inconsistencies between the different tables and figures, making it challenging to accurately track specific management actions and conditions across the different tables and documents. Specific examples are discussed in Section 5.0 of this memo, but in general it would be helpful to review the tables to identify overlapping information, and to be explicit about where and how they connect to the other components of the TEMP and the Resource Consent Conditions.

4.0 Terrestrial Ecological Impact Assessment

4.1 Resolved issues

The updated TEcIA and Terrestrial Ecology Response have clarified that the total area of indigenous habitat loss will be 15.94 hectares, 14.82 hectares of which is located within the Doolans (Central Otago District). 11.88 hectares of vegetation can be potentially revegetated (this is required in the conditions e.g. ECO.10-16), but this is still appropriately treated as habitat loss for the purposes of effects management.

The Terrestrial Ecology Response gives a good explanation for why Tarn 3 does not qualify as a wetland, namely the absence of hydrophytic vegetation and hydric soils. We agree with their reasoning for not treating the tarn as a wetland.

The response also clarifies that the vegetation plot methodology was used only for survey purposes (for which it is appropriate) and will not contribute to ongoing monitoring.

The response pointed to sections in the Doolans Creek Water Take Assessment of Effects (e3Scientific, 2026b); Sections 3.4.1 and 6.6) that appropriately explain why Tarn 3 is unlikely to be hydrologically linked to seepage wetlands further downhill (and therefore why the construction of a reservoir in Tarn 3 is unlikely to impact these seepages). Based on these explanations (and previous discussions with E3s), we agree that the downhill seepages are unlikely to be hydrologically linked to Tarn 3.

E3s have clarified that the temporary stream crossing immediately downstream of Tarn 2 crosses at a point where there is no fringing cushion bog around the tarn's outlet.

The response discusses the fact that, while avalanche control is highly likely to occur, it will only involve controlling the timing of avalanches rather than suppressing them. This is less likely to lead to negative effects. It does remain plausible that more frequent, less intense human-induced avalanches may alter the disturbance regime in the Doolans, however there is no information available to infer a possible level of effect from this.

The Terrestrial Ecology Response has clarified that the Maximum Likelihood (ML) vegetation mapping model includes a category for "Extra (Disturbed)", which allows it to capture areas of cleared/human-disturbed vegetation outside the area of the training data.

Section 6.1.4 now clarifies that the long-term viability of vegetation is only assessed as "High" under the assumption that ongoing weed control is successfully implemented and effective at preventing weed spread. This section now states that without management input, the long-term viability of the vegetation communities would be "Moderate". We agree with this, but note that only a fully successful weed control should be considered to result in a "High" level of long-term viability; a programme that is unsuccessful or only partially successful would result in the same "Moderate " long term viability as if weed control was not implemented.

E3s have clarified that the "Disturbed Vegetation" vegetation community does not represent the condition of the planned revegetation areas, which are expected to have higher indigenous coverage. Instead, the "Disturbed Vegetation" community is likely to be representative of future regeneration in areas where active revegetation cannot be undertaken.

Section 6.3 of the TEcIA now contains a paragraph which appropriately explains the reasoning for assigning a "Low" level of effect for habitat fragmentation on terrestrial invertebrates.

The response gives a good explanation for why the 60% survival requirement was chosen for revegetation, and why this is likely to be achievable. They clarify that if this and subsequent direct sowing of seeds are both unsuccessful then the pre-mitigation levels of effect will occur, e.g. an increased loss of ecological value. No further management is proposed in this situation, with the applicant accepting that such an outcome would lead to a higher residual level of effect; we consider that this approach requires further consideration.

The response clarifies that the cumulative effects assessment only considers the area of indigenous habitat cleared for the Remarkables Ski Field. E3s states that unofficial access paths and vehicle tracks in the wider ED are the other main cause of habitat loss in the alpine zone of the Remarkables ED, and that this area of habitat loss has not been quantified. Unofficial paths and tracks in the alpine zone are unlikely to meaningfully change the conclusions of the cumulative effects assessment.

The response provides a clear explanation for why effects management actions are able to reduce the residual level of effect to a greater degree in wetlands vegetation communities compared to upland vegetation communities (specifically for fragmentation, sedimentation, and weed introduction risks).

The reason for this is because of the additional effects management actions relating to sedimentation and hydrology that would specifically benefit wetlands, as well as the fact that wetland crossings are required to maintain hydrological connectivity.

The response explains why there is no monitoring proposed for terrestrial invertebrates in areas where vegetation has been transplanted. Their reasoning is that this would require extensive baseline surveying when only a single invertebrate species has a lowered level of residual effects as a result of the revegetation. We agree that if the proposed revegetation does not alter the residual level of effect for invertebrate habitat loss for all but one species, then post-revegetation invertebrate such monitoring is not needed.

All other minor errors raised in Wildlands' review of the draft TEcIA have now been fixed.

4.2 Unmanaged biodiversity outcomes

The updated TEcIA continues to leave "minor" or lower residual effects unaddressed, meaning the application cannot achieve a No Net Loss or Net Gain outcome for terrestrial ecology values. Such an outcome does not align with national policy directives such as the National Policy Statement for Indigenous Biodiversity (NPS-IB). As discussed in our review of the draft TEcIA (e3Scientific, 2026e; Wildland Consultants, 2026a), the fact that numerous lower-level effects are not managed to at least a no-net-loss level means that there is a heightened risk of multiple stressor effects, where many minor impacts interact to cumulatively harm ecological values on-site, particularly in conjunction with future climate change impacts.

The updated TEcIA still does not include discussion of effects related to ongoing disturbance from the maintenance and use of ski fields. The Terrestrial Ecology Response explains that – because these impacts are restricted to within the disturbance footprint – they will not create any additional negative impacts. The response does acknowledge that some vegetation disturbance may occur due to off-piste skiing where snow is shallow, however the likely level of effect from this is assessed as being negligible. We agree with this reasoning; impacts from skiing and snow grooming within the formed ski slope will occur in areas where vegetation clearance has already happened, while impacts outside this area are likely to be negligible.

Another related concern that was not raised in Wildlands' review of the draft TEcIA is that snowmaking activities could add nutrients to the alpine environment (Rixen *et al.* 2003). Because the water for snowmaking is derived from Doolans Creek at the base of the valley, it is likely to have significantly higher nutrient levels than the snow that falls naturally as precipitation. This impact is likely to be most pronounced were the nutrient-rich water accumulates, e.g. in the cushion bogs which are naturally adapted to very low nutrient levels and could be impacted by changes in groundwater nutrient levels. Deeper, more compact snow (and extended snow cover as a result) are also potential impacts as a result of snow grooming, and this could also impact the vegetation and hydrology of the Doolans.

4.3 Pump station/water supply

The applicant's reasoning for not taking water from the Rastus Burn makes sense (detailed in the Water Take Assessment of Effects; refer to Section 5.7). The applicant appears to have investigated a variety of other options for providing water to the Doolans expansion, none of which were deemed feasible. The main reason for this is that there is an existing water take in the Rastus Burn catchment. Additionally, there may be cultural issues with transferring water between catchments, although this is not known to have been raised by iwi at this stage. It should still be noted however the need to take water from Doolans Creek substantially increases the ecological impact of this project, and it significantly increases the length of permanent roading and underground piping and may also contribute to the need for the reservoir construction in Tarn 3. No other single design choice within this application has such a large ecological impact across a wide variety of values.

4.4 Vegetation surveys

The Terrestrial Ecology Response included rarefaction curves showing the levelling off of species richness with increasing numbers of plots in each vegetation community (Figure 1 of the Terrestrial Ecology Response; reproduced in Figure 1 of this memo). It is likely that most, but not all species have been captured within plots for the majority of habitat types. Therefore, ecological values are likely to have either been appropriately estimated, or only very slightly underestimated in these communities. There is less certainty for High Alpine Cushionfield and Dracophyllum scrub. Four or fewer plots were sampled in these habitats; evidence that these rarefaction curves are reaching their asymptotes is limited to a single datapoint and should not be considered conclusive. Reasonable explanations are given in the Terrestrial Ecology Response for why curves do not level off for two of the vegetation communities (Rocky Outcrop and Snowbank communities). We agree with the explanation given for the Snowbank community – only three plots were undertaken due to the very small extent of this vegetation community. Additionally, this community is entirely avoided by the proposed development footprint. We do not fully agree with E3s' argument that the uptick in diversity associated with the final plot (plot 7) is the sole reason why the rarefaction curve does not flatten off. It is only in the second to last plot (plot 6) that the apparent "flattening off" begins. More than a single data point worth of flattening is needed to support this claim. We do note that only a small area (0.16 ha) of Rocky Outcrop habitat is being impacted by the proposed works, so concerns around insufficient sampling for this vegetation are less pressing than for the High Alpine Cushionfield and Dracophyllum Scrub, both of which have more extensive overlap with the proposed works footprint.

4.5 Extrapolated vegetation mapping and magnitude of vegetation loss

4.5.1 Ecological District vegetation mapping

The Terrestrial Ecology Response acknowledges the concerns raised by Wildlands regarding the machine learning (ML) model used to infer alpine vegetation in the Remarkables Ecological District (ED). Specific points of concern are:

- The model was trained entirely on data from Rastus Burn and Doolans, then used to extrapolate outside this area. No ground-truthing was undertaken outside the surveyed area.
- The model relies solely on aerial imagery and does not incorporate any other environmental layers.
- The ML model uses aggregated vegetation categories, some of which cover multiple surveyed vegetation communities. The magnitude of effects assessment assumes that these aggregated vegetation types (based on Singers & Rogers, 2014) represent the same ratio of specific vegetation communities as was observed in the Doolans. For example, based on the distribution of *Chionochloa* grassland within the surveyed area, it is assumed that 70% of the AL1 vegetation type is "Snow tussock grassland" and 30% is "North facing snow tussock grassland". This is very likely to be an oversimplification.
- No modelling accuracy statistics have been provided, such as measures of sensitivity and specificity. Without these details, it is difficult to determine how reliable the ML model is.

E3s contend that, despite these flaws, their approach provides better accuracy than traditional qualitative approaches to assigning levels of effect to habitat loss. While it is true that such a method has the potential to improve the accuracy of assessed magnitudes for vegetation loss, it also risks introducing new statistical biases.

E3s have taken a number of steps to mitigate the limitations of the ML model:

- Percentage vegetation loss calculations are given at both the aggregated scale (used in the ML model) and the vegetation communities described from the field survey.

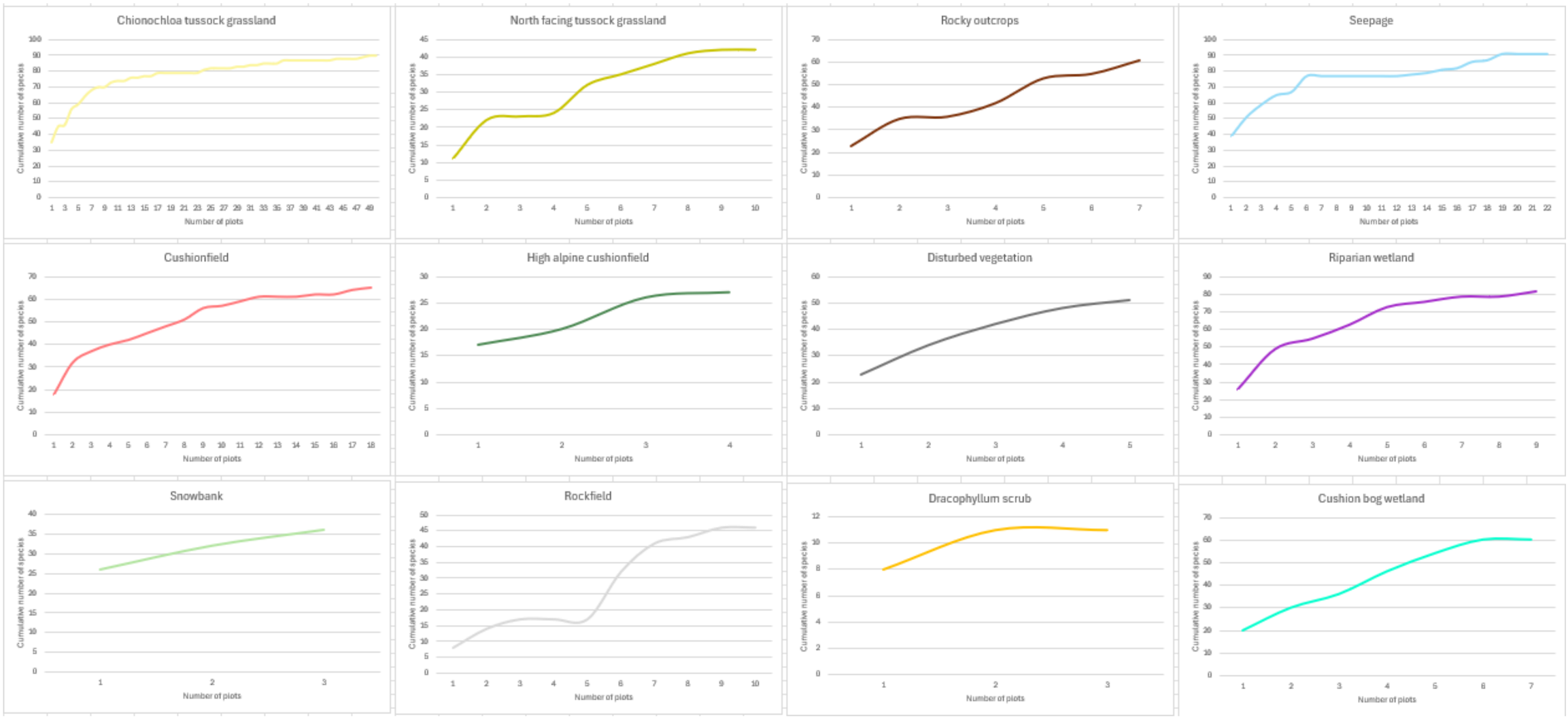


Figure 1 – Rarefaction curves from E3s' vegetation survey plots, taken from the Terrestrial Ecology Response (e3Scientific, 2026h).

- Expert checking of aerial imagery outside the training area, with manual correction and re-running of models based on expert checks.
- Splitting the analysis across low alpine (1100-1500m altitude) and high alpine (1500m+ altitude) areas, to prevent vegetation types being mapped at incorrect altitudes.
- Comparison of the ML model results for tarns and wetlands against predictions from wetness index, DEM slope analysis, and flow accumulation modelling.

We agree that these steps are likely to improve the accuracy of the ML vegetation mapping, however in our opinion they do not fix the core problem of extrapolating vegetation communities outside the surveyed area. Even if the broad vegetation types are mapped correctly, they will not necessarily contain equivalent ecological values to the vegetation communities within the upper Doolans. E3s do note that they checked plant lists on NZPCN from other locations in the alpine zone of the ED and found similar botanical values, which provides some support for their extrapolation of vegetation values outside the surveyed area. Additionally, the approach of using manual correction and re-running the model may lead to overfitting, with lower performance in other habitats as a result.

E3s also checked their ML mapping against existing datasets such as the Otago Current and Potential Ecosystems datasets and the Manaaki Whenua Potential vegetation data (Manaaki Whenua - Landcare Research, 2012; Wildland Consultants, 2020). E3s found that their results broadly aligned with these other sources of vegetation mapping; a notable difference was that E3s' ML model was better at picking out areas of rock and cushionfield dominated communities within areas that were broadly mapped as snow tussock grassland in the other datasets. This comparison suggests that the ML mapping is reasonably accurate at the broad level of vegetation classification used in these datasets. However, accuracy at these wider/aggregated habitat classes does not necessarily mean that the ML model is accurately picking up finer vegetation differences below the Singers and Rogers (2014) level. It is accuracy at this finer level of habitat identification that is needed for the ML modelling approach to be used over traditional effects assessment approaches. Currently, the TEcIA and Terrestrial Ecology Response do not clearly demonstrate that this level of accuracy has been achieved. To be an effective approach for assessing effects vs traditional approaches, the ML must more precisely identify habitats, i.e. the potential vegetation layer uses substantially wider habitat classes, so this testing approach does not get us what we really need to know – whether the ML picks up minor vegetation differences

E3s note that the ML model forms only part of the evidence used to assign magnitudes of effect, with expert opinion/local ecological knowledge and comparison to vegetation datasets elsewhere in the Remarkables ED alpine zone also used to determine magnitudes. Despite this, it should be noted that Table 14 in the updated TEcIA remains heavily based on the % vegetation loss calculations derived from the ML model's vegetation mapping. There are no instances where expert opinion disagrees with or overrules the model-derived calculation. This could be a sign that the model is performing accurately, or it could mean that the model outputs have been the primary way in which magnitudes of effect were determined.

4.5.2 Scale of assessment

A key point of disagreement that arose during the Terrestrial Ecology Feedback Meeting (7 August 2026) was about the appropriateness of assessing vegetation loss at the scale of alpine zone (>1,100m altitude) across the entire ED. E3s' position is that, because their assessment of ecological value was undertaken at the ED scale, their magnitude of effects assessment should be undertaken at the same scale, as per Environment Institute Of Australia And New Zealand (EIANZ) guidelines (EIANZ, 2026; Roper-Lindsay *et al*. 2018; discussed in detail in Sections 6.1.1–2 of the updated TEcIA). The updated TEcIA also notes specifically that EIANZ guidelines make a distinction between the Zone of Influence (ZOI) for effects and the scale at which magnitude should be assessed, and do not recommend assessing magnitude of effect at the spatial scale of the ZOI.

It is our opinion that assessing the magnitude of vegetation loss at the ED scale leads the updated TEcIA to calculate magnitudes of effect for vegetation loss that are too low. This approach has a number of issues, detailed below:

- EIANZ guidelines are just guidelines and not statutory; the matrix approach does not always provide the best assessment of effects and should not override sound ecological opinion. It is also worth noting what the different levels of magnitude represent (regardless of scale). For example, a "Moderate" magnitude of effect corresponds to:

  "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".

  That is the magnitude that has been assigned to 1.9 hectares of clearance of high alpine cushionfield. In our opinion, such a large loss of high-alpine habitat better aligns with a "High" or "Very High" magnitude of effect, regardless of the inferred abundance of this vegetation type elsewhere in the ED.

- We do not agree with E3s' claim that the assessment of ecological value is best characterised as having been undertaken at the scale of the ED.
  - All field surveying was conducted entirely within the upper Doolans and Rastus burn basins.
  - Various ecological significance criteria used in the TEcIA are assessed at the ED scale, however ecological significance criteria are not the same as an assessment of ecological value. The fact that some criteria make reference to the ED does not mean that this is the scale at which ecological values were assessed.

- Additionally, it is not clear how their assessments of ecological value would differ if it were characterised as having been undertaken at the ED scale vs a smaller (e.g. the upper Doolans/Rastus Burn) or a larger scale (e.g. regional or national). The ecological value assessments were based solely on survey data collected within the upper Rastus burn and Doolan basins and took into account a variety of different spatial perspectives, e.g. national and regional threat statuses, Naturally Uncommon Ecosystems (defined by their rarity at the national scale), vegetation uniqueness/rarity/etc within the ED, and species richness based on what was present within the two basins. It does not seem obvious that the ecological value would change much (or at all) if the assessment of ecological significance was instead characterised as having been undertaken at a different scale.

  This raises a problem: if the values stay the same regardless of scale, but the magnitudes decrease at larger scales, then picking a larger scale will lead to lower levels of effect.

- As discussed in EIANZ (2026), the RMA (Schedule 4, clause 7(1)(c)) specifies that the scale of effects assessment should focus on:

  "any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity"

  Based on this, similar alpine vegetation types located at the far end of the ED would not count as being in the "vicinity" of the effects in the upper Doolans and Rastus Burn basins.

- Our interpretation of the recently released EIANZ scale of effect explanatory note (EIANZ, 2026) also differs from that of E3s. We note that an example given for a terrestrial ecology project that assesses magnitude of effect at the wrong scale is a situation where ecological values are assessed within an area of affected habitat, but the magnitude of effect is calculated at the level of the wider habitat between distant geographic boundaries. To quote a relevant paragraph from the guidelines in full:

  "The wider landscape is relevant ecological context and should be considered. However, contextual information about the wider landscape should not replace the scale at which the ecological values were assessed, particularly where the wider habitat has not been surveyed, mapped or valued to

an equivalent level of detail. Nor should the existence of additional habitat elsewhere be used to dilute the permanent loss or modification of a rare, threatened or otherwise important ecological feature within the site or zone of influence."

We consider that it is essential for the TEcIA to show what percentage of actually surveyed and manually mapped vegetation within the Doolans and Rastus Burn will be cleared, in order to better inform the magnitude of effect assessment. A high % loss of a vegetation community within this area should be assigned an appropriate magnitude irrespective of how extensive these communities are predicted to be in the wider ED.

4.6 Naturally Uncommon Ecosystems

The TEcIA has been updated to note that the "Rockfield" and "Rocky Outcrops" vegetation communities both represent Naturally Uncommon Ecosystems (NUEs; Table 9). A minor mistake is that the "Rocky Outcrops" vegetation community is assigned to the "Screes of acidic rocks" NUE, rather than the "Cliffs, scarps, and tors of acidic rocks" NUE. It should also be noted that many of the landforms at higher altitudes may sit on moraine landforms, which could additionally classify them under the "Moraines" NUE. As E3s note in their response, the status of different vegetation communities as NUEs does not change their assessed ecological value, as they are already assessed as having a "High" or "Very High" rarity score. We agree that the assessed ecological values remain appropriate.

4.7 Wetland hydrology

The response from E3s clarifies that none of the wetland crossings will redirect groundwater flow from one crossing to another, and the updated Tracks, Stream Crossings and Stormwater Freshwater Ecological and Hydrological Impact Assessment (e3Scientific, 2026j) reflects this. It is appropriate for the TEcIA to stipulate that the crossing must have not impact on wetland hydrology, and for the assessment of effects to assume that this will be carried out successfully with appropriate monitoring.

4.8 Invertebrates

The response from E3s gives reasonable explanations for why invertebrate sampling was undertaken within a relatively narrow time window, and how desktop review was used to help account for taxa which may have been under-represented by the field survey. Additional sampling outside of the mid-January–early March time window would still be valuable and make the results more robust; in particular, sampling between October and December would be valuable, as it would capture emerging moths that could be missed later in summer/autumn. The TEcIA nonetheless does a good job of representing invertebrate values and does not downplay potential effects, with "High" and "Moderate" residual effects for many invertebrate taxa as a result of habitat loss and ongoing disturbance.

4.9 Residual levels of effect

The executive summary of the TEcIA has been updated to be clearer about the residual level of effect associated with habitat fragmentation. There appears to be an error however, as it now says that north-facing tussock grassland, *Dracophyllum* scrub, cushionfield, high alpine cushionfield, rockfield, and rocky outcrops in the Doolans all have a "Moderate" residual level of effect from fragmentation, whereas Table 18 gives a "High" level of residual effect for these habitats in the Doolans.

The Table 1 (below) shows a summary of all the initial and residual terrestrial ecological effects detailed in the TEcIA, stating whether Wildlands agrees with the assessed levels of effect.

Table 1 – Wildlands comment on terrestrial ecology levels of effect.

Effect	Level of Effect - Initial	Level of Effect - Residual	Wildlands Comment
Vegetation loss - North facing tussock grassland, Dracophyllum scrub.	Low	Low	Disagree, see discussion in Section 4.5 for an explanation of issues with the applicant's assessment of the magnitude of vegetation loss.
Vegetation loss - High alpine cushionfield.	High	Moderate	Disagree, see discussion in Section 4.5 for an explanation of issues with the applicant's assessment of the magnitude of vegetation loss. Additionally, it is not clear why effects management lowers the residual level of effect from vegetation loss this vegetation community but not for any other community.
Vegetation loss - All other vegetation communities present in the Doolans.	Moderate	Moderate	Disagree, see discussion in Section 4.5 for an explanation of issues with the applicant's assessment of the magnitude of vegetation loss.
Fragmentation/infrastructure impediment - Eastern falcon.	Moderate	Low	Agree
Fragmentation/infrastructure impediment - Ground dwelling invertebrates.	Low	Low	Agree
Fragmentation/infrastructure impediment - All other avifauna and terrestrial invertebrates.	Negligible	Negligible	Agree
Fragmentation/infrastructure impediment - North facing tussock grassland, *Dracophyllum* scrub, cushionfield, high alpine cushionfield, rockfield, and rocky outcrop).	High	High	Agree
Fragmentation/infrastructure impediment - Cushion bog, riparian wetland, and seepage).	Very High	Moderate	Agree
Weed introduction/mobilisation.	Very High	Low	Agree
Sedimentation - cushion bog, riparian wetland, seepage, and snowbank).	Very High	Moderate	Agree
Sedimentation - All other vegetation communities present in the Doolans.	High	Low	Agree
Habitat loss - Eastern falcon (nesting, low quality foraging).	Low	Low	Agree
Habitat loss - Eastern falcon (high quality foraging).	Moderate	Moderate	Agree
Habitat loss - NZ Pipit (nesting above 1700m).	Very Low	Very Low	Agree
Habitat loss - NZ Pipit (nesting below 1700m).	High	Low	Agree
Habitat loss - NZ Pipit (nesting below 1700m, foraging).	High	High	Agree
Habitat loss - Kea (nesting, foraging).	Low	Low	Agree
Habitat loss - Australasian harrier (nesting, foraging).	Very Low	Very Low	Agree

Effect	Level of Effect - Initial	Level of Effect - Residual	Wildlands Comment
Habitat loss - Southern black-backed gull (nesting, foraging).	Very Low	Very Low	Agree
Habitat loss - Paradise shelduck (nesting, foraging).	Very Low	Very Low	Agree
Habitat loss - McCann's skink.	Very Low	Very Low	Agree
Habitat loss - Terrestrial invertebrates (six species).	Low	Low	Agree
Habitat loss - Terrestrial invertebrates (14 species).	Moderate	Moderate	Agree
Habitat loss - Terrestrial invertebrates (two species).	High	High	Agree
Indirect disturbance - Eastern falcon (construction noise).	Moderate	Moderate	Agree
Indirect disturbance - Eastern falcon (operational noise, light, human presence/ski field operation).	Low	Low	Agree
Indirect disturbance - NZ pipit (construction noise).	High	Moderate	Agree
Indirect disturbance - NZ pipit (operational noise, human presence/ski field operation).	Low	Low	Agree
Indirect disturbance - NZ pipit (light).	Very Low	Very Low	Agree
Indirect disturbance - Paradise duck (all disturbances).	Very Low	Very Low	Agree
Indirect disturbance - Kea (construction noise).	Very High	Moderate	Disagree. Table 18 gives an initial Very High level of effect for construction noise disturbance in the Doolans; this is reduced to a Moderate residual level of effect despite no management action being described.
Indirect disturbance - Kea (operational noise).	Very High	Low	The effects management actions for operational noise disturbance do not appear to be directly related to noise disturbance, and it is not clear how they reduce the level of effect all the way down from Very High to Low.
Indirect disturbance - Kea (human presence/ski field operation).	Very High	Low	Agree
Indirect disturbance - Kea (light).	Very High	Unknown	The effects management actions and residual level of effect for light disturbance on Kea are not displayed at all in Table 18.
Indirect disturbance - Australasian harrier (all disturbances).	Very Low	Very Low	Agree
Indirect disturbance - Southern black-backed gull (all disturbances).	Very Low	Very Low	Agree
Indirect disturbance - McCann's Skink (all disturbances).	Very low	Very low	Agree
Indirect disturbance - Terrestrial invertebrates (construction noise; 15 species).	Moderate	Moderate	Agree
Indirect disturbance - Terrestrial invertebrates (construction noise; seven species).	High	High	Agree

Effect	Level of Effect - Initial	Level of Effect - Residual	Wildlands Comment
Indirect disturbance - Terrestrial invertebrates (operational noise; 20 species).	Low	Low	Agree
Indirect disturbance - Terrestrial invertebrates (operational noise; two species).	Moderate	Unknown	*Xanthorhoe frigida* and *Pyrausta comastis* are given a moderate level of effect as a result of operational noise, but effects management and residual level of effect are not shown in Table 18.
Indirect disturbance - Terrestrial invertebrates (light; 20 species).	Very low (winter), Low (summer)	Very low (winter), Low (summer)	Agree
Indirect disturbance - Terrestrial invertebrates (light; two species).	Low (winter), Very High (summer)	Unknown	*Xanthorhoe frigida* and *Pyrausta comastis* are given a moderate level of effect as a result of artificial light in summer, but effects management and residual level of effect are not shown in Table 18.
Indirect disturbance - All Threatened plant species (human presence/ski field operation).	Moderate	Low	Agree
Construction material – Kea.	Very high	Low	Agree
Cumulative effects (vegetation loss).	Low	Low	Agree

5.0 Terrestrial Ecology Management Plan

5.1 General

The TEMP does not appear to have been updated since it was reviewed by Wildlands in July (Wildland Consultants, 2026b). As such, Wildlands' feedback from that round of reviewing is included below, with minor edits. In general, there is a lack of clear alignment and consistency between the various large tables in the TEMP that cover effects management goals, monitoring, and performance/reporting criteria, as well as inconsistency in how these connect with the resource consent conditions. This made it difficult to determine the appropriateness of the measure in the TEMP; this lack of consistency also increases the risk that effects management actions will not be carried out as intended, making management goals less likely to be achieved.

5.2 Mitigation and monitoring

The TEMP makes multiple references to the need for bird deterrent measures if monitoring identifies that the Doolans Base Building represents a bird strike risk. These measures do not appear to be detailed anywhere in the TEMP however, even though the resource consent conditions specify that the deterrent measures must be identified in the TEMP. This means that it is unclear what specific deterrent measures would be considered and it is not possible to assess their merit as a mitigation measure.

The Gantt chart in Figure 6 shows that high alpine cushionfield (AH2) has less frequent monitoring events than all the other vegetation types. This is unusual given that this is the vegetation type that was assessed as having both the highest magnitude and highest level of effect from vegetation clearance in the lodged terrestrial EcIA. This vegetation type is not specifically mentioned in Table 6.1, meaning there is no explanation for why this vegetation type has a different monitoring regime. Given that this is the most impacted vegetation type in terms of habitat loss, there should be clear reasoning given in Table 6.1 for why it is monitored less frequently. Otherwise, there is a higher risk that impacts on this vegetation will be missed by monitoring.

Monitoring for the three wetland types in Table 6.2 is given as "baseline, six-monthly (two years), annually". Figure 6 only shows six-monthly monitoring for the first year, however. Time constraints meant that we were not able to check every line in Figure 6 against all the monitoring frequencies described in Tables 6.1–6.4, however it is possible that other monitoring events are also inconsistent between the two sections.

Additionally, wetlands do not have an initial three-month monitoring event (January 2027), unlike some other ecosystems. Given that wetlands are vulnerable to a wide range of potential impacts during works, the current monitoring frequency leaves a large six-month window during initial works where impacts on wetlands could go undetected. Compared to purely terrestrial ecosystems, wetlands are notably more vulnerable to discrete disturbances such as sedimentation, pollution, flooding, and disruption of groundwater supply, all of which could plausibly occur during early stages of the proposed construction works. The seepages and cushion bogs within the Doolans are especially vulnerable to such disturbances, as they comprise cushion and herbfield/turf communities that are specifically adapted to constant, stable levels of unpolluted groundwater. An additional round of monitoring at 3 months would improve that chance that such an impact could be identified early so that appropriate minimisation and remediation measures could be undertaken.

Monitoring for plant translocation is shown in Figure 6 as occurring annually every January. An explanation for why this month was chosen would be useful. Given the potential vulnerability of transplanted vegetation to summer heat and drought, the autumn months may represent a more practical window of time to assess revegetation success; a January monitoring window runs the risk

that late-summer heat/drought impacts would not be identified or remedied until the following summer.

5.3 Performance/reporting criteria

In Table 7.1 (reporting requirements for the project), some of the rows refer directly to the resource consent conditions (specifically those relating to vegetation/plant translocations), while the other criteria do not. If all of the criteria connect to specific conditions, then this should be clearly stated in the report and shown in Table 7.1, to allow for consistent cross-referencing. It is also not clear what the exact relationship is between the information in Section 6 and Table 7.1 of the TEMP. While the tables in Section 6 are primarily focused on risks/effects and management actions, they also have a column that details performance criteria for the different management actions.

Cross checking all the performance criteria across the different tables was not completed, however there appear to be performance criteria in Table 7.1 that do not appear at all in Section 6 of the TEMP. For example, performance criteria relating to the condition of *Dracophyllum* shrubland in Table 7.1 do not appear elsewhere in the TEMP.

Further, Table 7.1 only includes a low level of detail for some performance criteria, making the meaning of these criteria unclear. For example, the meaning of the criterion "*Dracophyllum*: No dieback >5 m" is unclear. Another example can be seen for cushionfields: "Cushionfields: ≥60% cushion survival". This also conflicts with Table 6.1, which specifies "≥70% survival". Cross-referencing all of Table 7.1 against Section 6 was not undertaken, but these examples suggest that even where criteria in Table 7.1 do link to with risks/effects in Section 6, there may still be inconsistencies in the specific thresholds specified.

In general, all of these inconsistencies identified in Table 7.1 make it difficult to assess the appropriateness of the proposed monitoring and reporting. There is also the risk that these issues in the TEMP will lead to monitoring and reporting being carried out in an inconsistent manner, should the project proceed.

6.0 Lizard Assessment and Management Plan

6.1 Resolved issues

The revised LMP more clearly describes the lizard values at the site, including specifying the likelihood of species present separately within either the wider LMP site or earthworks footprint in Table 1. Table 1, and the removal of a range of likelihoods for some individual species (though this is still retained in some areas of text, such as in Section 2.1.2 regarding *Oligosoma* aff. *inconspicuum* "Central – Southern", which may be erroneous), makes the desktop assessment in the revised LMP clearer regarding likelihoods of species presence.

Regarding the preparation and implementation of the LMP, we agree that Dr Tocher, Mr Knox and Ms Anderson are suitably qualified in this regard as per Section 1.7 of the revised LMP and the LMP Response. Section 4.4.5 of the revised LMP appropriately states that the construction of rock piles is to be undertaken under the supervision of the Project Herpetologist.

We agree based on the revised LMP and LMP Response that there is a low likelihood of Nevis skink and Lakes skink being present on site.

While detailed weather measurements are missing for most survey rounds, the revised Section 2.2.1.4 lists the specific weather threshold which is considered appropriate.

We acknowledge the difficulty in estimating accurate numbers of lizards in tussock grassland habitats and why a range of lizards to be impacted has been provided as per Section 3.1 of the revised LMP and acknowledge the relevant experience of Mr Knox in regard to estimating numbers of lizards in tussock grassland.

We agree that whether a lizard salvage is undertaken or not would not have an effect on the national population of McCann's skink, but it could have an impact on the local population.

Regarding assessing residual effects, we acknowledge that Section 4.4.2 of the revised LMP more clearly reflects the uncertainty of success of the habitat reduction and that further detail has been added regarding the compensation package.

We acknowledge that the proposed eDNA study (compensation) contributes to knowledge building in regard to cryptic lizard detection improvement, but it does not assist with providing benefit to lizard conservation unless successfully applied (and therefore meeting the NPS-IB principle for additionality (NPS-IB, 2025 Appendix 4, Principle 4).

6.2 Department of Conservation guidance documents

The lack of reference to the DOC guidelines for lizard salvage (DOC, 2019) and other standard technical guidance documents (e.g. DOC, 2023a, 2023b) was an issue raised in the previous memo which remains a point of disagreement with e3s. While not statutory documents, these guidance documents are commonly applied and provide clear ways to determine protective benefit for lizards.

6.3 Effects management hierarchy

The effects management hierarchy must be followed in order to be consistent with the NPS-IB and RMA (Section 3.16 (1). We acknowledge that the LMP has applied the effects management hierarchy to some degree, including some aspects of minimisation (habitat reduction) and remediation (construction of rock piles and translocation of snow tussocks) prior to proposing compensation, and that justification for not undertaking further minimisation (no lizard salvage), has been provided in Section 4.4.1 of the revised LMP. See Section 6.7 of this report below for further comments regarding management of effects on lizards and the application of the effects management hierarchy.

6.4 Experience of ecologists who undertook the survey

It remains unclear in the revised LMP and LMP Response if the majority of survey effort, particularly manual habitat searching in the Doolans, was undertaken by suitably qualified herpetologists. The LMP Response notes that Ms Anderson "and others" spent time undertaking opportunistic surveying in the project area, but no details are provided regarding how much time or the locations that were surveyed by suitably qualified herpetologists as opposed to other ecologists. As outlined in Section 5.3.3 of the previous memo, without information regarding the herpetological experience of the personnel (other than Ms Anderson) who undertook the manual searches, it is unclear as to whether their search effort is considered appropriate for the site and whether this should be counted towards the overall search effort.

6.5 Contingencies for additional species

Table 1 in the revised LMP lists *Oligosoma* aff. *inconspicuum* "Central – Southern" as having a moderate likelihood of presence within the earthworks footprint, but specific management and contingencies for this species are not included in the LMP, other than the Incidental Discovery Protocol (IDP). Clarity is sought from the applicant regarding the likelihood of this species, and further detail on lizard management is requested.

6.6 Survey effort

Section 2.2.2.1 of the revised LMP outlines an appropriate trapping effort in *Dracophyllum* scrub (250 trap days) and within and around the small area of rockfield habitat that could be suitable for geckos or Lakes skink (100 trap days). However, there is a lack of detail (i.e. person hours in appropriate weather conditions) regarding the exact hand-searching effort in the rockfield habitat to assess if the overall survey effort can be considered appropriate for detecting orange-spotted geckos within the earthworks footprint. In addition, no further comment has been provided addressing our concerns raised in the previous memo regarding the fragmented nature of the manual search effort and oversight/personnel who undertook manual searches. Therefore, we maintain the recommendation that further surveys targeting orange-spotted gecko are undertaken by suitably qualified herpetologists. Dependent on the implementation of this recommendation, we agree with the additional clarity provided in Section 2.2.2.1 of the revised LMP regarding overall lizard values not being a stand-out ecological feature of the LMP site.

6.7 Management of effects on lizards

6.7.1 Avoidance

As outlined in the previous memo, it remains unclear whether any opportunities for avoidance (NPS-IB, 2025 Section 1.6 (1) Interpretation – effects management hierarchy (a), Principle 3 DOC, 2019) of high-quality lizard habitats have been sufficiently assessed.

6.7.2 Minimisation

Lizard salvage

Justification for not undertaking lizard salvage has been added to Section 4.4.1 of the revised LMP. While it is agreed that the outcomes of salvages are often uncertain, on balance undertaking earthworks in areas where lizards are known to be present is likely to be more detrimental (i.e. result in more deaths and injuries to lizards) than relocating at least some proportion of the lizards present into appropriate habitat outside of impacted areas, even if no further management was taken at the release site. Therefore, releasing lizards at low densities into surrounding areas of known lizard habitat is less likely to lead to the death of lizards than not undertaking a lizard salvage. This approach is therefore unlikely to result in comparable significant adverse effects being caused to the resident lizard population. Additionally, McCann's skink are known to be able to persist at high densities in habitat with no predator control, and targeted mice control or control of larger predators as outlined in Section 4.4.1.2 of the revised LMP is not considered necessary for this species. Further, this reasoning is inconsistent with that used elsewhere in the documentation. For example, McCann's skink that are incidentally discovered through habitat reduction and site works (that are proposed to be released) are subject to the same ecological constraints. We agree with the assumption of the IDP for this project that relocating lizards outside of the earthworks footprint is preferable to leaving them in place, even though no further habitat enhancement is proposed for the release site. However, it is acknowledged the known certainty of impacts on resident and released lizards is low, due to the lack of studies that include both pre- and post-release monitoring of release sites. Therefore, outcome monitoring is recommended. This would provide more certainty regarding the success of the proposed lizard management (no lizard salvage, initial vegetation trimming, and relocation of lizards that are incidentally discovered during works). Outcome monitoring would provide valuable knowledge about the success of this form of lizard mitigation (which has no recent publications). For example, all references used regarding the success of lizard salvage as a mitigation tool in the revised LMP were ten years old and this indicates that further information, such as outcome monitoring is needed in this space.

Compensation does have the potential to provide wider benefits to New Zealand lizards, including species with higher threat statuses than the species known to be present on site, though this is likely at the expense of the individual lizards within the earthworks footprint if compensation is undertaken instead of lizard salvage (this is expanded on in Section 6.7.4).

However, if implemented successfully, habitat reduction (discussed below) could reduce direct effects to lizards in lieu of a salvage, but it would not be sufficient to reduce these impacts to a minor level, and compensation would be appropriate to address residual effects to lizards.

Habitat reduction

Minimisation (NPS-IB (Section 1.6 (1,b)) in the form of vegetation reduction has the potential to minimise the presence of lizards in earthworks footprints prior to earthworks. However, following the points raised in the previous memo, more detail is still required in Section 4.4.2 of the revised LMP to be able to assess the likelihood of success. The LMP should specify:

- The roles and responsibilities assigned to undertaking habitat reduction.
- The methods for habitat reduction and how these will be communicated.
- How cut vegetation will be managed.
- Detail regarding timing of each incremental reduction of vegetation for efficacy purposes.

Section 4.4.4 of the LMP suggests that there is potential for the habitat reduction methods to be impractical or too restrictive, and if so that additional compensation will be required instead of implementing the habitat reduction. Testing the methods to determine this prior to LMP implementation may help to confirm whether additional compensation is required at an early stage.

As raised in the previous memo, there is also no mention of how or if rocky habitat will be reduced in earthworks footprints, where present. Habitat reduction of rocky habitat should be considered, if feasible, as reducing habitat that could be suitable for geckos and Lakes skink (i.e. within the 0.01 hectares area of rockfield described in Section 2.2.2.1 of the revised LMP) or occasional loose rocks in areas of tussock grassland could lower the likelihood of lizards being impacted during earthworks. This may also provide an opportunity to capture some lizards that are incidentally detected during manual reduction (i.e. when removing rocks) that could be relocated as per the IDP. Relocated rocks could provide an opportunity to undertake habitat enhancement in surrounding areas.

Incidental Discovery Protocol

Section 4.5 of the revised LMP provides more detail regarding the process to be undertaken on the incidental discovery of lizards. The nature of the works involved suggests that incidental discoveries may be quite common (e.g. as no protective barriers are being installed between existing habitats and works footprints). Therefore, contingency should be provided in the case that the Project Herpetologist is uncontactable within a short timeframe (i.e. with 1–2 hours of discovery), as the IDP relies on a suitably qualified herpetologist for identification and further advice. It is also recommended that additional detail in the IDP is provided to give contractors clear and obvious instructions for all aspects of lizard capture and relocation (i.e. such as lizards to be placed in hard-sided containers while being transported to relocation site, and locations of suitable habitat where lizards can be released).

6.7.3 Remediation

Remediation (NPS-IB (Section 1.6 (1,c)) in the form of constructed rock piles and translocated snow tussocks is proposed in Section 4.4.5 of the revised LMP that is considered likely to create habitat for McCann's skink, if implemented successfully. However, there is a lack of detail around timing of remediation. While further plantings are proposed after two years if the plantings are insufficient to provide cover, there is a lack of detail regarding the methodology and the responsibility for the

monitoring of plantings and any plant maintenance and implementation of further plantings if required. The LMP also includes that the Project Herpetologist will inspect the rock piles following construction to provide advice regarding maximising rock pile function. However, there is a lack of detail regarding the timeframe and monitoring details, and any adaptive management actions or specific triggers around determining and ensuring the success of rock piles for lizard habitat remediation. For example, there is no inclusion of monitoring the colonisation of rock piles by lizards. Monitoring is key for determining success and informing future management (Principle 7 DOC, 2019).

6.7.4 Compensation

Consideration of effects management hierarchy

Overall, it is recommended that additional detail regarding management of effects on lizards is added as per the comments in Sections 6.7.1–6.7.3 of this report above, to provide more certainty around any potential opportunities for avoidance of adverse effects on lizards and how the success of minimisation and remediation will be ensured. This will provide more confidence that the effects management hierarchy has been appropriately followed to be consistent with the NPS-IB (Section 3.16 (1) (Implementation – Indigenous biodiversity outside SNAs)), prior to the consideration of compensation.

eDNA study proposal

Clarification is sought as to the following sentence in the LMP Response (Section 3.8) “As discussed above, the Project Herpetologist considers the effects management framework was not designed to provide a good outcome for lizards.”

The LMP Response (Section 3.8) does not provide sufficient reasoning for the eDNA proposal and how eDNA surveys will provide better long-term ecological benefits for cryptic alpine skinks and geckos. There is no evidence that development of this tool will lead to ecological benefits. There is also inherent uncertainty in whether the use of this tool to detect cryptic species is able to deliver ecological gains. It is considerd bad practice to trade quantifiable ecological value for ecological knowledge, the value of which is substantially more speculative. In addition, biodiversity compensation should not be applied where effects on indigenous biodiversity are uncertain, unknown or little understood (NPS-IB, 2025), as argued in the LMP Response. In addition, the proposal does not demonstrate how it meets the remaining principles of biodiversity compensation, such as additionality and time lags, as per Appendix 4 of the NPS-IB (2025).

Therefore, this proposal is not suitable as a method of compensating for the effects of the development. As per the NPS-IB, a financial contribution should only be considered if there is no effective option available for delivering biodiversity gains on the ground (which there is), and it directly funds an intended biodiversity gain that complies with the other principles of biodiversity compensation, which does not appear to be demonstrated.

Lakes skink translocation proposal

There is likely to be perceived ecological benefit of translocating Lakes skink into a predator-proof fenced sanctuary and the overall proposal scope and methods as outlined, if overseen by a suitably qualified herpetologist. However, there is no mention of monitoring of Lakes skink once translocation has taken place (either in the fenced sanctuary or of the source populations) or any associated contingencies if adverse outcomes are detected during monitoring. These are considered key aspects of translocation projects (DOC 2018 – Section 10. Post-release monitoring) and further detail should be added to address this.

The Lakes skink translocation proposal appropriately states that the applicant (NZSki) will fund all aspects of the translocation, and Section 4.7.3 of the revised LMP states that $20,000 is allocated to implementing the project. However, it is unclear if there are contingencies in place if project costs unexpectedly increase beyond the allocated funding (e.g. if additional trips to capture Lakes skink are required due to low capture rates). It is also not clear if this funding covers monitoring. Certainty should be provided to ensure that the translocation project will be successfully implemented in full.

Concerns regarding monitoring and funding certainty should be addressed appropriately to be consistent with the long-term outcomes principle for biodiversity compensation in the NPS-IB (Appendix 4: Principles for biodiversity compensation (6) Long-term outcomes). If these concerns are addressed, the addition of this proposal within the revised LMP provides more confidence that the LMP is consistent with the objective of the NPS-IB (Section 2.1 (1) (a) and (b) (iii) (Objective)) to maintain no overall loss in indigenous biodiversity, through the conservation of a 'Threatened – Nationally Vulnerable' species.

Contingency payment

As outlined in the previous memo, we still consider that there is a lack of detail regarding the additional $20,000 to be provided in the case of the mitigation in Sections 4.4.2 and 4.4.3 of the LMP not being implemented properly. This extra contingency is not considered appropriate as no detail is provided that is consistent with the NPS-IB compensation guidelines (Appendix 4, NPS-IB), other than Section 4.7.3 of the revised LMP noting that the additional funding will be added to the existing compensation package. More information is required detailing what this additional compensation will add to the proposed compensation projects. More detail is also required regarding how compliance will be determined for the mitigation in Sections 4.4.2 and 4.4.3 and the specific triggers for non-compliance to trigger the additional compensation funding.

7.0 Resource Consent Conditions and Biodiversity Compensation Package

7.1 Resolved issues

The section in the original lodged Resource Consent Conditions that referred to a Pest Control Plan (BIO.16-19) has been removed in the updated Resource Consent Conditions. This was an issue in the original conditions, as no Pest Control Plan was included elsewhere in the substantive application. The updated TEcIA and other terrestrial ecology documents do not include pest control as an effects management action, so there is no issue with this section being removed from the consent conditions.

7.2 Biodiversity compensation project

Section 4 of the updated Resource Consent Conditions, along with the Effects Management and Compensation Overview Addendum, provide detail on the updated Biodiversity Compensation Project. This project is the sole compensation action intended to deal with all residual effects identified in the updated TEcIA (except for lizard-related effects, which are compensated separately). The original Biodiversity Compensation Project required payment of $75,000 annually until 13.8 hectares of indigenous habitat was revegetated. The updated project now requires payments of $75,000 annually for the duration of the Doolans concession (adjusted for inflation each year), with the preference for the money to go towards predator control or indigenous revegetation planting. As in the original Resource Consent Conditions, no biodiversity accounting methodology or other form of modelling appears to have been used in order to quantify the benefit of the Biodiversity Compensation Project. While compensation does not aim for no-net-loss/net-gain outcomes with like-for-like biodiversity values, good practice compensation should still aim to deliver quantifiable benefits that incorporate

factors considered in offsetting models, such as time lag, and the likelihood of success (Maseyk *et al.* 2018). Revegetation and/or predator control projects in unspecified locations are very unlikely to be an adequate level of compensation for the large number of "Moderate" or higher residual effects identified in the updated TEcIA. While the cumulative amount of money put into the Biodiversity Compensation Project throughout the duration of the Doolans concession will be substantial, the fact that much of the ecological benefit will be delivered many years in the future means that there will be a substantial time lag between the negative ecological effects of the project and the benefits realised through the Biodiversity Compensation Project. Further, the conditions do not specify any level of ecological similarity or spatial proximity between the residual effects in the Doolans, and the benefits that are funded through the Biodiversity Compensation Project; theoretically, all of the money could be spent on lowland predator control in the North Island without breaching the conditions. A higher quality compensation outcome would be achieved if the conditions specify that the Biodiversity Compensation Project must focus on similar (albeit not like-for-like) ecosystems to those impacted, e.g. indigenous grasslands and wetlands in the Remarkables ED and/or adjacent EDs.

As per our original review of the Resource Consent Conditions, the conditions in BIO.7-12 which detail the development of a Biodiversity Compensation Project Plan are highly concerning. In order to provide a satisfactory review of the proposed compensation projection a plan should already be prepared. No review can be made at this stage regarding the feasibility or adequacy of the Biodiversity Compensation Project. Additionally, the Biodiversity Compensation Project Plan can be submitted as late as 18 months after the start of construction. This raises the serious risk that an insufficient plan will be submitted after irreversible ecological impacts have occurred. Condition BIO.10 gives the details that the Biodiversity Compensation Project Plan must specify. Notably absent from this condition are any requirements for the plan to actually show how the compensation will relate to and manage the residual effects identified in the updated TEcIA. Best practice would be for the conditions to require that the Biodiversity Compensation Project Plan explicitly tie back into the management of these residual effects. Currently, the condition only says that the plan must specify "The specific management and enhancement objectives for the Biodiversity Compensation Project". This means that even the objectives of the Biodiversity Compensation Project Plan may not be specified until 18 months after works have commenced on the ski field expansion.

Condition BIO.8 of the Biodiversity Compensation has been updated to add CODC as a party that will participate in the development and review of the biodiversity compensation plan. As CODC has now been added to that condition, the following condition (BIO.9) appears to be redundant, as BIO.9 details the requirement for CODC to be informed of feedback from the parties listed in BIO.9.

The Effects Management and Compensation Overview Addendum notes that the proposed compensation approach does not meet the principles of compensation in the NPS-IB and National Policy Statement for Freshwater Management (NPS-FM) and has not been informed by any modelling. The applicant's argument is that the project's overall benefits are large enough to outweigh the residual ecological effects. This argument is unsubstantiated.

7.2.1 Terrestrial ecology

The terrestrial ecology conditions in the updated Resource Consent Conditions are largely the same as when they were previously reviewed. The one piece of feedback previously provided is included below, with condition numbers updated as per the latest version of the conditions:

"[…] all appear to be appropriate, and make sense in relation the information in the lodged Terrestrial EcIA, TEMP, and LMP. One notable issue is that Condition ECO.2 (f)(ii) requires a methodology for the identification of the plant species set out in ECO.10. ECO.10 explains what species this applies to, pointing to Attachments B and C. Nowhere in these conditions and attachments is an identification methodology provided."

8.0 Other Documents

8.1 NPS-IB Objectives and Policies

The "Approvals Relating to the Resource Management Act" document includes Section 9.3.9, which assesses the proposed ski field expansion against the NPS-IB. Our feedback on the relevant policies is listed below:

- Policies 1 and 2 deal with the principles of the Treaty of Waitangi and the exercise of kaitiakitanga by tangata whenua; review of these topics is beyond the scope of this memo.

- Policy 3 requires the applicant to adopt a precautionary approach when considering adverse effects. For the most part, this has been followed in the TEcIA; the notable exception to this is the levels of effect assessed for vegetation loss. As discussed in Section 4.5, the use of the entire Ecological District as a baseline downplays the magnitude of effect from vegetation loss.

- Policy 4 requires ecological management to promote resilience to climate change. The applicant mentions that the project has considered potential climate-related impacts, and will improve long-term resilience. We disagree with this; consideration of climate change impacts on terrestrial ecology was not evident in any of the lodged documents reviewed. There does do not appear to be any consideration of future climate risks when assessing ecological effects and outlining the management approach for these effects. In addition, it is unlikely that the project will improve the long-term climate change resilience of the terrestrial ecological values on-site; instead, the many negative ecological impacts described in the TEcIA mean that a reduction in long-term climate change resilience is likely.

- Policy 5 requires biodiversity to be managed in an integrated way (including across regional councils). This policy has been to be adhered to by the applicant.

- Policies 6 deals with ecological significance. The applicant has correctly identified that the project area in the Doolans sits within mapped SNAs. Additionally, they correctly identify that all vegetation types present in the Doolans meet the NPS-IB criteria for ecological significance.

- Policy 7 requires effects management to protect ecologically significant vegetation and fauna habitats. The applicant has accurately represented the relevant residual effects idented in Table 18 of the TEcIA, although the omissions form that table are also absent from the applicant's discussion of Policy 7 (see Table 1 of this memo). The applicant acknowledges that the proposed Doolan expansion does not achieve stringent adherence to Policy 7. This is true, as it has numerous negative ecological effects, and does not demonstrate a net-gain or no-net-loss ecological outcome. The applicant does however characterise the project as aligning with Policy 7 "broadly", and claims that the principles of compensation will broadly be adhered to in the design of the biodiversity compensation project. We do not agree with this, for the reasons described in section 7.2 of this memo.

- Policies 8 and 15 apply to indigenous biodiversity outside of SNAs. These policies are not relevant to the ecological effects occurring in the Doolans.

- Policies 13 and 14 promote indigenous restoration and revegetation. The applicants' assessment does not discuss these policies in relation to the effects in the Doolans, however as the project proposes extensive revegetation and transplanting wherever possible, it is likely to align with these policies.

- Policy 10 deals with social, economic, cultural, and environmental wellbeing. The first three of these are outside the scope of this memo. To the extent that terrestrial ecological fall within environmental wellbeing, this project is unlikely to align with Policy 10, as it does not demonstrate a no-net-loss or net-gain for terrestrial ecological values.

- Policy 17 requires improved monitoring of indigenous biodiversity. In theory, the ecological monitoring laid out in the TEMP and consent conditions should mean that this project aligns with Policy 17. As noted in Section 5.0 however, the inconsistencies in the TEMP mean that monitoring and reporting may not be implemented in a consistent or effective manner.

  The applicant summarises that, overall, the project is generally consistent with the policies of the NPS-IB; this is justified by pointing to the proposed compensation. As discussed above and in Section 7.2, we do not consider that the proposed compensation is of suitable quality to manage the numerous residual effects associated with this project.

9.0 Conclusions

Many of the issues originally identified in the draft TEcIA have now been adequately resolved, and the updated TEcIA generally gives a highly detailed account of the terrestrial ecological values present. The most significant point of ongoing disagreement regarding the TEcIA is the way in which magnitudes of effect for vegetation loss have been assessed at the ED scale and informed by a ML vegetation mapping model.

The TEMP, which has not been updated, contains substantial detail on effects management, monitoring, and reporting across a wide range of biodiversity values. The TEMP includes several large charts and tables, which, despite covering related issues, display many inconsistencies and lack clear alignment.

The biggest terrestrial ecological concern for this project (excluding lizard-related effects) is the adequacy of the proposed compensation package. The updated TEcIA identifies a large number of “Moderate” or higher residual effects across a wide range of different biodiversity values, and the proposed Biodiversity Compensation Project does not represent a high-quality approach to compensating these residual effects, and the amount of money put towards compensation has not been substantiated.

Overall, further detail in the LMP is required to ensure potential effects have been appropriately managed. Appropriate justification has been provided for the proposed effects management (with the exception of part of the compensation package). The survey effort was extensive, but the herpetological experience of ecologists who undertook the survey is unclear and may have been ineffective at targeting cryptic species. Therefore, the likelihood of other species being present remains unclear. More input needs to be made to provide details regarding effects management and how no-net-loss will be achieved for indigenous lizards at this site.

Across all the reviewed documents, there are remaining issues regarding the adequacy and level of justification provided for the proposed management actions (especially regarding several of the compensation projects). In addition, while in general the documents have a high level of detail and are based on a substantial field survey effort, some of the documents contain inconsistencies or are missing key information that make it difficult to draw conclusions regarding the adequacy of the reporting.

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